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**SOUTH SANTIAM HATCHERY**

**A COMPILATION AND SUMMARY OF  
IHOT AUDITS FOR SPRING CHINOOK,  
FALL CHINOOK, AND SUMMER  
STEELHEAD**

**JULY 1998**

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**HATCHERY EVALUATION REPORT  
SUMMARY FOR**

**South Santiam Hatchery**

- **Spring Chinook**
- **Fall Chinook**
- **Summer Steelhead**

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

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NORTHWEST POWER PLANNING COUNCIL  
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## Executive Summary

This report compiles a summary of the findings of three separate Hatchery Evaluation Reports for Spring Chinook, Fall Chinook, and Summer Steelhead at the South Santiam 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 on the South Santiam River just downstream from Foster Dam and is operated by the Oregon Department of Fish and Wildlife. The hatchery is used for adult collection, egg incubation, and rearing of spring chinook and summer steelhead. Stayton Pond, a satellite facility, is used for the rearing of fall chinook.

### 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.

## **South Santiam Hatchery - Spring Chinook, Fall Chinook, and Summer Steelhead Results**

The South Santiam facility includes one pond for adult holding, 14 concrete Burrow's ponds, and incubation facilities. The hatchery is funded by both the state of Oregon and the U.S. Army Corps of Engineers to mitigate for fish losses caused by development of Foster and Green Peter dams.

### **SPRING CHINOOK**

The South Santiam Hatchery - Spring Chinook program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery did not have a smolt-to-adult goal. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, pathology-free water criteria, alarm requirements, feed preparation tests, which are all facilities requirements. The hatchery need additional incubators and rearing space and double-screening for 9 raceways. The hatchery needed to develop a smoltification goal, a smoltification monitoring program, and specific incubation and rearing standards. The hatchery needed to develop a written broodstock collection plan, written spawning protocols, and an approved Genetics Monitoring and Evaluation Program.

The specific areas in which the South Santiam 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:

- Check temperature of moist pellets at time of delivery to assess compliance with IHOT criteria
- Conduct IHOT QA/QC tests for feed preparation
- Construct two more small raceways to meet current program
- Develop alarm log
- Develop approved genetics M&E plan
- Develop smolt-to-adult goal for IHOT Operations Plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Develop written broodstock collection plan
- Develop written spawning protocols
- Follow IHOT protocols for checking of flow alarms daily
- Follow IHOT protocols for the disinfection of the interiors and exteriors of transport vehicles
- Follow IHOT temperature criteria for transportation
- Install 10 16-tray incubators and additional space
- Install security alarms
- Monitor and record DO and TGP
- Provide disease-free water for incubation and early rearing
- Provide double screens for Clackamas stock (9 raceways)

- Run analysis for water chemistry parameters, 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.

### **FALL CHINOOK**

The South Santiam Hatchery - Fall Chinook program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery did not have a smolt-to-adult goal and was not meeting its fry-to-smolt and production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm requirements, and feed preparation tests, which are all facilities requirements. The hatchery needed a new outlet structure with double screening, improved predation control, new feed storage and freezer, and rearing or acclimation in the subbasins. The hatchery needed to develop a smoltification goal, a smoltification monitoring program, and specific rearing standards. The hatchery was not in compliance with all the disinfection protocols involved with transportation.

The specific areas in which the South Santiam 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:

- Conduct IHOT QA/QC tests for feed preparation
- Develop smolt-to-adult goal for IHOT Operations Plan
- Develop smoltification goal and monitor
- Develop specific rearing standards for IHOT Operations Plan
- Follow IHOT protocols for disinfection of transportation equipment and personnel before and after use
- Follow IHOT protocols for the disinfection of the interiors and exteriors of transport vehicles
- Follow IHOT temperature criteria for transportation
- Improve predation control at Stayton Pond
- Monitor DO and TGP and record
- Provide feed storage and freezer
- Provide rearing or acclimation for the Mill Creek and Molalla components
- Review alarm requirements for the large rearing pond and install the required alarms
- 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.

