
WARM SPRINGS HATCHERY

**A SUMMARY OF THE IHOT AUDIT FOR
SPRING CHINOOK**

JULY, 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

**Warm Springs NFH
- Spring Chinook**

**A Summary of the Independent Audit Based on
Integrated Hatchery Operations Team (IHOT) Performance
Measures**

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CONTENTS

Section 1 Executive Summary.....	1
Section 2 Facility Description	3
Section 3 Remedial Actions	5
Section 4 Hatchery Contribution to Fisheries, Spawning Grounds and Hatcheries	7
Section 5 Annual Operating Expenditures.....	8

Executive Summary

This report presents a summary of the findings of the Hatchery Evaluation Report for Spring Chinook at the Warm Springs NFH. The original Hatchery Evaluation Report, prepared by Montgomery Watson, includes the complete findings. Details on the audit compliance status are included in the original report. The Hatchery Evaluation Report was based upon an audit conducted in 1996-1997 as part of a 2-year effort that will include 67 hatcheries and satellite facilities located on the Columbia and Snake River system in Idaho, Oregon, and Washington. The hatchery operating agencies include the U.S Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

The Warm Springs National Fish Hatchery is located on the north bank of the Warm Springs River, approximately 14 miles north of Warm Springs, Oregon. The hatchery is operated by the US Fish and Wildlife Service and is used for adult collection, incubation, and rearing of spring chinook.

Background

The hatchery audit was conducted as a requirement of the Northwest Power Planning Council (NPPC) “Strategy for Salmon” and the Columbia River Basin Fish and Wildlife Program. Under the audit, the hatcheries are evaluated against policies and related performance measures developed by the Integrated Hatchery Operations Team (IHOT) in January, 1995. IHOT is a multi-agency group established by the NPPC to direct the development of new basinwide standards for managing and operating fish hatcheries. The Bonneville Power Administration (BPA) contracted with Montgomery Watson to act as an independent contractor for the audit.

IHOT has established five basic policies that cover: (1) hatchery coordination, (2) hatchery performance standards, (3) fish health, (4) ecological interaction, and (5) genetics. The audit focuses on all these policies, with the exception of hatchery coordination. These policies are set forth in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries (IHOT 1995)*, which is the source for the performance measures that are the basis of this audit.

The Audit Process

The audit was based on the facility management’s response to a 109-page questionnaire. This audit form was completed through a five-step process in which:

- Information was obtained from headquarters.
- The hatchery manager was asked to fill out and return the audit form.
- A 1-2 day site audit visit was conducted to inspect facilities, review hatchery records, discuss audit form responses, and develop remedial action plans.
- A compliance report was developed to document the compliance status of each performance measure. This report was then shared with the hatchery manager and IHOT representative.

- This hatchery evaluation report was written to document compliance with IHOT performance measures and develop cost estimates for remedial actions when needed.

Warm Springs NFH - Spring Chinook Results

The Warm Springs facility includes three ponds for adult holding, 40 concrete raceways, 20 starter tanks, and incubation facilities. Warm Spring NFH was authorized in 1966 and began operating in 1978. Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) entered into an agreement with the U.S. Fish and Wildlife Service to stock the waters of the Water Springs Indian Reservation with salmon and trout to increase fishing opportunities. The goal of the hatchery is to produce spring chinook that will contribute to CTWSRO fisheries while providing adequate escapement for hatchery production.

SPRING CHINOOK

The Warm Springs NFH - Spring Chinook program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery was not meeting its adult return goal. The audit found that the hatchery was not in compliance with the screen mesh criteria, adult water quality monitoring criteria, temperature criteria, and pathology-free water criteria, which are all facilities requirements. The hatchery needed to construct additional early rearing tanks. The hatchery needed to develop specific incubation and rearing standards and a smoltification monitoring plan. In the compliance area for fish health policy, the hatchery did not provide foot baths in the incubation facility. The hatchery also did not have a Genetics Monitoring and Evaluation Program.

