
EASTBANK HATCHERY

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

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

Eastbank Hatchery

- **Spring Chinook (Chiwawa Stock)**
 - **Sockeye**
 - **Summer Chinook (Wells)**
- **Summer Chinook (Wenatchee)**
 - **Summer Steelhead**

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

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CONTENTS

Section 1 Executive Summary.....	1
Section 2 Facility Description	8
Section 3 Remedial Actions	11
Section 4 Hatchery Contribution to Fisheries, Spawning Grounds and Hatcheries	22
Section 5 Annual Operating Expenditures	27

Executive Summary

This report compiles a summary of the findings of five separate Hatchery Evaluation Reports for Spring Chinook (Chiwawa), Sockeye, Summer Chinook (Wells and Wenatchee), and Summer Steelhead at Eastbank 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.

Eastbank Hatchery is located on the east side of the Columbia River near Rocky Reach Dam, 7 miles north of Wenatchee, Washington. The hatchery is operated by the Washington Department of Fish and Wildlife. Five satellite facilities are located on four different rivers (Wenatchee, Chiwawa, Methow, and Similkameen). The hatchery is used for incubation and rearing of Steelhead; Spring Chinook, Summer Chinook, and Sockeye.

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.

Eastbank Hatchery - Spring Chinook (Chiwawa Stock), Sockeye, Summer Chinook (Wells), Summer Chinook (Wenatchee), and Summer Steelhead Results

The Eastbank facility includes three ponds for adult holding, 12 concrete raceways, 32 rearing ponds, and incubation facilities. The five satellite facilities consist of 7 ponds and 8 net pens. The hatchery was built to mitigate for smolt losses at Rock Island Dam and began operation in 1989.

SPRING CHINOOK (CHIWAHA)

The Eastbank Hatchery - Spring Chinook (Chiwawa Stock) program was in general compliance with many of the performance measures. In the area of program objectives, the hatchery did not have a Monitoring and Evaluation Plan in place and the required documentation on many of egg, fry, and adult production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm and security alarm requirements, rearing requirements, and incubation requirements, which are all facilities requirements. The hatchery was not following the IHOT protocols for feed production, vehicle disinfection, and transportation. The hatchery needed to develop specific incubation and rearing standards, a smoltification goal and monitoring program, and conduct fisheries contribution studies. The hatchery did not have a Genetics Monitoring and Evaluation Program and needed to evaluate a potential bias in the collection of broodstock.

The specific areas in which the Eastbank Hatchery - Spring Chinook (Chiwawa Stock) 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:

- Change hauling temperature or review IHOT temperature criteria for hauling
- Change program or rearing to meet size goal
- Conduct fish contribution studies
- Develop genetics monitoring and evaluation program
- Develop monitoring and evaluation plan
- Develop smoltification goal and monitor
- Develop spawning log and document spawning on daily or weekly basis
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Document adult contribution
- Document dates of release
- Document density and loading conditions in Chiwawa rearing ponds
- Document DO and TGP levels
- Document eyed-egg to fry survival
- Document fry-to-smolt survival
- Document green-egg to eyed-egg survival

- Document number at release
- Document rearing density prior to release
- Document smolt-to-adult survival
- Evaluate potential sampling bias in the collection of adults
- Follow IHOT QA/QC protocols for feed production
- Follow IHOT requirements for exterior and interior vehicle disinfection
- Install alarms in quarantine areas
- Install bird netting over raceways at Eastbank and Chiwawa Satellites
- Install second set of screens to 8 raceways
- Install security alarms
- Need an additional 50 half-stack incubators for full production
- Need two additional raceways for full production
- Rebuild release line and change release procedures
- Review IHOT incubation and rearing temperature criteria
- Review IHOT Operations Plan and discuss with staff
- Run analysis for water chemistry parameters, nitrite, and contaminants

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

SOCKEYE (LAKE WENATCHEE)

The Eastbank Hatchery - Sockeye (Lake Wenatchee Stock) program was in general compliance with many of the performance measures. In the area of program objectives, the hatchery did not have a Monitoring and Evaluation Plan in place and the required documentation on many of egg, fry, and adult production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm and security alarm requirements, incubation rearing requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery was not following the IHOT protocols for feed production, vehicle disinfection, and transportation. The hatchery needed to develop specific incubation and rearing standards and conduct fisheries contribution studies. The hatchery did not have a Genetics Monitoring and Evaluation Program in place. and needed to evaluate sampling bias in the collection of broodstock.