### **SUMMER STEELHEAD**

The South Santiam Hatchery - Summer Steelhead program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery did not have a smolt-to-adult goal or hatchery monitoring and evaluation program and needed to document its adult contribution. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, pathology-free water criteria, alarm requirements, feed preparation tests, which are all facilities requirements. The hatchery need additional rearing space and a new adult holding pond. The hatchery needed to develop a smoltification goal, a smoltification monitoring program, and specific incubation and rearing standards. The hatchery needed to develop a written

broodstock collection plan, written spawning protocols, and an approved Genetics Monitoring and Evaluation Program.

The specific areas in which the South Santiam Hatchery - Summer Steelhead 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:

- Check temperature of moist pellets at time of delivery to assess compliance with IHOT criteria
- Conduct fishery contribution studies
- Conduct IHOT QA/QC tests for feed preparation
- Construct new holding pond for steelhead broodstock
- Construct two more small raceways to meet current program
- Develop alarm log
- Develop approved genetics M&E plan
- Develop hatchery M&E plan
- Develop smolt-to-adult goal for IHOT Operations Plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Develop written broodstock collection plan
- Develop written spawning protocols
- Document adult contribution
- Follow IHOT protocols for checking of flow alarms daily
- Follow IHOT protocols for the disinfection of the interiors and exteriors of transport vehicles
- Follow IHOT temperature criteria for transportation
- Install security alarms
- Monitor and record DO and TGP
- Provide disease-free water for incubation and early rearing
- Release from hatchery to improve survival and reduce stress
- Run analysis for water chemistry parameters, 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

<b>Name:</b>	South Santiam Fish Hatchery
<b>Stock/Species:</b>	Spring Chinook Fall Chinook Summer Steelhead
<b>Operating Agency:</b>	Oregon Department of Fish & Wildlife
<b>Funding Agency:</b>	COE ODF&W
<b>Location:</b>	The hatchery is located on the South Santiam River just downstream from Foster Dam.
<b>Address:</b>	43182 North River Road Sweet Home, OR 97386
<b>Hatchery Manager:</b>	Mr. Victor Shawe
<b>Phone:</b>	(541) 367-3437
<b>Fax:</b>	(541) 367-4399
<b>Purpose:</b>	The hatchery is funded by both the state of Oregon and the U.S. Army Corps of Engineers (COE). The COE's obligation is to mitigate for fish losses caused by development of Foster and Green Peter dams. The COE mitigation agreement requires the annual production of no more than 71,000 lb of juvenile spring chinook and steelhead. The fall chinook production goal involves the production of lower river fall chinook that will contribute to NE Pacific and Columbia River Basin commercial and sport fisheries.



**Production Goal:**

**Spring Chinook**

Produce 300,000 smolts (33,340 lb) for release into the South Santiam River.

Provide a total of 3,257,200 eggs to Willamette Hatchery, McKenzie Hatchery, and Oregon's Salmon and Trout Enhancement Program.

Rear 545,000 smolts (36,333 lb) for transfer to Clackamas Hatchery (Clackamas Stock)

Acclimate 434,000 smolts (48,222 lb) for release into the South Santiam River

**Fall Chinook**

Rear 8,160,000 smolts (148,400 lb) for release into Mill Creek, Molalla River, North Santiam River and the Columbia River.

**Summer Steelhead**

Produce 144,000 smolts (32,000 lb) for release into the South Santiam River.

Produce 40,500 smolts (9,000 lb) for release into the North Santiam River.

Provide 1,425,000 eggs to Bonneville and Oak Springs hatcheries.

**Water Supply:**

The hatchery currently receives water from Foster Reservoir. A total of 8,400 gpm is available for the rearing units. An additional 5,500 gpm is used in the adult holding pond.

**Facilities:**

- Adult Holding: 1 asphalt adult holding pond
- Incubation: 30 full stack vertical tray incubators (480 trays)
- Early Rearing: None
- Raceways: 10 concrete Burrow's ponds - 4,147 cf each  
4 concrete Burrow's ponds - 5,022 cf each
- Rearing Ponds: None

Satellite Facilities:

Stayton Ponds

1 earth/gravel pond - 13,920,400 cf

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 South Santiam Hatchery - Spring Chinook, Fall Chinook, and Summer Steelhead**

This section presents the corrective actions required to bring the South Santiam Hatchery - Spring Chinook, Fall Chinook, and Summer Steelhead 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 (Tables 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 ( $\pm 40\%$ ).

