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# **HATCHERY EVALUATION REPORT**

**Klaskanine Hatchery - Winter Steelhead**

**March 1997**

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**Integrated Hatchery Operations Team (IHOT)**

# **HATCHERY EVALUATION REPORT**

## **Klaskanine Hatchery - Winter Steelhead**

### **An Independent Audit Based on Integrated Hatchery Operations Team (IHOT) Performance Measures**

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## Executive Summary

This report presents the findings of the independent audit of the Klaskanine Hatchery - Winter Steelhead program. The hatchery is located along the North Fork Klaskanine River approximately 12 miles southeast of Astoria, Oregon. The hatchery is used for adult collection, incubation, and rearing of coho and rearing of winter steelhead. Due to reduction in funding, this hatchery is currently not being used for the rearing of anadromous fish.

The audit was 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.

### 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). 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)*. That document 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.

## Klaskanine Hatchery - Winter Steelhead Results

The Klaskanine facility includes 6 series ponds, 16 concrete raceways, 1 rearing pond, and incubation facilities. Klaskanine Hatchery was first operated in 1911 by the state of Oregon, In 1953 the hatchery was enlarged and renovated under the Columbia River Fisheries Development Program (Mitchell Act) - a program to enhance declining fish runs in the Columbia River Basin. The goal of the hatchery is to produce lower river coho that will contribute to NE Pacific and Columbia River basin commercial and sport fisheries and create a consumptive winter steelhead fishery in the Klaskanine River. Due to reduction in funding, this hatchery is currently not being used for the rearing of anadromous fish.

The Klaskanine Hatchery - Winter Steelhead program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery was not documenting its adult contribution and smolt-to-adult contribution and needed to develop a written hatchery M&E plan. The audit found that the hatchery was not in compliance with water quality monitoring criteria, alarm requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery needed to develop specific rearing standards for the IHOT Operations Plan, develop a smoltification goal and monitoring plan, and conduct fisheries contribution studies. The hatchery was also not in compliance with the male:female fertilization ratio criteria. The hatchery did not have a broodstock collection plan, spawning protocols, and Genetics Monitoring and Evaluation Program.

The specific areas in which the Klaskanine Hatchery - Winter 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:

- Conduct fishery contribution studies
- Conduct IHOT QA/QC tests for feed preparation
- Develop alarm log
- Develop approved genetics M&E plan
- Develop smoltification goal and monitor
- Develop specific rearing standards for IHOT Operations Plan
- Develop written broodstock collection plan
- Develop written hatchery M&E plan
- Develop written spawning protocols
- Document adult contribution
- Document flow and density in adult holding
- Document smolt-to-adult survival
- Follow IHOT protocols for 1:1 spawning
- Install alarms at two intakes
- Monitor and record DO and TPG
- 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 (Type 1 in Table 3, Section 4 of this report) were not listed above.

## Facility Description

<b>Name:</b>	Klaskanine Hatchery
<b>Stock/Species:</b>	Coho Winter Steelhead
<b>Operating Agency:</b>	Oregon Department of Fish and Wildlife
<b>Funding Agency:</b>	Mitchell Act
<b>Location:</b>	The hatchery is located along the North Fork Klaskanine River approximately 12 miles southeast of Astoria, Oregon
<b>Address:</b>	Route 1, Box 764 Astoria, OR 97103
<b>Hatchery Manager:</b>	Mr. Bobby Bivans
<b>Phone:</b>	(503) 326-3653
<b>Fax:</b>	(503) 326-6883
<b>Purpose:</b>	Klaskanine Hatchery was first operated in 1911 by the state of Oregon, In 1953 the hatchery was enlarged and renovated under the Columbia River Fisheries Development Program (Mitchell Act) - a program to enhance declining fish runs in the Columbia River Basin. The goal of the hatchery is to produce lower river coho that will contribute to NE Pacific and Columbia River basin commercial and sport fisheries and create a consumptive winter steelhead fishery in the Klaskanine River.
<b>Production Goal:</b>	<b>Coho</b>  Produce 1,125,000 smolts (93,750 lb) for on-station releases  Provide 600,000 green eggs to the Clatsop Economic Development Commission when needed  Provide 20,000 eyed eggs to Oregon's Salmon and Trout Enhancement Program  <b>Winter Steelhead</b>  Produce 60,000 smolts (12,000 lb) for on-station release

**Water Supply:**

Water is supplied by gravity flow and from three intakes located on the North Fork Klaskanine River and North Fork of the North Fork Klaskanine River. The current water right is for 22,442 gpm although the maximum water usage is 11,000 gpm.

**Facilities:**

Adult Holding:	In last section of series raceway (see below)
Incubation:	14 shallow troughs 40 half stack vertical - 320 trays
Early Rearing:	14 shallow troughs
Raceways:	16 concrete raceways - 4,800 cf each 6 series raceways - 7,200 cf each
Rearing Ponds:	1 asphalt pond - 210,000 cf
Satellite Facilities:	None

## Section 3

# Compliance Status

The hatchery audits are based on compliance with written IHOT performance measures. These performance measures are documented in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* (referred to as *IHOT 1995* in this report).<sup>1</sup> The purpose of the performance measures is to implement new basinwide policies that provide regional guidelines for operating anadromous hatcheries in the Columbia Basin.