The specific areas in which the Eastbank Hatchery - Sockeye (Lake Wenatchee Stock) 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:

- Change hauling temperature or review IHOT temperature criteria for hauling
- Conduct fish contribution studies
- Develop donor selection document
- Develop genetics monitoring and evaluation program
- Develop green-egg to eyed-egg survival goal and document
- Develop monitoring and evaluation plan
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Document adult contribution
- Document density in netpens
- Document DO and TGP levels
- Document eyed-egg to fry survival
- Document size and dates of releases

- Document smolt-to-adult survival
- Evaluate sampling bias in the collection of broodstock
- Follow IHOT incubation standards
- Follow IHOT QA/QC protocols for feed production
- Follow IHOT requirements for exterior and interior vehicle disinfection
- Improve production of pre-smolts
- Install alarms in quarantine areas
- Install security alarms at hatchery and on netpens
- Need 50 additional half stacks for full program
- Review IHOT criteria for disease-free water for adult holding and rearing
- Review IHOT Operations Plan and discuss with staff
- Review IHOT spawning, incubation, and rearing temperature criteria
- Run analysis for water chemistry parameters, 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 CHINOOK (WELLS)

The Eastbank Hatchery - Summer Chinook (Wells Stock) program was in general compliance with many of the performance measures. In the area of program objectives, the hatchery did not have a Monitoring and Evaluation Plan in place and the required documentation on many of egg, fry, and adult production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm and security alarm requirements, rearing requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery was not following the IHOT protocols for feed production, vehicle disinfection, and transportation. The hatchery needed to develop specific incubation and rearing standards, a smoltification goal and monitoring program, and conduct fisheries contribution studies. The hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Eastbank Hatchery - Summer Chinook (Wells Stock) 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:

- Change hauling temperature or review IHOT temperature criteria for hauling
- Change volitional release procedures
- Conduct fish contribution studies
- Construct two additional raceways and one super-raceway
- Decrease turbidity at Similkameen Satellite
- Develop genetics monitoring and evaluation program
- Develop monitoring and evaluation plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Develop IHOT criteria for Isoflow incubators
- Discuss IHOT Operations Plan with staff
- Review release procedures as they relate to overall program
- Document adult contribution
- Document DO and TGP levels
- Develop eyed-egg to fry survival goal for IHOT
- Document fry-to-smolt survival

- Document green-egg to eyed-egg survival
- Document smolt production
- Document smolt-to-adult survival
- Follow IHOT QA/QC protocols for feed production
- Follow IHOT requirements for exterior and interior vehicle disinfection
- Install alarms in quarantine areas
- Install bird netting over raceways
- Install second set of screens to raceways
- Install security alarms
- Need 50 additional half stack incubators for full program
- Review IHOT incubation and rearing temperature criteria
- Discuss IHOT Operations Plan with staff
- Review release procedures as they relate to overall program
- Run analysis for water chemistry parameters, 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 CHINOOK (WENATCHEE)

The Eastbank Hatchery - Summer Chinook (Wenatchee Stock) program was in general compliance with many of the performance measures. In the area of program objectives, the hatchery did not have a Monitoring and Evaluation Plan in place, was not meeting its adult return goal, and did not have the required documentation on many of egg, fry, and adult production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm and security alarm requirements, rearing requirements, and pathology-free water criteria, which are all facilities requirements. The hatchery was not following the IHOT protocols for feed production, vehicle disinfection, and transportation. The hatchery needed to develop specific incubation and rearing standards, a smoltification goal and monitoring program, and conduct fisheries contribution studies. The hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Eastbank Hatchery - Summer Chinook (Wenatchee Stock) 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:

