

---

CASCADE HATCHERY

A COMPILATION AND SUMMARY OF  
IHOT AUDIT FOR COHO

JULY 1998

---

**HATCHERY EVALUATION REPORT  
SUMMARY FOR**

**Cascade Hatchery  
- Coho**

**A Summarized Compilation of Independent Audits Based on  
Integrated Hatchery Operations Team (IHOT) Performance  
Measures**

SUMMARY REPORT PREPARED BY:  
DON SAMPSON  
SAMPSEL CONSULTING SERVICES  
FOR THE  
NORTHWEST POWER PLANNING COUNCIL  
JULY 1998

Original IHOT Audit Reports Prepared by:

Montgomery Watson  
2375 130th Avenue NE  
Suite 200  
Bellevue, WA 98005  
March 1997

BPA Project Number 95-2  
Contract Number 95AC49468

# CONTENTS

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

## Section 1

# Executive Summary

This report compiles a summary of the findings of the Hatchery Evaluation Reports for Coho at Cascade Hatchery. The original Hatchery Evaluation Report, prepared by Montgomery Watson, presented each species and program separately and include the complete findings. Details on the audit compliance status for each species and program are included in the original reports. The Hatchery Evaluation Reports were based upon audits 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.

Cascade Hatchery is located along Eagle Creek near the town of Cascade Locks, Oregon. The hatchery is operated by the Oregon Department of Fish and Wildlife and used for adult holding, spawning, incubation, and rearing of coho.

## Background

The audit is being 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.

## **Cascade Hatchery - Coho Results**

The Cascade facility includes one ponds for adult holding, 30 concrete raceways, and incubation facilities. Cascade Hatchery was authorized under the Mitchell Act and began operating in 1959 as part of the Columbia River Fisheries Development Program - a program to enhance declining fish runs in the Columbia River Basin.

The Cascade Hatchery - Coho 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, pre-spawning survival goal, and did not have a smolt-to-adult goal. The audit found that the hatchery was not in compliance with the water quality monitoring, alarm, pathology-free water, acclimation (Umatilla River releases) requirements, which are all facilities requirements. Approximately 6 more raceways are needed to meet the density criteria. The hatchery was not following all food preparation, feeding, and transportation protocols. The hatchery did not have specific incubation and rearing standards or smoltification goals. The hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Cascade Hatchery - Coho 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:

- Construct 6 more raceways
- Develop alarm log
- Develop genetics M&E Program
- Develop groundwater supply for disease-free water
- Develop smolt-to-adult survival goal for IHOT Operations Plan
- Develop smoltification goal and implement monitoring program
- Develop written incubation standards for IHOT Operations Plan
- Develop written rearing standards for IHOT Operations Plan
- Follow IHOT feeding protocols

- Follow IHOT recommendations for equipment and rain gear sanitation
- Follow IHOT recommendations for monitoring of food preparation
- Follow IHOT transportation protocols
- Install flow alarms for adult holding, security alarms, and pager system
- Install second set of screens
- Provide acclimation for Umatilla River releases
- Rebuild adult holding ponds
- Review IHOT temperature criteria; may need well for tempering
- Review Operations Plan with staff
- Review potential for providing rearing in Yakima and Umatilla subbasins
- Run analysis for alkalinity and hardness
- Run analysis for contaminants
- Run analysis for dissolved nitrogen
- Run analysis for nitrite
- Run analysis for turbidity
- Run water chemistry analysis

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

## Facility Description

<b>Name:</b>	Cascade Hatchery
<b>Stock/Species:</b>	Coho Fall Chinook (adults are sometimes collected at this facility and used for backup for other programs)
<b>Operating Agency:</b>	Oregon Department of Fish & Wildlife
<b>Funding Agency:</b>	Mitchell Act
<b>Location:</b>	Cascade Hatchery is located along Eagle Creek near the town of Cascade Locks, Oregon
<b>Address:</b>	Cascade Fish Hatchery Oregon Department of Fish & Wildlife Star Route B, Box 12 Cascade Locks, OR 97014
<b>Hatchery Manager:</b>	Mr. Alan Meyer
<b>Phone:</b>	(541) 374-8381
<b>Fax:</b>	(503) 374-8191
<b>Purpose:</b>	<p>Cascade Hatchery was authorized under the Mitchell Act and began operating in 1959 as part of the Columbia River Fisheries Development Program - a program to enhance declining fish runs in the Columbia River Basin.</p> <p>The goal of the hatchery is to produce coho to help meet the goals the Columbia River Fisheries Development Program (U.S. v. Oregon Agreement)</p>

**Production Goal:**

**Coho**

Produce 700,000 coho smolts (46,665 lb) for release into the Yakima River.

Produce 1,000,000 coho smolts (66,670 lb) for release into the Umatilla River System.