The audit focuses on performance measures for IHOT policies that cover (1) hatchery performance standards, (2) fish health, (3) ecological interaction, and (4) genetics. These performance measures are intended to guide hatchery operations once production is established. For that reason, the hatchery operations audit included broodstock collection, spawning, incubation of eggs, fish rearing and feeding, fish release, equipment maintenance and operations, and personnel training. Production priorities are beyond the scope of this audit.

Based on *IHOT 1995*, a detailed 109-page audit form was developed. The audit form divided the performance measures into six major sections along major program and technical criteria areas. Two additional sections (sections 1 and 8) include general information and expenditure information needed for this Hatchery Evaluation Report and blank forms for additional comments. The following is the basic structure of the IHOT audit form:

Section 1	Performance Measures for General Information and Expenditure Information (PMs General 1-2)
Section 2	Performance Measures for Program Objectives (PMs 1-4)
Section 3	Performance Measures for Facility Requirements (PMs 5-15)
Section 4	Performance Measures for Hatchery Practices (PMs 16-25)
Section 5	Performance Measures for Fish Health Policy (PMs 26-34)
Section 6	Performance Measures for Ecological Interactions (PMs 35-38)
Section 7	Performance Measures for Genetics Policy (PMs 39-43)
Section 8	Blank Forms for Additional Comments.

Several performance measures are repeated in various sections of the audit form. These performance measures overlap in *IHOT 1995* and were retained to allow individuals interested in specific portions of the audit (such as Genetics or Fish Health) to determine the compliance status of all performance measures for a given topic in one location. A repeated performance measure is indicated by shaded text.

## The Hatchery Audit Process

The hatchery audit will be conducted over a 2-year period that concludes in 1997. At each hatchery, a five-step process was used to complete the overall hatchery audit.

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<sup>1</sup>Integrated Hatchery Operations Team (IHOT) 1995. *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries*, Bonneville Power Administration, Portland, Oregon.

This process consisted of research and onsite visits. The site visit at the Klaskanine Hatchery was conducted on March 19, 1997.

The following is the five-step audit process:

1. Information was obtained from headquarters.
2. The hatchery manager was asked to fill out and return the **Audit Form**.
3. A 1-2 day site audit visit was conducted at each hatchery. During that visit an audit team inspected facilities, reviewed hatchery records, discussed audit form responses, and developed remedial action plans when appropriate.
4. During the site visit, the compliance status of each performance measure was discussed with the hatchery manager and IHOT representative. A portion of the Hatchery Evaluation Report was sent to the hatchery manager following the audit visit as a **Compliance Report**. That Compliance Report is Table 2 of this report.
5. Information from steps 1-4 was used to prepare a draft **Hatchery Evaluation Report**. This draft report was submitted to the operating agencies for review of the information used to determine compliance. Based on review and comments, a final Hatchery Evaluation Report was developed. The final report documents the compliance of a particular hatchery with the IHOT performance measures and presents cost estimates to correct any deficiencies.

## **Compliance Status of Klaskanine Hatchery - Winter Steelhead**

The following table includes information on life-stages that are held on this facility for some portion of their rearing cycle (Table 1). For multi-facility programs, summary cost and contribution data is presented at the facility where rearing occurs. For the compliance status relating to performance measures that do not occur at this hatchery, please refer to the Hatchery Evaluation Reports for the hatcheries and stocks listed in Table 1. A check mark (✓) indicates that the specific life-stage is held at this facility.

This section documents the compliance status of the Klaskanine Hatchery - Winter Steelhead program. Each performance measure is presented in a table taken from the audit form (Table 2). The compliance status is identified by the following categories:

- **N/A** (not applicable)
- **Yes** (in compliance)
- **?** (unknown; generally due to unavailability of information to determine compliance)
- **No** (not in compliance).

Remedial actions are suggested for performance measures not in compliance. These remedial actions are grouped into categories and listed in Section 4 of this report, where the cost of the required remedial actions is also presented.

**Table 1 Summary Program Information for Klaskanine Hatchery - Winter Steelhead**

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	Klaskanine Hatchery	Big Creek Hatchery				
Adult Collection	✓					
Adult Holding	✓					
Spawning	✓					
Fertilization		✓				
Incubation						
green-to-eyed		✓				
eyed-to-hatch		✓				
Rearing						
fry		✓				
fingerlings	✓					
smolts	✓					
Acclimation/release	✓					

