KALAMA HATCHERY

A COMPILATON AND SUMMARY OF IHOT AUDITS FOR COHO, FALL CHINOOK, AND SPRING CHINOOK

JULY 1998

HATCHERY EVALUATION REPORT
SUMMARY FOR

Kalama Hatchery
- **Coho (Type N)**
- **Fall Chinook**
- **Spring Chinook**

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

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Section 1

Executive Summary

This report compiles a summary of the findings of three separate Hatchery Evaluation Reports for Coho (Type N), Fall Chinook, and Spring Chinook at Kalama 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 included 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 Kalama hatchery is located along the Kalama River at about river mile 10 and is operated by the Washington Department of Fish and Wildlife. The nearest town is Kalama, Washington, located approximately 12 miles south of the hatchery. The hatchery is used for adult collection, egg incubation, and rearing of spring chinook, fall chinook, and coho (Type N).

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.

Kalama Hatchery - Coho (Type N), Fall Chinook, and Spring Chinook Results

The Kalama facility includes six ponds for adult holding (also used for rearing), 12 concrete raceways, and incubation facilities. The hatchery was authorized under the Mitchell Act and began operation in 1958 as part of the Columbia River Fisheries Development Program - a program to mitigate for fishery losses caused by hydroelectric system development. The goal of the hatchery is to produce lower river fall chinook, spring chinook, and coho that will contribute to NE Pacific and Columbia River Basin commercial and sport fisheries.

COHO

The Kalama Hatchery - Coho (Type N) 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 green-egg to eyed-egg survival goal. The audit found that the hatchery was not in compliance with the screen mesh criteria, predation control facilities, turbidity criteria, water quality monitoring requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery needed to develop specific incubation and rearing standards for the IHOT Operations Plan. The hatchery was not meeting the flow and loading criteria for incubation and flow criteria for its rearing ponds. The hatchery needed to develop smoltification goals and a monitoring plan. The hatchery was also not meeting all the food storage and alarm requirements. In the compliance area for fish health policy, the hatchery did not have foot baths and was not following all the sanitation protocols. The hatchery needed to develop a broodstock collection plan, spawning protocols, and a Genetics Monitoring and Evaluation Program.

The specific areas in which the Kalama Hatchery - Coho (Type N) 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 IHOT QA/QC tests for feed preparation
- Construct settling pond for 1,000 gpm
- Develop approved genetics M&E plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for the IHOT Operations Plan
- Develop written broodstock collection plan

- Develop written spawning protocols
- Follow IHOT loading and flow criteria for incubation or revise
- Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat
- Increase flow to rearing ponds by 2,600 gpm
- Install alarms on microscreens
- Install bird screens over rearing area (34,000 sf)
- Install foot baths
- Install security alarms
- Install telephone pagers
- Monitor and record DO and TGP
- Replace intake screen material
- Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants
- Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish
- Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock

FALL CHINOOK

The Kalama Hatchery - Fall Chinook program was in general compliance with most of the performance measures. The audit found that the hatchery was not in compliance with the screen mesh criteria, predation control facilities, turbidity criteria, water quality monitoring requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery needed to develop specific incubation and rearing standards for the IHOT Operations Plan. The hatchery was not meeting the flow and loading criteria for incubation and flow and density criteria for the raceways. The hatchery needed to develop smoltification goals and a monitoring plan. The hatchery was not meeting all the food storage and alarm requirements. In the compliance area for fish health policy, the hatchery did not have foot baths and was not following all the sanitation protocols. The hatchery also needed to develop a broodstock collection plan, spawning protocols, and a Genetics Monitoring and Evaluation Program.