- Change hauling temperature or review IHOT temperature criteria for hauling
- Change volitional release procedures
- Conduct fish contribution studies
- Construct two additional raceways and one super-raceway
- Develop genetics monitoring and evaluation program
- Develop monitoring and evaluation plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Develop IHOT criteria for Isoflow incubators
- Document adult contribution
- Document DO and TGP levels
- Document egg take
- Document eyed-egg to fry survival
- Document green-egg to eyed-egg survival

- Document smolt-to-adult survival
- Follow IHOT QA/QC protocols for feed production
- Follow IHOT requirements for exterior and interior vehicle disinfection
- Improve pre-spawning mortality
- Install alarms in quarantine areas
- Install bird netting over raceways
- Install second set of screens to raceways
- Install security alarms
- Modify rearing program to meet size at release
- Review IHOT criteria for disease-free water for adult holding
- Review IHOT incubation and rearing temperature criteria
- Review IHOT Operations Plan and discuss with staff
- Review release procedures as they relate to overall program
- Run analysis for water chemistry parameters, nitrite, and contaminants
- Need 50 additional half stacks for full program

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

SUMMER STEELHEAD

The Eastbank Hatchery - Steelhead program was in general compliance with many of the performance measures. In the area of program objectives, the hatchery did not have a Monitoring and Evaluation Plan in place and the required documentation on many of egg, fry, and adult production goals. The audit found that the hatchery was not in compliance with the water quality monitoring requirements, alarm and security alarm requirements, rearing requirements, incubation facilities, and rearing facilities, which are all facilities requirements. The hatchery was not following the IHOT protocols for feed production, vehicle disinfection, and transportation. The hatchery needed to develop specific incubation and rearing standards, a smoltification goal and monitoring program, and conduct fisheries contribution studies. The hatchery did not have a Genetics Monitoring and Evaluation Program in place and needed to evaluate its release strategy.

The specific areas in which the Eastbank Hatchery - 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:

- Change hauling temperature or review IHOT temperature criteria for hauling
- Conduct fish contribution studies
- Construct acclimation ponds on the Wenatchee River
- Construct two additional raceways for full program
- Develop genetics monitoring and evaluation program
- Develop monitoring and evaluation plan
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for IHOT Operations Plan
- Document adult contribution
- Document DO and TGP levels
- Document rearing density just prior to release
- Document smolt-to-adult survival
- Eliminate corners and dead areas of pond to improve release facilities
- Evaluate the release strategy

- Follow IHOT density and loading criteria in the operation of the rearing ponds
- Follow IHOT incubation criteria for loading and flow
- Follow IHOT protocols for tempering hauling water prior to release
- Follow IHOT QA/QC protocols for feed production
- Follow IHOT requirements for exterior and interior vehicle disinfection
- Install alarms in quarantine areas
- Install bird netting over raceways
- Install security alarms
- Insulate feeders
- Modify rearing program to reduce the number of precocious males
- Modify rearing to meet release goal
- Need 8 more deep troughs for early rearing
- Need additional 50 half stack incubators for full program
- Review IHOT incubation temperature criteria
- Review IHOT Operations Plan and discuss with staff
- Run analysis for water chemistry parameters, nitrite, and contaminants

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

Facility Description

Name:	Eastbank Fish Hatchery
Stock/Species:	Summer Chinook (Wenatchee Stock) Summer Chinook (Wells Stock) Sockeye (Lake Wenatchee Stock) Spring Chinook (Chiwawa Stock) Steelhead
Operating Agency:	Washington Department of Fish and Wildlife
Funding Agency:	Chelan PUD
Location:	Eastbank Hatchery is located on the east side of the Columbia River near Rocky Reach Dam, 7 miles north of Wenatchee, Washington. Five satellite facilities are located on four different rivers (Wenatchee, Chiwawa, Methow, and Similkameen).
Address:	Eastbank Fish Hatchery Washington Department of Fish and Wildlife 13246 Lincoln Rock Road E East Wenatchee, WA 98802
Hatchery Manager:	Mr. Steve Robards
Phone:	(509) 884-8301
Fax:	(509) 886-0823
Purpose:	The hatchery was built to mitigate for smolt losses at Rock Island Dam and began operation in 1989.