The specific areas in which the Warm Springs NFH - Spring Chinook program requires remedial actions based on the IHOT performance measures are listed below. These remedial actions are listed in alphabetical order without intent of ranking or otherwise assigning priority:

- Activate existing phone dialer system
- Construct at least 10 more starter tanks for early rearing
- Develop approved genetics M&E plan
- Develop smoltification monitoring program
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Install foot baths
- Provide 1/8" mesh for 2 Rex traveling screens
- Provide disinfection for 15,000 gpm
- Provide system to reduce high temperature
- Provide upgraded water supply for rearing
- Run analysis for missing water chemistry parameters, turbidity, alkalinity, hardness, and missing contaminant parameters

Non-compliance issues resulting from items beyond human control or Performance Measures not relevant to this hatchery were not listed above.

Facility Description

Name:	Warm Springs National Fish Hatchery
Stock/Species:	Spring Chinook
Operating Agency:	U.S. Fish and Wildlife Service
Funding Agency:	U.S. Fish and Wildlife Service
Location:	The hatchery is located on the north bank of the Warm Springs River, approximately 14 miles north of Warm Springs, Oregon.
Address:	P.O. Box 790 Warm Springs, OR 97761
Hatchery Manager:	Mr. Mike Paiya
Phone:	(541) 553-1692
Fax:	
Purpose:	Warm Spring NFH was authorized in 1966 and began operating in 1978. Confederated Tribes of the Warm Springs Reservation of Oregon entered into an agreement with the U.S. Fish and Wildlife Service to stock the waters of the Water Springs Indian Reservation with salmon and trout to increase fishing opportunities. The goal of the hatchery is to produce spring chinook that will contribute to CTWSRO fisheries while providing adequate escapement for hatchery production.
Production Goal:	Spring Chinook Produce 750,000 smolts for on-station release
Water Supply:	Water is supplied by pumping from the Warm Springs River. Water use ranges from 9,000 to 18,000 gpm.
Facilities:	
Adult Holding:	1 concrete catch pond - 672 cf 2 concrete brood ponds, 4,200 and 4,400 cf
Incubation:	16 full stacks of vertical tray incubators - 256 trays

Early Rearing: 20 starter tanks - 78 cf each

Raceways: 20 Burrow's raceways - 2,000 cf each

20 converted Burrow's raceways - 1,000 cf each

Rearing Ponds: None

Satellite Facilities: None

Section 3
Remedial Actions

Based on the compliance status for each performance measure, remedial actions were developed. The required remedial actions are organized into five categories. The types of categories range across a spectrum from those actions that are beyond human control, to those that require a change in agency policy or procedures, to those that involve a significant capital cost to put in place. The following are the five types of remedial actions identified under phase 1 of the audit:

The Five Types of Remedial Actions

Type	Description
1	Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery
2	Remedial actions requiring changes in agency policies or procedures
3	Remedial actions requiring changes in monitoring coverage or interval
4	Remedial actions requiring significant capital expenditures
5	Remedial actions that may require significant capital expenditures but are not clearly definable at this time

Remedial Actions at Warm Springs NFH - Spring Chinook

This section presents the corrective actions required to bring the Warm Springs NFH - Spring Chinook program into compliance with IHOT performance measures. The remedial actions described here are suggestions developed by the Montgomery Watson Audit Team. The remedial actions and associated cost estimates have not been analyzed or prioritized by the respective operating agencies, fishery managers, or IHOT. There may be additional remedial actions, not included in this report, proposed by the respective operating agencies. For some non-compliance areas, other remedial actions could be proposed. The required remedial actions are cross-referenced to each IHOT performance measure that was not in compliance. Where appropriate, the costs associated with the remedial actions are also presented (Table 3).

The cost estimates presented in this section are based on professional experience from similar projects. In most cases, only a lump-sum figure is presented, and detailed take-off lists have not been prepared. The cost estimates are essentially order of magnitude estimates ($\pm 40\%$).

The suggested remedial activities may also present several levels of action. Optional actions have been listed for several problems. These optional actions are desirable for either operational or safety considerations.

