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August 4, 2003

MEMORANDUM

TO: Fish and Wildlife Committee Members

FROM: Bruce Suzumoto

SUBJECT: Artificial Production Review and Evaluation (APRE) update

Staff will update the Committee on the progress of the APRE process and present the latest products and documents. Attached are examples of a draft APRE program report and a draft HGMP report. It is anticipated that the final draft of the basinwide APRE report will be completed by the end of August. Staff will also discuss future implementation issues pertaining to the APRE and regional hatchery reform.

w:\bs\2003\council meetings\081203\apre update \apre memo 080403.doc

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348

Telephone: 503-222-5161
Toll free: 800-452-5161

Fax: 503-820-2370
Web site: www.nwcouncil.org

APRE Summary

Program name:	Spring Chinook
Subbasin:	Klickitat
ESA status:	Not listed and not a candidate for listing

Operational facilities involved:		
Operators	**Co-operators**	**Role**
	Yakama Tribe	Technician
Funding Source(s)	Mitchell Act	
Annual Operating Cost*	$ 189000	

*Annual Operating Cost is reflected in dollars. The origin of this value is not consistent among programs, as it may reflect total facility costs or multiple programs for a given species.

The purpose of this program is to contribute to
Harvest
Conservation/recovery

Comments:
nc nc nc

as mitigation for
Hydro impacts

Comments:
nc nc nc

for Spring Chinook.

This is an integrated **program.**

Program description:

Age Class	Maximum Number	Size (fpp)	Release Date	Location			
				Stream	Release Point (RKm)	Major Watershed	Ecoprovince
Eggs	nya	nya	nya	nya	nya	nya	nya
Unfed Fry	nya	nya	nya	nya	nya	nya	nya
Fry	nya	nya	nya	nya	nya	nya	nya
Fingerling	200000	60	nya	Klickitat	68+	Klickitat	Columbia Gorge
Yearling	600000	7	03/01/02	Klickitat	68	Klickitat	Columbia Gorge

Comment:
Spring yearlings on station release.

Broodstock source	Klickitat
Broodstock collection location	

(stream, RKm, subbasin)	Klickitat, 68, Klickitat
Adult holding location (stream, RKm, subbasin)	Klickitat, 68, Klickitat
Spawning location (stream, RKm, subbasin)	Klickitat, 68, Klickitat
Incubation location (facility name, stream, RKm, subbasin)	Klickitat, 68, Klickitat
Rearing location (facility name, stream, RKm, subbasin)	Klickitat, 68, Klickitat

Comment:
text from HGMP Klickitat Spring Chinook production program:

With the exception of some fingerling releases, all activity from broodstock capture through release take place at the Klickitat Hatchery, river mile 42.5 (WRIA 30), Washington. Fingerling releases take place most years in the spring in the upper watershed at approximately river mile 70 (WRIA 30).

GIS coordinates for Klickitat Hatchery X=121.182, Y=46.041

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Klickitat Spring Chinook	H	1995	2002
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya

Comment:
text from HGMP Klickitat Spring Chinook Production Program:

Broodstock used in the supplementation program since 1988 originated from adults returning to the Klickitat Hatchery trap. No other source of broodstock has been used since that time.

Status and goals for target stock:

☒ = Low ☒ = Medium ☒ = High

	Now	10-15 years	30-50 years
Biological Significance	☐	☐	☐
Viability	☐	☐	☐

Habitat			

Hatchery program performance indicators for the target stock:			
Recruits per Spawner	**Smolt-to-Adult Survival**	**Escapement and Hatchery Spawning**	**Total Catch**

Consistency of hatchery program with the goals for the target stock:

Statement from reviewer about whether hatchery operations are consistent with goals.

Guidelines for improving key operational elements to increase the likelihood of meeting goals for the target stock :

Broodstock Collection

- Sufficient broodstock should be collected to maintain an effective population size of 1000 fish per generation.
- "Representative samples of natural and hatchery population components should be collected with respect to size, age, sex ratio, run and spawn timing, and other traits important to long-term fitness. "
- 10% or more of the broodstock should be derived from wild fish each year.

Adult Holding

- Hatchery intake screening for the adult holding supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Incubation

- "The water used for incubation should meet or exceed the recommended Integrated Hatchery Operations Team (IHOT) water quality standards for the following compounds: ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc. "
- Hatchery intake screening for the incubation water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.

Rearing

- "The water used for rearing should meet or exceed the recommended Integrated Hatchery Operations Team (IHOT) water quality standards for the following compounds: ammonia, carbon dioxide, chlorine, pH, copper, dissolved oxygen, hydrogen sulfide, dissolved nitrogen, iron, and zinc. "
- Juvenile rearing density and loading guidelines used at the facility should be based on life-stage specific survival studies conducted on-site.
- Hatchery intake screening for the rearing water supply should comply with Integrated Hatchery Operations Team (IHOT) and National Marine Fisheries Service facility standards.
- The water used for rearing should provide natural water temperature profiles that result in fish similar in size to naturally produced fish of the same species.
- The program should attempt to better mimic the natural stream environment by rearing under natural water temperature profiles.
- The program should use a diet and growth regime that mimics natural seasonal growth patterns.
- IHOT juvenile rearing standards should be followed for alarm systems.
- IHOT juvenile rearing standards should be followed for predator control measures to provide the necessary security for the cultured stock.

Release

- Fish produced should be qualitatively similar to natural fish in growth rate.
- Marking/tagging techniques should be used to distinguish between the hatchery and natural populations.
- Fish produced should be qualitatively similar to natural fish in physiological status.
- Volitional releases during natural out-migration timing should be practiced.
- Fish should be released at an optimum time and size that has been determined by a site-specific survival study.
- Fish produced should be qualitatively similar to natural fish in size.
- Fish should be released at sizes and life history stages similar to those of natural fish of the same species.
- Fish produced should be qualitatively similar to natural fish in behavior.

M&E

- Results of program evaluation should be reported/documented so that they can be taken into consideration when determining whether hatchery operations should be changed.

These recommendations represent an opportunity to improve key operational elements for this type of program. Detailed information on the benefits and risks of all operational phases as they affect the outcome of this program are available in *APRE Report for Spring Chinook in the Klickitat*

Consistency of hatchery program with goals for other stocks:

Hatchery fish may affect other stocks in several ways. Naturally spawning populations may be subject to genetic interactions through interbreeding. Ecological interactions through predation and competition may occur between the hatchery population and other populations, and natural populations may be incidentally harvested in fisheries targeting a more abundant hatchery stock. Abundant hatchery stocks may also mask the status of natural populations. Conversely an increase in the number of artificially produced fish may improve the ecological function of a watershed through their contribution of marine derived nutrients.

A number of factors are known to affect the likelihood and severity of such interactions, among them the abundance of the hatchery population relative to other populations; the time, size and life stage at which hatchery fish are released; and the quantity and quality of habitat available to the co-mingled stocks. The table below lists the current status of some of the populations in the subbasin where the hatchery fish are released that might be vulnerable to these interactions.

Stock Name	ESA Listing	Viability	Biological Significance
Summer Chinook-Natural	Not listed and not a candidate for listing	L	H
Summer Steelhead-Natural	Threatened	L	H
Winter Steelhead-Natural	Threatened	L	H

Additional reviewer comments:

Trends in the program that should be highlighted.

Manager/operator response reviewer comments:

Text that will be added by manager/operator.

HATCHERY AND GENETIC MANAGEMEI PLAN (HGMP)

Hatchery Program	Warm Springs National Fish Hatchery
Species or Hatchery Stock	Warm Springs River Spring Chinook Salmon
Agency/Operator	USFWS
Watershed and Region	Deschutes River
Date Submitted	nya
Date Last Updated	nya

Section 1: General Program Description

1.1 Name of hatchery or program.

1 Warm Springs National Fish Hatchery

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

1 Warm Springs River Spring Chinook Salmon

9 ESA Status: Not listed and not a candidate for listing

1.3 Responsible organization and individuals.

3

Name (and title): Michael L. Paiya
Project Leader
Agency or Tribe: USFWS - Warm Spring NFH
Address: PO Box 790 Warm Springs, OR 97761
Telephone: (541) 553-1692

Fax: (541) 553-1551
Email: mike_paiya@fws.gov

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

	Co-operators	Role
4	Confederated Tribes of the Warm Springs Reservation of Oregon	Fisheries Co-manager
	USFWS	Hatchery Operator, Fisheries Co-manager
	ODFW	Fisheries Co-manager
	nya	nya

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

	Funding Sources
	USFWS
	nya
	nya
5	nya
	nya
	nya
	nya

	Operational Information	Number
6	Full time equivalent staff	6
	Annual operating cost (dollars)	538000

Comments:

text from HGMP 10 October 2002:

The Warm Springs NFH is fully funded by the USFWS. The hatchery has a staff of six full time e and has an annual operating budget of $538,000.

nc

Data source:

nds
nds

1.5 Location(s) of hatchery and associated facilities.

Broodstock source	Warm Springs NFH
Broodstock collection location (stream, RKm, subbasin)	at Hatchery RKm 16
Adult holding location (stream, RKm, subbasin)	Warm Springs NFH
Spawning location (stream, RKm, subbasin)	Warm Springs NFH
Incubation location (facility name, stream, RKm, subbasin)	Warm Springs NFH
Rearing location (facility name, stream, RKm, subbasin)	Warm Springs NFH

2

Comments:

text from HGMP 10 October 2002:

Warm Springs National Fish Hatchery is located at Rkm 16 of the Warm Springs River, within t
Springs Indian Reservation. The Warm Spring River enters the Deschutes River at Rkm 135, wl
enters the Columbia River at Rkm 329. The hatchery site lies in Section 24, Township 8 South,
East, Willamette Meridian, Oregon. Shitike Creek enters the Deschutes River at Rkm 174 after
approximately 61 km from its headwaters near Mt. Jefferson.

Data source:

nds

1.6 Type of program.

8 Integrated

Comments:

nc

Data source:

nds

1.7 Purpose (Goal) of program.

9 The purpose of this hatchery program is to provide harvest , to contribute to conservation/recov
research and education.

10 the purpose of the program is mitigation for ** NO STATEMENT PROVIDED FOR THIS CH

Comments:

text from HGMP 10 October 2002:

The goals of the Warm Springs National Fish Hatchery (NFH) spring Chinook program are as f

1.) Augment wild fish runs in the Warm Springs River in order to provide a sustainable harvest hatchery spring Chinook salmon for the CTWSRO.

2.) Restore spring Chinook salmon populations in Shitike Creek.

3.) Research techniques for integrating wild and hatchery fish in a way that maintains the biolo genetic characteristics of fish populations in both the hatchery and stream environments.

Honor Federal governemental responsibility to the Warm Springs Tribe as per treaty

Data source:

nds
nds

1.8 Justification for the program.

- Hatchery fish accessible to fisheries because the fish produced are differentially marked t selective harvest.
- Hatchery fish accessible to fisheries because the fish produced are available in sufficient the fisheries (location, time, gear) that are intended to benefit from the program (i.e. to m harvest goals).

138

Comments:

Honor Federal governemental responsibility to the Warm Springs Tribe as per treaty

text from HGMP 10 October 2002:

In 1959, the USFWS, responding to a request by the CTWSRO, began investigating salmon an enhancement possibilities on Warm Springs Reservation waters. In 1966 Congress authorized t construction of Warm Springs National Fish Hatchery (NFH) in order to enhance anadromous f Reservation waters and meet the future needs of the resource as well as those of the Tribe. Full at the hatchery began in 1978. The USFWS and the CTWSRO have cooperatively managed the Springs NFH in a manner that will provide harvest opportunities for hatchery spring Chinook s while protecting wild fish populations in the subbasin.
nc

nc
nc

Data source:

nds
nds
nds
nds
nds

1.9 List of program "Performance Standards".

The program adheres to the following fish culture guideline(s) and standard(s):
IHOT
PNFHPC
11 tribal
federal
other

Comments:

Hatchery Specific Developed Guidelines

Data source:

Warm Springs National Fish Hatchery Operational Plan and Implementation Plan 2002-2006

1.10 List of program "Performance Indicators", designated by "benefits" and "risks".

Indicators of Harvest Benefits

Indicator	Performance Standard	Indicator is Monit
Spawner to spawner survival of hatchery fish	nya	nya
Contribution of hatchery fish to target fisheries	1620	Y
Angler success (hatchery fish per angler day) in target recreational fisheries	nya	nya
Contribution of hatchery fish to cultural needs	630	Y
Selective harvest success (expected benefits of mass marking)	nya	nya

139

Indicators of Conservation Benefits

Indicator	Performance Standard	Indicator is Monit
Genetic and life history diversity (over	No Change	No Change

	time)		
	Spawner to spawner reproductive success of hatchery fish	nya	nya
	Reproductive success of the receiving (supplemented) naturally spawning population	nya	nya
141	Contribution to the abundance of the naturally spawning population	1,300 wild spawners	Y
	Time and location of spawning	No change From Historic	Y
	Contribution to ecosystem function (e.g. through nutrient enhancement, food web effects, etc.)	nya	nya

Indicators of Harvest Risks

	Indicator	Performance Standard	Indicator is Monit
	Harvest impacts on co-mingled stocks	nya	nya
140	Bias in run size estimation of natural stocks due to masking effect	nya	nya
	Lack of harvest access (under harvest due e.g. to co-mingling with weaker stocks)	nya	nya

Indicators of Conservation Risks

	Indicator	Performance Standard	Indicator is Monit
	Unintended contribution of hatchery fish to natural spawning (through straying)	nya	nya
	Loss of genetic and life history diversity	No Change	Y
	Loss of reproductive success	nya	nya
142	Ecological interactions through competition with natural stocks (by life stage)	nya	nya
	Ecological interactions through predation on natural stocks (by life stage)	nya	nya
	Adverse effects of hatchery operations and facilities on fish migration Disease transfers	nya	nya

The following plans and methods are proposed to collect data for each Performance Indicator: 1 subsample of wild and hatchery fish are biosampled in order to collect length, age, sex, and cod information for adult fish. The USFWS operates a fish barrier dam and adult fish ladder adjacer hatchery on the Warm Springs River. Approximately 10% of the wild run and 40% of the hatch sampled at the hatchery. The CTWSRO operates a migrant traps downstream of the hatchery or Springs River and near the mouth of Shitike Creek that monitor juvenile outmigration timing of hatchery fish.

Run timing of wild spring Chinook salmon is monitored at the hatchery fish ladder. Broodstock hatchery program are collected based on historical run timing averages of the wild run.

Creel surveys conducted by the CTWSRO and the Oregon Department of Fish and Wildlife (OI coded-wire tag recoveries, and hatchery returns are used to estimate the contribution of Warm S NFH spring Chinook salmon to various fisheries.

Adults are selected for outplanting in Shitike Creek at spawn time in the hatchery. Redd surveys telemetry, genetic surveys, and juvenile monitoring will be used to evaluate the contribution of Spring NFH spring Chinook salmon to natural production in Shitike Creek.

Specialists from the Lower Columbia River Fish Health Center (LCRFHC) will inspect adult br yearly and monitor juvenile fish on a monthly basis to assess health and detect potential disease As necessary, the LCRFHC will recommend remedial or preventative measures to prevent or tre with administration of therapeutic and prophylactic treatments as deemed necessary.

144 Three to six weeks prior to release or transfer, 60 fish from each lot will be given a health exam health specialists from the LCRFHC. All juvenile fish at the hatchery are externally marked and wire tagged (CWT) prior to release. Juvenile fish are sampled by the USFWS for mark quality a retention prior to release. The tag retention goal at release is a minimum of 95%.

Smolt to adult survival rates are estimated for each brood year. Creel surveys conducted by CTV ODFW sample fish caught in fisheries in the Deschutes River. A subsample of hatchery spring C salmon returning to the hatchery are biosampled. Coded-wire tag recoveries are used to estimate structure of returning fish.

