
MAGIC VALLEY HATCHERY

**A COMPILATION AND SUMMARY OF
IHOT AUDITS FOR SUMMER
STEELHEAD**

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

**Magic Valley Hatchery
- Summer Steelhead**

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

SUMMARY REPORT PREPARED BY:
DON SAMPSON
SAMPSEL CONSULTING SERVICES
FOR THE
NORTHWEST POWER PLANNING COUNCIL
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Original IHOT Audit Reports Prepared by:

Montgomery Watson
2375 130th Avenue NE
Suite 200
Bellevue, WA 98005
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BPA Project Number 95-2
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Executive Summary

This report compiles a summary of the findings of the Hatchery Evaluation Report for Summer Steelhead at Magic Valley 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 Snake River, approximately 7 miles northwest of the town of Filer in the Snake River Canyon in Idaho and is operated by the Idaho Department of Fish and Game. The hatchery is used for egg and rearing of summer steelhead.

Background

The hatchery audit was conducted as a requirement of the Northwest Power Planning Council (NPPC) "Strategy for Salmon" and the Columbia River Basin Fish and Wildlife Program. Under the audit, the hatcheries are evaluated against policies and related performance measures developed by the Integrated Hatchery Operations Team (IHOT) in January 1995. IHOT is a multi-agency group established by the NPPC to direct the development of new basinwide standards for managing and operating fish hatcheries. The Bonneville Power Administration (BPA) was contracted along with Montgomery Watson to complete the hatchery 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.

Magic Valley Hatchery - Summer Steelhead Results

The Magic Valley facility includes 32 concrete raceways, 20 start tanks and upwelling incubators. Magic Valley Hatchery was constructed in 1987 by the U.S. Army Corps of Engineers as part of the Lower Snake River Compensation Program (LSRCP) - a program to mitigate anadromous fishery losses caused by the four federal dams constructed on the lower Snake River.

The Magic Valley Hatchery was in compliance with most of the performance measures. In the area of program objectives, the hatchery needed to improve its fry-to-smolt survival and adult returns. The audit found that the hatchery was not in compliance with the temperature criteria, water quality monitoring criteria, alarm requirements, doubling screening requirements, predation control facilities, and feed handling facilities. It was also not in compliance with the screen approach criteria, adult holding facilities, turbidity criteria, and pathology-free water criteria, which are all facilities requirements. The hatchery also slightly exceeded its density criteria for rearing, needed to develop specific incubation and rearing standards for the IHOT Operations Plan, and needed to develop a smoltification goal and monitoring program, and to construct acclimation ponds in the Salmon River subbasin. In the compliance area for fish health policy, the hatchery needed to obtain copies of egg and fish transfer/release records. The hatchery did not have an approved Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Magic Valley Hatchery - Summer Steelhead program requires remedial actions based on the IHOT performance measures are listed below. These remedial actions are listed in alphabetical order without intent of ranking or otherwise assigning priority:

- Complete bird netting around raceways
- Construct acclimation ponds in the Salmon River subbasin
- Develop approved genetics monitoring and evaluation program
- Develop logger for alarms
- Develop smoltification goals and monitoring program
- Develop specific incubation standards for IHOT Operations Plan
- Develop specific rearing standards for early rearing and rearing for IHOT Operations Plan
- Avoid leaving buckets of feed exposed to the light or heat
- Document adult returns
- Follow IHOT standards for cab disinfection
- Improve communications between evaluation biologists and hatchery staff
- Improve fry-to-smolt survival
- Modify hatchery operations or modify rearing density standard to eliminate densities greater than criteria
- Monitor oxygen concentration during hauling
- Monitor TGP
- Obtain copies of egg and fish transfer/release records
- Perform IHOT QA/QC feed tests
- Provide additional screen panels and install double screens
- Provide rearing in the Salmon river subbasin
- Review compliance with manufacturers recommendation for feed storage
- Run analysis for contaminants
- Run analysis for missing water chemistry parameters
- Use chiller to meet IHOT temperature criteria
- Wear protective garments when handling eggs or culture water

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

Name:	Magic Valley Hatchery
Stock/Species:	Summer Steelhead
Operating Agency:	Idaho Department of Fish and Game
Funding Agency:	Lower Snake River Compensation Program (LSRCP)
Location:	Located on the Snake River, approximately 7 miles northwest of the town of Filer in the Snake River Canyon. The elevation of the hatchery is 3,000 feet above sea level.
Address:	Idaho Department of Fish and Game Magic Valley Hatchery Route 1 Filer, ID 83328
Hatchery Manager:	Mr. Bob Moore
Phone:	(208) 326-3230
Fax:	
Purpose:	Magic Valley Hatchery was constructed in 1987 by the U.S. Army Corps of Engineers as part of the LSRCP - a program to mitigate anadromous fishery losses caused by the four federal dams constructed on the lower Snake River. The LSRCP mitigation goal is to return 11,600 adult steelhead above Lower Granite Dam.
Production Goal:	Summer Steelhead Produce 2.0 million "A" and "B" strain smolts (400,000 lb) for release into the Salmon River and its tributaries
Water Supply:	The hatchery is located on the south shore of the Snake River while the Crystal Springs water supply is on the north side. Water is delivered to the hatchery by gravity flow at an average flow rate of 125 cfs.
Facilities:	
Adult Holding:	none
Incubation:	40 upwelling units
Early Rearing:	20 starter tanks - 429 cf each
Raceways:	32 raceways - 6,158 cf each