Production Goal:

Summer Chinook (Wenatchee Stock)

Produce 864,000 yearling spring chinook for release in the Wenatchee River.

Summer Chinook (Wells Stock)

Produce 400,000 yearling summer chinook for release into the Methow River

Produce 576,000 yearling summer chinook for release into the Similkameen River.

Sockeye (Lake Wenatchee Stock)

Produce 200,000 subyearling sockeye for release into Lake Wenatchee from Lake Wenatchee net pens.

Spring Chinook (Chiwawa Stock)

Produce 672,000 yearlings spring chinook for release into the Chiwawa River.

Steelhead

Produce 200,000 summer steelhead smolts for off-station release.

Water Supply:

Four deep aquifer wells provide up to 53 cfs of water at a relatively constant temperature. The five satellites are supplied with approximately 89 cfs of river water.

Facilities:

Adult Holding:	2 adult salmon holding raceways 1 adult steelhead raceways - 3,760 cf
Incubation:	29 8 stacks (232 trays)
Early Rearing:	6 shallow troughs - 30 cf each
Raceways:	5 concrete raceways - 22,000 cf each 7 concrete raceways - 3,700 cf each
Rearing Ponds:	2 concrete ponds - 52,000 cf each 30 concrete ponds - 36,000 cf each

Satellite Facilities:

Similkameen Satellite Facility

1 rearing pond - 2,386 cf

2 concrete raceways - 168 cf each

Chiwawa Satellite Facility

2 rearing ponds - 75,000 cf each

Lake Wenatchee Satellite Facility

8 net pens - 7,400 cf each

Dryden Satellite Facility

1 lined rearing pond - 115,200 cf

Carlton Satellite Facility

1 lined rearing pond - 53,400 cf

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 Eastbank Hatchery - Spring Chinook (Chiwawa Stock), Sockeye, Summer Chinook (Wells), Summer Chinook (Wenatchee) and Summer Steelhead

This section presents the corrective actions required to bring the Eastbank Hatchery - Spring Chinook (Chiwawa Stock), Sockeye, Summer Chinook (Wells), Summer Chinook (Wenatchee), 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. Where appropriate, the costs associated with the remedial actions are also presented (Table 3a, 3b, 3c, 3d, 3e).

The cost estimates presented in this section are based on professional experience from similar projects. In most cases, only a lump-sum figure is presented, and detailed take-off lists have not been prepared. The cost estimates are essentially order of magnitude estimates ($\pm 40\%$).

The suggested remedial activities may also present several levels of action. Optional actions have been listed for several problems. These optional actions are desirable for either operational or safety considerations.

**Table 3a. Remedial Actions Required at Eastbank Hatchery - Spring Chinook
(Chiwawa Stock)**

Remedial Action Required	Cost	PMs¹
Type 1 – Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve adult returns	----	4c, 4g
Type 2 – Remedial actions requiring changes in agency policies or procedures		
Discuss IHOT Operations Plan with staff	----	2
Develop monitoring and evaluation plan	----	3
Document adult contribution	----	4a
Document green-egg to eyed-egg survival	----	4d
Document eyed-egg to fry survival	----	4e
Document fry-to-smolt survival	----	4f
Document smolt-to-adult survival	----	4h
Review IHOT incubation and rearing temperature criteria	----	5a
Follow IHOT QA/QC protocols for feed production	----	12
Rebuild release line and change release procedures	----	13
Develop specific incubation and rearing standards for IHOT Operations Plan	----	18, 19
Document density and loading conditions in Chiwawa rearing ponds	----	19
Develop smoltification goal and monitor	----	22a1
Document rearing density prior to release	----	22a2
Document number at release	----	22a4
Change program or rearing to meet size goal	----	22a5