Wild spring Chinook salmon abundance is monitored as fish pass through the fish ladder at Wai NFH. The CTWSRO and USFWS will conduct redd surveys in order to estimate spawning abu

During the steelhead migration period all fish are sorted by hand. All hatchery steelhead, identi having missing or deformed fins, are killed at the hatchery and distributed to the CTWSRO. All steelhead are passed upstream. The disposition of each fish handled is recorded in fish removal files maintained by the USFWS Columbia River Fisheries Program Office.

Fish passed upstream are monitored either manually or through a video-monitor system.

All carcasses are screened by the fish health center for disease prior to being outplanted into the
Carcasses are treated (by evisceration and heat-baking) to prevent potential disease transmissior

Monitoring programs will be incorporated into project designs. Examples of project designs inc
studies, rearing density studies, and rearing environment projects.

Effectively communicate with other salmon producers, managers, and the public in the Columb
Basin.

Environmental monitoring of total suspended solids, settleable solids, in-hatchery water tempera
hatchery dissolved oxygen, nitrogen, ammonia, and pH is conducted annually at the hatchery.

Trapping efficiency is evaluated on a regular basis. During efficiency testing upstream bound fi
held overnight and then manually examined for fin clips and the presence of coded-wire tags. V
monitoring is used to estimate wild fish passage above the hatchery.

The CTWSRO and USFWS formulate a pre-season run prediction for Warm Springs River stoc
returning to the Deschutes River. The CTWSRO and ODFW co-manage and monitor the fishery
to ensure that impacts to wild fish are minimized.

A juvenile trap located downstream of Warm Springs NFH monitors the outmigration of hatche
fish. Juvenile releases may also be monitored using radio telemetry, PIT tagging, snorkeling, tra
other techniques.

Coded-wire tag recoveries throughout the Columbia basin are recorded and summarized in orde
estimate the amount of straying of Warm Springs NFH spring Chinook salmon.

Screens are monitored by hatchery personnel on a regular basis.

Juvenile fish health is monitored on at least a monthly basis at the hatchery in order to detect po
disease problems. A fish health specialist will examine affected fish and make recommendation
remedial or preventative measures. Therapeutic and prophylactic treatments will be administere
consultation with the fish health specialist and in accordance with USFWS and the Integrated H

Operation Team?s policies. Wild fish used in the broodstock are checked for disease. Wild fish the stream are periodically checked, as identified in the hatchery operations plan.

143 The program contributes to information gain in the following way(s): Hatchery program contrib research to improve performance and cost effectiveness
New information affects change to the hatchery program through a structured adaptive decision process
Hatchery program participates in basin wide-coordinated research efforts
Hatchery program actively contributes to public education
Funding for monitoring of performance indicators is adequate

Comments:

Contribution of Hatchery fish to target fisheries is for in Deschutes River harvest only

nc
nc
nc
nc
nc

Data source:

nds
nds
nds
nds
nds
Draft HGMP

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

198 nya

Data source:

nds

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

					Location		
Age Class	Maximum Number	Size (ffp)	Release Date	Stream	Release Point (RKm)	Major Watershed	Ecopro

	Eggs	0	nya	nya	nya	nya	nya	nya
	Unfed Fry	0	nya	nya	nya	nya	nya	nya
1	Fry	0	nya	nya	nya	nya	nya	nya
	Fingerling	75000	6-22	Oct - Nov	Warm Springs	16	Deschutes River	Columl Plateau
	Yearling	750000	9-22	Mar - Apr	Warm Springs	16	Deschutes River	Columl Plateau

Comments:

nc

Data source:

nds

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

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	6	1767	0	5	1390
1991	9	816	0	1	634
1992	137	973	0	89	766
1993	126	534	0	4	308
1994	15	435	0	0	62
1995	nya	235	0	2	289
1996	nya	1245	0	42	734
1997	nya	867	113	3	922
1998	nya	271	21	0	624
1999	nya	492	32	2	2676
2000	nya	2630	285	73	6300
2001	nya	2193	303	59	4163

33

Comments:

nc

Data source:

Draft HGMP

Status and Goals of Stocks and Habitats

	NoRs		HoRs		Combined (HoRs + NoRs)	
Brood Year	Smolt to Adult Survival(%)	Recruits per Spawner	Smolt to Adult Survival(%)	Recruits per Spawner	Smolt to Adult Survival(%)	Recruits per Spawner
Goal	nya	nya	nya	nya	nya	nya
1988	1.78	2.65	0.1825	1.79	nya	nya
1989	0.69	0.82	0.0201	0.21	nya	nya
1990	0.40	0.52	0.0049	0.04	nya	nya
1991	0.37	0.28	0.0167	0.22	nya	nya
1992	2.57	4.11	0.1582	1.58	nya	nya
1993	2.68	3.55	0.2678	4.10	nya	nya
1994	0.46	0.99	0.1436	1.94	nya	nya
1995	12.95	4.54	0.4120	7.30	nya	nya
1996	2.27	6.09	0.5889	14.35	nya	nya
1997	nya	nya	0.2407	nya	nya	nya
1998	nya	nya	0.0558	nya	nya	nya
1999	nya	nya	nya	nya	nya	nya

34

Comments:

Limited data for HoRs SAR from CWT missing production groups for Warm Springs NFH fish in the Warm Springs River; 1996-1999 incomplete data

Data source:

Annual Coded Wire Tag Program Missing Production Groups (USFWS), 1997 NOR and HOR Draft HGMP.

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

7 The first year of operation for this hatchery was 1979 .

Comments:

text from HGMP 10 October 2002:

Full production at Warm Springs NFH began in 1978.

Data source:

nds

1.14 Expected duration of program.

148 The final year of the program is undetermined.

149 The program is on-going with no planned termination.

Comments:

nc
nc

Data source:

nds
nds

1.15 Watersheds targeted by program.

1 Deschutes River

1.16 Indicate alternative actions considered for attaining program goals, and reasons why those actio being proposed.

The hatchery program is a part of a strategy to meet conservation and/or harvest goals for the ta The tables below indicate what the short- and long-term goals are for the stock in terms of stock (biological significance and viability), habitat and harvest. The letters in the table indicate High, or Low levels for the respective attributes. Changes in these levels from current status indicate e outcomes for the hatchery program and other strategies (including habitat protection and restora

18

	Biological Significance	Viability	Habitat
Current Status	H	H	M
Short-term Goal	M	H	M
Long-term Goal	L	H	H

This table shows current status and goals for harvest opportunity. **H** implies harvest opportunity year, **M** opportunity most years, **L** some years, and **N** no opportunity.

			Location of Fishery			
	Fishery type		Marine	L. Columbia	Zone 6	U. Columbia	Subba
		Current Status	N	N	H	nya	nya
19	Commercial	Short-term Goal	N	N	H	nya	nya
20		Long-term Goal	N	M	H	nya	nya
21		Current Status	nya	nya	H	nya	M
22	Ceremonial	Short-term Goal	nya	nya	H	nya	H
23		Long-term Goal	nya	nya	H	nya	H
		Current Status	nya	nya	H	nya	M
	Subsistence	Short-term Goal	nya	nya	H	nya	H
		Long-term Goal	nya	nya	H	nya	H

	Current Status	N	N	nya	nya	M
Recreational	Short-term Goal	N	L	nya	nya	H
	Long-term Goal	N	L	nya	nya	H
	Current Status	nya	nya	nya	nya	M
Catch and Release	Short-term Goal	nya	nya	nya	nya	M
	Long-term Goal	nya	nya	nya	nya	M

Comments:

nc
nc
nc
nc
double check marine short-term and long-term

all hatchery spch (WS and RB) are marked.

Data source:

nds
nds
nds
nds
nds
see ODFW

Section 2: Program Effects on ESA-Listed Salmonid Populations

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

150 The program has the following permits or authorizations: 401 certification
.

Comments:

Section 7 in progress

text from HGMP 10 October 2002:

NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin 1999.

Data source:

nds

2.2.1 Descriptions, status and projected take actions and levels for ESA-listed natural populations in t area.

Listed populations that may be incidentally affected by the spring Chinook salmon program incl species utilizing habitat in the Warm Springs River, Shitike Creek, Deschutes River, and the Co River downstream of the confluence of the Deschutes River. Of particular concern to the Warm NFH is the population of threatened summer steelhead (Oncorhynchus mykiss). Summer steelhe Warm Springs River and the Deschutes River subbasin, a component of the Middle Columbia R Evolutionary Significant Unit, were listed as a threatened species by the National Marine Fisher in 1999. The life history characteristics of Warm Springs River summer steelhead are typical of Columbia steelhead. Adult steelhead migrate from the ocean, up the Columbia River, and begin the Deschutes River in June. Most adults destined to spawn in the Warm Springs River overwin mainstem of the Deschutes River and begin their spawning migration by entering the Warm Spr in mid-February. The peak migration past Warm Springs NFH typically occurs in mid-April and completed by late May (CRiS Database 7/11/02.). Steelhead may begin spawning soon after the Warm Springs River, with spawning taking place from late February to early June. Spawning in Springs River subbasin primarily occurs in the upper sections of the river above Warm Springs in tributaries such as Mill Creek, Beaver Creek, and Badger Creek (Cates 1992).

145 Depending on the time of spawning and water temperatures, fry emerge from the gravel in sprin summer. Juvenile steelhead in the Warm Springs River exhibit two life history strategies. Some steelhead rear in the Warm Springs River for one to three years until they begin the smolting pro migrate to the ocean. Another component of the juvenile population migrates out of the Warm S River as presmolts and continues to rear in the Deschutes River for one to three years before sm migrating to the ocean. The outmigration of juvenile steelhead from the Warm Springs River oc the higher spring flows, typically from March through June. A smaller outmigration of primaril juvenile steelhead occurs in the fall (Cates 1992).

Shitike Creek, a tributary of the Deschutes River located on the Warm Springs Reservation, also population of summer steelhead. The life history characteristics of steelhead in Shitike Creek ar to be similar to those in the Warms Springs River, with adult steelhead entering Shitike Creek in spring and spawning taking place shortly after entrance into the creek. The primary spawning ar Shitike Creek is thought to be below Peters Pasture (RM 25). Juvenile steelhead rear in the lowe of the creek or emigrate to the Deschutes River for rearing. The CTWSRO operates an adult we rotary screw trap near the mouth of Shitike Creek in order to gather life history information on s bull trout, and spring Chinook salmon. Steelhead redd surveys are also conducted by CTWSRO late April or early May.

nya

Listed stocks may be directly affected by nya.

The following ESA listed natural salmonid populations occur in the subbasin where the progran released:

ESA listed stock	Viability	Habitat
Steelhead-Integrated	M	M
Bull Trout- Natural	M	M

H, M and L refer to high, medium and low ratings, low implying critical and high healthy.

Comments:

nc
nc
nc
nc

Data source:

Draft HGMP
nds
nds
nc

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

nya

Most recent available spawning escapement estimates are shown in the table below:

Steelhead-Integrated

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	2773	3700	nya	0	424
1991	2651	4900	nya	0	312
1992	2183	900	nya	0	290
1993	1865	1500	nya	0	322
1994	1604	500	nya	0	199
1995	2643	1662	nya	0	325
1996	4466	3458	nya	0	279
1997	4269	1820	nya	0	273
1998	1363	3800	nya	0	326

1999	3095	4790	nya	0	274
2000	2667	8985	nya	0	227
2001	5837	8749	nya	0	268

Bull Trout- Natural

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya
1992	nya	nya	nya	nya	nya
1993	nya	nya	nya	nya	nya
1994	nya	nya	nya	nya	nya
1995	nya	nya	nya	nya	nya
1996	nya	nya	nya	nya	nya
1997	nya	nya	nya	nya	nya
1998	nya	nya	nya	nya	nya
1999	nya	nya	nya	nya	nya
2000	nya	nya	nya	nya	nya
2001	nya	nya	nya	nya	nya

Comments:

nc
nc
nc

Data source:

nds
nds
Draft HGMP

2.2.3 Describe hatchery activities, including associated monitoring and evaluation and research progr may lead to the take of listed fish in the target area, and provide estimated annual levels of take.

Warm Springs Spring Chinook- Integrated

ESU/Population	Stehad
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Fall Chinook - Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Steelhead-Integrated

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Red Band Rainbow Trout- Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Bull Trout- Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya

Hatchery Program Operator nya

Round Butte Spring Chinook - Hatchery

ESU/Population nya

Activity nya

Location of hatchery activity nya

Dates of activity nya

Hatchery Program Operator nya

Red Band Rainbow Trout (Oaks Springs)-Hatchery

ESU/Population nya

Activity nya

Location of hatchery activity nya

Dates of activity nya

Hatchery Program Operator nya

151

Kokanee- Hatchery

ESU/Population nya

Activity nya

Location of hatchery activity nya

Dates of activity nya

Hatchery Program Operator nya

Brown Trout

ESU/Population nya

Activity nya

Location of hatchery activity nya

Dates of activity nya

Hatchery Program Operator nya

Kokanee-Lake Billy Chinook

ESU/Population nya

Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Brook Trout

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Cranebows- Integrated

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Rainbow Trout Stock 53

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

154 nya

Comments:

nc
text from HGMP 10 October 2002:

Incidental take of summer steelhead could occur through activities associated with the Warm Sp

adult collection facility. A fish barrier dam, adjacent to the hatchery, blocks upstream passage o and directs them into a fish ladder located at the hatchery. Upon entering the fish ladder, fish ar directed into holding ponds or passed upstream above the barrier dam. An automated fish passa is used during the spring Chinook salmon migration period, generally from May through the en September. The automated passage system is designed to minimize handling of wild fish by pas separating returning hatchery spring Chinook salmon, identified by the presence of coded-wire wild fish. The passage system uses a 15-foot long denil steeppass fishway with a coded-wire ta detector and gate. As fish swim through the fishway and tube detector, coded-wire tagged fish a and a gate opens that shunts them into a holding pond. Non coded-wire tagged fish do not trigg and are able to continue migrating up through the fish ladder and upstream of the barrier dam. A system records non-coded wire tagged fish as they pass upstream of the hatchery. The video sy hatchery personnel to monitor the number, species, and origin of fish passing upstream. During of the automated passage system wild fish are not handled by hatchery personnel, thereby reduc potential take of listed species. Migration delays as fish find their way into the fish ladder and t passage system, rejection of the fish ladder resulting in displaced spawning, and injuries suffere try to jump the barrier dam are potential incidental takes associated with the barrier dam. The a of incidental take associated with the barrier dam is unknown at this time. Based on observation hatchery personnel of fish movements through the barrier dam and passage system, the level of assumed to be low (Mike Paiya, USFWS Warm Springs NFH, pers. comm..).

The automated passage system is only used during the spring Chinook salmon migration period from April 15 to September 30. The proper functioning of the passage system relies on 100% c tagging of hatchery fish, with all non coded-wire tagged fish passed upstream. All spring Chino juveniles released from Warm Springs NFH are coded-wire tagged (the tag retention goal is 95% hatchery fish from hatcheries outside the subbasin may not be coded-wire tagged. The Warm Sp River, and the Deschutes River subbasin in general, has a high incidence of stray hatchery steel (Olson and Pastor 1998). In order to preserve the genetic integrity of wild steelhead in the War River, it is the policy of Warm Springs NFH to pass only wild (unmarked) steelhead above the l dam. In order to accomplish this goal, the automated fish passage system is not used until the st migration has ended, usually sometime in late April. During the steelhead migration period fish way into the fish ladder and into a holding pond. Hatchery personnel then hand sort the fish. Fis sedated using CO2, sorted, measured, and then either passed upstream or collected for the hatch wild summer steelhead, bull trout, and other indigenous fish species are passed upstream. Stray steelhead, identified as having missing or deformed fins, are held in holding ponds, killed, and c to the CTWSRO.