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.



<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMS<sup>1</sup></b>
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Install security alarms	\$20,000	6
Install 10 16-tray incubators and additional space	\$110,000	8, 18
Construct two more small raceways to meet current program	\$140,000	9, 19
Provide double screens for Clackamas stock (9 raceways)	\$2,000	10
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Provide disease-free water for incubation and early rearing	----	5h, 28

**Table 3b. Remedial Actions Required at South Santiam Hatchery - Fall Chinook**

<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMS<sup>2</sup></b>
<b>Type 1</b> - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
None	----	
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Develop smolt-to-adult goal for IHOT Operations Plan	----	4h
Conduct IHOT QA/QC tests for feed preparation	----	12
Develop specific rearing standards for IHOT Operations Plan	----	19
Develop smoltification goal and monitor	----	22a1
Follow IHOT protocols for disinfection of transportation equipment and personnel before and after use		23
Follow IHOT protocols for the disinfection of the interiors and exteriors of transport vehicles	----	23
Follow IHOT temperature criteria for transportation	----	23
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		

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

<sup>2</sup> PMS are performance measures that were extracted from the IHOT 1995 report

<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMS<sup>2</sup></b>
Monitor DO and TGP and record	----	5b
Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants	----	5c-5g

Remedial Action Required	Cost	PMS <sup>1</sup>
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Improve predation control at Stayton Pond	\$1.0 million	4f-4g, 11
Review alarm requirements for this large rearing pond and install the required alarms	\$12,000	6
Provide feed storage and freezer (120 sf)	\$24,000	12
Provide rearing or acclimation for Millcreek and Molalla components	\$2.0 million	22b, 37
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
None	----	

**Table 3c. Remedial Actions Required at South Santiam Hatchery - Summer Steelhead**

Remedial Action Required	Cost	PMS <sup>2</sup>
<b>Type 1</b> - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
None	----	
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Develop hatchery M&E plan	----	3
Document adult contribution	----	4a
Develop smolt-to-adult goal for IHOT Operations Plan	----	4h
Follow IHOT protocols for checking of flow alarms daily	----	6
Develop alarm log	----	6
Conduct IHOT QA/QC tests for feed preparation	----	12

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

<sup>2</sup> PMS are performance measures that were extracted from the IHOT 1995 report.

<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMS<sup>2</sup></b>
Check temperature of moist pellets at time of delivery to assess compliance with IHOT criteria	----	12
Develop specific incubation and rearing standards for IHOT Operations Plan	----	18-19
Develop smoltification goal and monitor	----	22a1
Release from hatchery to improve survival and reduce stress	----	22c
Follow IHOT protocols for the disinfection of the interiors and exteriors of transport vehicles	----	23
Follow IHOT temperature criteria for transportation	----	23
Conduct fishery contribution studies	----	24
Develop written broodstock collection plan	----	41
Develop written spawning protocols	----	42
Develop approved genetics M&E plan	----	43



<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMS<sup>1</sup></b>
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		
Monitor and record DO and TGP	----	5b
Run analysis for water chemistry parameters, alkalinity, hardness, nitrite, and contaminants	----	5c, 5e-g
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Construct new holding pond for steelhead broodstock	\$1.5 million	4b
Install security alarms	\$10,000	6
Construct two more small raceways to meet current program	\$140,000	9
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Provide disease-free water for incubation and early rearing	----	5h, 28

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<sup>1</sup> 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 South Santiam Hatchery - Spring Chinook, Fall Chinook, and Summer Steelhead 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:  
South Santiam Hatchery - Spring Chinook**

Year	Fisheries <sup>1</sup> (Broodyear)	Spawning Grounds <sup>1</sup> (Broodyear)	Hatchery <sup>1</sup> (Broodyear)	Total Combined Contribution <sup>2</sup> (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985				2,007	1.38%
1986				297	1.17%
1987				1,443	1.05%
1988				1,619	0.21%
1989				8,046	0.73%
1990					
1991					
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.