The specific areas in which the Kalama Hatchery - Fall 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:

- Chill 450 gpm of incubation water by 7°F; heat 450 gpm of incubation water by 5°F
- Conduct IHOT QA/QC tests for feed preparation
- Construct two 20’x80’ raceways
- Construct settling pond for 1,000 gpm
- Develop approved genetics M&E plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for the IHOT Operations Plan
- Develop written broodstock collection plan
- Develop written spawning protocols
- Follow IHOT loading and flow criteria for incubation or revise
- Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat
- Increase flow to raceways by 700 gpm
- Install alarms on microscreens
- Install bird screens over rearing area (34,000 sf)
- Install foot baths
- Install security alarms
- Install telephone pagers
- Monitor and record DO and TGP
- Replace intake screen material
- Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants
- Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish

- Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock

SPRING CHINOOK

The Kalama Hatchery - 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 pre-spawning survival goal and needed to document its adult contribution and smolt-to-adult survival. The audit found that the hatchery was not in compliance with the screen mesh criteria, predation control facilities, turbidity criteria, water quality monitoring requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery needed to develop specific incubation and rearing standards for the IHOT Operations Plan. The hatchery was not meeting the flow and loading criteria for incubation. The hatchery needed to develop a monitoring plan. The hatchery also was not meeting all the food storage, transportation and alarm requirements. In the compliance area for fish health policy, the hatchery did have foot baths and was not following all the sanitation protocols. The hatchery needed to develop a broodstock collection plan, spawning protocols, and a Genetics Monitoring and Evaluation Program.

The specific areas in which the Kalama Hatchery - 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:

- Chill 45 gpm of water for incubation by 7°F
- Chill 700 gpm of water for adult holding by 10 - 15°F
- Conduct IHOT QA/QC tests for feed preparation
- Construct settling pond for 1,000 gpm
- Develop approved genetics M&E plan
- Develop specific incubation and rearing standards for the IHOT Operations Plan
- Develop written broodstock collection plan
- Develop written spawning protocols
- Follow IHOT loading and flow criteria for incubation or revise
- Follow IHOT protocols for disinfection of other equipment
- Follow IHOT protocols for disinfection of transport tank interiors
- Follow IHOT protocols for disinfection of transport vehicle interiors and exteriors
- Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat
- Follow IHOT temperature criteria for hauling

- Install alarms on microscreens
- Install bird screens over rearing area (34,000 sf)
- Install foot baths
- Install security alarms
- Install telephone pagers
- Monitor and record DO and TGP
- Replace intake screen material
- Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants
- Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish
- Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock

Section 2

Facility Description

Name:	Kalama Hatchery
Stock/Species:	Spring Chinook Fall Chinook Coho (Type N)
Operating Agency:	Washington Department of Fish and Wildlife
Funding Agency:	Mitchell Act (NMFS)
Location:	The hatchery is located along the Kalama River at about river mile 10. The nearest town is Kalama, Washington, located approximately 12 miles south of the hatchery.
Address:	Box 3900 Kalama River Road Kalama, WA 98625
Hatchery Manager:	Mark Johnson
Phone: **Fax:**	(360) 673-4825 (360) 673-4827
Purpose:	The hatchery was authorized under the Mitchell Act and began operation in 1958 as part of the Columbia River Fisheries Development Program - a program to mitigate for fishery losses caused by hydroelectric system development. The goal of the hatchery is to produce lower river fall chinook, spring chinook, and coho that will contribute to NE Pacific and Columbia River Basin commercial and sport fisheries.

Production Goal:

Spring Chinook

Produce 550,000 yearlings for the Lower Kalama Hatchery for extended rearing and release.

Pass 400 adult males upstream

Fall Chinook

Produce 3,500,000 subyearlings for on-station release

Provide eggs/fish to other facilities

Pass 250 adult males upstream

Coho (Type N)

Produce 900,000 yearlings for on-station release

Water Supply:

Water rights total 8,055 gpm from four sources: Kalama River, two unnamed creeks and a well (domestic water). The majority of water is supplied from the Kalama River with the two unnamed creeks providing seasonal water.

Facilities:

Adult Holding:	6 adult holding ponds (also used for rearing) - 12,000 cf each
Incubation:	60 16-tray vertical stack incubators - 960 trays
Early Rearing:	None
Raceways:	12 raceways - 5,600 cf each
Rearing Ponds:	6 rearing ponds (also used for adult holding) - 12,000 cf each
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 Kalama Hatchery - Coho (Type N), Fall Chinook, and Spring Chinook

This section presents the corrective actions required to bring the Kalama Hatchery - Coho (Type N), Fall Chinook, and Spring Chinook programs into compliance with IHOT performance measures. The remedial actions suggested here are just that, 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 3a, 3b, and 3c).