Incidental take of listed species may occur during the manual sorting of fish in the fish ladder at Springs NFH. Potential take could occur as a result of delay in migration timing, stress associat handling, or misidentification of wild and hatchery steelhead. Hatchery personnel attempt to mi handling stress on fish by following the appropriate fish handling guidelines. Direct take on list as a result of the fish barrier dam, fish ladder, and hatchery sorting procedures has been minima unmarked adult steelhead were accidentally killed in 1998. No other mortality of unmarked adu at the hatchery has been recorded since 1995 (CRiS Database 3/18/02).

Monitoring activities associated with the Warm Springs spring Chinook program also have the

for incidental take of listed steelhead and bull trout. A rotary screw trap, located at approximate
of the Warm Springs River, is operated by the CTWSRO in order to gather outmigration timing
population estimates for juvenile spring Chinook salmon. The trap is typically operated from m
through mid-November. Juvenile spring Chinook salmon collected at the trap are anesthetized v
222, measured, weighed, and a subsample is marked and released upstream for mark-recapture
estimates. Some juvenile spring Chinook salmon may be implanted with radio-tags in order to
their migration behavior in the Deschutes River (See Section 12). Listed juvenile steelhead and
are also collected at the trap. Juvenile steelhead and juvenile resident trout are visually indisting
and are summarized together for monitoring purposes. Juvenile steelhead will be handled, meas
marked using the same procedures as for spring Chinook salmon. For an estimate of the numbe
steelhead trapped see Take Table 1. The probability of capture for juvenile bull trout in the trap
with fewer than ten bull trout trapped per year (Bob Spateholts, CTWSRO Warm Springs, pers.
juvenile bull trout are collected at the trap they will be weighed, measured, marked, and release

Incidental take of juvenile summer steelhead may occur through stress associated with the hand
marking procedures. Procedures associated with the juvenile trap are designed to minimize stres
potential take. The traps are checked regularly in order to minimize the amount of time fish are
trap. The amount of time fish are under anesthetic is carefully monitored and fish are allowed su
time to recover before being released back into the river. The potential for direct take of listed s
the traps as a result of trap malfunction or predator intrusion is considered to be low. The CTW
observed mink predation on fish caught in the screw trap (Bob Spateholts, CTWSRO Warm Spr
comm.). If recurring predators become a problem, live traps may be set to relocate the predators
the trap site. During periods of high flows debris may clog the rotary screw mechanism or live b
possibly resulting in descaling or wounding of fish in the trap. Daily monitoring of the trap is ex
minimize take associated with trap malfunction or predator intrusion. If high flows are anticipat
is raised in order to reduce the likelihood of trap malfunction. The traps are also deactivated wh
temperatures exceed 20 degrees Celsius or if there are visible signs of stress in fish in the live b
Estimated take levels for listed steelhead in the Warm Springs River are summarized in Take Ta

The USFWS expects to conduct research and monitoring activities at the hatchery and in the str
environment that will focus on the ecological interactions of hatchery and wild fish in the Warm
River, Shitike Creek, and Deschutes River. The research program is intended to gather informat
will help managers evaluate hatchery practices and reduce impacts of the hatchery program on
populations. Proposed research activities associated with Warm Spring NFH are discussed in de
Section 12. Sampling of spring Chinook salmon will occur through the normal hatchery and mo
activities on the Warm Springs River. Incidental take associated with the research program is ex
be minimal. Up to 100 juvenile spring Chinook salmon will be implanted with radio-tags at the
screw trap on the Warm Springs River. Other research activities on the Warm Springs River inc
expanded redd surveys and tissue sampling for genetic pedigree analysis of hatchery spring Chi
salmon at the Warm Springs NFH.

The USFWS and the CTWSRO also anticipate conducting monitoring and research activities or
Creek. Shitike Creek is small tributary of the Deschutes River that is located on the Warm Sprin
Reservation. Since 2000, the USFWS and the CTWSRO have outplanted Warm Springs NFH a

Chinook salmon into Shitike Creek. The objectives of the monitoring and research program are

1) Evaluate the contribution of outplanted spring Chinook salmon to the natural production in S
Creek.

2) Investigate the potential ecological interactions of spring Chinook, bull trout, and summer ste
Shitike Creek.

As part of the monitoring program, adult spring Chinook salmon will be sampled at a temporary
located near the mouth of Shitike Creek. The temporary weir is operated by the CTWSRO as pa
trout monitoring program funded by the Bonneville Power Administration. The weir is typically
in late April or early May, after the main upstream migration of adult summer steelhead. Adult
migrating upstream are trapped at the weir and sampled by CTWSRO personnel. Sampling incl
length measurements and scale samples. As part of the spring Chinook salmon program, tissue a
samples will be collected from all upstream migrating spring Chinook salmon. Incidental take o
may occur at the weir as a result of handling stress or delayed migration, although the weir is ty
installed after the steelhead migration (Take Table 2).

Juvenile sampling of downstream migrating fish occurs at a rotary screw trap located near the n
Shitike Creek in the town of Warm Springs. The screw trap is operated when flows are sufficier
from March through June and from October through November. The CTWSRO operates the tra
the bull trout study and also to gather juvenile population estimates for steelhead and spring Chi
Procedures for operating the Shitike Creek screw trap are the same as for the Warm Springs Riv
trap. The outplanting monitoring program will collect tissue samples (fin clips) from approxima
juvenile spring Chinook salmon captured at the trap. Passive Integrated Transponder (PIT) tags
be applied to juvenile Chinook salmon. No additional take of listed species is anticipated as a re
spring Chinook salmon sampling. The USFWS and the CTWSRO will also conduct snorkel sur
juvenile sampling in Shitike Creek during July and August. Snorkel surveys will collect observa
on microhabitat preferences, species associations, and species interactions for juvenile salmonic
samples from age 0 spring Chinook salmon will be collected during the summer. It is anticipate
spring Chinook salmon will be collected using either minnow trapping or seining techniques. M
traps will be baited with tuna or cat food and placed in selected pools for 45 minutes. The pools
block-netted at the upstream and downstream ends in order to prevent migration into or emigrat
the pool during sampling. After 45 minutes the traps will be removed and the fish in the traps w
sampled. The fish will then be returned to the stream and the block nets will be removed. If sein
snorkelers will enter the stream and ?herd? spring Chinook towards a seine, where they will be
and sampled. During sampling the fish will be held in containers of freshwater, anesthetized wit
counted, and placed into a recovery bucket. Once the fish have fully recovered they will be rele
into the stream. Incidental take may occur as a result of harassment or stress associated the minn
or with snorkelers ?herding? fish towards a seine. In order to minimize potential take, minnow t
seining will not take place in locations where there is a high abundance of listed species.
nc

Data source:

From Draft HGMP
nds
Draft HGMP

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 Can Chum Conservation Initiative*) or other regionally accepted policies (e.g. the *NPPC Annual Pro Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviatic the plan or policies.

155 nya

Comments:

nc

Data source:

nds

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

	Document Title	T
	Federal Statute 184	C
156	IHOT Standards and Policies	C
	Intra-Service Section 7 Consultation for bull trout	C
	Memorandum of Understanding between the USFWS and the CTWSRO, March 10, 1998	M

Comments:

nc

Data source:

Draft HGMP

3.3 Relationship to harvest objectives.

157 Artificial production at Warm Springs NFH is integrated with harvest management in order to p sustainable harvest of hatchery spring Chinook salmon while minimizing risks to wild fish popu the Warm Springs and Deschutes Rivers. All juvenile hatchery spring Chinook salmon released Warm Springs NFH are externally marked for visual identification. The CTWSRO and the Ore Department of Fish and Wildlife (ODFW) co-manage harvest in the Deschutes River Subbasin, harvest in the Columbia River is managed by the parties to U.S. v. Oregon. Harvest manageme are consistent with the ODFW Lower Deschutes River Fish Subbasin Management Plan (1997) for Warm Springs River spring Chinook salmon occurs primarily in the Deschutes River and lo Springs River. Wild fish abundance drives fishery management decisions made by the CTWSR

ODFW.

Comments:

nc

Data source:

Draft HGMP

3.4 Relationship to habitat protection and recovery strategies.

Natural production in the Warm Springs River and Deschutes River is limited by the following quantity, water quality, consumptive water use, instream water rights, water diversion screening sedimentation, stream substrate, cover, and barriers to fish passage (ODFW 1997). The CTWSI
158 responsible for habitat protection and recovery strategies on the Warm Springs Reservation. Ha conditions in the Warm Springs River and Shitike Creek are considered to be fair to good. The have implemented various habitat restoration programs including riparian fencing, water divers modifications, and placement of instream structures.

Comments:

nc

Data source:

nds

3.5 Ecological interactions.

The following species co-occur to a significant degree with the program fish in either freshwate marine life stages.

159
- Steelhead
- Pink
- Chum
- Sockeye
- Coho
- Chinook

Comments:

nc

Data source:

nds

Section 4. Water Source

4.1

Provide a quantitative and narrative description of the water source (spring, well, surface), wate

profile and natural limitations to production attributable to the water source.

The following statements describe the adult holding water source:

- The water source is pumped.
- The water source is specific-pathogen free.
- The water source is accessible to anadromous fish.
- Water is from the natal stream for the cultured stock.

12
- The water used meets or exceeds the recommended Integrated Hatchery Operations Tear water quality guidelines for ammonia, carbon dioxide, chlorine, pH, copper, dissolved ox hydrogen sulfide, dissolved nitrogen, iron, and zinc
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow alarms at the head box.
- The water supply is protected by back-up power generation.
- Naturally produced fish do not have access to intake screens.

The following statements describe the incubation water source:

- The water source is gravity flow.
- The water source is pathogen-free.
- The water source is fish free.
- Water is available from multiple sources.
- The water used provides natural water temperature profiles that results in hatching/emerg timing similar to that of the naturally produced stock.

13
- Incubation water can be heated or chilled to approximate natural water temperature profil
- The water used meets or exceeds the recommended Integrated Hatchery Operations Tear water quality guidelines for temperature.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Tear water quality guidelines for ammonia, carbon dioxide, chlorine, pH, copper, dissolved ox hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow and/or pond level alarms at the holding pond(s).
- The water supply is protected by back-up power generation

The following statements describe the rearing water source:

- The water source is pumped.
- The water source is specific-pathogen free.
- The water source is accessible to anadromous fish.
- Water is from the natal stream for the cultured stock.
- The hatchery operates to allow all migrating species of all ages to by-pass or pass throug related structures.

14
- Adequate flows are maintained to provide unimpeded passage of adults and juveniles in t reach created by hatchery water withdrawals.
- The water used meets or exceeds the recommended Integrated Hatchery Operations Tear water quality guidelines for ammonia, carbon dioxide, chlorine, pH, copper, dissolved ox hydrogen sulfide, dissolved nitrogen, iron, and zinc.
- The water supply is protected by flow alarms at the intake(s).
- The water supply is protected by flow alarms at the head box.
- The water supply is protected by back-up power generation.
- Naturally produced fish do not have access to intake screens.

Comments:

text from HGMP 10 October 2002:

The water source for the hatchery is the Warm Springs River. All water rights on the Warm Spr
are the property of the CTWSRO. The intake structure and pumps are located at the hatchery si
upstream of the barrier dam. Prior to being pumped, water is passed through a trash rack and tra
screen. In front of the traveling screen is a fish bypass which deposits small fish below the barr
The screens on the intake are 3/16th inch mesh.
nc
nc

Data source:

nds
nds
nds

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

15 The facility operates within the limitations established in its National Pollution Discharge Elim
System (NPDES) permit , The production from this facility falls below the minimum productio
requirement for an NPDES permit, but the facility operates in compliance with state or federal
for discharge and The facility does not have a discharge permit.

Comments:

text from HGMP 10 October 2002:

A small number of wild juvenile steelhead or resident rainbow trout, lamprey, and suckers has l
observed in the rearing ponds at the hatchery. This indicates that juvenile fish from the Warm S
River are making it through the intake and into the hatchery. The Integrated Hatchery Operatio
noted that the current 3/16th inch mesh does not meet the 1/10th inch standard for screening fac
(IHOT 1996). The Warm Springs NFH Implementation Plan (CTWSRO and USFWS 2002) ide
need to replace the water intake structure to meet NMFS Hatchery Biological Opinion criteria.

Data source:

nds

Section 5. Facilities

5.1 Broodstock collection facilities (or methods).

Brookstock for this program is collected:

16

- by volitional return to adult capture pond.
- from wild by weir. ** NO STATEMENT PROVIDED FOR THIS CHOICE **

	Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available F (gpm)
188	2	Oval Ponds	7800	50	26	6	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

Comments:

text from HGMP 10 October 2002:

All fish passing upstream are blocked by a barrier dam and are directed to a fish ladder at Warm NFH. All fish must use the fish ladder in order to pass upstream of the hatchery. During the spri Chinook salmon migration period (April 16- September 30), an automated fish passage system i pass all wild (unmarked) fish upstream of the barrier dam (see Section 2.2.3 for more details). F not passed upstream are directed into a catch pond. The catch pond measures 28ft x 8ft, with a v of 3ft. Fish are then moved from the catch ponds into holding ponds at the hatchery. Fish are he holding ponds until spawning.
nc

Data source:

nds
nds

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

99 IHOT guidelines for transportation are followed.

	Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical (s) Used	Dc (p
187	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

Comments:

USFWS Guidelines

text from 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting are
and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tank
the CTWSRO.
text from HGMP 10 October 2002:

Approximately 200 hatchery adult spring Chinook salmon are outplanted into Shitike Creek dur
August and early September. Staff from the CTWSRO use a tank truck to transport fish from th
holding ponds to five release sites along Shitike Creek.

Egg Transportation

There is no off-station transport of spring Chinook salmon eggs at the present time.

Fingerling Transportation

There is no off-station transport of spring Chinook salmon fingerlings at the present time.

Smolt Transportation

There is no off-station transport of spring Chinook salmon smolts occurring at the present time.

There has been transport of eggs, fingerlings, and smolts to other sites for research purposes by
the past. Emergency conditions at the hatchery may result in the temporary transfer of eggs or ju
other hatcheries.

Data source:

nds
nds

5.3 Broodstock holding and spawning facilities.

Spawning for this program takes place:

16

- in a covered facility. ** NO STATEMENT PROVIDED FOR THIS CHOICE **** NO STATEMENT PROVIDED FOR THIS CHOICE **

34 Integrated Hatchery Operations Team (IHOT) adult holding guidelines followed for adult holdi
and predator control measures to provide the necessary security for the broodstock.

	Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available F (gpm)
188	2	Oval Ponds	7800	50	26	6	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

Comments:

text from HGMP 10 October 2002:

All fish passing upstream are blocked by a barrier dam and are directed to a fish ladder at Warm NFH. All fish must use the fish ladder in order to pass upstream of the hatchery. During the spri Chinook salmon migration period (April 16- September 30), an automated fish passage system i pass all wild (unmarked) fish upstream of the barrier dam (see Section 2.2.3 for more details). F not passed upstream are directed into a catch pond. The catch pond measures 28ft x 8ft, with a v of 3ft. Fish are then moved from the catch ponds into holding ponds at the hatchery. Fish are he holding ponds until spawning.
text from HGMP 10 October 2002:

Two oval shaped ponds, each 50ft x 26ft with approximately a 6ft water depth are used to hold l until spawning. Each pond is fully enclosed at the top and sides above the water surface by nylo The netting prevents fish from jumping out of the holding ponds and prevents predators from ga entry. The ponds are plumbed to supply chilled water as summer water temperatures increase.
nc

Data source:

nds

nds

5.4 Incubation facilities.

	Incubator Type	Units (number)	Flow (gpm)	Volume (cu.ft.)	Loading-Eyeing (eggs/unit)	Loading-Hatch (eggs/unit)
189	Heath Incubators 15 /stack	16	nya	nya	5000	nya
	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya

Comments:

nc

Data source:

nds

5.5 Rearing facilities.

Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Flow (gpm)	Maximum Flow Index	Maxi Den Ind
20	Retangular Burrows ponds	2040	75	16	1.7	nya	nya	nya
20	Modified Rectangular Burrows	1020	75	8	1.7	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya	nya	nya

190

Comments:

text from HGMP 10 October 2002:

All Warm Springs NFH spring Chinook salmon smolts are released onsite at the hatchery. Gates opened at the end of each raceway that allow fish to leave the hatchery via a pipe that enters the Springs River, just downstream of the adult barrier dam.