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
the hatchery programs outlined in a subbasin management plan?		✓			Columbia Basin System Planning Production Plan	
Is the hatchery operating under a current hatchery management plan? Is it understood by staff? Is it being followed?		✓ ✓ ✓			IHOT Operations Plan	
Is a hatchery monitoring and evaluation plan in place? Do you have a written monitoring and evaluation plan?				✓		Develop written hatchery M&E Plan
What is the hatchery's contribution to fisheries, spawning grounds, and other resources?				✓	Review of records	Document adult contribution
Does the hatchery meet pre-spawning survival as compared with established goal?		✓			Review of records; in compliance 3 out of last 3 years	
Does the hatchery meet egg-take as compared with established hatchery goal?	✓				Help meet Big Creek egg-take goal	
Does the hatchery meet hatchery egg-to eyed-egg survival as compared with established goal?	✓				At Big Creek Hatchery	
Does the hatchery meet hatchery eyed-egg to fry survival as compared with established goal?	✓				At Big Creek Hatchery	
Does the hatchery meet hatchery fry to smolt survival as compared with established goal?	✓				At Big Creek Hatchery	
Does the hatchery meet hatchery smolt to adult survival as compared with established goal?		✓			Review of records; in compliance 3 out of last 3 years	
Does the hatchery meet hatchery smolt survival (smolt to adult) as compared with established goal?			✓			Document smolt-to-adult survival
Does the hatchery meet hatchery number of eggs, fry, fingerlings, smolts, and/or adults meet basinwide needs?	✓				Review of records/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Temperature</b>						
Does your water temperature meet the criteria for spawning?		✓			Review of records/Discussion	
Does your water temperature meet the criteria for incubation?	✓				No incubation for this stock	
Does your water temperature meet the criteria for rearing?		✓			Review of records/Discussion	
<b>Dissolved gases</b>						
Is the oxygen level near saturation?			✓		No data	Monitor DO and record
Is the dissolved nitrogen level less than saturation?			✓		No data	Monitor TGP and record
<b>Chemistry</b>						
Ammonia (un-ionized)			✓		No data	Run analysis
Carbon Dioxide			✓		See above	See above
Chlorine			✓		See above	See above
H			✓		See above	See above
Copper			✓		See above	See above
Hydrogen Sulfide			✓		See above	See above
Iron			✓		See above	See above
Zinc			✓		See above	See above
<b>Turbidity</b>						
Does your turbidity meet the criteria?			✓		No data	Run analysis

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Alkalinity and hardness</b>						
Does your alkalinity and hardness meet the criteria?			✓		No data	Run analysis
<b>Nitrite</b>						
Does your nitrite meet the criteria?			✓		No data	Run analysis
<b>Pesticides/Contaminants</b>						
Aldrin			✓		No data	Run analysis
Dieldrin			✓		See above	See above
Endrin			✓		See above	See above
Heptachlor			✓		See above	See above
Chlordane			✓		See above	See above
Methoxychlor			✓		See above	See above
Permethrin			✓		See above	See above
Malathion			✓		See above	See above
Parathion			✓		See above	See above
<b>Pathogens</b>						
What portions of the hatchery have disease-free water?						
Adult holding				✓	Inspection of facilities/Discussion	None
Incubation	✓				No incubation at this hatchery	
Early rearing	✓				No early rearing at this hatchery	
Rearing				✓	Inspection of facilities/Discussion	None
Others				✓	Inspection of facilities/Discussion	None

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Alarm Systems</b>						
Do the following areas have alarms?						
Intake				✓	Inspection of facilities/Discussion	Install alarms on two intakes
Large rearing ponds and adult holding ponds		✓			Inspection of facilities/Discussion	
Raceway headboxes and rearing ponds		✓			Inspection of facilities/Discussion	
Incubation facilities		✓			Inspection of facilities/Discussion	
Quarantine areas and facilities	✓				No quarantine areas and facilities	
Water treatment systems	✓				No water treatment systems	
Security				✓	Inspection of facilities/Discussion	Install security alarms
Are there outside systems and buzzers in onsite residences?		✓			Discussion	
Are water flow alarms checked daily?		✓			Review of records/Discussion	
Are all other alarms checked weekly?		✓			Discussion	
Is there a log of alarms for emergencies, tests, and maintenance requirements?				✓	Review of records/Discussion	Develop alarm log
Are telephone pagers used?		✓			Discussion	
<b>Adult collection and holding facilities</b>						
Do you meet the adult holding criteria?			✓		Do not measure	Document flow and density in adult holding