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

<b>Year</b>	<b>Fisheries<sup>1</sup> (Broodyear)</b>	<b>Spawning Grounds<sup>1</sup> (Broodyear)</b>	<b>Hatchery<sup>1</sup> (Broodyear)</b>	<b>Total Combined Contribution<sup>2</sup> (Broodyear)</b>	<b>Smolt to Adult Survival (percent)</b>
1981					
1982					
1983					
1984				11,635	0.13%
1985				479	0.0049%
1986					
1987					
1988					
1989					
1990					
1991					
1992					

**Table 4c. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:  
South Santiam Hatchery - Summer Steelhead**

<b>Year</b>	<b>Fisheries<sup>3</sup> (Broodyear)</b>	<b>Spawning Grounds<sup>1</sup> (Broodyear)</b>	<b>Hatchery<sup>1</sup> (Broodyear)</b>	<b>Total Combined Contribution<sup>4</sup> (Broodyear)</b>	<b>Smolt to Adult Survival (percent)</b>
1983					

<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.

<sup>3</sup> Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.

<sup>4</sup> Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

1984					
1985					
1986					
1987	No information available	No information available	No information available	No information available	No information available
1988	No information available	No information available	No information available	No information available	No information available
1989	No information available	No information available	No information available	No information available	No information available
1990	No information available	No information available	No information available	No information available	No information available
1991					
1992					

## 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 South Santiam Hatchery are presented in Table 5 by program. The detailed breakdown of program expenditures for spring chinook, fall chinook, and summer steelhead at this hatchery are presented in separate tables (Tables 6a, 6b, and 6c).

**Table 6. Annual Operating Expenses - South Santiam Hatchery**

<b>Program</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
1. Spring Chinook	<b>\$253,875</b>	<b>\$240,914</b>	<b>\$270,157</b>
2. Summer Steelhead	<b>\$175,694</b>	<b>\$164,666</b>	<b>\$198,865</b>
3. Fall Chinook	<b>\$312,855</b>	<b>\$225,057</b>	<b>\$157,234</b>
4.			
5.			
<b>Total Hatchery Costs</b>	<b>\$742,424</b>	<b>\$630,637</b>	<b>\$626,256</b>

**Table 6a. Detailed Expenditures at South Santiam Hatchery by Program**  
**Spring Chinook**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$172,561	\$166,730	\$188,001
Operational Costs	\$232,905	\$257,529	\$284,689
Capital Costs	\$10,776	\$2,888	\$3,525
Indirect Costs	\$65,810	58,044	\$69,797
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$429,569</b>	<b>\$405,580</b>	<b>\$469,022</b>
<b>Source of Funds</b>			
COE	<b>30%</b>	<b>30%</b>	<b>30%</b>
ODFW	<b>70%</b>	<b>70%</b>	<b>70%</b>
Program Production (lb)	60,000	60,000	60,000
Total Production (lb)	101,452	100,968	104,100
Program as Percent of Total	59.1%	59.4%	57.6%
<b>Program Costs</b>	<b>\$253,875</b>	<b>\$240,914</b>	<b>\$270,157</b>

<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.

**Table 6b. Detailed Expenditures at South Santiam Hatchery by Program**

**Summer Steelhead**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$172,561	\$166,730	\$188,001
Operational Costs	\$232,905	\$257,529	\$284,689
Capital Costs	\$10,776	\$2,888	\$3,525
Indirect Costs	\$65,810	58,044	\$69,797
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$429,569</b>	<b>\$405,580</b>	<b>\$469,022</b>
<b>Source of Funds</b>			
COE	<b>30%</b>	<b>30%</b>	<b>30%</b>
ODFW	<b>70%</b>	<b>70%</b>	<b>70%</b>
Program Production (lb)	41,452	40,968	44,100
Total Production (lb)	101,452	100,968	104,100
Program as Percent of Total	40.6%	40.6%	40.6%
<b>Program Costs</b>	<b>\$175,694</b>	<b>\$164,666</b>	<b>\$198,865</b>

<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.

**Table 6c. Detailed Expenditures at South Santiam Hatchery by Program**

**Fall Chinook**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>			
<b>Source of Funds</b>			
COE	<b>30%</b>	<b>30%</b>	<b>30%</b>
ODFW	<b>70%</b>	<b>70%</b>	<b>70%</b>
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>	<b>\$312,855</b>	<b>\$225,057</b>	<b>\$157,234</b>

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<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.