Data source:

nds

5.6 Acclimation/release facilities.

Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Flow (gpm)	Maximum Flow Index	Maxi Den Ind
20	Retangular Burrows ponds	2040	75	16	1.7	nya	nya	nya
20	Modified Rectangular Burrows	1020	75	8	1.7	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya	nya	nya	nya

190

Comments:

text from HGMP 10 October 2002:

All Warm Springs NFH spring Chinook salmon smolts are released onsite at the hatchery. Gates opened at the end of each raceway that allow fish to leave the hatchery via a pipe that enters the Springs River, just downstream of the adult barrier dam.

Data source:

nds

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

Gas/Oil spill in upper watershed 1998-1999 for release of fish. Oxygen levels in adult ponds sa tolerable levels - problem is being addressed.

text from HGMP 10 October 2002:

160 In March of 1999, a traffic accident on Highway 26 resulted in a spill of diesel fuel into Beaver tributary to the Warm Springs River above Warm Springs NFH. Due to concerns about fuel ent water supply at the hatchery, all of the brood year 1998?s smolts were released early. On 4 Mar approximately 775,000 smolts were released from the hatchery and into the Warm Springs Rive release was approximately four to six weeks earlier than the normal release time at Warm Sprin No direct mortality from the early release was observed. In addition to the early release of BY 1 smolts, BY 1999 juveniles were transported to Round Butte Hatchery. Round Butte Hatchery is the Deschutes River at the base of Round Butte Dam (RM 110), and is operated by the Oregon Department of Fish and Wildlife. Round Butte Hatchery and its satellite (Pelton Ladder) are us collection, egg incubation, and rearing of spring Chinook salmon and summer steelhead. Round Hatchery temporarily held the BY 1999 juveniles until the water supply at WSNFH was tested to be safe.

Comments:

nc

Data source:

nds

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

70 Fish are reared in multiple facilities or with redundant systems to reduce the risk of catastrophic

78 The facility is sited so as to minimize the risk of catastrophic fish loss from flooding.

79 Staff is notified of emergency situations at the facility.

80 The facility is continuously staffed to assure the security of fish stocks on-site.

Comments:

text from HGMP 10 October 2002:

Warm Springs NFH is equipped with backup generators and pumps that provide power in case failures. An automated alarm system alerts on-call staff members of potential problems at the h during non-work hours. The hatchery also has a chemical spill kit and floating booms to contai accidental spills. In extreme situations, fish at WSNFH can be transported to Round Butte hatcl temporary holding.

The LCRFHC manages fish health and disease prevention in accordance with the USFWS Fish IHOT policies and with protocols of ODFW. Any health problems are managed promptly by fi personnel to limit mortality and reduce disease transmission.
nc
On-site housing
Round Butte Hatchery rear the same stock

Data source:

nds
nds
nds
nds

Section 6. Broodstock Origin and Identity

6.1 Source.

17 The broodstock chosen represents natural populations native or adapted to the watersheds in wh hatchery fish will be released.

Comments:

D.Olson USFWS 04/23/03

text from HGMP 10 October 2002:

-Wild Warm Springs River spring Chinook salmon (unlisted)

-Warm Springs NFH spring Chinook salmon

-Round Butte Hatchery spring Chinook salmon (potential use during years of low returns to Wa Springs hatchery).

Round Butte Hatchery spring Chinook salmon are thought to have similar life history character Warm Springs NFH spring Chinook salmon (Doug Olson, USFWS Vancouver, pers. comm). T broodstock for Round Butte Hatchery was collected from a trap at Sherars Falls in the lower De River. It is likely that most fish collected at the falls were Warm Springs River spring Chinook since the Warm Springs River is the major producer of spring Chinook salmon in the Deschutes subbasin.

Data source:

nds

6.2.1 History.

Broodstock Source	Origin	Year(s) Used	
		Begin	End
Warm Springs	N	1978	Present
Warm Springs	H	1981	Present
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya
nya	nya	nya	nya

183

Comments:

Use approximately 10% of wild run, recently changed to a sliding scale based on return numbers.

text from HGMP 10 October 2002:

During the first four years of broodstock collection (1978-1981), 100% of the broodstock was collected f Warm Springs River spring Chinook salmon. Since 1981, the majority of broodstock has been of Warm NFH origin. In order to maintain wild characteristics in the hatchery program, the Warm Springs NFH O and Implementation Plan 2002-2006 sets a goal of having an average of 10% of the hatchery broodstock origin, based on a sliding scale according to total wild returns.

Data source:

Draft HGMP, Warm Springs National Fish Hatchery Operational Plan and Implementation Plan 2002-2(

6.2.2 Annual size.

22 The program collects sufficient numbers of donors from the natural stock to minimize founder

23

25

27 The program collects sufficient broodstock to maintain an effective population size of 1000 fis generation.

28 More than 10% of the broodstock is derived from wild fish each year.

Comments:

text from HGMP 10 October 2002:

The broodstock collection goal is 630 adult spring Chinook salmon.
text from HGMP 10 October 2002:

All fish passing upstream are blocked by a barrier dam and are directed to a fish ladder at Warr NFH. During the spring Chinook salmon migration period (April 15- September 30), an automa passage system is used to pass all wild, unmarked fish upstream of the barrier (see Section 2.2.3 details). All coded-wire tagged fish are shunted into holding ponds. Adult fish are selected for b proportionately throughout the run based on wild stock run timing. The target for broodstock co presented on the following page.
Total broodstock requirement is 630 fish.

Data source:

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

Return Year	Total Catch (all ages)	Natural Escapement		Hatchery Spawning	
		NoRs	HoRs	NoRs	HoRs
Goal	nya	nya	nya	nya	nya
1990	6	1767	0	5	1390
1991	9	816	0	1	634
1992	137	973	0	89	766

	1993	126	534	0	4	308
	1994	15	435	0	0	62
	1995	nya	235	0	2	289
	1996	nya	1245	0	42	734
33	1997	nya	867	113	3	922
	1998	nya	271	21	0	624
	1999	nya	492	32	2	2676
	2000	nya	2630	285	73	6300
	2001	nya	2193	303	59	4163

Comments:

nc

Data source:

Draft HGMP

6.2.4 Genetic or ecological differences.

19 The broodstock chosen displays morphological and life history traits similar to the natural popu

Comments:

text from HGMP 10 October 2002:

Wild Warm Springs River spring Chinook salmon are adapted to the physical and biological characteristics of the Warm Springs River.

Data source:

nds

6.2.5 Reasons for choosing.

18 dna

20

21 The broodstock chosen has the desired life history traits to meet harvest goals.

Comments:

Wild stock is self-sustaining (not extirpated) D.Olson USFWS 04/23/03

text from HGMP 10 October 2002:

The goal of the Warm Springs NFH spring Chinook salmon program has been to integrate wild hatchery fish in a way that maintains the biological and genetic characteristics of the fish popul both the hatchery and stream environments. Monitoring and evaluation of the program has beer since its inception in 1978. Recent evaluation studies indicate that while measurable difference detected in some life history characteristics, the hatchery population closely mimics those of th population (Olson and Spateholts 2001).
nc
nc

Data source:

nds
nds
nds

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

The following procedures are in place that maintain broodstock collection within programmed l

161

- The collection plan for natural origin adults is in place that prevents collection of surplus
- Excess adults are used for seeding available habitat in accordance with genetic guideline
- Excess adults are culled at random and sold, buried, or donated to food banks depending quality

Comments:

text from HGMP 10 October 2002:

No adverse genetic effects to listed summer steelhead or bull trout are expected from the spring salmon hatchery broodstock selection process.

Surplus hatchery fish are used to meet the needs of the CTWSRO. Since 2000, approximately 2 hatchery spring Chinook salmon have been held at the hatchery and outplanted into Shitike Cre September. Other surplus fish are killed and distributed to the CTWSRO for tribal needs.

Data source:

nds

Section 7. Broodstock Collection

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

	Adults				
Year	Females	Males	Jacks	Eggs	Juvenile
Planned	378	252	2-5%	nya	825000

1990	448	289	0	nya	nya
1991	272	197	0	nya	nya
1992	322	228	22	619102	551151
1993	161	117	2	462561	398142
1994	28	20	3	296163	420866
1995	48	43	15	540869	467427
1996	380	282	0	1047542	790422
1997	296	200	3	899119	815570
1998	355	177	44	1039781	770419
1999	393	180	39	1126032	827665
2000	308	189	8	857836	618822
2001	265	209	15	768071	nya

191

Comments:

text from HGMP 10 October 2002:

The annual broodstock collection goal is a maximum of 630 adult spring Chinook salmon. The g have, on a 10 year average, 10% of the hatchery broodstock be of wild fish origin.

The Warm Springs NFH Operation and Implementation Plan 2002-2006 sets a broodstock goal spring Chinook salmon, assuming 90% pre-spawning survival and a return that is 60% female. V number of returning males is low, the male to female spawning ratio will be 1:2. Fish that are 60 length or longer are considered adults. Between two and five percent of the broodstock will be c of jacks, i.e. fish less than 60 cm in length. The percentage reflects the estimated contribution of the wild spawning population.

Data source:

Draft HGMP

7.2 Collection or sampling design

16
- Broodstock collected by volitional return to adult capture pond.
- Broodstock collected from wild by weir.

22 The program collects sufficient numbers of donors from the natural stock to minimize founder e

23

24 Representative samples of the population are collected with respect to size, age, sex ratio, run a timing, and other traits important to long-term fitness.

25 The proportion of spawners brought into the hatchery follows a “spread-the-risk” strategy that a improve the probability of survival for the entire population.

27 The program collects sufficient broodstock to maintain an effective population size of 1000 fisl generation.)

28 More than 10% of the broodstock is derived from wild fish each year.

Comments:

text from HGMP 10 October 2002:

The broodstock collection goal is 630 adult spring Chinook salmon.
text from HGMP 10 October 2002:

All fish passing upstream are blocked by a barrier dam and are directed to a fish ladder at Warn NFH. During the spring Chinook salmon migration period (April 15- September 30), an automa passage system is used to pass all wild, unmarked fish upstream of the barrier (see Section 2.2.3 details). All coded-wire tagged fish are shunted into holding ponds. Adult fish are selected for b proportionately throughout the run based on wild stock run timing. The target for broodstock co presented on the following page.

Total broodstock requirement is 630 fish.

Data source:

7.3 Identity.

100

101 100% of the hatchery fish released are marked so that they can be distinguished from the natura population.

102 Marked fish can be identified using non-lethal means.

106 Wild fish make up 5-30% (between five and thirty percent) % of the broodstock for this progra

Comments:

text from HGMP 10 October 2002:

All juvenile Warm Springs NFH spring Chinook salmon are adipose-fin clipped and coded-wir prior to release. The USFWS samples juvenile fish for mark quality and tag retention prior to re program goal is a minimum tag retention rate of 95%. The automated fish passage system sorts hatchery and wild fish based on the presence of coded-wire tags.

nc
nc
Wild fish incorporated into broodstock based on sliding scale (Warm Springs Hatchery 2002-2
operations plan). For example, if fewer than 800 wild fish return, no wild fish are used in brooc
between 1,300 and 1,399 wild fish return, then 10% of brood stock are wild fish. If > 2,300 wil
return, then 20% of broodstock will be wild fish. The goal is to achieve a 10-year average of 1(
fish in brood stock. D.Olson USFWS 04/23/03

Data source:

nds
nds
nds
nds

7.4 Proposed number to be collected:

198 **7.4.1 Program goal (assuming 1:1 sex ratio for adults):**
nya

**7.4.2 Broodstock collection levels for the last twelve years (e.g. 1990-2001), or for most rec
available.**

		Adults			
Year	Females	Males	Jacks	Eggs	Juvenile
Planned	378	252	2-5%	nya	825000
1990	448	289	0	nya	nya
1991	272	197	0	nya	nya
1992	322	228	22	619102	551151
191 1993	161	117	2	462561	398142
1994	28	20	3	296163	420866
1995	48	43	15	540869	467427
1996	380	282	0	1047542	790422
1997	296	200	3	899119	815570
1998	355	177	44	1039781	770419
1999	393	180	39	1126032	827665
2000	308	189	8	857836	618822
2001	265	209	15	768071	nya

Comments:

text from HGMP 10 October 2002:

The annual broodstock collection goal is a maximum of 630 adult spring Chinook salmon. The g have, on a 10 year average, 10% of the hatchery broodstock be of wild fish origin.

The Warm Springs NFH Operation and Implementation Plan 2002-2006 sets a broodstock goal spring Chinook salmon, assuming 90% pre-spawning survival and a return that is 60% female. V number of returning males is low, the male to female spawning ratio will be 1:2. Fish that are 60 length or longer are considered adults. Between two and five percent of the broodstock will be c of jacks, i.e. fish less than 60 cm in length. The percentage reflects the estimated contribution of the wild spawning population.

Data source:

Draft HGMP

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

The following procedures are in place that maintain broodstock collection within programmed l

161

- The collection plan for natural origin adults is in place that prevents collection of surplus
- Excess adults are used for seeding available habitat in accordance with genetic guidelines
- Excess adults are culled at random and sold, buried, or donated to food banks depending quality.

Comments:

text from HGMP 10 October 2002:

No adverse genetic effects to listed summer steelhead or bull trout are expected from the spring salmon hatchery broodstock selection process.

Surplus hatchery fish are used to meet the needs of the CTWSRO. Since 2000, approximately 2 hatchery spring Chinook salmon have been held at the hatchery and outplanted into Shitike Cre September. Other surplus fish are killed and distributed to the CTWSRO for tribal needs.

Data source:

nds

7.6 Fish transportation and holding methods.

Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical (s) Used	Dc (p
nya	nya	nya	nya	nya	nya	nya

	nya	nya	nya	nya	nya	nya	nya
187	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

	Ponds (number)	Pond Type	Volume (cu.ft)	Length (ft.)	Width (ft.)	Depth (ft.)	Available F (gpm)
188	2	Oval Ponds	7800	50	26	6	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

33 Spawning mortality exceeds 10%.

99 IHOT guidelines for transport are followed for this program.

Comments:

text from HGMP 10 October 2002:

Approximately 200 hatchery adult spring Chinook salmon are outplanted into Shitike Creek dur August and early September. Staff from the CTWSRO use a tank truck to transport fish from th holding ponds to five release sites along Shitike Creek.

Egg Transportation

There is no off-station transport of spring Chinook salmon eggs at the present time.

Fingerling Transportation

There is no off-station transport of spring Chinook salmon fingerlings at the present time.

Smolt Transportation

There is no off-station transport of spring Chinook salmon smolts occurring at the present time.

There has been transport of eggs, fingerlings, and smolts to other sites for research purposes by the past. Emergency conditions at the hatchery may result in the temporary transfer of eggs or ju

other hatcheries.
nc
Prespawning mortality of hatchery brood stock is usually lower than 10%, but has been 20 to 30
years. Pre-spawning mortality of fish spawning in stream upstream of hatchery has averaged 40
holding pond covers and a volitional passage system is being tested to minimize pre-spawning r
both hatchery and wild fish. D.Olson USFWS 04/23/03
USFWS Guidelines

text from 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting are
and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tank
the CTWSRO.

