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# **HATCHERY EVALUATION REPORT**

**Magic Valley - Summer Steelhead**

**September 1996**

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**Integrated Hatchery Operations Team (IHOT)**

# **HATCHERY EVALUATION REPORT**

## **Magic Valley Hatchery - Summer Steelhead**

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

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Project Number 95-2  
Contract Number 95AC49468

September 1996

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## Executive Summary

This report presents the findings of the independent audit of the Magic Valley Hatchery - Summer Steelhead program. The hatchery is located on the Snake River, approximately 7 miles northwest of the town of Filer in the Snake River Canyon in Idaho. The hatchery is used for egg and rearing of summer steelhead.

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.

## 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 for anadromous fishery losses caused by the four federal dams constructed on the lower Snake River.

The Magic Valley Hatchery was in general 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

<b>Name:</b>	Magic Valley Hatchery
<b>Stock/Species:</b>	Summer Steelhead
<b>Operating Agency:</b>	Idaho Department of Fish and Game
<b>Funding Agency:</b>	Lower Snake River Compensation Program (LSRCP)
<b>Location:</b>	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.
<b>Address:</b>	Idaho Department of Fish and Game Magic Valley Hatchery Route 1 Filer, ID 83328
<b>Hatchery Manager:</b>	Mr. Bob Moore
<b>Phone:</b>	(208) 326-3230
<b>Fax:</b>	
<b>Purpose:</b>	Magic Valley Hatchery was constructed in 1987 by the U.S. Army Corps of Engineers as part of the LSRCP - a program to mitigate for 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.
<b>Production Goal:</b>	Summer Steelhead  Produce 2.0 million "A" and "B" strain smolts (400,000 lb) for release into the Salmon River and its tributaries
<b>Water Supply:</b>	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.
<b>Facilities:</b>	
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

## 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. This process consisted of research and onsite visits. The site visit at the Magic Valley Hatchery was conducted on September 11, 1996.

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

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 Magic Valley Hatchery - Summer 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 Magic Valley Hatchery - Summer 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 Magic Valley Hatchery - Summer Steelhead (“A” Run)**

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	Pahsimeroi Hatchery	Sawtooth Hatchery	Magic Valley Hatchery	Salmon River		
Adult Collection	✓					
Adult Holding	✓					
Spawning	✓					
Fertilization	✓					
Incubation						
green-to-eyed		✓				
eyed-to-hatch			✓			
Rearing						
fry			✓			
fingerlings			✓			
smolts			✓			
Release				✓		

**Table 1 (Continued) Summary Program Information for Magic Valley Hatchery - Summer Steelhead ( "B" Run, Dworshak Stock)**

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	Dworshak Hatchery	Clearwater Hatchery	Magic Valley Hatchery	Salmon River tributaries		
Adult Collection	✓					
Adult Holding	✓					
Spawning	✓					
Fertilization	✓					
Incubation						
green-to-eyed		✓				
eyed-to-hatch			✓			
Rearing						
fry			✓			
fingerlings			✓			
smolts			✓			
Release				✓		

**Table 1 (Continued) Summary Program Information for Magic Valley Hatchery - Summer Steelhead ( "B" Run, East Fork)**

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	East Fork, Salmon River	Sawtooth Hatchery	Magic Valley Hatchery			
Adult Collection	✓					
Adult Holding	✓					
Spawning	✓					
Fertilization	✓					
Incubation						
green-to-eyed		✓				
eyed-to-hatch			✓			
Rearing						
fry			✓			
fingerlings			✓			
smolts			✓			
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 and Lower Snake River Compensation Program (LSRCP)	
<p>ie hatchery operating under a current hatchery rational plan?</p> <p>Is it understood by staff?</p> <p>Is it being followed?</p>		<p>✓</p> <p>✓</p> <p>✓</p>			IHOT Operations Plan and Hatchery Operations & Maintenance Manual	
<p>hatchery monitoring and evaluation plan in place?</p> <p>Do you have a written monitoring and evaluation plan?</p>		✓				
<p>ult contribution to fisheries, spawning grounds, and chery</p>				✓		Document adult contribution
<p>ult pre-spawning survival as compared with blished goal</p>	✓				No broodstock at this hatchery	
<p>-take as compared with established hatchery goal</p>	✓				No spawning at this hatchery	
<p>en-egg to eyed-egg survival as compared with blished goal</p>	✓				No green-egg incubation at this hatchery	
<p>d-egg to fry survival as compared with established l</p>		✓			In compliance 5 out of last 5 years for both A and B runs	
<p>to smolt survival as compared with established goal</p>					In compliance 5 out of last 5 years	
' Run		✓				
' Run				✓	In compliance 1 out of last 5 years	Improve fry-to-smolt survival
<p>duction as compared with established goal</p>		✓			In compliance 3 out of last 3 years for both stocks.	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
percent survival (smolt to adult) as compared with published goal				✓	In compliance 0 out of last 3 years; both A and B Runs	Improve adult returns and better document adult returns
number of eggs, fry, fingerlings, smolts, and/or adults meet basinwide needs	✓					

