
IRRIGON HATCHERY

A COMPILATION AND SUMMARY OF
IHOT AUDITS FOR SUMMER STEELHEAD
(GRANDE RONDE AND IMNAHA STOCKS)

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

Irrigon Hatchery

- **Summer Steelhead (Grande Ronde Stock)**
- **Summer Steelhead (Imnaha Stock)**

**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	4
Section 3 Remedial Actions	5
Section 4 Hatchery Contribution to Fisheries, Spawning Grounds and Hatcheries	10
Section 5 Annual Operating Expenditures	12

Section 1

Executive Summary

This report compiles a summary of the findings of two separate Hatchery Evaluation Reports for Summer Steelhead (Grande Ronde and Imnaha Stocks) programs at Irrigon Hatchery. The original Hatchery Evaluation Reports, prepared by Montgomery Watson, presented each species and program separately and include the complete findings. Details on the audit compliance status for each species and program are included in the original reports. The Hatchery Evaluation Reports were based upon audits conducted in 1996-1997 as part of a 2-year effort that will include 67 hatcheries and satellite facilities located on the Columbia and Snake River system in Idaho, Oregon, and Washington. The hatchery operating agencies include the U.S Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

The hatchery is located on the Columbia River near Irrigon in northeastern Oregon and is operated by the Oregon Department of Fish and Wildlife. The hatchery is used for egg incubation and rearing of summer steelhead stocks from the Imnaha and Grande Ronde River basins.

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.

Irrigon Hatchery - Summer Steelhead (Grande Ronde and Imnaha Stocks) Results

The Irrigon facility includes 32 concrete raceways, 68 circular starting tanks, and incubation facilities. The hatchery water supply consists of five wells supplying 19,000 gpm. The hatchery began operation in 1984 as part of the Lower Snake River Compensation Program, (LSRCP) a program to mitigate for spring chinook and summer steelhead losses caused by the four federal dams constructed on the lower Snake River.

SUMMER STEELHEAD (GRANDE RONDE STOCK)

The Irrigon Hatchery - Summer Steelhead (Grande Ronde Stock) program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery did not meet its production and percent survival (smolt to adult) goal in 1 of the 3 years evaluated as a result of low egg take. In the area of facility requirements, the audit found that the hatchery was not in compliance with the IHOT criteria for water quality in the areas of chemistry, alkalinity and hardness, nitrite, and contaminants due to a lack of analyses for these parameters. The hatchery also did not have double screening for the rearing raceways and did not follow IHOT recommendations for the frequency of monitoring alarms. In the area of hatchery practices, the audit found that the hatchery needed to develop written criteria and standards for incubation and rearing practices, written criteria for percent smoltification, did not rear the fish in the subbasin, and did not follow IHOT protocols for disinfection of the exterior and cab of the fish transport vehicles. In the area of genetics policy, the audit found that the hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Irrigon Hatchery - Summer Steelhead (Grande Ronde 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:

- Adopt IHOT procedures for transport vehicle exterior and cab disinfection
- Develop a genetics M&E program in line with IHOT policies and procedures
- Develop loading and flow criteria for 4-stack incubators
- Develop written rearing standards and practices
- Develop written smoltification criteria
- Implement IHOT monitoring schedule for alarm system checks
- Provide rearing in the Grande Ronde subbasin
- Provide second set of screens on rearing raceways
- Run analysis for alkalinity and hardness
- Run analysis for chemistry parameters
- Run analysis for contaminants
- Run analysis for nitrite

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

SUMMER STEELHEAD (IMNAHA STOCK)

The Irrigon Hatchery - Summer Steelhead (Imnaha Stock) program was in general compliance with most of the performance measures. In the area of program objectives, the hatchery did not meet its percent survival (smolt to adult) goal in 1 of the 3 years evaluated as a result of low egg take. In the area of facility requirements, the audit found that the hatchery was not in compliance with the IHOT criteria for water quality in the areas of chemistry, alkalinity and hardness, nitrite, and

contaminants due to a lack of analyses for these parameters. The hatchery also did not have double screening for the rearing raceways and did not follow IHOT recommendations for the frequency of monitoring alarms. In the area of hatchery practices, the audit found that the hatchery needed to develop written criteria and standards for incubation and rearing practices, written criteria for percent smoltification, did not meet size and time at release goals, did not rear the fish in the subbasin, and did not follow IHOT protocols for disinfection of the exterior and cab of the fish transport vehicles. In the area of genetics policy, the audit found that the hatchery did not have a Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Irrigon Hatchery - Summer Steelhead (Imnaha 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:

- Accelerate incubation to meet size at release goals
- Adopt IHOT procedures for transport vehicle exterior and cab disinfection
- Develop a genetics monitoring & evaluation program in line with IHOT policies and procedures
- Develop loading and flow criteria for 4-stack incubators
- Develop written rearing standards and practices
- Develop written smoltification criteria
- Implement IHOT monitoring schedule for alarm system checks
- Provide rearing in the Imnaha subbasin
- Provide second set of screens on rearing raceways
- Run analysis for alkalinity and hardness
- Run analysis for chemistry parameters
- Run analysis for contaminants
- Run analysis for nitrite