Data source:

nds
nds

nds

7.7 Describe fish health maintenance and sanitation procedures applied.

98 "Fish transfers into the subbasin are inspected and accompanied by notifications as described in
PNFHPC guidelines.

32 Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection comm
(PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfe
or adults and broodstock holding and disposal of carcasses.

Comments:

text from HGMP 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting ar
and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tan
the CTWSRO.

Data source:

text from HGMP 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting ar
and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tan
the CTWSRO.

7.8 Disposition of carcasses.

32 Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection comm (PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfe or adults and broodstock holding and disposal of carcasses.

103 Hatchery adults are distributed by staff within the subbasin to provide hatchery adults are distri staff) within the subbasin to provide ecological benefits and hatchery adults are distributed (by within the subbasin to provide natural production.

The following procedures are in polace that maintain broodstock collection within programmed

161
- The collection plan for natural origin adults is in place that prevents collection of surplus
- Excess adults are used for seeding available habitat in accordance with genetic guideline
- Excess adults are culled at random and sold, buried, or donated to food banks depending quality

Comments:

text from HGMP 10 October 2002:

Prior to spawning, surplus fish are distributed to the CTWSRO. After spawning, broodstock ca either buried or used for stream nutrient enrichment. Prior to placement in streams, all carcasse screened by health exams and treated (by evisceration and heat-baking) to prevent potential dis transmission.
text from HGMP 10 October 2002:

No adverse genetic effects to listed summer steelhead or bull trout are expected from the spring salmon hatchery broodstock selection process.

Surplus hatchery fish are used to meet the needs of the CTWSRO. Since 2000, approximately 2 hatchery spring Chinook salmon have been held at the hatchery and outplanted into Shitike Cre September. Other surplus fish are killed and distributed to the CTWSRO for tribal needs.

Data source:

nds
nds

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

29 The program has guidelines for acceptable contribution of hatchery fish to natural spawning.

30 These guidelines are met for all affected natural stocks.

32 Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection comm (PNFHPC), state or tribal guidelines are followed for broodstock fish health inspection , transfe or adults and broodstock holding and disposal of carcasses.

Comments:

text from HGMP 10 October 2002:

No listed fish are used in the WSNFH spring Chinook salmon broodstock. Risk aversion measu steelhead passage through the collection facility are discussed in Section 2.2.3.
2002-2006 Hatchery Operation Plan guidelines to limit hatchery spawners to 10% of natural pr Warm Springs River. Warm Springs hatchery adults used in supplementation experiment in Shi D.Olson USFWS 04/23/03

Data source:

Section 8. Mating

8.1 Selection method.

35 Males and females available on a given day are mated randomly.

39

Comments:

text from HGMP 10 October 2002:

Spawners are randomly collected over the entire run and randomly spawned from ripe fish over four week period.
Fish spawning in the stream do.

Data source:

8.2 Males.

38 Precocious males are used as a set percentage or in proportion to their contribution to the adult

37 Back-up males are not used in the spawning protocol.

Comments:

text from HGMP 10 October 2002:

Approximately 40% of the adults collected are males. The intent is to utilize a spawning popula adults and to use a 1:1 male to female spawning ratio. Between 2% and 5% of the broodstock w jacks, defined as males less than 60 cm in length.
text from HGMP 10 October 2002:

No listed fish populations are used in broodstock collection or mating.

Data source:

8.3 Fertilization.

36 Gametes are NOT pooled prior to fertilization.

39

11 IHOT PNFHPC tribal federal other guidelines are followed for culture practices for this prograı

40 Disinfection procedures that prevent pathogen transmission between stocks of fish are impleme during spawning.

Comments:

text from 10 October 2002:

Ripe fish are separated out during spawning days at the hatchery. A 1:1 male to female spawnir desired, however the actual ratio may differ based on the number of ripe individuals available.

Fluid is taken from each female, and carcasses of both males and females are checked by the fis staff for signs of Bacterial Kidney Disease. If signs of gross Bacterial Kidney Disease are detec fish health staff informs the hatchery and the spawn products of those fish are removed from pr Eggs from each female are placed in separate numbered buckets and sperm from each male is p numbered baggies. Sperm is added to the eggs with approximately 16 ounces of water/sperm ex mix. The female number and male number is written on the bucket used to hold the egg/sperm ı The bucket of fertilized eggs is poured into a water/iodophor mixture and allowed to sit for 20 ı After the 20 minute waiting period fresh water is turned on the eggs. The eggs are then placed i darkened room, supplied with a constant flow of water, and given weekly applications of forma eye-up. During this time the fertilized eggs from each female are kept separate.
Fish spawning in the stream do.
Hatchery Specific Developed Guidelines

Follow USFWS Fsish Health Protocols

Data source:

Warm Springs National Fish Hatchery Operational Plan and Implementation Plan 2002-2006
nds

8.4 Cryopreserved gametes.

162 Cryopreserved gametes are not used.

Comments:

nc

Data source:

nds

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

35 Males and females available on a given day are mated randomly.

36 Gametes are NOT pooled prior to fertilization.

37 Back-up males are not used in the spawning protocol.

38 Precocious males are used as a set percentage or in proportion to their contribution to the adult

39

Comments:

text from HGMP 10 October 2002:

Spawners are randomly collected over the entire run and randomly spawned from ripe fish over four week period.
text from 10 October 2002:

Ripe fish are separated out during spawning days at the hatchery. A 1:1 male to female spawnir desired, however the actual ratio may differ based on the number of ripe individuals available.

Fluid is taken from each female, and carcasses of both males and females are checked by the fis staff for signs of Bacterial Kidney Disease. If signs of gross Bacterial Kidney Disease are detec fish health staff informs the hatchery and the spawn products of those fish are removed from pr Eggs from each female are placed in separate numbered buckets and sperm from each male is p numbered baggies. Sperm is added to the eggs with approximately 16 ounces of water/sperm ex

mix. The female number and male number is written on the bucket used to hold the egg/sperm
The bucket of fertilized eggs is poured into a water/iodophor mixture and allowed to sit for 20
After the 20 minute waiting period fresh water is turned on the eggs. The eggs are then placed i
darkened room, supplied with a constant flow of water, and given weekly applications of forma
eye-up. During this time the fertilized eggs from each female are kept separate.
text from HGMP 10 October 2002:

No listed fish populations are used in broodstock collection or mating.
text from HGMP 10 October 2002:

Approximately 40% of the adults collected are males. The intent is to utilize a spawning popula
adults and to use a 1:1 male to female spawning ratio. Between 2% and 5% of the broodstock w
jacks, defined as males less than 60 cm in length.
Fish spawning in the stream do.

Data source:

Section 9. Incubation and Rearing.

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

Year	Egg Take	Green-Eyed Survival (%)	Eyed-Ponding Survival (%)	Egg Survival Performance Std.	Fry-fingerling Survival (%)	Rearing Survival Performance Std.	Fingerl Smc Surviva
1990	nya	nya	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya	nya	nya
1992	619102A	96	94	nya	nya	nya	94
1993	462561	91	82	nya	nya	nya	nya
1994	296163B	97C	95	nya	nya	nya	nya
1995	540869D	93	92	nya	nya	nya	94
1996	1047542	78	77	nya	nya	nya	98
1997	899119	93	93	nya	nya	nya	98
1998	1039781	95	80	nya	nya	nya	93
1999	1126032	85	75	nya	nya	nya	97
2000	857836	86	85	nya	nya	nya	85
2001	768071	97	89	nya	nya	nya	nya

192

Comments:

*Number released is an actual count, other numbers are estimated from sample counts.

A853,102 eggs were taken, 234,000 were discarded.

BIncludes 216,449 green eggs transferred from Round Butte Hatchery.

CIncludes 34,413 eyed eggs transferred from Round Butte Hatchery.

DIncludes 414,689 eggs transferred from Round Butte Hatchery

Data source:

Draft HGMP

9.1.2 Cause for, and disposition of surplus egg takes.

163 Policy prohibiting taking extra eggs above and beyond programed numbers.
45 Eggs are not culled randomly over all segments of egg-take.
48 Families are NOT incubated individually.
59 No culling of juveniles occur.
60
61
44 1 (eggs are culled once)

Comments:

If surplus eggs taken, eggs from high titer BKD females are first for culling.
nc
nc
nc
Use all fish not culling
For disease - BKD

Data source:

nds
nds
nds
nds
nds
nds

9.1.3 Loading densities applied during incubation.

51 Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations we

followed for incubator capacities.

47 Families within spawning groups are NOT mixed randomly at ponding, thus unintentional rear differences may affect families differently.

42 Eggs are NOT incubated under conditions that result in equal survival of all segments of the po ponding.

Comments:

nc
nc
text from HGMP 10 October 2002:

5,000 eggs per Heath tray

Data source:

nds
nds
nds

9.1.4 Incubation conditions.

49 Incubation takes place in home stream water.

50 The program does NOT use water sources that result in hatching/emergence timing similar to tl naturally produced population.

51 Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations we followed for incubator capacities.

53 Eggs are monitored when needed to determine fertilization efficiency and embryonic developm

42 Eggs are NOT incubated under conditions that result in equal survival of all segments of the po ponding.

47 Families within spawning groups are NOT mixed randomly at ponding, thus unintentional rear differences may affect families differently.

48 Families are NOT incubated individually.

43

Comments:

text from HGMP 10 October 2002:

Eggs are kept at 50 degrees F, left undisturbed until eye-up, and then electronically counted, 5,(Heath tray.
nc
nc
text from HGMP 10 October 2002:

Formalin is run through the watering system on the eggs until eye-up. After eye-up and during
dead eggs are removed by an electronic counter, weighed, sampled, and discarded. After counti
eggs are manually picked from the trays and subtracted from the egg count. At ponding, 60 fisl
sampled for a health exam.
nc
nc
nc
Occasionally

Data source:

nds
nds
nds
nds
nds
nds
nds
nds

9.1.5 Ponding.

The procedures used for determining when fry are ponded include:

55
- Fry are removed from incubation units when 80-90% of observed fry have yolk-sac mate
80-90% utilized and contained within body cavity ("button-up")
- Fry are ponded based on visual inspection of the amount of yolk remaining

46 Eggs are NOT incubated in a manner that allows volitional ponding of fry.

Comments:

text from HGMP 10 October 2002:

At complete button-up (1,600 temperature units, 1,100 fish per pound) fry are moved into tanks
usually begins near the end of January and is completed by the end of February.
nc

Data source:

nds
nds

9.1.6 Fish health maintenance and monitoring.

52

53 Eggs are monitored when needed to determine fertilization efficiency and embryonic developm

54 Following eye-up stage, eggs are inventoried, and dead or undeveloped eggs removed and disp
described in the disease control guidelines.

56 Dead or culled eggs are discarded in a manner that prevents transmission to receiving watershe

Comments:

nc
text from HGMP 10 October 2002:

Formalin is run through the watering system on the eggs until eye-up. After eye-up and during dead eggs are removed by an electronic counter, weighed, sampled, and discarded. After counti eggs are manually picked from the trays and subtracted from the egg count. At ponding, 60 fish sampled for a health exam.
nc
nc

Data source:

nds
nds
nds
nds

9.1.7 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse gene ecological effects to listed fish during incubation.

47 Families within spawning groups are NOT mixed randomly at ponding, thus unintentional rear differences may affect families differently.

49 Incubation takes place in home stream water.

50 The program does NOT use water sources that result in hatching/emergence timing similar to tl naturally produced population.

51 Integrated Hatchery Operations Team (IHOT) species-specific incubation recommendations we followed for incubator capacities.

52

56 Dead or culled eggs are discarded in a manner that prevents transmission to receiving watershe

61 dna

Comments:

nc
text from HGMP 10 October 2002:

Eggs are kept at 50 degrees F, left undisturbed until eye-up, and then electronically counted, 5,(Heath tray.
nc
nc
nc
nc

Use all fish not culling

Data source:

nds
nds
nds
nds
nds
nds
nds

9.2.1 Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerli fingerling to smolt) for the most recent twelve years (1990-2001), or for years dependable data a available.

Year	Egg Take	Green-Eyed Survival (%)	Eyed-Ponding Survival (%)	Egg Survival Performance Std.	Fry-fingerling Survival (%)	Rearing Survival Performance Std.	Fingerl Smc Surviva
1990	nya	nya	nya	nya	nya	nya	nya
1991	nya	nya	nya	nya	nya	nya	nya
1992	619102A	96	94	nya	nya	nya	94
1993	462561	91	82	nya	nya	nya	nya
1994	296163B	97C	95	nya	nya	nya	nya
1995	540869D	93	92	nya	nya	nya	94
1996	1047542	78	77	nya	nya	nya	98
1997	899119	93	93	nya	nya	nya	98
1998	1039781	95	80	nya	nya	nya	93
1999	1126032	85	75	nya	nya	nya	97
2000	857836	86	85	nya	nya	nya	85
2001	768071	97	89	nya	nya	nya	nya

192

Comments:

*Number released is an actual count, other numbers are estimated from sample counts.

A853,102 eggs were taken, 234,000 were discarded.

BIncludes 216,449 green eggs transferred from Round Butte Hatchery.

CIncludes 34,413 eyed eggs transferred from Round Butte Hatchery.

DIncludes 414,689 eggs transferred from Round Butte Hatchery

Data source:

Draft HGMP

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

71 The juvenile rearing density and loading guidelines used at the facility are based on: life-stage s survival studies conducted on-site and life-stage specific survival studies conducted at other fac

72 IHOT standards are followed for: water quality , predator control measures to provide the neces security for the cultured stock , loading and density.

Comments:

text from HGMP 10 October 2002:

Pond densities range from a density index of 0.08 (approximately 0.44 lbs fish/ft3) to a density 0.16 (approximately 0.88 lbs fish/ft3), based on an average fish size of 20 fish/lb.

Density and loading criteria vary with annual production goals. Current production goals allow indices to be kept at or below 0.5, and flow indices to be within accepted standards for spring C salmon (Piper et al. 1982)

nc

Data source:

nds

nds

9.2.3 Fish rearing conditions.

66 The program uses a diet and growth regime that mimics natural seasonal growth patterns.

67 Settleable solids, unused feed and feces are removed periodically to ensure proper cleanliness c containers.

72 IHOT standards are followed for: water quality , predator control measures to provide the neces security for the cultured stock , loading and density.

71 The juvenile rearing density and loading guidelines used at the facility are based on life-stage s survival studies conducted on-site and life-stage specific survival studies conducted at other fac

Comments:

nc

text from HGMP 10 October 2002:

Temperatures in the rearing ponds are monitored daily. Dissolved oxygen levels are monitored monthly, weekly, or daily basis as needed. Temperatures during the rearing cycle range from b

degrees F to 72 degrees F. Ponds are cleaned by brush twice a week during the summer.
nc
text from HGMP 10 October 2002:

Pond densities range from a density index of 0.08 (approximately 0.44 lbs fish/ft3) to a density 0.16 (approximately 0.88 lbs fish/ft3), based on an average fish size of 20 fish/lb.

Density and loading criteria vary with annual production goals. Current production goals allow indices to be kept at or below 0.5, and flow indices to be within accepted standards for spring C salmon (Piper et al. 1982)

Data source:

nds
nds
nds
nds

9.2.4 Indicate biweekly or monthly fish growth information (average program performance), includin weight, and condition factor data collected during rearing, if available.

	Rearing Period	Length (mm)	Weight (fpp)	Condition Factor	Growth Rate	Hepatosomatic Index	Bod Moist Conte
	Jan 00	36	1098	nya	nya	nya	nya
	Feb 00	48	448	nya	nya	nya	nya
	Mar 00	51	389	nya	nya	nya	nya
	Apr 00	60	228	nya	nya	nya	nya
	May 00	74	122	nya	nya	nya	nya
194	Jun 00	99	52	nya	nya	nya	nya
	Jul 00	112	36	nya	nya	nya	nya
	Aug 00	112	36	nya	nya	nya	nya
	Sep 00	112	36	nya	nya	nya	nya
	Oct 00	128	24	nya	nya	nya	nya
	Nov 00	128	24	nya	nya	nya	nya
	Dec 00	128	20	nya	nya	nya	nya

Comments:

For Brood Year 1999

Data source:

Draft HGMP

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

64
- Operator conducts periodic feed quality analysis.
- Feed is stored under proper conditions as described by IHOT guidelines.