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Incubation facilities</b>						
Type 1: <u>Shallow troughs</u> Do you have an adequate number of units for the overall program?	✓				Do not incubate at this hatchery	
Type 2: <u>Vertical stack</u> Do you have an adequate number of units for the overall program?	✓				See above	
<b>Rearing facilities</b>						
Type 1: <u>Concrete raceways</u> Do you have an adequate number of units for the overall program?	✓				Not used for winter steelhead	
Type 2: <u>Series canal</u> Do you have an adequate number of units for the overall program?		✓			Inspection of facilities/Discussion	
Type 3: <u>Rearing pond</u> Do you have an adequate number of units for the overall program?	✓				Not used for winter steelhead	
<b>Feeding facilities</b>						
Do you meet the approach velocity criteria?		✓			Inspection of facilities/Discussion	
Are the fish screens regularly cleaned?		✓			Inspection of facilities/Discussion	
Does the screen mesh meet screen opening criteria?		✓			Inspection of facilities/Discussion	
Are rearing containers double screened for fish that should not be released to adjacent water?	✓				Release on-station	
<b>Predator control facilities</b>						
Are your predation control facilities effective?		✓			Inspection of facilities/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>d storage facilities and quality control</b>						
Does the storage of dry/semi-moist/moist foods (dry <12%; semi-moist 12-20%; moist >20% moisture) follow food manufacturer's recommendations?		✓			Inspection of facilities/Discussion	
Does a regional quality control officer oversee production procedures and monitor:						
Verification by feed manufacturer that ingredients meet specifications?				✓	Discussion	Conduct IHOT QA/QC tests for feed preparation
Ensure feed does not contain unwanted drugs or other additives?				✓	Discussion	See above
Analyze ingredients contained in the final food product to ensure that feed specifications have been met?				✓	Discussion	See above
Are the foods stored and handled according to the following criteria?						
Moist pellets should not exceed 10 °F at point of delivery.		✓			Discussion	
Moist pellets should be removed from freezer just prior to feeding.		✓			Discussion	
Do not leave buckets of feed or feed containers outside exposed to light or heat.		✓			Discussion	
Open bags of feed should be fed within 1 to 2 days except when feeding small groups of fish.		✓			Discussion	
Automatic feeder hoppers and bulk storage facilities should be insulated against excessive temperatures (80 °F and above).	✓				None	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Release facilities</b>						
Do the release facilities ensure that fish are not subjected to adverse conditions?		✓			Inspection of facilities/Discussion	
<b>Pollution abatement facilities</b>						
Do the pollution abatement facilities meet all federal and state regulations (or good engineering practice)?		✓			Inspection of facilities/Discussion	
Are pollution abatement facilities operated correctly?		✓			Discussion	
<b>Transportation facilities</b>						
Are the transport systems adequate to meet IHOT performance measures for transportation practices?		✓				