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

Remedial Action Required	Cost	PMs¹
Type 2 (Continued) - Remedial actions requiring changes in agency policies or procedures		
Document dates of release	----	22a6
Follow IHOT requirements for exterior and interior vehicle disinfection	----	23
Change hauling temperature or review IHOT temperature criteria for hauling	----	23
Conduct fish contribution studies	----	24
Evaluate potential sampling bias in the collection of adults	----	39
Develop spawning log and document spawning on daily or weekly basis	----	42
Develop genetics monitoring and evaluation program	----	43
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, nitrite, and contaminants	----	5c, 5f, 5g
Type 4 - Remedial actions requiring significant capital expenditures		
Install alarms in quarantine areas	\$5,000	6
Install security alarms	\$5,000	6
Need an additional 50 half-stack incubators for full production	\$45,000	8
Need two additional raceways for full production	\$150,000	9
Install second set of screens to 8 raceways	\$25,000	10
Install bird netting over raceways at Eastbank (\$55,000) and Chiwawa (\$45,000) Satellites	\$100,000	11
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
None	----	5d

Table 3b. Remedial Actions Required at Eastbank Hatchery - Sockeye (Lake Wenatchee Stock)

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

Remedial Action Required	Cost	PMS¹
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		
Review IHOT Operations Plan and discuss with staff	----	2
Develop monitoring and evaluation plan	----	3
Document adult contribution	----	4a
Develop green-egg to eyed-egg survival goal and document	----	4d
Document eyed-egg to fry survival	----	4e
Document smolt-to-adult survival	----	4h
Review IHOT spawning, incubation, and rearing temperature criteria	----	5a
Review IHOT criteria for disease-free water for adult holding and rearing	----	5h
Follow IHOT QA/QC protocols for feed production	----	12
Develop specific incubation and rearing standards for IHOT Operations Plan	----	18, 19
Follow IHOT incubation standards	----	18

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

Remedial Action Required	Cost	PMS¹
Type 2 (Continued) - Remedial actions requiring changes in agency policies or procedures		
Document density in netpens	----	19, 22a2
Document size and dates of releases	----	22a5, 22a6
Follow IHOT requirements for exterior and interior vehicle disinfection	----	23
Change hauling temperature or review IHOT temperature criteria for hauling	----	23
Conduct fish contribution studies	----	24
Evaluate sampling bias in the collection of broodstock	----	39
Develop donor selection document	----	40
Develop genetics monitoring and evaluation program	----	43
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, nitrite, and contaminants	----	5c, 5f, 5g
Type 4 - Remedial actions requiring significant capital expenditures		
Install alarms in quarantine areas	\$5,000	6
Install security alarms at hatchery and on netpens	\$10,000	6
Need 50 additional half stacks for full program	\$45,000	8
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Improve production of pre-smolts	----	22a4

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

Remedial Action Required	Cost	PMS¹
Type 2 (Continued) - Remedial actions requiring changes in agency policies or procedures		
Conduct fish contribution studies	----	24
Develop genetics monitoring and evaluation program	----	43
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, nitrite, and contaminants	----	5c, 5f, 5g
Type 4 - Remedial actions requiring significant capital expenditures		
Install alarms in quarantine areas	\$5,000	6
Install security alarms	\$5,000	6
Need 50 additional half stack incubators for full program	\$45,000	8
Construct two additional raceways and one super-raceway	\$350,000	9
Install second set of screens to raceways	\$5,500	10
Install bird netting over raceways	\$55,000	11
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Decrease turbidity at Similkameen Satellite	----	5d

Table 3d. Remedial Actions Required at Eastbank Hatchery - Summer Chinook (Wenatchee Stock)

Remedial Action Required	Cost	PMS²
Type 1 – Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve adult returns	----	4c, 4g

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

² PMS are performance measures that were extracted from the IHOT 1995 report.