65 The correct amount and type of food is provided to achieve the desired growth rate , body comp condition factorsfor the species and life stages being reared.

Rearing Period	Length (mm)	Weight (fpp)	Condition Factor	Growth Rate	Hepatosomatic Index	Bod Moist Conte
Jan 00	36	1098	nya	nya	nya	nya
Feb 00	48	448	nya	nya	nya	nya
Mar 00	51	389	nya	nya	nya	nya
Apr 00	60	228	nya	nya	nya	nya
May 00	74	122	nya	nya	nya	nya
Jun 00	99	52	nya	nya	nya	nya
Jul 00	112	36	nya	nya	nya	nya
Aug 00	112	36	nya	nya	nya	nya
Sep 00	112	36	nya	nya	nya	nya
Oct 00	128	24	nya	nya	nya	nya
Nov 00	128	24	nya	nya	nya	nya
Dec 00	128	20	nya	nya	nya	nya

194

66 The program uses a diet and growth regime that mimics natural seasonal growth patterns.

Comments:

text from HGMP 10 October 2002:

Biomoist grower and Biomoist feed is used during rearing. Erythromycin feed (21 days) is used and September. Feeding rates range from 1.5% to 3% B.W./day. Conversion rates averaged 1.6 1999.
nc
For Brood Year 1999

nc

Data source:

nds

nds
Draft HGMP
nds

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

64
- Operator conducts periodic feed quality analysis.
- Feed is stored under proper conditions as described by IHOT guidelines.

65 The correct amount and type of food is provided to achieve the desired growth rate , body comp condition factorsfor the species and life stages being reared.

Rearing Period	Food Type	Application Schedule (#feedings/day)	Feeding Rate Range (% B.W./day)	Lbs. Fed Per gpm of Inflow	Food Conversi During Period
Jan-Dec	Biomoist Grower & Biomoist Feed	nya	1.5-3	nya	1.62 in 19
195 nya	Use Erythromycin feed (21days) in May and Sept	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya
nya	nya	nya	nya	nya	nya

Comments:

text from HGMP 10 October 2002:

Biomoist grower and Biomoist feed is used during rearing. Erythromycin feed (21 days) is used and September. Feeding rates range from 1.5% to 3% B.W./day. Conversion rates averaged 1.6 1999.
nc
nc

Data source:

nds
nds
nds

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

62 IHOT fish health guidelines are followed to prevent transmission between lots of fish on site or transmission or amplification to or within the watershed.

63 Whenever possible, vaccines are used to minimize the use of antimicrobial compounds.

71 The juvenile rearing density and loading guidelines used at the facility are based on life-stage s survival studies conducted on-site and life-stage specific survival studies conducted at other fac

Comments:

nc
text from HGMP 10 October 2002:

Fish health is monitored daily by hatchery staff. A fish health specialist visits at least once per examine fish in each lot, checking both healthy and symptomatic fish in the rearing ponds. If n the appropriate chemotherapy or cultural changes are administered after consultation with the f specialist. Sanitation procedures follow guidelines established by the Fish Hatchery Manageme (Piper et al. 1982).
text from HGMP 10 October 2002:

Pond densities range from a density index of 0.08 (approximately 0.44 lbs fish/ft3) to a density 0.16 (approximately 0.88 lbs fish/ft3), based on an average fish size of 20 fish/lb.

Density and loading criteria vary with annual production goals. Current production goals allow indices to be kept at or below 0.5, and flow indices to be within accepted standards for spring C salmon (Piper et al. 1982)

Data source:

nds
nds
nds

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

87 The migratory state of the release population is determined by volitional release and other crite

Comments:

historical timming of wild outmigration

Data source:

nds

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

68 The program attempts to better mimic the natural rearing environment by reducing rearing dens agency or other guidelines) and providing natural or artificial cover.

69 Fish produced are qualitatively similar to natural fish in health and other characteristics.

66 The program uses a diet and growth regime that mimics natural, seasonal growth patterns.

84 Fish are released at sizes similar to natural fish of the same life stage and species.

88 Fish are released in a manner that simulates natural seasonal migration patterns.

Comments:

Rearing density experiments on-going D.Olson USFWS 04/23/03
NATURES type evaluations are planned. D.Olson USFWS 04/23/03

text from HGMP 10 October 2002:

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

Shade coverings have been installed over each rearing pond.

nc
text from HGMP 10 October 2002:

Release times were chosen to mimic the life history characteristics of the wild spring Chinook s population in the Warm Springs River (Olson et al. 1995). The fall release is a strictly volitiona while spring releases are a combination of volitional and forced releases.
Fall and Spring releases

Data source:

nds
nds
nds
nds
nds

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

60 When juveniles are culled, it is done randomly over all segments of the population.

72 IHOT standards are followed for: water quality , predator control measures to provide the neces security for the cultured stock , loading and density.

80 The facility is continuously staffed to assure the security of fish stocks on-site.

84 Fish are released at sizes similar to natural fish of the same life stage and species.

88 Fish are released in a manner that simulates natural seasonal migration patterns.

98 "Fish transfers into the subbasin are inspected and accompanied by notifications as described ir PNFHPC guidelines.

76 Fish inventory data accurately reflect rearing vessel population abundance with 10%.

86 Volitional release is practiced during natural out-migration timing.

96 Fish are released in the same subbasin as the final rearing facility.

Comments:

nc
nc
On-site housing
text from HGMP 10 October 2002:

Release times were chosen to mimic the life history characteristics of the wild spring Chinook s population in the Warm Springs River (Olson et al. 1995). The fall release is a strictly volitiona while spring releases are a combination of volitional and forced releases.
Fall and Spring releases
text from HGMP 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting ar and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tan the CTWSRO.
nc
nc
text from HGMP 10 October 2002:

All juvenile releases currently occur onsite at Warm Springs NFH. Beginning in 2000, approxi adult fish have been outplanted into Shitike Creek annually. The adult fish are transported usin gallon tank truck with aerated water.

Data source:

nds
nds
nds
nds
nds
nds
nds
nds
nds

Section 10. Release

10.1 Proposed fish release levels.

					Location			
	Age Class	Maximum Number	Size (ffp)	Release Date	Stream	Release Point (RKm)	Major Watershed	Ecopro
	Eggs	0	nya	nya	nya	nya	nya	nya
1	Unfed Fry	0	nya	nya	nya	nya	nya	nya
	Fry	0	nya	nya	nya	nya	nya	nya
	Fingerling	75000	6-22	Oct - Nov	Warm Springs	16	Deschutes River	Columl Plateau
	Yearling	750000	9-22	Mar - Apr	Warm Springs	16	Deschutes River	Columl Plateau

Comments:

nc

Data source:

nds

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

					Location			
	Age Class	Maximum Number	Size (ffp)	Release Date	Stream	Release Point (RKm)	Major Watershed	Ecopro
	Eggs	0	nya	nya	nya	nya	nya	nya
1	Unfed Fry	0	nya	nya	nya	nya	nya	nya
	Fry	0	nya	nya	nya	nya	nya	nya
	Fingerling	75000	6-22	Oct - Nov	Warm Springs	16	Deschutes River	Columl Plateau
	Yearling	750000	9-22	Mar - Apr	Warm Springs	16	Deschutes River	Columl Plateau

96 Fish are released in the same subbasin as the final rearing facility.

Comments:

nc
text from HGMP 10 October 2002:

All juvenile releases currently occur onsite at Warm Springs NFH. Beginning in 2000, approxir adult fish have been outplanted into Shitike Creek annually. The adult fish are transported using gallon tank truck with aerated water.

Data source:

nds
nds

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

>

	Eggs/Unfed Fry Release			Fry Release			Fingerling Release			Year
Release Year	Number	Date (MM/DD)	Avg Size (fpp)	Number	Date (MM/DD)	Avg size (fpp)	Number	Date (MM/DD)	Avg Size (fpp)	Number
1991	nya	nya	nya	nya	nya	nya	8521	11/04	6	816420
1992	nya	nya	nya	nya	nya	nya	47257	10/01, 11/16	21	650986
1993	nya	nya	nya	nya	nya	nya	23099	11/15	21	509757
1994	nya	nya	nya	nya	nya	nya	16497	11/16	13	527565
1995	nya	nya	nya	nya	nya	nya	53001	11/22	14	381645
1996	nya	nya	nya	nya	nya	nya	30394	11/13	12	367885
1997	nya	nya	nya	nya	nya	nya	90809	11/14	16	437033
1998	nya	nya	nya	nya	nya	nya	35718	11/09	20	699613
1999	nya	nya	nya	nya	nya	nya	91377	11/17	18	775852
2000	nya	nya	nya	nya	nya	nya	42921	11/15	22	679042
2001	nya	nya	nya	nya	nya	nya	57975	11/14	22	784744
2002	nya	nya	nya	nya	nya	nya	nya	nya	nya	nya
Avg	nya	nya	nya	nya	nya	nya	45234	11/15	17	602777

196

Comments:

nc

Data source:

Draft HGMP

10.4 Actual dates of release and description of release protocols.

84 Fish are released at sizes similar to natural fish of the same life stage and species.

85 Fish are released at a time, size, location, and in a manner that achieves harvest goals for the stc

86 Volitional release during natural out-migration timing is practiced.

88 Fish are released in a manner that simulates natural seasonal migration patterns.

89

90

91 Fish are released at a time and size specified in an established juvenile production goal.

92 The carrying capacity of the subbasin has NOT been taken into consideration in sizing this prog

87 The migratory state of the release population is determined by volitional release and other crite

Comments:

nc
nc
text from HGMP 10 October 2002:

Release times were chosen to mimic the life history characteristics of the wild spring Chinook s
population in the Warm Springs River (Olson et al. 1995). The fall release is a strictly volitiona
while spring releases are a combination of volitional and forced releases.
Fall and Spring releases
On-going studies of time and size at release. D.Olson USFWS 04/23/03
nc
nc
nc
historical timming of wild outmigration

Data source:

nds
nds
nds
nds
nds
nds
nds
nds
nds

10.5 Fish transportation procedures, if applicable.

96 Fish are released in the same subbasin as the final rearing facility.

	Equipment Type	Capacity (gallons)	Supplemental Oxygen (y/n)	Temperature Control (y/n)	Normal Transit Time (minutes)	Chemical (s) Used	Dc (p
187	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya
	nya	nya	nya	nya	nya	nya	nya

nya nya nya nya nya nya nya

Comments:

text from HGMP 10 October 2002:

All juvenile releases currently occur onsite at Warm Springs NFH. Beginning in 2000, approxir adult fish have been outplanted into Shitike Creek annually. The adult fish are transported using gallon tank truck with aerated water.
text from HGMP 10 October 2002:

Approximately 200 hatchery adult spring Chinook salmon are outplanted into Shitike Creek dur August and early September. Staff from the CTWSRO use a tank truck to transport fish from th holding ponds to five release sites along Shitike Creek.

Egg Transportation

There is no off-station transport of spring Chinook salmon eggs at the present time.

Fingerling Transportation

There is no off-station transport of spring Chinook salmon fingerlings at the present time.

Smolt Transportation

There is no off-station transport of spring Chinook salmon smolts occurring at the present time.

There has been transport of eggs, fingerlings, and smolts to other sites for research purposes by the past. Emergency conditions at the hatchery may result in the temporary transfer of eggs or ju other hatcheries.

Data source:

nds
nds

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

Does not apply.

166 text from HGMP 10 October 2002:

The water source for Warm Springs NFH is the Warm Springs River. Fish are reared and releas

Comments:

nc

Data source:

nds

10.7 Marks applied, and proportions of the total hatchery population marked, to identify hatchery ad

100

101 100% of the hatchery fish released are marked so that they can be distinguished from the natura population.

102 Marked fish can be identified using non-lethal means.

Comments:

text from HGMP 10 October 2002:

All juvenile Warm Springs NFH spring Chinook salmon are adipose-fin clipped and coded-wir prior to release. The USFWS samples juvenile fish for mark quality and tag retention prior to re program goal is a minimum tag retention rate of 95%. The automated fish passage system sorts hatchery and wild fish based on the presence of coded-wire tags.

nc
nc

Data source:

nds
nds
nds

10.8 Disposition plans for fish identified at the time of release as surplus to programmed or approve

No surplus.

167

Text from HGMP 10 October 2002:

No broodstock or eggs are taken beyond approved levels.

163 Policy prohibiting taking extra eggs above and beyond programed numbers.

Comments:

nc
nc

Data source:

nds
nds

10.9 Fish health certification procedures applied pre-release.

97 All fish are examined for the presence of “reportable pathogens” as defined in the PNFHPC dis control guidelines, within 3 weeks prior to release.

98 Fish transfers into the subbasin are inspected and accompanied by notifications as described in PNFHPC guidelines.

Comments:

text from HGMP 10 October 2002:

Hatchery operations comply with the USFWS Fish Health Policy and Implementation Guidelin Integrated Hatchery Operations Team?s Fish Health Policy. Three to six weeks prior to release, from each lot are given a health exam. If fish are held longer than one month past the designate date a second health exam is performed.
text from HGMP 10 October 2002:

Broodstock fish are held and spawned onsite at the hatchery. Fish designated for outplanting ar and sorted during spawning at the hatchery and are trucked to Shitike Creek in a 300 gallon tan the CTWSRO.

Data source:

nds
nds

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

Pull the boards.

text from HGMP 10 October 2002:

168

Juvenile fish can be released onsite into the Warm Springs River in response to emergency con

Comments:

nc

Data source:

nds

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

84 Fish are released at sizes similar to natural fish of the same life stage and species.

86 Volitional release during natural out-migration timing is practiced.

88 Fish are released in a manner that simulates natural seasonal migration patterns.

89

91 Fish are released at a time and size specified in an established juvenile production goal.

104 The percent of the naturally spawning population in the subbasin that consists of adults from th is 5-30% (between five and thirty percent).

The percent of hatchery fish spawning in the wild is estimated by:

105

- Annual stream surveys (e.g. carcasses)
- Escapement data from a weir or dam
- Harvest records, creel surveys

95 Fish are released at times of the year and sizes to allow adoption of multiple life history strateg

94 Fish are released within the historic range for that stock.

93 The carrying capacity of the subbasin was taken into account when determining the number of released.

Comments:

text from HGMP 10 October 2002:

Release times were chosen to mimic the life history characteristics of the wild spring Chinook s population in the Warm Springs River (Olson et al. 1995). The fall release is a strictly volitiona while spring releases are a combination of volitional and forced releases.

nc

Fall and Spring releases

On-going studies of time and size at release. D.Olson USFWS 04/23/03

nc

nc

Warm Springs River and Shitike Creek.

nc
nc
nc
nc

Data source:

nds
nds
nds
nds
nds
nds
nds
nds
nds
nds
nds

Section 11. Monitoring and Evaluation of Performance Indicators

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

1) A subsample of wild and hatchery fish are biosampled in order to collect length, age, sex, an wire tag information for adult fish. The USFWS operates a fish barrier dam and adult fish ladde to the fish hatchery on the Warm Springs River. Approximately 10% of the wild run and 40% c hatchery run are sampled at the hatchery. The CTWSRO operates a migrant traps downstream c hatchery on the Warm Springs River and near the mouth of Shitike Creek that monitor juvenile outmigration timing of wild and hatchery fish.

Run timing of wild spring Chinook salmon is monitored at the hatchery fish ladder. Broodstock hatchery program are collected based on historical run timing averages of the wild run.

