
KOOSKIA HATCHERY

A COMPILATION AND SUMMARY OF
IHOT AUDIT FOR SPRING CHINOOK

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

**Kooskia NFH
- Spring Chinook**

**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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September 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 Spring Chinook at Kooskia National Fish 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.

The hatchery is located in north-central Idaho, approximately 75 miles southeast of Lewiston in northwest Idaho County. The hatchery is used for adult collection, incubation, and rearing of spring chinook and operated as satellite of Dworshak NFH by the US Fish and Wildlife Service.

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.

Kooskia NFH - Spring Chinook Results

The Kooskia facility includes one pond for adult holding, 12 concrete raceways, 6 Burrow's ponds, 42 circular starter tanks, 32 rectangular starter tanks, and incubation facilities. The purpose of the hatchery is to service and enhance the stocks of chinook salmon in Middle Fork Snake River Basin.

The Kooskia NFH 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 survival goals for eye-egg to fry and fry-to-smolt. The audit found that the hatchery was not in compliance with the screen approach criteria, temperature criteria, alarm facilities, water quality and contaminant criteria, food storage facilities, release facilities, and adult holding facilities, which are all facilities requirements. The hatchery did not have any information on loading and density for early rearing and rearing. In the compliance area for fish health policy, the hatchery was not conducting the monthly fish health visits and did not meet the foot bath requirement or disinfection of equipment and rain gear. In the area of genetics policy, the hatchery did not have a broodstock collection plan or a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Kooskia 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:

- Conduct monthly fish health monitoring visits
- Develop a genetics monitoring and evaluation program
- Develop additional well supply, develop water supply from Middle Fork, or add more chiller capacity
- Develop broodstock collect plan
- Develop eye-egg to fry survival goal
- Develop fry-to-smolt goal
- Develop information on density and loading for early rearing and rearing
- Develop smoltification goal and monitoring program
- Develop written rearing standards for IHOT Operations Plan
- Disinfect equipment and rain gear utilized in broodstock handling or spawning prior to its use elsewhere in the hatchery
- Document summary of all diagnostic cases by fish lot
- Follow IHOT criteria for checking alarms
- Follow IHOT disinfection protocols for vehicle cab
- Follow IHOT protocols for checking proper functioning of pure oxygen aeration system
- Follow IHOT recommendations for moist pellets
- Follow IHOT temperature criteria for transportation
- Follow manufacturer's recommendation for storage of feeds
- Install alarm for headboxes
- Install foot bath in incubation facility
- Install logging system for alarms
- Rebuild release line to reduce stress
- Run analysis for alkalinity and hardness
- Run analysis for chemistry parameters
- Run analysis for contaminants
- Run analysis for turbidity

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

Facility Description

Name:	Kooskia NFH (A satellite of Dworshak NFH)
Stock/Species:	Spring Chinook
Operating Agency:	U.S. Fish and Wildlife Service
Funding Agency:	Lower Snake Compensation Program
Location:	Located in north-central Idaho, approximately 75 miles southeast of Lewiston in northwest Idaho County. The hatchery is situated in a narrow valley of Clear Creek, just upstream of the confluence with the Middle Fork Clearwater River.
Address:	Dworshak/Kooskia National Fish Hatchery U.S. Fish and Wildlife Service P.O. Box 18, State Highway 7 Ahsahka, ID 83520-0018
Hatchery Manager:	Mr. William Miller (complex manager) Mr. Richard "Kip" Bottomly (on-site hatchery manager)
Phone:	(208) 476-4591
Fax:	
Purpose:	The hatchery was authorized in 1961 to facilitate restoration of depleted, national significant fishery resources. Its first year of operation was 1969. It is currently used for adult collection and rearing of spring chinook. The purpose of the hatchery is to service and enhance the stocks of chinook salmon in Middle Fork Snake River Basin.
Production Goal:	Spring Chinook 800,000 yearling spring chinook (20/lb) for on-station release Total production: 40,000 lb
Water Supply:	Water rights total 13,456 gpm from six wells and Clear Creek. Just over half the water is from Clear Creek. Water available for hatchery use ranges from 4,389 to 8,527 gpm, with the majority supplied from Clear Creek. The hatchery is operated with a water re-use system that incorporates biofilters between uses.
Facilities:	
Adult Holding:	1 adult holding pond