Remedial Action Required	Cost	PMS ²
Type 2 – Remedial actions requiring changes in agency policies or procedures		
Review IHOT Operations Plan and discuss with staff	----	2
Develop monitoring and evaluation plan	----	3
Document adult contribution	----	4a
Document green-egg to eyed-egg survival	----	4d
Document eyed-egg to fry survival	----	4e
Document smolt-to-adult survival	----	4h
Review IHOT incubation and rearing temperature criteria	----	5a
Review IHOT criteria for disease-free water for adult holding	----	5h
Follow IHOT QA/QC protocols for feed production	----	12
Change volitional release procedures	----	13
Develop specific incubation and rearing standards for IHOT Operations Plan	----	18, 19
Develop IHOT criteria for Isoflow incubators	----	18

Remedial Action Required	Cost	PMs¹
Type 2 (Continued) - Remedial actions requiring changes in agency policies or procedures		
Develop smoltification goal and monitor	----	22a1
Modify rearing program to meet size at release	----	22a5
Review release procedures as they relate to overall program	----	22c
Follow IHOT requirements for exterior and interior vehicle disinfection	----	23
Change hauling temperature or review IHOT temperature criteria for hauling	----	23
Conduct fish contribution studies	----	24
Develop genetics monitoring and evaluation program	----	43
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, nitrite, and contaminants	----	5c, 5f, 5g
Type 4 - Remedial actions requiring significant capital expenditures		
Install alarms in quarantine areas	\$5,000	6
Install security alarms	\$5,000	6
Need 50 additional half stacks for full program	\$45,000	8
Construct two additional raceways and one super-raceway	\$350,000	9
Install second set of screens to raceways	\$5,500	10
Install bird netting over raceways	\$55,000	11
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.

Remedial Action Required	Cost	PMS¹
Type 2 (Continued) - Remedial actions requiring changes in agency policies or procedures		
Follow IHOT protocols for tempering hauling water prior to release	----	23
Conduct fish contribution studies	----	24
Develop genetics monitoring and evaluation program	----	43
Type 3 – Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, nitrite, and contaminants	----	5c, 5f, 5g
Type 4 – Remedial actions requiring significant capital expenditures		
Install alarms in quarantine areas	\$5,000	6
Install security alarms	\$5,000	6
Install bird netting over raceways	\$55,000	11
Type 5 – Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Need additional 50 half stack incubators for full program	\$45,000	8
Construct two additional raceways for full program	\$150,000	9
Need 8 more deep troughs for early rearing	\$15,000	19
Modify rearing program to reduce the number of precocious males	----	20, 22a7
Modify rearing to meet release goal	----	22a4
Construct acclimation ponds on the Wenatchee River	----	22b

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

Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Eastbank Hatchery - Spring Chinook (Chiwawa Stock), Sockeye, Summer Chinook (Wells), Summer Chinook (Wenatchee), and Summer Steelhead programs contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries (Tables 4a, 4b, 4c, 4d, and 4e). 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:
Eastbank Hatchery - Spring Chinook (Chiwawa Stock)**

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					
1989	27	158	1	186	0.44%
1990					
1991					
1992					
1993					

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.

**Table 4b. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Eastbank Hatchery - Sockeye (Lake Wenatchee Stock)**

Year	Fisheries¹ (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution² (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988					
1989					
1990					
1991					
1992					
1993	?	35,300	307		18.7

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.

**Table 4c. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Eastbank Hatchery - Summer Chinook (Wells Stock)**

Year	Fisheries¹ (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution² (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988					
1989	1,375	487	0	1,862	0.52%
1990					
1991					
1992					
1993					

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.

**Table 4d. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Eastbank Hatchery - Summer Chinook (Wenatchee Stock)**

Year	Fisheries¹ (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution² (Broodyear)	Smolt to Adult Survival (percent)
1983					
1984					
1985					
1986					
1987					
1988					
1989	408	204	12	624	0.43%
1990					
1991					
1992					
1993					

**Table 4e. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Eastbank Hatchery - Steelhead**

Year	Fisheries³ (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution⁴ (Broodyear)	Smolt to Adult Survival (percent)
1985					

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.