Creel surveys conducted by the CTWSRO and the Oregon Department of Fish and Wildlife (O coded-wire tag recoveries, and hatchery returns are used to estimate the contribution of Warm S NFH spring Chinook salmon to various fisheries.

Adults are selected for outplanting in Shitike Creek at spawn time in the hatchery. Redd survey telemetry, genetic surveys, and juvenile monitoring will be used to evaluate the contribution of Spring NFH spring Chinook salmon to natural production in Shitike Creek.

Specialists from the Lower Columbia River Fish Health Center (LCRFHC) will inspect adult b
yearly and monitor juvenile fish on a monthly basis to assess health and detect potential disease
As necessary, the LCRFHC will recommend remedial or preventative measures to prevent or tr
with administration of therapeutic and prophylactic treatments as deemed necessary.

Three to six weeks prior to release or transfer, 60 fish from each lot will be given a health exam
health specialists from the LCRFHC. All juvenile fish at the hatchery are externally marked and
wire tagged (CWT) prior to release. Juvenile fish are sampled by the USFWS for mark quality
retention prior to release. The tag retention goal at release is a minimum of 95%.

Smolt to adult survival rates are estimated for each brood year. Creel surveys conducted by CT
ODFW sample fish caught in fisheries in the Deschutes River. A subsample of hatchery spring
salmon returning to the hatchery are biosampled. Coded-wire tag recoveries are used to estimat
structure of returning fish.

Wild spring Chinook salmon abundance is monitored as fish pass through the fish ladder at Wa
NFH. The CTWSRO and USFWS will conduct redd surveys in order to estimate spawning abu

144

During the steelhead migration period all fish are sorted by hand. All hatchery steelhead, identi
having missing or deformed fins, are killed at the hatchery and distributed to the CTWSRO. Al
steelhead are passed upstream. The disposition of each fish handled is recorded in fish removal
files maintained by the USFWS Columbia River Fisheries Program Office.

Fish passed upstream are monitored either manually or through a video-monitor system.

All carcasses are screened by the fish health center for disease prior to being outplanted into the
Carcasses are treated (by evisceration and heat-baking) to prevent potential disease transmissio

Monitoring programs will be incorporated into project designs. Examples of project designs inc
studies, rearing density studies, and rearing environment projects.

Effectively communicate with other salmon producers, managers, and the public in the Columb
Basin.

Environmental monitoring of total suspended solids, settleable solids, in-hatchery water temper hatchery dissolved oxygen, nitrogen, ammonia, and pH is conducted annually at the hatchery.

Trapping efficiency is evaluated on a regular basis. During efficiency testing upstream bound fi held overnight and then manually examined for fin clips and the presence of coded-wire tags. V monitoring is used to estimate wild fish passage above the hatchery.

The CTWSRO and USFWS formulate a pre-season run prediction for Warm Springs River sto returning to the Deschutes River. The CTWSRO and ODFW co-manage and monitor the fisher to ensure that impacts to wild fish are minimized.

A juvenile trap located downstream of Warm Springs NFH monitors the outmigration of hatche wild fish. Juvenile releases may also be monitored using radio telemetry, PIT tagging, snorkeli trapping, or other techniques.

Coded-wire tag recoveries throughout the Columbia basin are recorded and summarized in orde estimate the amount of straying of Warm Springs NFH spring Chinook salmon.

Screens are monitored by hatchery personnel on a regular basis.

Juvenile fish health is monitored on at least a monthly basis at the hatchery in order to detect p disease problems. A fish health specialist will examine affected fish and make recommendatio remedial or preventative measures. Therapeutic and prophylactic treatments will be administere consultation with the fish health specialist and in accordance with USFWS and the Integrated H Operation Team?s policies. Wild fish used in the broodstock are checked for disease. Wild fish in the stream are periodically checked, as identified in the hatchery operations plan.

Comments:

nc

Data source:

Draft HGMP

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

146 The USFWS expects to continue to fund monitoring and evaluation programs associated with W Springs NFH.

Comments:

nc

Data source:

Draft HGMP

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

Incidental take of summer steelhead could occur through activities associated with the Warm S NFH adult collection facility. A fish barrier dam, adjacent to the hatchery, blocks upstream pas fish and directs them into a fish ladder located at the hatchery. Upon entering the fish ladder, fi either directed into holding ponds or passed upstream above the barrier dam. An automated fish system is used during the spring Chinook salmon migration period, generally from May throug of September. The automated passage system is designed to minimize handling of wild fish by separating returning hatchery spring Chinook salmon, identified by the presence of coded-wire wild fish. The passage system uses a 15-foot long denil steeppass fishway with a coded-wire ta detector and gate. As fish swim through the fishway and tube detector, coded-wire tagged fish a and a gate opens that shunts them into a holding pond. Non coded-wire tagged fish do not trigg and are able to continue migrating up through the fish ladder and upstream of the barrier dam. A system records non-coded wire tagged fish as they pass upstream of the hatchery. The video sy allows hatchery personnel to monitor the number, species, and origin of fish passing upstream. operation of the automated passage system wild fish are not handled by hatchery personnel, the reducing the potential take of listed species. Migration delays as fish find their way into the fish and through the passage system, rejection of the fish ladder resulting in displaced spawning, an suffered as adults try to jump the barrier dam are potential incidental takes associated with the b dam. The actual level of incidental take associated with the barrier dam is unknown at this time observations by hatchery personnel of fish movements through the barrier dam and passage sys level of take is assumed to be low (Mike Paiya, USFWS Warm Springs NFH, pers. comm..).

The automated passage system is only used during the spring Chinook salmon migration period from April 15 to September 30. The proper functioning of the passage system relies on 100% c tagging of hatchery fish, with all non coded-wire tagged fish passed upstream. All spring Chinc juveniles released from Warm Springs NFH are coded-wire tagged (the tag retention goal is 95 stray hatchery fish from hatcheries outside the subbasin may not be coded-wire tagged. The Wa River, and the Deschutes River subbasin in general, has a high incidence of stray hatchery steel (Olson and Pastor 1998). In order to preserve the genetic integrity of wild steelhead in the War River, it is the policy of Warm Springs NFH to pass only wild (unmarked) steelhead above the dam. In order to accomplish this goal, the automated fish passage system is not used until the st migration has ended, usually sometime in late April. During the steelhead migration period fish way into the fish ladder and into a holding pond. Hatchery personnel then hand sort the fish. Fis sedated using CO2, sorted, measured, and then either passed upstream or collected for the hatch wild summer steelhead, bull trout, and other indigenous fish species are passed upstream. Stray

steelhead, identified as having missing or deformed fins, are held in holding ponds, killed, and
to the CTWSRO.

Incidental take of listed species may occur during the manual sorting of fish in the fish ladder a
Springs NFH. Potential take could occur as a result of delay in migration timing, stress associat
handling, or misidentification of wild and hatchery steelhead. Hatchery personnel attempt to m
handling stress on fish by following the appropriate fish handling guidelines. Direct take on list
as a result of the fish barrier dam, fish ladder, and hatchery sorting procedures has been minima
unmarked adult steelhead were accidentally killed in 1998. No other mortality of unmarked adu
steelhead at the hatchery has been recorded since 1995 (CRiS Database 3/18/02).

Monitoring activities associated with the Warm Springs spring Chinook program also have the
for incidental take of listed steelhead and bull trout. A rotary screw trap, located at approximate
of the Warm Springs River, is operated by the CTWSRO in order to gather outmigration timing
population estimates for juvenile spring Chinook salmon. The trap is typically operated from m
through mid-November. Juvenile spring Chinook salmon collected at the trap are anesthetized
222, measured, weighed, and a subsample is marked and released upstream for mark-recapture
estimates. Some juvenile spring Chinook salmon may be implanted with radio-tags in order to
their migration behavior in the Deschutes River (See Section 12). Listed juvenile steelhead and
are also collected at the trap. Juvenile steelhead and juvenile resident trout are visually indistin
and are summarized together for monitoring purposes. Juvenile steelhead will be handled, meas
147 marked using the same procedures as for spring Chinook salmon. For an estimate of the numbe
steelhead trapped see Take Table 1. The probability of capture for juvenile bull trout in the trap
with fewer than ten bull trout trapped per year (Bob Spateholts, CTWSRO Warm Springs, pers
juvenile bull trout are collected at the trap they will be weighed, measured, marked, and release
upstream.

Incidental take of juvenile summer steelhead may occur through stress associated with the hand
marking procedures. Procedures associated with the juvenile trap are designed to minimize stre
potential take. The traps are checked regularly in order to minimize the amount of time fish are
trap. The amount of time fish are under anesthetic is carefully monitored and fish are allowed s
time to recover before being released back into the river. The potential for direct take of listed s
the traps as a result of trap malfunction or predator intrusion is considered to be low. The CTW
observed mink predation on fish caught in the screw trap (Bob Spateholts, CTWSRO Warm Sp
comm.). If recurring predators become a problem, live traps may be set to relocate the predator
from the trap site. During periods of high flows debris may clog the rotary screw mechanism o
possibly resulting in descaling or wounding of fish in the trap. Daily monitoring of the trap is e
minimize take associated with trap malfunction or predator intrusion. If high flows are anticipa
trap is raised in order to reduce the likelihood of trap malfunction. The traps are also deactivate
water temperatures exceed 20 degrees Celsius or if there are visible signs of stress in fish in the
Estimated take levels for listed steelhead in the Warm Springs River are summarized in Take T

The USFWS expects to conduct research and monitoring activities at the hatchery and in the st

environment that will focus on the ecological interactions of hatchery and wild fish in the Warm River, Shitike Creek, and Deschutes River. The research program is intended to gather informa will help managers evaluate hatchery practices and reduce impacts of the hatchery program on populations. Proposed research activities associated with Warm Spring NFH are discussed in d Section 12. Sampling of spring Chinook salmon will occur through the normal hatchery and mo activities on the Warm Springs River. Incidental take associated with the research program is e be minimal. Up to 100 juvenile spring Chinook salmon will be implanted with radio-tags at the screw trap on the Warm Springs River. Other research activities on the Warm Springs River inc expanded redd surveys and tissue sampling for genetic pedigree analysis of hatchery spring Chi salmon at the Warm Springs NFH.

The USFWS and the CTWSRO also anticipate conducting monitoring and research activities o Creek. Shitike Creek is small tributary of the Deschutes River that is located on the Warm Spri Reservation. Since 2000, the USFWS and the CTWSRO have outplanted Warm Springs NFH a Chinook salmon into Shitike Creek. The objectives of the monitoring and research program are follows:

1) Evaluate the contribution of outplanted spring Chinook salmon to the natural production in S Creek.

2) Investigate the potential ecological interactions of spring Chinook, bull trout, and summer st Shitike Creek.

As part of the monitoring program, adult spring Chinook salmon will be sampled at a temporar located near the mouth of Shitike Creek. The temporary weir is operated by the CTWSRO as pa trout monitoring program funded by the Bonneville Power Administration. The weir is typically in late April or early May, after the main upstream migration of adult summer steelhead. Adult migrating upstream are trapped at the weir and sampled by CTWSRO personnel. Sampling incl taking length measurements and scale samples. As part of the spring Chinook salmon program, scale samples will be collected from all upstream migrating spring Chinook salmon. Incidental steelhead may occur at the weir as a result of handling stress or delayed migration, although the typically installed after the steelhead migration (Take Table 2).

Juvenile sampling of downstream migrating fish occurs at a rotary screw trap located near the m Shitike Creek in the town of Warm Springs. The screw trap is operated when flows are sufficie typically from March through June and from October through November. The CTWSRO opera as part of the bull trout study and also to gather juvenile population estimates for steelhead and Chinook. Procedures for operating the Shitike Creek screw trap are the same as for the Warm S River screw trap. The outplanting monitoring program will collect tissue samples (fin clips) fro approximately 1000 juvenile spring Chinook salmon captured at the trap. Passive Integrated Tr (PIT) tags may also be applied to juvenile Chinook salmon. No additional take of listed species anticipated as a result of the spring Chinook salmon sampling. The USFWS and the CTWSRO conduct snorkel surveys and juvenile sampling in Shitike Creek during July and August. Snork

will collect observational data on microhabitat preferences, species associations, and species in
for juvenile salmonids. Tissue samples from age 0 spring Chinook salmon will be collected dur
summer. It is anticipated that age 0 spring Chinook salmon will be collected using either minno
or seining techniques. Minnow traps will be baited with tuna or cat food and placed in selected
45 minutes. The pools will be block-netted at the upstream and downstream ends in order to pr
migration into or emigration out of the pool during sampling. After 45 minutes the traps will be
and the fish in the traps will be sampled. The fish will then be returned to the stream and the blo
will be removed. If seining is used, snorkelers will enter the stream and ?herd? spring Chinook
seine, where they will be collected and sampled. During sampling the fish will be held in contai
freshwater, anesthetized with MS-222, counted, and placed into a recovery bucket. Once the fis
fully recovered they will be released back into the stream. Incidental take may occur as a result
harassment or stress associated the minnow traps or with snorkelers ?herding? fish towards a se
order to minimize potential take, minnow trapping or seining will not take place in locations wh
is a high abundance of listed species.

Comments:

nc

Data source:

Draft HGMP

Section 12. Research

12.1 Objective or purpose.

1.) Determine the over-wintering behavior and distribution of fall volitional releases of juvenile
spring Chinook salmon in the Deschutes River.

2.) Determine the migration behavior of juvenile hatchery fish that leave the Deschutes River sy
169 enter the Columbia River.

3.) Investigate hatchery spring Chinook salmon interactions among and between species during
wintering.

Comments:

nc

Data source:

Draft HGMP

12.2 Cooperating and funding agencies.

170 Funding for this study is being provided by the USFWS. The United States Geological Survey (and the CTWSRO are taking the lead in conducting the study.

Comments:

nc

Data source:

Draft HGMP

12.3 Principle investigator or project supervisor and staff.

Principle Investigator: Rachel Wardell

Project Leader: Dennis Rondorf

USGS

Columbia River Research Laboratory

5501 A Cook-Underwood Road

Cook, WA 98605

509-538-2299

171 USFWS: Doug Olson

CRFPO

9317 NE Highway 99, Suite I

Vancouver, WA 98665

360-696-7605

CTWSRO: Bob Spateholts

P.O. Box C

Warm Springs OR

541-553-2045

Comments:

nc

Data source:

nds

12.4 Status of stock, particularly the group affected by project, if different than the stock(s) describe Section 2.

172 nya

Comments:

nc

Data source:

nds

12.5 Techniques: include capture methods, drugs, samples collected, tags applied.

Juvenile hatchery spring Chinook salmon will be collected at a rotary screw trap located at Rkn Warm Springs River. The CTWSRO operate the trap as part of the monitoring and evaluation a associated with the Warm Springs NFH (see Section 2.2.3). Only juvenile hatchery spring Chin salmon will be used in the telemetry/PIT tag study. Fish will be collected during the fall trappin approximately 15 October to 15 November. Fish will be anesthetized using MS-222 and radio t surgically implanted. Radio-tag size will be no larger than 6% tag weight to fish weight ratio. U juvenile hatchery spring Chinook will be radio-tagged. Up to 1000 PIT tags will be applied to j hatchery fish caught in the rotary screw trap. In addition, approximately 60 juvenile hatchery sp Chinook will be sampled for ATPase using non-lethal techniques.

173

Once fish are tagged they will be tracked throughout the Deschutes River and Columbia River u radio-telemetry and PIT tag monitoring. Three fixed telemetry-stations located on the Deschute will monitor movement of radio-tagged fish in the subbasin. Telemetry sites at The Dalles Dam Bonneville Dam will scan for tagged fish in the mainstem Columbia River. Mobile telemetry re and a backpack PIT tag detector will be used for mobile tracking.

Comments:

nc

Data source:

Draft HGMP

12.6 Dates or time periods in which research activity occurs.

174 Collection will occur between 15 October and 15 November in 2002. Tracking of tagged fish w place from 15 October through January of the following year. The expected project duration is

through 2006.