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

Facility Description

Name:	Irrigon Hatchery
Stock/Species:	Summer Steelhead (Grande Ronde Stock)
Operating Agency:	Oregon Department of Fish and Wildlife
Funding Agency:	Lower Snake River Compensation Program
Location:	Near Irrigon, OR on the Columbia River
Address:	Irrigon Hatchery Route 2, Box 149 Irrigon, OR 97844
Hatchery Manager:	Mr. Mike Gribble
Phone:	(541) 922-5732
Fax:	(541) 922-2609
Purpose:	Irrigon Hatchery serves as an egg incubation and rearing facility for summer steelhead destined for the Grande Ronde and Imnaha River systems. Irrigon is also used as a final rearing site for legal-sized rainbow trout destined for northeast Oregon waters.
Production Goal:	<p>Summer Steelhead (Grande Ronde stock) Produce 1,350,000 smolts (270,000 pounds)</p> <p>Summer Steelhead (Imnaha stock) Produce 330,000 smolts (66,000 pounds)</p>
Water Supply:	Five wells supplying approximately 19,000 gpm
Facilities:	
Adult Holding:	N/A
Incubation:	10 12-tray vertical incubators (120 trays) 14 3x4-tray vertical incubators (168 trays)
Early Rearing:	68 6-foot diameter, circular fiberglass tanks (530 cf each)
Raceways:	32 20x100 ft concrete raceways (57,350 gal each)
Rearing Ponds:	N/A
Satellite Facilities:	N/A

Section 3
Remedial Actions

Based on the compliance status for each performance measure, remedial actions were developed. The required remedial actions are organized into five categories. The types of categories range across a spectrum from those actions that are beyond human control, to those that require a change in agency policy or procedures, to those that involve a significant capital cost to put in place. The following are the five types of remedial actions identified under phase 1 of the audit:

The Five Types of Remedial Actions

Type	Description
1	Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery
2	Remedial actions requiring changes in agency policies or procedures
3	Remedial actions requiring changes in monitoring coverage or interval
4	Remedial actions requiring significant capital expenditures
5	Remedial actions that may require significant capital expenditures but are not clearly definable at this time

Remedial Actions at Irrigon Hatchery - Summer Steelhead (Grande Ronde and Imnaha Stocks)

This section presents the corrective actions required to bring the Irrigon Hatchery - Summer Steelhead (Grande Ronde and Imanah Stocks) programs into compliance with IHOT performance measures. The remedial actions described here are suggestions developed by the Montgomery Watson Audit Team. The remedial actions and associated cost estimates have not been analyzed or prioritized by the respective operating agencies, fishery managers, or IHOT. There may be additional remedial actions, not included in this report, proposed by the respective operating agencies. For some non-compliance areas, other remedial actions could be proposed. The required remedial actions are cross-referenced to each IHOT performance measure that was not in compliance. Where appropriate, the costs associated with the remedial actions are also presented (Tables 3a and 3b).

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 Irrigon Hatchery: Summer Steelhead (Grande Ronde 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 ocean survival to increase adult returns and subsequent egg take to meet goals	----	4g, 4h
Provide electronic security alarms; however, not a problem for this hatchery because onsite staff conduct security checks	----	6
Provide telephone pagers; however, not a problem for this hatchery because residences are hard-wired to alarm system	----	6
Insulate feeders against excessive temperatures; however, no problems experienced	----	12
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Implement IHOT monitoring schedule for alarm system checks	----	6
Develop loading and flow criteria for 4-stack incubators	----	18, 30
Develop written rearing standards and practices	----	19, 21, 31
Develop written smoltification criteria	----	22a1, 36
Adopt IHOT procedures for transport vehicle disinfection	----	23
Develop a genetics M&E program in line with IHOT policies and procedures	----	43

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

Remedial Action Required	Cost	PMS ¹
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Run analysis for chemistry parameters	----	5c, 21, 29
Run analysis for alkalinity and hardness	----	5e, 21, 29
Run analysis for nitrite	----	5f, 21, 29
Run analysis for contaminants	----	5g, 21, 29
Type 4 - Remedial actions requiring significant capital expenditures		
Provide second set of screens on rearing raceways	\$30,000	10
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Provide rearing in the Grande Ronde subbasin	----	22b

Table 3b. Remedial Actions Required at Irrigon Hatchery - Summer Steelhead (Imnaha Stock)

Remedial Action Required	Cost	PMS ¹
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve ocean survival to increase adult returns	----	4h, 22a5, 36
Provide electronic security alarms; however, not a problem for this hatchery because on-site staff conduct security checks	----	6
Provide telephone pagers; however, not a problem for this hatchery because residences are hard-wired to alarm system	----	6
Insulate feeders against excessive temperatures; however, no problems experienced	----	12
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Implement IHOT monitoring schedule for alarm system checks	----	6
Develop loading and flow criteria for 4-stack incubators	----	18, 30