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Broodstock selection practices</b>						
Is the donor selection process document attached? (PM #40a)	✓				Existing program; does not apply	
Was the donor selection outline followed in selecting the hatchery broodstock? (PM #40b-c)	✓				Existing program; does not apply	
<b>Spawning practices</b>						
Were the appropriate number of spawners, male/female ratios, and fertilization protocols used? (PM #42c-g)				✓	Review of records/Discussion	See PM #42
<b>Incubation practices</b>						
Are specific incubation standards listed in the hatchery operations plan?	✓				No incubation at this hatchery	
Are incubation practices written?	✓				See above	
Incubation Type 1: <u>Shallow troughs</u> (see PM #8) - do you meet the loading and flow criteria?	✓				See above	
Incubation Type 2: <u>Heath tray</u> (see PM #8) - do you meet the loading and flow criteria?	✓				See above	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>rearing practices</b>						
specific rearing standards listed in the hatchery operations plan?				✓	Review IHOT Hatchery Operations Plan	Develop specific rearing standards for the IHOT Operations Plan
rearing practices written?				✓		See above
rearing Unit Type 1: <u>Concrete raceways</u> (see PM #9)						
Do you meet the density and DI criteria?	✓				Not used for winter steelhead	
Do you meet the Loading and FI criteria?	✓				See above	
rearing Unit Type 2: <u>Series canal</u> (see PM #9)						
Do you meet the density and DI criteria?		✓			Review of records/Discussion	
Do you meet the Loading and FI criteria?		✓			Review of records/Discussion	
rearing Unit Type 3: <u>Rearing pond</u> (see PM #9)						
Do you meet the density and DI criteria?	✓				Not used for winter steelhead	
Do you meet the Loading and FI criteria?	✓				See above	
<b>smolt quality</b>						
Do you produce a high quality smolt?		✓			Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Health management practices</b>						
Are the monthly hatchery monitoring visits being conducted? (PM #26)		✓			Review of records/Discussion	
Are the annual broodstock inspections being conducted? (PM #27)		✓			Review of records/Discussion	
Is there pathogen-free water (PM #5h) and are the sanitation procedures being followed? (PM #28)				✓	Review of records/Discussion	See PM #5h
Are the following water quality parameters within criteria? (PM #5a-5g)						
Water temperature		✓			Review of records/Discussion	
Dissolved gases			✓		Review of records/Discussion	See PM #5b
Chemistry			✓		Review of records/Discussion	See PM #5c
Turbidity			✓		Review of records/Discussion	See PM #5d
Alkalinity and hardness			✓		Review of records/Discussion	See PM #5e
Nitrite			✓		Review of records/Discussion	See PM #5f
Contaminants			✓		Review of records/Discussion	See PM #5g
Are rearing standards being followed? (PM #19)		✓			Review of records/Discussion	See PM #19
Are egg and fish transfer/release requirements met? (PM #31)		✓			Review of records/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Do hatchery performance meet requirements defined in the regional hatchery policies and in basin and hatchery plans for the following areas?</b></p> <p><b>Percent smoltification</b></p> <p>Do you measure percent smoltification?  Do you have a smoltification goal  Did you meet the smoltification criteria?</p>			✓	✓ ✓	Discussion Discussion Discussion	Develop smoltification goal and monitor See above See above
<p><b>Rearing density (prior to release)</b></p> <p>Did you meet the rearing density criteria just prior to release?</p>		✓			Review of records/Discussion	
<p><b>Disease condition (at release)</b></p> <p>Did you meet all disease regulations just prior to release?</p>		✓			Review of records/Discussion	
<p><b>Release number (at release)</b></p> <p>Did you meet the release number goal?</p>		✓			Review of records/Discussion	
<p><b>Release size (at release)</b></p> <p>Did you meet the size goal?</p>		✓			Review of records/Discussion	
<p><b>Release dates (at release)</b></p> <p>Did you meet the release date goal?</p>		✓			Review of records/Discussion	
<p><b>Release location (at release)</b></p> <p>Did you release the fish at the specified location?</p>		✓			Review of records/Discussion	
<p><b>Subbasin acclimation (at release)</b></p> <p>Were the fish reared in the subbasin?  Were the fish acclimated in the subbasin?</p>		✓ ✓			Discussion Discussion	
<p><b>Release strategy appropriate for the program?</b></p>		✓			Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Transportation facilities</b>						
Do transportation equipment and personnel receive disinfection before and after use?	✓				Transported by Big Creek Hatchery	
Is the fish tank interior disinfected using a solution of 200 ppm active chlorine for 30 minutes minimum or formaldehyde gas generation method (relative humidity of 60% for 2 hrs)?	✓				See above	
Is the exterior of the fish transport vehicle disinfected using high pressure steam (115-130°C), high temperature acid, or with 200 ppm chlorine for 30 minutes?	✓				See above	
Is the fish transport vehicle (cab) disinfected using 600 ppm quaternary ammonia compounds (1.5 ml of 50% stock solution/liter water)?	✓				See above	
Is other equipment disinfected including fish pumps, nets, egg sorters, waders, boots, rain gear, hoses and other equipment using one of the following solutions?  200 ppm chlorine for 30 minutes 600 ppm quaternary ammonia compound for 30 minutes 200 ppm iodophor solution for 10 minutes	✓				See above	
Do personnel wear protective garments when handling fish eggs or cultural water?	✓				See above	
Do the fish transport truck/chassis and tank/unit receive an inspection and service prior to the release season?	✓				See above	
Is a daily service inspection completed before starting up and leaving for the day?	✓				See above	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Transportation facilities</b>						
Does the fish transport unit receive an inspection prior to loading?	✓				Transported by Big Creek Hatchery	
Does a pre-loading inspection covering tank water level, pumps or aerators, oxygen injection system settings, displacement gauge, and truck loading/hauling density tables checked and reviewed occur prior to loading fish in the transport unit?	✓				See above	
Do hauling criteria include checking the fish 45 minutes to 1 hour after loading?	✓				See above	
When fish are active and systems are functioning properly, is the oxygen concentration reduced and maintained at approximately 8 ppm?	✓				See above	
Is water temperature in the transportation unit maintained within the 42-48 °F range?	✓				See above	
Do fish releasing procedures include the following criteria?						
Releasing the fish at the correct release site or into the correct water body.	✓				See above	
Tempering or the difference between the liberation tank and the target water body should not exceed 10°F.	✓				See above	
The liberation hose should be angled so that fish gently hit the water. Using a tripod is a method of ensuring the hose will stay at the proper angle.	✓				See above	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Evaluation practices</b></p> <p>Has the hatchery conducted fishery contribution studies?</p> <p>Determine the requirements for evaluating and improving management programs?</p> <p>Develop guidelines that define the geographical area and identify component stocks (hatchery and/or wild) that comprise the management unit?</p> <p>Develop guidelines that define if the proper stocks of fish are currently being used?</p> <p>Determine which management units contribute to a specific fishery and the time periods of those contributions?</p> <p>Determine the relative contributions of the various management units to a specific fishery over the different time periods?</p>				<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>Discussion</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p>	<p>Conduct fishery contribution studies</p>

