
SANDY HATCHERY

A COMPILATION AND SUMMARY OF
IHOT AUDIT FOR COHO

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

**Sandy Hatchery
- Coho**

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

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JULY 1998

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December 1996

BPA Project Number 95-2
Contract Number 95AC49468

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Executive Summary

This report compiles a summary of the findings of the Hatchery Evaluation Reports for Coho at Sandy Hatchery. The original Hatchery Evaluation Reports, 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.

Sandy Hatchery is located along Cedar Creek (a Sandy River tributary) near the town of Sandy, Oregon. The hatchery is operated by the Oregon Department of Fish and Wildlife and used for adult collection, 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.

Sandy Hatchery - Coho Results

The Sandy facility includes one pond for adult holding, 20 concrete raceways, and incubation facilities. Marmot Pond is operated as satellite to Sandy Hatchery for the acclimation of Clackamas Hatchery Spring Chinook and Big Creek Hatchery Winter Steelhead. Sandy Hatchery began operation in 1951 as a state-funded facility. In 1959, the hatchery became part of the Columbia River Fisheries Development Program (Mitchell Act) -- a program to enhance declining runs in the Columbia River Basin.

The Sandy 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 and needed to develop a smolt-to-adult survival goal. The audit found that the hatchery was not in compliance with the disease-free water criteria, water quality monitoring requirements, and regional oversight of feed production criteria, which are all facilities requirements. The hatchery needed to develop specific incubation and rearing standards for the IHOT Operations Plan, exceeded its density criteria for rearing, was not following all of the transportation disinfection requirements, and did not have a smoltification goal or monitoring program. In the compliance area for fish health policy, the hatchery did not have foot baths in the incubation facilities. The hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Sandy 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:

- Develop a genetics M&E program
- Develop smolt-to-adult survival goal for IHOT Operations Plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for the IHOT Operations Plan
- Follow IHOT protocols for use of protective garments when handling fish eggs or cultural water
- Follow IHOT QA/QC for food preparation
- Follow IHOT recommendations for disinfection of the exteriors and interiors of transport vehicles
- Monitor TGP
- Provide disease-free water supply for incubation and early rearing
- Provide foot baths for incubation facilities
- Provide heating capability for incubation
- Review IHOT requirement for disease-free water for rearing
- Review IHOT temperature criteria for rearing
- Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants

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

Facility Description

Name:	Sandy Hatchery
Stock/Species:	Coho
Operating Agency:	Oregon Department of Fish & Wildlife
Funding Agency:	Mitchell Act
Location:	Sandy Hatchery is located along Cedar Creek (a Sandy River tributary) near the town of Sandy, Oregon.
Address:	Sandy Fish Hatchery Oregon Department of Fish & Wildlife 39800 SE Fish Hatchery Road Sandy, OR 97055
Hatchery Manager:	Mr. Ken Bourne
Phone:	(503) 668-4222
Fax:	(503) 668-4572
Purpose:	Sandy Hatchery began operation in 1951 as a state-funded facility. In 1959, the hatchery became part of the Columbia River Fisheries Development Program (Mitchell Act) -- a program to enhance declining runs in the Columbia River Basin.
Production Goal:	Coho Produce 1,000,000 coho smolts (66,7000) for on-station release Provide 2,000,000 green eggs to the Eagle Creek National Fish Hatchery as a backup to its program. Provide a total of 2,445,450 eyed coho eggs to McKenzie, Oxbow and Klamath hatcheries, Oregon's Salmon and Trout Enhancement Program, and Oregon State University.

Water Supply:

Water rights total 12,577 gpm from a spring and Cedar Creek. Water is supplied to the hatchery by gravity flow from Cedar Creek with a high flow of 8,000 gpm in March and a low flow of 1,800 gpm in July and August. A small amount of spring water is also used. Water is recirculated in the rearing ponds during the summer months. Adult holding ponds are supplied with water from the rearing ponds.

Facilities:

Adult Holding:	1 concrete adult holding pond - 8,190 cf
Incubation:	24 concrete troughs - 23 cf each
Early Rearing:	24 concrete troughs - 23 cf each
Raceways:	20 concrete raceways - 5,600 cf each
Rearing Ponds:	None
Satellite Facilities:	Marmot Pond (used to acclimate Clackamas Spring Chinook and Big Creek Winter Steelhead)

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 Sandy Hatchery - Coho

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

Remedial Action Required	Cost	PMS ¹
<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> <p>Install security alarms</p>	<p>----</p> <p>----</p>	<p>4g</p> <p>6</p>
<p>Type 2 - Remedial actions requiring changes in agency policies or procedures</p> <p>Develop smolt-to-adult survival goal for IHOT Operations Plan</p> <p>Review IHOT temperature criteria for rearing</p> <p>Review IHOT requirement for disease-free water for rearing</p> <p>Follow IHOT QA/QC for food preparation</p> <p>Develop specific incubation and rearing standards for the IHOT Operations Plan</p> <p>Develop smoltification goal and monitor</p> <p>Follow IHOT recommendations for disinfection of the exteriors and interiors of transport vehicles</p> <p>Follow IHOT protocols for use of protective garments when handling fish eggs or cultural water</p> <p>Provide foot baths for incubation facilities</p> <p>Develop a genetics M&E program</p>	<p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p>	<p>4h</p> <p></p> <p></p> <p>12</p> <p>18-19, 22a2</p> <p>22a1</p> <p>23</p> <p>23</p> <p>28</p> <p></p>
<p>Type 3 - Remedial actions requiring changes in monitoring coverage or interval</p> <p>Monitor TGP</p> <p>Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants</p>	<p>----</p> <p>----</p>	<p>5b</p> <p>5c-5g</p>

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

Remedial Action Required	Cost	PMs ¹
Type 4 - Remedial actions requiring significant capital expenditures Provide heating capability for incubation (144 gpm) Provide disease-free water supply for incubation and early rearing (9 cfs)	\$50,000 \$2.3 Million	5a 5h
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time None	----	

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 Sandy 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:
Sandy Hatchery - Coho**

Year	Fisheries ¹ (Broodyear)	Spawning Grounds ¹ (Broodyear)	Hatchery ¹ (Broodyear)	Total Combined Contribution ² (Broodyear)	Smolt to Adult Survival (percent)
1982					
1983					
1984					
1985					
1986					
1987				25,029	2.36%
1988				39,456	4.13%
1989				32,684	3.11%
1990				726	0.07%
1991				9,207	0.90%
1992					

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

Table 5. Annual Operating Expenses - Sandy Hatchery

Program	1994	1995	1996
1. Coho	\$309,438	\$329,347	\$315,434
2.			
3.			
4.			
5.			
Total Hatchery Costs	\$309,438	\$329,347	\$315,434

Table 6. Detailed Expenditures at Sandy Hatchery by Program

Coho

Component	1994	1995	1996
Personnel Costs	\$168,017	\$178,177	\$166,866
Operational Costs	\$89,788	\$96,241	\$90,894
Capital Costs			\$6,095
Indirect Costs	\$51,633	\$54,989	\$51,579
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs			
Total Hatchery Costs	\$309,438	\$329,347	\$315,434
Source of Funds			
Mitchell Act			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	100%	100%	100%
Program Costs	\$309,438	\$329,347	\$315,434

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