Rearing Ponds: none

Satellite Facilities: none

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 categories range 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:

Table 2. 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 Magic Valley Hatchery - Summer Steelhead

This section presents the corrective actions required to bring the Magic Valley Hatchery - Summer Steelhead program into compliance with IHOT performance measures. The remedial actions described here are suggestions developed by the Montgomery Watson Audit Team. The remedial actions and associated cost estimates have not been analyzed or prioritized by the respective operating agencies, fishery managers, or IHOT. There may be additional remedial actions, not included in this report, proposed by the respective operating agencies. For some non-compliance areas, other remedial actions could be proposed. The required remedial actions are cross-referenced to each IHOT performance measure that was not in compliance. Where appropriate, the costs associated with the remedial actions are also presented (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 maybe desirable for either operational or safety considerations.

Table 3. Remedial Actions Required at Magic Valley Hatchery - Summer Steelhead

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 adult returns	----	4h
Install security alarms and use telephone pagers	----	6
Insulate bulk storage facilities	----	12
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Document adult returns	----	4h
Use chiller to meet IHOT temperature criteria	----	5a
Review compliance with manufacturers recommendation for feed storage	----	
Perform IHOT QA/QC feed tests	----	12
Do not leave buckets of feed exposed to the light or heat	----	12
Develop specific incubation standards for IHOT Operations Plan	----	18
Develop specific rearing standards for early rearing and rearing for IHOT Operations Plan	----	19
Modify hatchery operations or modify rearing density standard to eliminate densities greater than criteria	----	19
Develop smoltification goals and monitoring program	----	22a1
Follow IHOT standards for cab disinfection	----	23
Wear protective garments when handling eggs or culture water	----	23
Improve communications between evaluation biologists and hatchery staff	----	24
Obtain copies of egg and fish transfer/release records	----	31
Develop approved genetics monitoring and evaluation program	----	43

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

Remedial Action Required	Cost	PMs¹
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Monitor TGP	----	5b
Run analysis for missing water chemistry parameters	----	5c
Run analysis for contaminants	----	5g
Monitor oxygen concentration during hauling	----	23
Type 4 - Remedial actions requiring significant capital expenditures		
Develop logger for alarms	\$1000	6
Provide additional screen panels and install double screens	\$7000	10
Complete bird netting around raceways	\$7000	11
Construct acclimation ponds in the Salmon River subbasin		22b
3 acclimation ponds @ 1,000,000 per site	\$3,000,000	
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Improve fry-to-smolt survival	----	4f
Provide rearing in the Salmon River 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 Magic Valley Hatchery - Summer Steelhead 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: Magic Valley Hatchery - Summer Steelhead (A Run and B Run Combined)

Year	Fisheries ¹ (Broodyear)	Spawning Grounds (Broodyear)	Hatchery ¹ (Broodyear)	Total Combined Contribution ² (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985					
1986					
1987					
1988	2,644	818	347		---
1989	5,767	---	1,161		---
1990	5,189	905	859		---
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, 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 Magic Valley Hatchery are presented in Table 5 by program. The detailed breakdown of the Steelhead program expenditures at this hatchery are presented in separate tables (Tables 6).

Table 5. Annual Operating Expenses - Magic Valley Hatchery

Program	1994	1995	1996
1. Summer Steelhead	\$610,245	\$555,532	\$587,340
2.			
3.			
4.			
5.			
Total Hatchery Costs	\$610,245	\$555,532	\$587,340

Table 6. Detailed Expenditures at Magic Valley Hatchery by Program

Summer Steelhead

Component	1994	1995	1996
Personnel Costs	\$182,445	\$198,604	\$230,500
Operational Costs	\$329,566	\$282,570	\$239,100
Capital Costs	\$21,433	\$2,182	\$47,300
Indirect Costs	\$76,801	\$72,176	\$70,440
Lumped Hatchery Costs ¹			
Lumped Third-Party Costs			
Total Hatchery Costs	\$610,245	\$555,532	\$587,340
Source of Funds			
	100%	100%	100%
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
Program Costs	\$610,245	\$555,532	\$587,340

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