Provide 1,587,000 coho eggs to Oxbow Hatchery

Produce 2,100,000 coho fingerlings (14,000 lb) for transfer to Upper Herman Creek Ponds (Oxbow Hatchery)

Produce 500,000 coho fingerlings (20,000 lb) for transfer to Lower Herman Creek Ponds (Oxbow Hatchery).

**Total Production:** 147,335 lb

**Water Supply:**

Water is supplied by gravity from Eagle Creek. The total water right is 20,197 gpm and the average water usage is about 7,117 gpm.

**Facilities:**

Adult Holding:	1 concrete adult holding pond - 22,50 cf
Incubation:	12 deep troughs - 22 cf each 28 shallow troughs - 9 cf each
Early Rearing:	12 deep troughs - 22 cf each 28 shallow troughs - 9 cf each
Raceways:	30 concrete raceways - 3,120 cf each
Rearing Ponds:	none
Satellite Facilities:	none



## 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 Cascade Hatchery - Coho

This section presents the corrective actions required to bring the Cascade Hatchery - Coho 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 Cascade Hatchery - Coho**

<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMs<sup>1</sup></b>
<b>Type 1</b> - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve adult returns	----	4c, 4g
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Review Operations Plan with staff	----	2
Develop smolt-to-adult survival goal for IHOT Operations Plan	----	4h
Review IHOT temperature, may need well for tempering	----	5a, 22a5
Develop alarm log	----	6
Follow IHOT recommendations for monitoring of food preparation	----	12
Follow IHOT feeding protocols	----	12
Develop written incubation standards for IHOT Operations Plan	----	18
Develop written rearing standards for IHOT Operations Plan	----	19, 22a2
Develop smoltification goal and implement monitoring program	----	22a1
Use existing acclimation ponds for Umatilla River releases	----	22b, 22c
Follow IHOT transportation protocols	----	23
Follow IHOT recommendations for equipment and rain gear sanitation	----	28
Develop Genetics M&E Program	----	43
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		
Run analysis for dissolved nitrogen	----	5b
Run water chemistry analysis	----	5c
Run analysis for turbidity	----	5d

<sup>1</sup> PMs are performance measures that were extracted from the IHOT 1995 report.

<b>Type 3 (Continued)</b> - Remedial actions requiring changes in monitoring coverage or interval		
Run analysis for alkalinity and hardness	----	5e
Run analysis for nitrite	----	5f
Run analysis for contaminants	----	5g
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Rebuild adult holding ponds	\$410,000	4b
Install flow alarms for adult holding, security alarms, and pager system	\$20,000	6
Construct 6 more raceways	\$450,000	9
Install second set of screens on 30 raceways	\$9,000	10
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Develop groundwater supply for disease-free water		5h
Review potential for providing rearing in Yakima and Umatilla subbasins	----	22b
Provide acclimation for Umatilla River releases	----	22b

## Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Cascade Hatchery - Coho 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: Cascade Hatchery - Coho**

Year	Fisheries <sup>1</sup> (Broodyear)	Spawning Grounds (Broodyear)	Hatchery (Broodyear)	Total Combined Contribution <sup>2</sup> (Broodyear)	Smolt to Adult Survival (percent)
1982					
1983					
1984					
1985					
1986					
1987				3323	0.75%
1988				17634	1.25%
1989				1762	0.11%
1990				4849	0.47%
1991				462	0.03%
1992					

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

<sup>2</sup> Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions; contribution based on Umatilla and Yakima rivers releases.

## 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, and 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 Cascade Hatchery are presented in Table 5 by program. The detailed breakdown of program expenditures at this hatchery are presented in separate tables (Table 6).

**Table 5. Annual Operating Expenses - Cascade Hatchery**

<b>Program</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
1. Coho	\$431,945	\$382,188	\$355,577
2.			
3.			
4.			
5.			
<b>Total Hatchery Costs</b>	<b>\$431,945</b>	<b>\$382,188</b>	<b>\$355,577</b>

**Table 6. Detailed Expenditures at Cascade Hatchery by Program**

**Coho**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$217,151	\$214,780	\$172,717
Operational Costs	\$141,474	\$102,442	\$129,677
Capital Costs	\$7,800	\$5,856	\$0
Indirect Costs	\$65,520	\$59,110	\$53,183
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs	\$0	\$0	\$0
<b>Total Hatchery Costs</b>	<b>\$431,945</b>	<b>\$382,188</b>	<b>\$355,577</b>
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	100%	100%	100%
<b>Program Costs</b>	<b>\$431,945</b>	<b>\$382,188</b>	<b>\$355,577</b>

w:\co\hot audits\oregon\big cr.-irrigon\cascade-lfinal.doc

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