Comments:

nc

Data source:

Draft HGMP

12.7 Care and maintenance of live fish or eggs, holding duration, transport methods.

175 Fish will be collected at the rotary screw trap. After fish are anesthetized and tags are implantec be placed in a recovery container and supplied with a constant flow of river water until they hav recovered from the anesthetic. Fish will then be released back into the Warm Springs River, approximately 5 meters downstream of the rotary screw trap.

Comments:

nc

Data source:

Draft HGMP

12.8 Expected type and effects of take and potential for injury or mortality.

176 No additional take of listed species beyond that identified in Section 2.2.3 is anticipated as a res study. The rotary screw trap is operated as part of the monitoring and evaluation activities assoc Warm Springs NFH (see Section 2). Samples for this study will be taken from fish captured thr normal monitoring activities. Tracking of radio-tagged and PIT tagged fish will take place from or in boats and is not expected to result in any take of listed species.

Comments:

nc

Data source:

Draft HGMP

12.9 Level of take of listed fish: number of range or fish handled, injured, or killed by sex, age, or siz already indicated in Section 2 and the attached “take table” (Table 1).

Warm Springs Spring Chinook- Integrated

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Fall Chinook - Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Steelhead-Integrated

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Red Band Rainbow Trout- Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Bull Trout- Natural

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Round Butte Spring Chinook - Hatchery

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya

Dates of activity	nya
Hatchery Program Operator	nya

Red Band Rainbow Trout (Oaks Springs)-Hatchery

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Kokanee- Hatchery

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

180

Brown Trout

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Kokanee-Lake Billy Chinook

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Brook Trout

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Cranebows- Integrated

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Rainbow Trout Stock 53

ESU/Population	nya
Activity	nya
Location of hatchery activity	nya
Dates of activity	nya
Hatchery Program Operator	nya

Annual Take of Listed Fish by Life Stage (number of fish)

Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock) (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya

Unintentional lethal take (g)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

	ESU/Population	Stehad
	Activity	nya
152	Location of hatchery activity	nya
	Dates of activity	nya
	Hatchery Program Operator	nya

Annual Take of Listed Fish by life Stage (number of fish)

Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harrass (a)	nya	nya	nya	nya
Collect for transport (b)	nya	nya	nya	nya
Capture, handle, and release (c)	nya	nya	nya	nya
153 Capture, handle, tag/mark/tissue sample, and release (d)	nya	nya	nya	nya
Removal (e.g., brookstock (e)	nya	nya	nya	nya
Intentional lethal take (f)	nya	nya	nya	nya
Unintentional lethal take (f)	nya	nya	nya	nya
Other take (specify) (h)	nya	nya	nya	nya

Comments:

text from HGMP 10 October 2002:

Incidental take of summer steelhead could occur through activities associated with the Warm Sp
adult collection facility. A fish barrier dam, adjacent to the hatchery, blocks upstream passage o
and directs them into a fish ladder located at the hatchery. Upon entering the fish ladder, fish are
directed into holding ponds or passed upstream above the barrier dam. An automated fish passa

is used during the spring Chinook salmon migration period, generally from May through the en
September. The automated passage system is designed to minimize handling of wild fish by pas
separating returning hatchery spring Chinook salmon, identified by the presence of coded-wire
wild fish. The passage system uses a 15-foot long denil steeppass fishway with a coded-wire tag
detector and gate. As fish swim through the fishway and tube detector, coded-wire tagged fish a
and a gate opens that shunts them into a holding pond. Non coded-wire tagged fish do not trigge
and are able to continue migrating up through the fish ladder and upstream of the barrier dam. A
system records non-coded wire tagged fish as they pass upstream of the hatchery. The video sys
hatchery personnel to monitor the number, species, and origin of fish passing upstream. During
of the automated passage system wild fish are not handled by hatchery personnel, thereby reduc
potential take of listed species. Migration delays as fish find their way into the fish ladder and th
passage system, rejection of the fish ladder resulting in displaced spawning, and injuries suffere
try to jump the barrier dam are potential incidental takes associated with the barrier dam. The ac
of incidental take associated with the barrier dam is unknown at this time. Based on observation
hatchery personnel of fish movements through the barrier dam and passage system, the level of
assumed to be low (Mike Paiya, USFWS Warm Springs NFH, pers. comm..).

The automated passage system is only used during the spring Chinook salmon migration period
from April 15 to September 30. The proper functioning of the passage system relies on 100% co
tagging of hatchery fish, with all non coded-wire tagged fish passed upstream. All spring Chino
juveniles released from Warm Springs NFH are coded-wire tagged (the tag retention goal is 95%
hatchery fish from hatcheries outside the subbasin may not be coded-wire tagged. The Warm Sp
River, and the Deschutes River subbasin in general, has a high incidence of stray hatchery steell
(Olson and Pastor 1998). In order to preserve the genetic integrity of wild steelhead in the Warr
River, it is the policy of Warm Springs NFH to pass only wild (unmarked) steelhead above the l
dam. In order to accomplish this goal, the automated fish passage system is not used until the st
migration has ended, usually sometime in late April. During the steelhead migration period fish
way into the fish ladder and into a holding pond. Hatchery personnel then hand sort the fish. Fis
sedated using CO2, sorted, measured, and then either passed upstream or collected for the hatch
wild summer steelhead, bull trout, and other indigenous fish species are passed upstream. Stray
steelhead, identified as having missing or deformed fins, are held in holding ponds, killed, and c
to the CTWSRO.

Incidental take of listed species may occur during the manual sorting of fish in the fish ladder at
Springs NFH. Potential take could occur as a result of delay in migration timing, stress associate
handling, or misidentification of wild and hatchery steelhead. Hatchery personnel attempt to mi
handling stress on fish by following the appropriate fish handling guidelines. Direct take on liste
as a result of the fish barrier dam, fish ladder, and hatchery sorting procedures has been minima
unmarked adult steelhead were accidentally killed in 1998. No other mortality of unmarked adu
at the hatchery has been recorded since 1995 (CRiS Database 3/18/02).

Monitoring activities associated with the Warm Springs spring Chinook program also have the
for incidental take of listed steelhead and bull trout. A rotary screw trap, located at approximate
of the Warm Springs River, is operated by the CTWSRO in order to gather outmigration timing
population estimates for juvenile spring Chinook salmon. The trap is typically operated from m

through mid-November. Juvenile spring Chinook salmon collected at the trap are anesthetized v
222, measured, weighed, and a subsample is marked and released upstream for mark-recapture
estimates. Some juvenile spring Chinook salmon may be implanted with radio-tags in order to r
their migration behavior in the Deschutes River (See Section 12). Listed juvenile steelhead and
are also collected at the trap. Juvenile steelhead and juvenile resident trout are visually indistinç
and are summarized together for monitoring purposes. Juvenile steelhead will be handled, meas
marked using the same procedures as for spring Chinook salmon. For an estimate of the numbe
steelhead trapped see Take Table 1. The probability of capture for juvenile bull trout in the trap
with fewer than ten bull trout trapped per year (Bob Spateholts, CTWSRO Warm Springs, pers.
juvenile bull trout are collected at the trap they will be weighed, measured, marked, and release

Incidental take of juvenile summer steelhead may occur through stress associated with the hand
marking procedures. Procedures associated with the juvenile trap are designed to minimize stres
potential take. The traps are checked regularly in order to minimize the amount of time fish are
trap. The amount of time fish are under anesthetic is carefully monitored and fish are allowed su
time to recover before being released back into the river. The potential for direct take of listed s
the traps as a result of trap malfunction or predator intrusion is considered to be low. The CTW
observed mink predation on fish caught in the screw trap (Bob Spateholts, CTWSRO Warm Spr
comm.). If recurring predators become a problem, live traps may be set to relocate the predators
the trap site. During periods of high flows debris may clog the rotary screw mechanism or live b
possibly resulting in descaling or wounding of fish in the trap. Daily monitoring of the trap is ex
minimize take associated with trap malfunction or predator intrusion. If high flows are anticipat
is raised in order to reduce the likelihood of trap malfunction. The traps are also deactivated wh
temperatures exceed 20 degrees Celsius or if there are visible signs of stress in fish in the live b
Estimated take levels for listed steelhead in the Warm Springs River are summarized in Take Ta

The USFWS expects to conduct research and monitoring activities at the hatchery and in the str
environment that will focus on the ecological interactions of hatchery and wild fish in the Warm
River, Shitike Creek, and Deschutes River. The research program is intended to gather informat
will help managers evaluate hatchery practices and reduce impacts of the hatchery program on v
populations. Proposed research activities associated with Warm Spring NFH are discussed in de
Section 12. Sampling of spring Chinook salmon will occur through the normal hatchery and mo
activities on the Warm Springs River. Incidental take associated with the research program is ex
be minimal. Up to 100 juvenile spring Chinook salmon will be implanted with radio-tags at the
screw trap on the Warm Springs River. Other research activities on the Warm Springs River inc
expanded redd surveys and tissue sampling for genetic pedigree analysis of hatchery spring Chi
salmon at the Warm Springs NFH.

The USFWS and the CTWSRO also anticipate conducting monitoring and research activities or
Creek. Shitike Creek is small tributary of the Deschutes River that is located on the Warm Sprin
Reservation. Since 2000, the USFWS and the CTWSRO have outplanted Warm Springs NFH a
Chinook salmon into Shitike Creek. The objectives of the monitoring and research program are

1) Evaluate the contribution of outplanted spring Chinook salmon to the natural production in S
Creek.

2) Investigate the potential ecological interactions of spring Chinook, bull trout, and summer ste
Shitike Creek.

As part of the monitoring program, adult spring Chinook salmon will be sampled at a temporary
located near the mouth of Shitike Creek. The temporary weir is operated by the CTWSRO as pa
trout monitoring program funded by the Bonneville Power Administration. The weir is typically
in late April or early May, after the main upstream migration of adult summer steelhead. Adult
migrating upstream are trapped at the weir and sampled by CTWSRO personnel. Sampling incl
length measurements and scale samples. As part of the spring Chinook salmon program, tissue
samples will be collected from all upstream migrating spring Chinook salmon. Incidental take o
may occur at the weir as a result of handling stress or delayed migration, although the weir is ty
installed after the steelhead migration (Take Table 2).

Juvenile sampling of downstream migrating fish occurs at a rotary screw trap located near the n
Shitike Creek in the town of Warm Springs. The screw trap is operated when flows are sufficien
from March through June and from October through November. The CTWSRO operates the tra
the bull trout study and also to gather juvenile population estimates for steelhead and spring Chi
Procedures for operating the Shitike Creek screw trap are the same as for the Warm Springs Riv
trap. The outplanting monitoring program will collect tissue samples (fin clips) from approxima
juvenile spring Chinook salmon captured at the trap. Passive Integrated Transponder (PIT) tags
be applied to juvenile Chinook salmon. No additional take of listed species is anticipated as a re
spring Chinook salmon sampling. The USFWS and the CTWSRO will also conduct snorkel sur
juvenile sampling in Shitike Creek during July and August. Snorkel surveys will collect observa
on microhabitat preferences, species associations, and species interactions for juvenile salmonic
samples from age 0 spring Chinook salmon will be collected during the summer. It is anticipate
spring Chinook salmon will be collected using either minnow trapping or seining techniques. M
traps will be baited with tuna or cat food and placed in selected pools for 45 minutes. The pools
block-netted at the upstream and downstream ends in order to prevent migration into or emigrat
the pool during sampling. After 45 minutes the traps will be removed and the fish in the traps w
sampled. The fish will then be returned to the stream and the block nets will be removed. If sein
snorkelers will enter the stream and ?herd? spring Chinook towards a seine, where they will be
and sampled. During sampling the fish will be held in containers of freshwater, anesthetized wit
counted, and placed into a recovery bucket. Once the fish have fully recovered they will be rele
into the stream. Incidental take may occur as a result of harassment or stress associated the minn
or with snorkelers ?herding? fish towards a seine. In order to minimize potential take, minnow t
seining will not take place in locations where there is a high abundance of listed species.
nc
nc

Data source:

nds
Draft HGMP

Draft HGMP

12.10 Alternative methods to achieve project objects.

177 None at this time.

Comments:

nc

Data source:

Draft HGMP

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

178 Similar species to summer steelhead and bull trout include spring Chinook salmon and resident trout. No mortality to these species is anticipated from this research project.

Comments:

nc

Data source:

HGMP

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

179 Non-lethal sampling techniques will be applied. The research project intends to use hatchery sp Chinook salmon to investigate potential impacts of hatchery activities on wild fish populations. screw trap is operated as part of the monitoring and evaluation activities associated with Warm NFH (see Section 2). This research project will use fish collected during the normal monitoring No additional listed fish will be sampled or handled as a result of the research project. Take est steelhead resulting from the monitoring and evaluation program in the Warm Springs River are in Take Tables.

Comments:

nc

Data source:

nds

Section 13. Attachments and Citations

13.1 Attachments and Citations

text from HGMP 10 October 2002:

Cates, B. C. 1992. Warm Springs National Fish Hatchery evaluation and anadromous fish study on the Warm Springs Indian Reservation, 1975-1989. Progress Report. U. S. Fish and Wildlife Service, Lower Columbia River Fisheries Resource Office, Vancouver, Washington.

Cederholm, C. J. 1999. Pacific salmon carcasses: Essential contributions of nutrients and energ aquatic and terrestrial ecosystems. Fisheries 24 (10): 6-15.

CRiS (Columbia River Information System) Database, Stephen Pastor Database Manager (Stephen_Pastor@fws.gov), United States Fish and Wildlife Service, Columbia River Fisheries Office, Vancouver, Washington. http://columbiariver.fws.gov

CTWSRO (Confederated Tribes of the Warm Springs Reservation of Oregon) and USFWS (Ur Fish and Wildlife Service), 2002. Warm Springs National Fish Hatchery Operational and Imple Plan 2002-2006. United States Fish and Wildlife Service, Columbia River Fisheries Program O Vancouver, Washington.

Dambacher, J. M. , 2002. Project Report: Relative abundance of juvenile Chinook salmon in Sh Creek, of the Confederate Tribes of the Warm Springs Reservation, Oregon. Oregon Departmer and Wildlife, Corvallis, OR.

Groot, C. and L. Margolis. 1991. Pacific salmon life histories. UBC Press, University of Britisl Vancouver, British Columbia.

IHOT (Integrated Hatchery Operations Team), 1996. Operations Plans for (USFWS) anadromo production facilities in the Columbia River Basin. Annual Report to the Bonneville Power Adm Portland, Oregon.

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Program Office, Vancouver, Washington.

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Columbia Fish District, Oregon Department of Fish and Wildlife, The Dalles, Oregon.

Oregon Department of Fish and Wildlife (ODFW), 1997. Lower Deschutes River Subbasin Ma
Plan. Mid-Columbia Fish District, Oregon Department of Fish and Wildlife, The Dalles, Orego

Piper, R. G., I. B. McElwain, L. E. Orme, J. P. McCraren, L. G. Fowler, and J. R. Leonard, 198
hatchery management. United States Department of Interior, Fish and Wildlife Service, Washir

USFWS (United States Fish and Wildlife Service). 1998. Intra-Service Section 7 biological eva

form for listed bull trout and Warm Springs National Fish Hatchery operations.

Wardell, R. E., N. S. Adams, D. W. Rondorf, C. Brun, and R. Dodson, 2002. Feasibility study t determine the distribution of juvenile hatchery spring Chinook salmon in the Deschutes River a potential effect upon the aquatic community, Annual Report for 2000. United States Geological Biological Resources Division, Columbia River Research Laboratory, Cook, Washington. http://columbiariver.fws.gov

Comments:

nc

Data source:

nds

Section 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

14.1 Certification Language and Signature of Responsible Party

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

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____