1986					
1987					
1988	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided
1989	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided
1990	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided
1991	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided
1992	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided
1993	No information Provided	No information Provided	No information Provided	No information Provided	No information Provided

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 Eastbank Hatchery are presented in Table 5 by program. The detailed breakdown of program expenditures for summer chinook (Wenatchee), summer chinook (Wells), sockeye, spring chinook, and summer steelhead programs at this hatchery are presented in separate tables (Tables 6a, 6b, 6c, 6d, and 6e).

Table 5. Annual Operating Expenses - Eastbank Hatchery

Program	1994	1995	1996
1. Summer Chinook (Wenatchee Stock)	Information missing	\$508,736	\$544,347
2. Summer Chinook (Wells Stock)	Information missing	\$575,034	\$644,359
3. Sockeye (Lake Wenatchee Stock)	Information missing	\$142,067	\$102,869
4. Spring Chinook (Chiwawa Stock)	Information missing	\$125,831	\$18,574
5. Steelhead	\$144,636	\$139,123	\$118,585
Total Hatchery Costs	Information missing	\$1,353,022	\$1,428,733

**Table 6a. Detailed Expenditures at Eastbank Hatchery by Program
Summer Chinook (Wenatchee Stock)**

Component	1994	1995	1996
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹	Information missing	\$1,166,322	\$1,242,033
Lumped Third-Party Costs	\$186,700	\$186,700	\$186,700
Total Hatchery Costs	Information missing	\$1,353,022	\$1,428,733
Source of Funds			
Program Production (#)	627,331	900,429	797,350
Total Production (#)	1,853,710	2,396,273	2,092,377
Program as Percent of Total	33.8%	37.6%	38.1
Program Costs	Information missing	\$508,736	\$544,347

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 Eastbank Hatchery by Program
Summer Chinook (Wells Stock)

Component	1994	1995	1996
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹	Information missing	\$1,166,322	\$1,242,033
Lumped Third-Party Costs	\$186,700	\$186,700	\$186,700
Total Hatchery Costs	Information missing	\$1,353,022	\$1,428,733
Source of Funds			
Program Production (#)	950,823	1,019,375	942,859
Total Production (#)	1,853,710	2,396,273	2,092,377
Program as Percent of Total	51.3%	42.5%	45.1%
Program Costs	Information missing	\$575,034	\$644,359

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 Eastbank Hatchery by Program
Sockeye (Lake Wenatchee Stock)**

Component	1994	1995	1996
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹	Information missing	\$1,166,322	\$1,242,033
Lumped Third-Party Costs	\$186,700	\$186,700	\$186,700
Total Hatchery Costs	Information missing	\$1,353,022	\$1,428,733
Source of Funds			
I			
Program Production (#)	190,443	252,859	150,800
Total Production (#)	1,853,710	2,396,273	2,092,377
Program as Percent of Total	10.3%	10.5%	7.2%
Program Costs	Information missing	\$142,067	\$102,869

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 6d. Detailed Expenditures at Eastbank Hatchery by Program
Spring Chinook (Chiwawa Stock)**

Component	1994	1995	1996
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹	Information missing	\$1,166,322	\$1,242,033
Lumped Third-Party Costs	\$186,700	\$186,700	\$186,700
Total Hatchery Costs	Information missing	\$1,353,022	\$1,428,733
Source of Funds			
I			
Program Production (#)	85,113	223,610	27,226
Total Production (#)	1,853,710	2,396,273	2,092,377
Program as Percent of Total	4.6%	9.3%	1.3%
Program Costs	Information missing	\$125,831	\$18,574

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 6e. Detailed Expenditures at Eastbank Hatchery by Program

Steelhead

Component	1994	1995	1996
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs ¹	\$109,636	\$104,123	\$1,242,033
Lumped Third-Party Costs	\$35,000	\$35,000	\$186,700
Total Hatchery Costs	\$144,636	\$139,123	\$1,428,733
Source of Funds			
I			
Program Production (#)			
Total Production (#)			
Program as Percent of Total	100%	100%	8.3%
Program Costs	\$144,636	\$139,123	\$118,585

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