Table 3. Remedial Actions Required at Warm Springs NFH - Spring Chinook

Remedial Action Required	Cost	PMS¹
<p>Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery</p> <p>Improve adult returns</p>	----	4c, 4g, 4h, 22a4
<p>Type 2 – Remedial actions requiring changes in agency policies or procedures</p> <p>Develop specific incubation and rearing standards for IHOT Operations Plan</p> <p>Develop smoltification monitoring program</p> <p>Install foot baths</p> <p>Develop approved genetics M&E plan</p>	<p>----</p> <p>----</p> <p>----</p> <p>----</p>	<p>18-19</p> <p>22a1</p> <p>28</p> <p>43</p>
<p>Type 3 - Remedial actions requiring changes in monitoring coverage or interval</p> <p>Run analysis for missing water chemistry parameters, turbidity, alkalinity, hardness, and missing contaminant parameters</p>	----	5c-5g
<p>Type 4 - Remedial actions requiring significant capital expenditures</p> <p>Activate existing phone dialer system</p> <p>Construct at least 10 more starter tanks for early rearing</p> <p>Provide 1/8" mesh for 2 Rex traveling screens</p>	<p>500</p> <p>\$50,000</p> <p>\$10,000</p>	<p>6</p> <p>9, 19</p> <p>10</p>
<p>Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time</p> <p>Provide system to reduce high temperature</p> <p>Provide disinfection for 15,000 gpm</p> <p>Provide upgraded water supply for rearing</p>	<p>----</p> <p>----</p> <p>----</p>	<p>5a</p> <p>5h, 28</p> <p>20</p>

¹ PMS are performance measures that were extracted from the IHOT 1995 report.

Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Warm Springs NFH - Spring Chinook program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries (Table 4). Data is reported by broodyear. A broodyear refers to the adult contribution from the eggs produced from a single group of spawning adults. For some species, this may include fish caught as 2-, 3-, 4-, 5-, and 6-year old fish. Because of the return distribution and data processing delays, the complete adult contribution for a given broodyear may not be available until 4 to 5 years after the fish have been released from the hatchery.

**Table 4. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Warm Springs NFH - Spring Chinook**

Year	Fisheries ¹ (Broodyear)	Spawning Grounds ¹ (Broodyear)	Hatchery ¹ (Broodyear)	Total Combined Contribution ² (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985					
1986					
1987	374	?	552	926	0.14
1988	490	?	851	1341	0.18
1989	80	?	141	221	0.021
1990					
1991					

¹ Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.

² Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

Annual Operating Expenditures

The level and detail of annual operating expenditures varies widely depending on hatchery, operating agency, and funding source. When provided, expenditures were presented in terms of personnel costs, operating costs (power, feed, supplies), capital costs, indirect costs charged to the federal government, third-party costs, and other costs. These cost components were summed to determine a total hatchery annual cost. Based on discussion with the hatchery manager, the percent of total hatchery costs allocated to a given program was estimated. The total hatchery costs and the percent of hatchery costs allocated to a given program were used to compute the cost of a given program. The total expenditures for the Warm Springs NFH are presented in Table 5 by program. The detailed breakdown of program expenditures at this hatchery are presented in separate tables (Table 6a).

Table 5. Annual Operating Expenses - Warm Springs NFH

Program	1994	1995	1996
1. Spring Chinook	\$459,840	\$450,024	\$541,863
2.			
3.			
4.			
5.			
Total Hatchery Costs	\$459,840	\$450,024	\$541,863

Table 6a. Detailed Expenditures at Warm Springs NFH by Program
Spring Chinook

Component	1994	1995	1996
Personnel Costs	\$250,512	\$242,468	\$275,792
Operational Costs	\$209,328	\$207,556	\$266,071
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs			
Total Hatchery Costs	\$459,840	\$450,024	\$541,863
Source of Funds			
U.S. Fish & Wildlife Service	100%	100%	100%
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	100%	100%	100%
Program Costs	\$459,840	\$450,024	\$541,863

¹ When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.