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>Temperature</b></p> <p>Does your water temperature meet the criteria for spawning?</p> <p>Does your water temperature meet the criteria for incubation?</p> <p>Does your water temperature meet the criteria for rearing?</p>	✓				<p>No spawning at this hatchery</p> <p>Review of records/Discussion. Over criteria by 3 degrees. Chilling is available but the hatchery doesn't feel it is worth while in this situation to reduce the water temperature by only 3 degrees.</p>	Use chiller to meet IHOT temperature criteria
<p><b>Dissolved gases</b></p> <p>Is the oxygen level near saturation?</p> <p>Is the dissolved nitrogen level less than saturation?</p>		✓	✓		<p>Review of records/Discussion.</p> <p>Site inspection; they have equipped system with degassing chambers because of concern over gas supersaturation. Fix seems to work.</p>	Monitor TGP
<p><b>Chemistry</b></p> <p>Ammonia (un-ionized)</p> <p>Carbon Dioxide</p> <p>Chlorine</p> <p>pH</p> <p>Copper</p> <p>Hydrogen Sulfide</p> <p>Iron</p> <p>Zinc</p>		✓	✓		<p>No data</p> <p>No data</p> <p>Review of records/Discussion</p> <p>Copper 0.01 mg/l. no risk perceived</p> <p>No data</p>	<p>Run analysis</p> <p>Run analysis</p> <p>Run analysis to confirm</p> <p>Run analysis</p>
<p><b>Turbidity</b></p> <p>Does your turbidity meet the criteria?</p>		✓			Review of records/Discussion	
<p><b>Alkalinity and hardness</b></p> <p>Does your alkalinity and hardness meet the criteria?</p>		✓			Review of records/Discussion	
<p><b>Nitrite</b></p> <p>Does your nitrite meet the criteria?</p>		✓			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>Contaminants</b>  Aldrin Endrin Dieldrin Heptachlor Chlordane Methoxychlor Lindane Malathion Guthion			✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		No contaminant data	Run analysis for contaminants
<b>Biogens</b>  What portions of the hatchery have disease-free water?  Adult holding Incubation Early rearing Rearing Others	✓	✓ ✓ ✓			No adults at this hatchery Discussion Discussion Discussion	

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	
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	✓				Inspection of facilities/ Discussion	
Water treatment systems	✓				Inspection of facilities/ Discussion	
Security				✓	Inspection of facilities/ Discussion	Install security alarms
Are there outside systems and buzzers in on-site residences?		✓			Discussion	
Are water flow alarms checked daily?		✓			Review of records /Discussion	
Are all other alarms checked weekly?		✓			Review of records /Discussion	
Is there a log of alarms for emergencies, tests, and maintenance requirements?				✓	Review of records/Discussion	Develop system to log alarms
Are telephone pagers used?				✓	Present but not used	Not important
<b>Adult collection and holding facilities</b>						
Do you meet the adult holding criteria?	✓				no adults at this hatchery	
<b>Incubation facilities</b>						
Type 1: <u>Upwelling Jar</u> Do you have an adequate number of units for the overall program?		✓			Inspection of facilities/Discussion	
Type 2: <u>N/A</u> Do you have an adequate number of units for the overall program?	✓					