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>ining practices</b>						
Does the hatchery have a training schedule for its staff?		✓			Review of records/Discussion	
Does each staff member have a personal training plan approved by a supervisor and reviewed annually?		✓			Review of records/Discussion	
Does the hatchery routinely exchange training details between other hatcheries and agencies?		✓			Review of records/Discussion	
Does the hatchery encourage and reward off-duty training of staff?		✓			Review of records/Discussion	
Does the hatchery conduct monthly staff meetings?		✓			Review of records/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>monthly hatchery monitoring visits being conducted by a qualified fish health specialist as described below?</b>						
Conduct visit at least monthly		✓			Review of records/Discussion	
Monitoring conducted by qualified fish health specialist		✓			Review of records/Discussion	
Examine a representative sample of healthy and moribund fish from each lot.		✓			Review of records/Discussion	
Review fish culture practices with hatchery manager.		✓			Review of records/Discussion	
Report finding and results of necropsies on standard form.		✓			Review of records/Discussion	
Recommend appropriate drug or chemical treatment.		✓			Review of records/Discussion	
Summarize fish health status or stock prior to release or transfer to another facility.		✓			Review of records/Discussion	
<b>all of the functions of the hatchery yearly monitoring visits being completed as described below?</b>						
Annually examine each broodstock for the presence of reportable viral pathogens.		✓			Review of records/Discussion	
Annually screen each salmon broodstock for the presence of <i>Renibacterium salmoninarum</i> .		✓			Review of records/Discussion	
Conduct inspection by or under the supervision of qualified fish health specialist.		✓			Review of records/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Are hatchery sanitation procedures followed as described below?</b>						
Are there any sources of pathogen-free water, especially for incubation and early rearing?	✓				No incubation or early rearing	
Disinfect/water harden eggs in iodophor?	✓				No incubation	
Are foot baths containing disinfectant placed at the incubation facility's entrance and exit?	✓				No incubation	
Is equipment and rain gear utilized in broodstock handling or spawning sanitized prior to its use elsewhere in the hatchery?		✓				
Is equipment used to collect dead fish sanitized prior its use in another pond and/or lot of fish?		✓			Inspection of facilities/Discussion	
Is equipment, including vehicles used to transfer fish between facilities, disinfected prior to use with any other fish lots or at any other location?		✓			Inspection of facilities/Discussion	
Are rearing vessels sanitized after fish are removed and prior to introducing a new fish lot or stock?		✓			Inspection of facilities/Discussion	
Are dead fish properly disposed of?		✓			Inspection of facilities/Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>water quality parameters being followed?</b>						
Are the following water quality parameters within criteria? (PM #5a-5g)						
Water temperature		✓			Review of records/Discussion	
Dissolved gases			✓		Review of records/Discussion	See PM #5b
Chemistry			✓		Review of records/Discussion	See PM #5c
Turbidity			✓		Review of records/Discussion	See PM #5d
Alkalinity and hardness			✓		Review of records/Discussion	See PM #5e
Nitrite			✓		Review of records/Discussion	See PM #5f
Contaminants			✓		Review of records/Discussion	See PM #5g
io to PM #21						
<b>incubation and rearing standards being followed?</b>						
Are the incubation practices following the IHOT incubation criteria? (PM #18)	✓				No incubation	
Are the rearing practices following the IHOT criteria? (PM #19)		✓			Review of records/Discussion	
io to rearing practices PM #18-PM #19						
<b>egg and fish transfer/release requirements met?</b>		✓			Discussion	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Is the hatchery's program outlined in a subbasin management plan?</b></p> <p>Refer to subbasin plan PM #1</p>		✓			Columbia Basin System Planning Production Plan	
<p><b>Is the hatchery operating under a current hatchery operational plan?</b></p> <p>Refer to operational plan PM #2</p>		✓			Review IHOT Operations Plan	
<p><b>Is hatchery monitoring and evaluation plan in place?</b></p> <p>Refer to hatchery monitoring and evaluation plan PM #3</p>				✓		Develop a written hatchery M&E plan

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p>Does the hatchery program meet requirements established in the regional hatchery policies and basin planning documents in the following areas: species, stock, broodstock collection location, broodstock numbers, broodstock collection strategy, spawning and egg-take protocols?</p> <p>Does the hatchery program meet the requirements for the following?</p>						
Species protocols (PM #1)		✓			Review of records/Discussion	
Stock protocols (PM #1)		✓			Review of records/Discussion	
Broodstock collection location protocols (PM #41b for existing program; PM #39b for new program )		✓			Review of records/Discussion	
Broodstock numbers protocols (PM #42c)				✓	Review of records/Discussion	See PM #42
Broodstock collection strategy protocols (PM #41b-d for existing program; PM 39b-f for new program)		✓			Review of records/Discussion	
Spawning protocols (PM #42d-e)				✓	Review of records/Discussion	See PM #42
Egg-take protocols (PM #42f-g)				✓	Review of records/Discussion	See PM #42

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Do the hatchery's performance meet requirements defined in the regional hatchery policies and in the basin and hatchery plans for the following areas: percent smoltification, rearing density, disease condition, and the number, size date(s), and location of release?</b>						
Percent smoltification (PM #22a1)				✓	Review of records/Discussion	See PM #22a1
Rearing density (PM #22a2)		✓			Review of records/Discussion	
Disease condition (PM #22a3)		✓			Review of records/Discussion	
Number at release (PM #22a4)		✓			Review of records/Discussion	
Size at release (PM #22a5)		✓			Review of records/Discussion	
Date of release (PM #22a6)		✓			Review of records/Discussion	
Location of release (PM #22a7)		✓			Review of records/Discussion	
<b>Are fish reared in the subbasin or acclimated in the basin?</b>		✓			Discussion	
PM #22b						
<b>Is the release strategy appropriate for the program?</b>		✓			Discussion	
PM #22c						