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 (± 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 3a. Remedial Actions Required at Kalama Hatchery - Coho (Type N)

Remedial Action Required	Cost	PMs[1]
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Increase adult returns	----	4c
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Conduct IHOT QA/QC tests for feed preparation	----	12
Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat	----	12
Develop specific incubation and rearing standards for the IHOT Operations Plan	----	18-19
Follow IHOT loading and flow criteria for incubation or revise	----	18
Develop smoltification goal and monitor	----	22a1
Install foot baths	----	28
Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish	----	28
Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock	----	28
Develop written broodstock collection plan	----	41
Develop written spawning protocols	----	42
Develop approved genetics M&E plan	----	43
Type 3 – Remedial actions requiring changes in monitoring coverage or interval		
Monitor and record DO and TGP	----	5b
Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants	----	5c, 5e-5g

[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		
Construct settling pond for 1,000 gpm	$400,000	4d, 5d
Install alarms on microscreens	$5,000	6
Install security alarms	$10,000	6
Install telephone pagers	$5,000	6
Replace intake screen material	$3,600	10
Install bird screens over rearing (34,000 sf)	$51,000	11
Increase flow to rearing ponds by 2,600 gpm	$50,000	19
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.

Table 3b. Remedial Actions Required at Kalama Hatchery - Fall Chinook

Remedial Action Required	Cost	PMs[1]
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
None	----	
Type 2 – Remedial actions requiring changes in agency policies or procedures		
Conduct IHOT QA/QC tests for feed preparation	----	12
Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat	----	12
Develop specific incubation and rearing standards for the IHOT Operations Plan	----	18-19
Follow IHOT loading and flow criteria for incubation or revise	----	18
Develop smoltification goal and monitor	----	22a1
Install foot baths	----	28
Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish	----	28
Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock	----	28
Develop written broodstock collection plan	----	41
Develop written spawning protocols	----	42
Develop approved genetics M&E plan	----	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		
Monitor and record DO and TGP	----	5b
Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants	----	5c, 5e-5g
Type 4 - Remedial actions requiring significant capital expenditures		
Chill 450 gpm of incubation water by 7 °F; heat 450 gpm of incubation water by 5 °F	$440,000	5a
Construct settling pond for 1,000 gpm	$400,000	4d, 5d
Install alarms on microscreens	$5,000	6
Install security alarms	$10,000	6
Install telephone pagers	$5,000	6
Replace intake screen material	$3,600	10
Install bird screens over rearing (34,000 sf)	$51,000	11
Construct two 20'x80' raceways	$210,000	19
Increase flow to raceways by 700 gpm	$45,000	19
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
None	----	

Table 3c. Remedial Actions Required at Kalama Hatchery - Spring Chinook

Remedial Action Required	Cost	PMs[1]
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
None	----	

[1] PMs are performance measures that were extracted from the IHOT 1995 report.

Remedial Action Required	Cost	PMs[1]
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Conduct IHOT QA/QC tests for feed preparation	----	12
Follow IHOT protocols for not leaving buckets of feed or feed containers exposed to light or heat	----	12
Develop specific incubation and rearing standards for the IHOT Operations Plan	----	18-19
Follow IHOT loading and flow criteria for incubation or revise	----	18
Follow IHOT protocols for disinfection of transport tank interiors	----	23
Follow IHOT protocols for disinfection of transport vehicle interiors and exteriors	----	23
Follow IHOT protocols for disinfection of other equipment	----	23
Follow IHOT temperature criteria for hauling	----	23
Install foot baths	----	28
Sanitize equipment used to collect dead fish prior to its use in another pond and/or lot of fish	----	28
Sanitize rearing vessels after fish are removed and prior to introducing a new lot of fish or stock	----	28
Develop written broodstock collection plan	----	41
Develop written spawning protocols	----	42
Develop approved genetics M&E plan	----	43
Remedial Action Required	**Cost**	**PMs[1]**
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Monitor and record DO and TGP	----	5b
Run analysis for water quality parameters, alkalinity, hardness, nitrite, and contaminants	----	5c, 5e-5g
Type 4 - Remedial actions requiring significant capital expenditures		

[1] PMs are performance measures that were extracted from the IHOT 1995 report.