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>ring facilities</b></p> <p>Type 1: <u>Concrete Vats</u> Do you have an adequate number of units for the overall program?</p> <p>Type 2: <u>Concrete Raceways</u> Do you have an adequate number of units for the overall program?</p> <p>Type 3: <u>N/A</u> Do you have an adequate number of units for the overall program?</p>		✓			<p>Inspection of facilities/Discussion.</p> <p>Inspection of facilities/Discussion</p>	
<p><b>eeening facilities</b></p> <p>Do you meet the approach velocity criteria:</p> <p>Are the fish screens regularly cleaned?</p> <p>Does Screen Mesh (openings) meet current opening criteria?</p> <p>Are rearing containers double screened for fish that should not be released to adjacent water?</p>	✓	✓		✓	<p>Spring supply; no indigenous fish</p> <p>Slots are available, but not enough screens</p>	<p>Provide additional screen panels and install double screens.</p>
<p><b>ator control facilities</b></p> <p>Are your predation control facilities effective?</p>				✓	<p>Discussion. Bird screen over the top of all the raceways but sides are open.</p>	<p>Complete bird netting around raceways</p>

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>			✓		Discussion; believe they are okay but have no documentation.	Review compliance with manufacturers recommendation for feed storage
Does the storage of dry/semi-moist/moist foods (dry<12%; semi-moist 12-20%; moist >20% moisture) follow food manufacturer's recommendations?						
Does a regional quality control officer oversee production procedures and monitor:						
Verification by feed manufacturer that ingredients meet specifications?				✓	Discussion.	Perform IHOT QA/QC feed tests
Ensure feed does not contain unwanted drugs or other additives?				✓		Perform IHOT QA/QC feed tests
Analyze ingredients contained in the final food product to ensure that feed specifications have been met?				✓		Perform IHOT QA/QC feed tests
Are the foods stored and handled according to the following criteria?						
Moist pellets should not exceed 10 °F at point of delivery.		✓				
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.				✓		Do not leave buckets of feed exposed to the light or heat
Open bags of feed should be fed within one to two days except when feeding small groups of fish.		✓				
Automatic feeder hoppers and bulk storage facilities should be insulated against excessive temperatures (80°F and above).				✓	Bulk storage used mainly in cooler months. No insulation.	No a problem at this hatchery

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

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?	✓				Existing program; does not apply	
Was the donor selection outline followed in selecting the hatchery broodstock? to PM #40 in Genetics	✓				Existing program; does not apply	
<b>Spawning practices</b>						
Were the appropriate number of spawners, male/female ratios, and fertilization protocols used? to PM #42 in Genetics Section	✓				Review of records/Discussion	
<b>Incubation practices</b>						
Are specific incubation standards listed in the hatchery operations plan?		✓			Not in IHOT Operations Plan but in hatchery plan	Develop specific incubation standards for IHOT Operations Plan
Are incubation practices written?		✓				
Incubation Type 1: <u>Upwellers</u> (See PM #8) Do you meet the loading and flow criteria?		✓			Discussion	
Incubation Type 2: <u>N/A</u> (See PM #8) Do you meet the loading and flow criteria?	✓					

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>ring practices</b>						
Are specific rearing standards listed in the hatchery operations plan?		✓			Not in IHOT Operations Plan but in hatchery plan	Develop specific rearing standards for IHOT Operations Plan
Are rearing practices written?		✓			Review of rearing standards, O&M	
Rearing Unit Type 1: <u>Linear Vats</u> (see PM #9) Do you meet the density and DI criteria? Do you meet the Loading and FI criteria?		✓		✓	Discussion; slightly over criteria, but probably not significant	Develop specific early rearing standards for IHOT Operations Plan
Rearing Unit Type 2: <u>Raceway top section</u> (see PM #9) Do you meet the density and DI criteria? Do you meet the Loading and FI criteria?		✓ ✓				
Rearing Unit Type 3: <u>Raceways, Full</u> (see PM #9) Do you meet the density and DI criteria? Do you meet the Loading and FI criteria?		✓		✓	Slightly over criteria	
<b>olt 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 and are the sanitation procedures being followed? (PM #28)		✓				
Are the following water quality parameters within criteria? (PM #5a-5h)						
Water temperature				✓	Review of records/Discussion	Use chillers for incubation Monitor TGP Run analysis for missing parameters
Dissolved gases					Review of records/Discussion	
Chemistry			✓		Review of records/Discussion	
Turbidity			✓		Review of records/Discussion	
Alkalinity and hardness		✓			Review of records/Discussion	
Nitrite		✓			Review of records/Discussion	
Contaminants		✓	✓		Review of records/Discussion	Run analysis for contaminants
Are rearing standards being followed? (PM #19)				✓	Review of records/Discussion	Modify rearing procedures or modify rearing criteria. See PM#19
Are egg and fish transfer/release requirements met? (PM #31)		✓			Review of records/Discussion	
<b>Do hatchery performance meet requirements defined in the regional hatchery policies and in basin and hatchery plans for the following areas?</b>						
<b>Percent smoltification</b>						
Do you measure percent smoltification?				✓		Develop smoltification goal and monitoring program
Do you have a smoltification goal?				✓	No goal found	
Did you meet the smoltification criteria?			✓			