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>new programs, has a broodstock collection plan developed?</b></p> <p>Is the broodstock collection plan written?</p> <p>For a non-captive broodstock program:</p> <p>Was an unbiased, representative sample collected?</p> <p>Was the recommended number of broodstock collected?</p> <p>For a captive broodstock program:</p> <p>Were captive brood progeny excluded as donors for propagating the next generation of the captive broodstock program?</p> <p>Were full-sib crosses avoided?</p> <p>Is the broodstock collection plan understood and being followed by staff?</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>				<p>Existing Program; does not apply</p>	
<p><b>a new program, was the donor selection outline followed in selecting the hatchery broodstock?</b></p> <p>Is a donor selection plan written?</p> <p>Was the donor selection outline followed in selecting the broodstock?</p> <p>Was the target stock recommended in the donor selection process actually used?</p>	<p>✓</p> <p>✓</p> <p>✓</p>				<p>Existing Program; does not apply</p> <p>Existing Program; does not apply</p> <p>Existing Program; does not apply</p>	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>existing programs, were the broodstock collection cedures followed?</b></p> <p>Is the broodstock collection plan written?</p> <p>Does the broodstock collection plan follow the guideline:</p> <p>Was an unbiased, representative sample collected?</p> <p>Was the recommended number of broodstock collected?</p> <p>Were the broodstock collection procedures in hatchery operation plan understood and followed?</p>				<p>✓</p> <p></p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>None provided</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p>	<p>Develop written broodstock collection plan</p> <p>See above</p> <p>See above</p> <p>See above</p>

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Are the spawning protocols written?</b></p> <p><b>Are daily or weekly spawning logs available?</b></p> <p><b>Was the appropriate number of spawners used?</b></p> <p><b>Did you attempt to spawn all collected broodstock and randomize mating with respect to age class, and other traits?</b></p> <p><b>Was the sex-ratio within the limits given in the performance standards?</b></p> <p><b>Were the fertilization protocols followed?</b></p> <p><b>If the hatchery needed to reduce the number of eggs retained, was this done by representative sampling of each male/female cross?</b></p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>None provided</p> <p>Review of records</p> <p>Use pooled matrix spawning</p> <p>Discussion</p> <p>Use pooled matrix spawning</p> <p>Use pooled matrix spawning</p> <p>Discussion</p>	<p>Develop written spawning protocols</p> <p>Follow IHOT protocols for 1:1 spawning</p> <p>Follow IHOT protocols for 1:1 spawning</p> <p>Follow IHOT protocols for 1:1 spawning</p>

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Is there a genetics monitoring and evaluation program available?</b></p> <p>Is a genetics monitoring and evaluation program available?</p> <p>Does the plan address the following elements listed in HOT:</p> <p>Does the program have elements needed to meet evaluation goals 1-4?</p> <p>Has a qualified geneticist reviewed and endorsed the program (goal 5)?</p> <p>Will the program collect the data and maintain the records needed to evaluate compliance on an ongoing basis (goal 5)?</p> <p>Is the program understood and followed by staff?</p>				<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>None provided</p> <p>See above</p> <p>See above</p> <p>See above</p> <p>See above</p>	<p>Develop approved genetics M&amp;E plan</p> <p>See above</p> <p>See above</p> <p>See above</p> <p>See above</p>

## 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 Klaskanine Hatchery - Winter Steelhead

This section presents the corrective actions required to bring the Klaskanine Hatchery - Winter Steelhead program into compliance with IHOT performance measures. The remedial actions suggested here are just that, suggestions developed by the Montgomery Watson Audit Team. 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 ( $\pm 40\%$ ).

More importantly, 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 Klaskanine Hatchery - Winter Steelhead**

<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		
Install security alarms	----	6
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Develop written hatchery M&E plan	----	3
Document adult contribution	----	4a
Document smolt-to-adult survival	----	4h
Develop alarm log	----	6
Document flow and density in adult holding	----	7
Conduct IHOT QA/QC tests for feed preparation	----	12
Develop specific rearing standards for IHOT Operations Plan	----	18-19
Develop smoltification goal and monitor	----	22a1
Conduct fishery contribution studies	----	24
Develop written broodstock collection plan	----	41
Develop written spawning protocols	----	42
Follow IHOT protocols for 1:1 spawning	----	42
Develop approved genetics M&E plan	----	43
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		
Monitor DO and TPG and record	----	5b
Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants	----	5c-5g

<sup>1</sup> PMS are performance measures that were extracted from the IHOT 1995 report. The IHOT performance measures are listed in Table 2 (Section 3 of this report) in numerical order.

Remedial Action Required	Cost	PMs <sup>1</sup>
<b>Type 4</b> - Remedial actions requiring significant capital expenditures  Install alarms at two intakes	\$20,000	6
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time  None	----	

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<sup>1</sup> PMs are performance measures that were extracted from the IHOT 1995 report. The IHOT performance measures are listed in Table 2 (Section 3 of this report) in numerical order.