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

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

Remedial Action Required	Cost	PMS ¹
Develop written rearing standards and practices	----	19, 21, 31
Develop written smoltification criteria	----	22a1, 36
Accelerate growth rates through increased incubation temperature	----	22a6, 36
Adopt IHOT procedures for transport vehicle disinfection	----	23
Develop a genetics M&E program in line with IHOT policies and procedures	----	43

Remedial Action Required	Cost	PMS¹
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Run analysis for chemistry parameters	----	5c, 21, 29
Run analysis for alkalinity and hardness	----	5e, 21, 29
Run analysis for nitrite	----	5f, 21, 29
Run analysis for contaminants	----	5g, 21, 29
Type 4 - Remedial actions requiring significant capital expenditures		
Provide second set of screens on rearing raceways	\$30,000	10
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Provide rearing in the Imnaha subbasin	----	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 Irrigon Hatchery - Summer Steelhead (Grande Ronde and Imnaha Stocks) contributions of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries (Table 4a and 4b). 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.

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Table 4a. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries: Irrigon Hatchery - Summer Steelhead (Grande Ronde Stock)

Year	Fisheries ¹ (Broodyear)	Spawning Grounds ¹ (Broodyear)	Hatchery ¹ (Broodyear)	Total Combined Contribution ¹ (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985					
1986				4654	0.79
1987				2716	0.52
1988				1156	0.21
1989				2888	0.96
1990				2483	1.05
1991					
1992					

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

¹ Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

**Table 4b. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Irrigon Hatchery - Summer Steelhead (Imnaha Stock)**

Year	Fisheries¹ (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution² (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985					
1986				159	0.17
1987				1,309	0.53
1988				649	0.26
1989				2,521	1.01
1990				2,527	1.04
1991					
1992					

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.

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 were 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 Irrigon Hatchery are presented in Table 5 by program. The detailed breakdown of program expenditures at this hatchery is presented in separate tables (Tables 6a, 6b and 6c).

Table 5. Annual Operating Expenses - Irrigon Hatchery

Program	1994	1995	1996
1. Summer Steelhead (Grande Ronde Stock)	\$629,778	\$639,873	\$623,797
2. Summer Steelhead (Imnaha Stock)	\$163,977	\$151,032	\$134,589
3. Rainbow Trout (State Funds)	\$9,436	\$8,454	\$8,466
4.			
5.			
Total Hatchery Costs	\$803,191	\$799,360	\$766,852

**Table 6a. Detailed Expenditures at Irrigon Hatchery by Program
Summer Steelhead (Grande Ronde Stock)**

Component	1993	1994	1995
Personnel Costs	\$336,767	\$321,319	\$298,461
Operational Costs	\$323,942	\$353,078	\$353,711
Capital Costs	\$21,058	\$0	\$0
Indirect Costs	\$121,424	\$124,963	\$114,680
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs	\$0	\$0	\$0
Total Hatchery Costs	\$803,191	\$799,360	\$766,852
Source of Funds			
Program Production (lb)	247,484	254,073	257,433
Total Production (lb)	315,630	317,400	316,470
Program as Percent of Total	78.4	80.0	81.3
Program Costs	\$629,778	\$639,873	623,797

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 Irrigon Hatchery by Program
Summer Steelhead (Imnaha stock)**

Component	1994	1995	1996
Personnel Costs	\$336,767	\$321,319	\$298,461
Operational Costs	\$323,942	\$353,078	\$353,711
Capital Costs	\$21,058	\$0	\$0
Indirect Costs	\$121,424	\$124,963	\$114,680
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs	\$0	\$0	\$0
Total Hatchery Costs	\$803,191	\$799,360	\$766,852
Source of Funds			
LSRCP (100%)			
Program Production (lb)	64,438	59,970	55,543
Total Production (lb)	315,630	317,400	316,470
Program as Percent of Total	20.4	18.9	17.6
Program Costs	\$163,977	\$151,032	\$134,589

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 Irrigon Hatchery by Program

Rainbow Trout

Component	1994	1995	1996
Personnel Costs	\$336,767	\$321,319	\$298,461
Operational Costs	\$323,942	\$353,078	\$353,711
Capital Costs	\$21,058	\$0	\$0
Indirect Costs	\$121,424	\$124,963	\$114,680
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs	\$0	\$0	\$0
Total Hatchery Costs	\$803,191	\$799,360	\$766,852
Source of Funds			
State Funds (100%)			
Program Production (lb)	3,708	3,357	3,494
Total Production (lb)	315,630	317,400	316,470
Program as Percent of Total	1.2	1.1	1.1
Program Costs	\$9,436	\$8,454	\$8,466

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