Incubation:

Early Rearing: 42 circular starter tanks
32 rectangular starter tanks

Raceways: 12 raceways
6 Burrow's ponds

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 Kooskia NFH - Spring Chinook

This section presents the corrective actions required to bring the Kooskia 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 Kooskia NFH - Spring Chinook

Remedial Action Required	Cost	PMS¹
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve adult returns	----	4g, 4h, 22a4, 41
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Develop eye-egg to fry survival goal	----	4e
Develop fry-to-smolt goal	----	4f
Install security alarm	----	6
Follow manufacturer's recommendation for storage of feeds	----	12
Follow IHOT recommendations for moist pellets	----	12
Develop written rearing standards for IHOT Operations Plan	----	19
Develop information on density and loading for early rearing and rearing	----	19, 22a2
Conduct monthly fish health monitoring visits	----	21, 26
Document summary of all diagnostic cases by fish lot	----	21,31
Develop smoltification goal and monitoring program	----	22a1
Follow IHOT disinfection protocols for vehicle cab	----	23
Follow IHOT protocols for checking proper functioning of pure oxygen aeration system	----	23
Follow IHOT temperature criteria for transportation	----	23
Install foot bath in incubation facility	----	28
Disinfect equipment and rain gear utilized in broodstock handling or spawning prior to its use elsewhere in the hatchery	----	28
Develop broodstock collect plan	----	35,41
Develop a genetics monitoring and evaluation program	----	43

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

Remedial Action Required	Cost	PMs ¹
Type 3 - Remedial actions requiring changes in monitoring coverage or interval Run analysis for chemistry parameters Run analysis for turbidity Run analysis for alkalinity and hardness Run analysis for contaminants Follow IHOT criteria for checking alarms	 ---- ---- ---- ---- ----	 5c 5d 5e 5g 6
Type 4 - Remedial actions requiring significant capital expenditures Install alarm for headboxes Install logging system for alarms Rebuild release line to reduce stress	 \$5,000 \$5,000 \$75,000	 6 6 13
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time Develop additional well supply, develop water supply from Middle Fork, or add more chiller capacity	 ----	 5a

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 Kooskia NFH - Spring Chinook 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:
Kooskia NFH - Spring Chinook**

Year	Fisheries ¹ (Broodyear)	Spawning Grounds ¹ (Broodyear)	Hatchery ¹ (Broodyear)	Total Combined Contribution ¹ (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988	173	0	907		0.27
1989					
1990					
1991					
1992					

Only one year data is listed in the Missing Production Groups (1994); other calendar year data provided by hatchery but not presented.

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

¹ 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 Kooskia NFH are presented in Table 5 by program. The detailed breakdown of program expenditures at this hatchery is presented in a separate table (Table 6).

Table 5. Annual Operating Expenses - Kooskia NFH

Program	1994	1995	1996
1. Spring Chinook	N/A	\$224,000	\$227,000
2.			
3.			
4.			
5.			
Total Hatchery Costs	N/A	\$224,000	\$227,000

Table 6. Detailed Expenditures at Kooskia NFH by Program

Spring Chinook

Component	1994	1995	1996
Personnel Costs		\$137,000	\$142,000
Operational Costs		\$84,000	\$80,000
Capital Costs		\$3,000	\$5,000
Indirect Costs			
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs			
Total Hatchery Costs	N/A	\$224,000	\$227,000
Source of Funds			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	100%	100%	100%
Program Costs	N/A	\$224,000	\$227,000

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