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

This section presents the audit findings for the Klaskanine Hatchery - Winter Steelhead program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries. 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:  
Klaskanine Hatchery - Winter Steelhead**

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)
1983					
1984					
1985					
1986					
1987	Complete data not available	Complete data not available	Complete data not available	Complete data not available	Complete data not available
1988	Complete data not available	Complete data not available	Complete data not available	Complete data not available	Complete data not available
1989	Complete data not available	Complete data not available	Complete data not available	Complete data not available	Complete data not available
1990	Complete data not available	Complete data not available	Complete data not available	Complete data not available	Complete data not available
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.

## 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. Table 5 shows the annual operating expenses for the Klaskanine Hatchery - Winter Steelhead program. For programs that occur at more than one facility (as shown on Table 1 in Section 3 of this report), the cost breakdown for the component(s) at each facility is presented in separate tables (Tables 5a and 5b).

**Table 5. Annual Operating Expenses: Klaskanine Hatchery - Winter Steelhead**

Hatchery	1994	1995	1996
1. Klaskanine Hatchery	\$9,000	\$9,000	\$12,000
2. Big Creek Hatchery	\$51,478	\$55,520	\$107,314
3.			
4.			
5.			
<b>Total Program Costs</b>	<b>\$60,478</b>	<b>\$54,520</b>	<b>\$119,314</b>

The total expenditures for the Klaskanine Hatchery are presented in Table 6 by program. The detailed breakdown of program expenditures at this hatchery are presented in separate tables (Tables 6a, and 6b).

**Table 6. Annual Operating Expenses - Klaskanine Hatchery**

Program	1994	1995	1996
1. Coho	\$372,243	\$302,179	\$268,536
2. Winter Steelhead	\$9,000	\$9,000	\$12,000
3.			
4.			
5.			
<b>Total Hatchery Costs</b>	<b>\$381,243</b>	<b>\$311,179</b>	<b>\$270,536</b>

**Table 5a. Annual Operating Expenses: Klaskanine Hatchery - Winter Steelhead  
Expenditure Occurring at Klaskanine Hatchery**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$165,025	\$163,499	\$142,794
Operational Costs	\$136,792	\$97,795	\$84,327
Capital Costs	\$23,956	\$1,809	\$0
Indirect Costs	\$55,471	\$48,076	\$43,418
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$381,243</b>	<b>\$311,179</b>	<b>\$270,536</b>
<b>Source of Funds</b>			
NMFS	<b>100%</b>	<b>100%</b>	<b>100%</b>
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>	<b>\$9,000</b>	<b>\$9,000</b>	<b>\$12,000</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 5b. Annual Operating Expenses: Klaskanine Hatchery - Winter Steelhead  
Expenditure Occurring at Big Creek Hatchery <sup>2</sup>**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$304,339	\$274,232	\$313,356
Operational Costs	\$215,988	\$174,801	\$162,612
Capital Costs	\$61,043	\$1,632	\$4,527
Indirect Costs	\$99,635	\$78,622	\$92,805
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs	\$91,643	\$78,493	\$139,149
<b>Total Hatchery Costs</b>	<b>\$772,698</b>	<b>\$607,779</b>	<b>\$712,449</b>
<b>Source of Funds</b>			
Mitchell Act	<b>88.1%</b>	<b>87.1%</b>	<b>80.5%</b>
Bureau of Reclamation	<b>2.3%</b>	<b>3.0%</b>	<b>2.9%</b>
ODFW (R &E)	<b>9.5%</b>	<b>10.0%</b>	<b>16.6%</b>
Program Production (lb)	17,531	20,602	33,333
Total Production (lb)	263,146	225,532	221,296
Program as Percent of Total	6.7%	9.1%	15.1%
<b>Program Costs</b>	<b>\$51,478</b>	<b>\$55,520</b>	<b>\$107,314</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.

<sup>2</sup>Klaskanine Hatchery only conducts a small portion of the winter rearing program. The costs on this table reflect the total program expenditure for winter steelhead at Big Creek Hatchery.

**Table 6a. Detailed Expenditures at Klaskanine Hatchery by Program**

**Coho**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$165,025	\$163,499	\$142,794
Operational Costs	\$136,792	\$97,795	\$84,327
Capital Costs	\$23,956	\$1,809	\$0
Indirect Costs	\$55,471	\$48,076	\$43,418
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$381,243</b>	<b>\$311,179</b>	<b>\$270,536</b>
<b>Source of Funds</b>			
NMFS	<b>100%</b>	<b>100%</b>	<b>100%</b>
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>	<b>\$372,243</b>	<b>\$302,179</b>	<b>\$268,536</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 Klaskanine Hatchery by Program**

**Winter Steelhead**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$165,025	\$163,499	\$142,794
Operational Costs	\$136,792	\$97,795	\$84,327
Capital Costs	\$23,956	\$1,809	\$0
Indirect Costs	\$55,471	\$48,076	\$43,418
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$381,243</b>	<b>\$311,179</b>	<b>\$270,536</b>
<b>Source of Funds</b>			
NMFS	<b>100%</b>	<b>100%</b>	<b>100%</b>
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>	<b>\$9,000</b>	<b>\$9,000</b>	<b>\$12,000</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.