Remedial Action Required	Cost	PMs[1]
Chill 700 gpm of water for adult holding by 10 - 15 °F	$880,000	4b, 5a
Chill 45 gpm of water for incubation by 7 °F	$20,000	5a
Construct settling pond for 1,000 gpm	$400,000	4d, 5d
Install alarms on microscreen	$5,000	6
Install security alarms	$10,000	6
Install telephone pagers	$5,000	6
Replace intake screen material	$3,600	10
Install bird screens over rearing area (34,000 sf)	$51,000	11
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
None	----	

Section 4

Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Kalama Hatchery - Coho (Type N), Fall Chinook, and Spring Chinook programs contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries (Tables 4a, 4b and 4c).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 4a. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries: Kalama Hatchery - Coho (Type N)

Year	Fisheries[1] (Broodyear)	Spawning Grounds[1] (Broodyear)	Hatchery[1] (Broodyear)	Total Combined Contribution[2] (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988	2,540		107	2,647	8.83%
1989	180		31	211	0.68%
1990	46		4	50	0.17%
1991	19		14	33	0.11%
1992					

Table 4b. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries: alama Hatchery - Fall Chinook

[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.

Year	Fisheries[1] (Broodyear)	Spawning Grounds[1] (Broodyear)	Hatchery[1] (Broodyear)	Total Combined Contribution[2] (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988	235	55	99	389	0.17
1989					
1990					
1991					
1992					

Table 4c. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries: Kalama Hatchery - Spring Chinook

Year	Fisheries[3] (Broodyear)	Spawning Grounds[1] (Broodyear)	Hatchery[1] (Broodyear)	Total Combined Contribution[4] (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					

[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.

[3] Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.
[4] Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

1987	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery
1988	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery
1989	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery
1990	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery	Reported at Fallert Creek Hatchery
1991					
1992					

Section 5

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 Kalama Hatchery are presented in Table 5 by program. The detailed breakdown of the Spring Chinook, Fall Chinook, and Coho program expenditures at this hatchery are presented in separate tables (Tables 6a, 6b, and 6c).

Table 5. Annual Operating Expenses - Kalama Hatchery

Program	**1991**	**1992**	**1993**
1. Spring Chinook	**$22,870**	**$11,789**	**$9,059**
2. Fall Chinook	**$256,713**	**$203,355**	**$218,045**
3. Coho (Type N)	**$245,850**	**$299,629**	**$280,344**
4.			
5.			
Total Hatchery Costs	**$525,432**	**$514,772**	**$507,448**

Table 6a. Detailed Expenditures at Kalama Hatchery by Program

Spring Chinook

Component	**1991**	**1992**	**1993**
Personnel Costs			
Operational Costs			
Capital Costs			

Indirect Costs			
Lumped Hatchery Costs[1]			
Lumped Third-Party Costs			
Total Hatchery Costs	**$525,432**	**$514,772**	**$507,448**
Source of Funds			
NMFS	**100%**	**100%**	**100%**
Program Production (lb)	4,000	2,400	1,745
Total Production (lb)	91,900	104,800	97,745
Program as Percent of Total	4.35%	2.29%	1.79%
Program Costs	**$22,870**	**$11,789**	**$9,059**

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

Table 6b. Detailed Expenditures at Kalama Hatchery by Program

Fall Chinook

Component	1991	1992	1993
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs[1]			
Lumped Third-Party Costs			
Total Hatchery Costs	**$525,432**	**$514,772**	**$507,448**
Source of Funds			
NMFS	**100%**	**100%**	**100%**
Program Production (lb)	44,900	41400	42,000
Total Production (lb)	91,900	104,800	97,745
Program as Percent of Total	48.9%	39.5%	43.0%
Program Costs	**$256,713**	**$203,355**	**$218,045**

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

Table 6c. Detailed Expenditures at Kalama Hatchery by Program

Coho (Type N)

Component	1991	1992	1993
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs[1]			
Lumped Third-Party Costs			
Total Hatchery Costs	**$525,432**	**$514,772**	**$507,448**
Source of Funds			
NMFS	**100%**	**100%**	**100%**
Program Production (lb)	43,000	61,000	54,000
Total Production (lb)	91,900	104,800	97,745
Program as Percent of Total	46.8%	58.2%	55.2%
Program Costs	**$245,850**	**$299,629**	**$280,344**

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