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>Rearing density (prior to release)</b>  Did you meet the rearing density criteria just prior to release?		✓			Discussion	
<b>Disease condition (at release)</b>  Did you meet all disease regulations just prior to release?		✓			Discussion	
<b>Release number (at release)</b>  Did you meet the release number goal?		✓			Within 10%; release numbers regulated by NMFS	
<b>Release size (at release)</b>  Did you meet the size goal?		✓			NMFS goal, within 10%	
<b>Release date (at release)</b>  Did you meet the release date goal?		✓				
<b>Release location (at release)</b>  Did you release the fish at the specified location?		✓			Review of records/Discussion	
<b>Release location (at release)</b>  Are the fish reared in the subbasin?  Are the fish acclimated in the subbasin?				✓  ✓	Discussion  Plant directly from hatchery to river.	Provide rearing in the Salmon River subbasin  Construct acclimation ponds in the Salmon River subbasin
<b>Release strategy appropriate for the program?</b>		✓				

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<b>nsportation facilities</b>						
Do transportation equipment and personnel receive disinfection before and after use?		✓			Discussion	
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)?		✓				
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?		✓				
Is the fish transport vehicle (cab) disinfected using 600 ppm quaternary ammonia compounds (1.5 ml of 50% stock solution/liter water)?				✓	Not done. Hatchery unclear on frequency required.	Follow IHOT standards for cab disinfection
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		✓				
Do personnel wear protective garments when handling fish eggs or cultural water?				✓	Wash hands but don't use rain gear. Hatchery thinks impractical due to temperature	Wear protective garments when handling eggs or culture water
Do the fish transport truck/chassis and tank/unit receive an inspection and service prior to the release season?		✓				
Is a daily service inspection completed before starting up and leaving for the day?		✓				
Does the fish transport unit receive an inspection prior to loading?		✓				
		✓				

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>nsportation facilities</b></p> <p>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 the fish in the transport unit?</p> <p>Do hauling criteria include checking the fish 45 minutes to 1 hour after loading?</p> <p>When fish are active and systems are functioning properly, is the oxygen concentration reduced and maintained at approximately 8 ppm?</p> <p>Is water temperature in the transportation unit maintained within the 42-48 °F range?</p> <p>Do fish releasing procedures include the following criteria?</p> <p>Releasing the fish at the correct release site or into the correct water body.</p> <p>Tempering or the difference between the liberation tank and the target water body should not exceed 10°F.</p> <p>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.</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>		<p>✓</p>	<p>Uncertain, oxygen feed rate set but not measured.</p>	<p>Monitor oxygen concentration during hauling</p>

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 to:</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>These items covered by management and research biologists. Hatchery assists in studies and provides personnel as requested for these studies; but they do not conduct them</p>	<p>Improve communication between evaluation biologists and hatchery staff</p>
<p><b>Training practices</b></p> <p>Does the hatchery have a training schedule for its staff?</p> <p>Does each staff member have a personal training plan approved by a supervisor and reviewed annually?</p> <p>Does the hatchery routinely exchange training details between other hatcheries and agencies?</p> <p>Does the hatchery encourage and reward off-duty training of staff?</p> <p>Does the hatchery conduct monthly staff meetings?</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>				

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>monthly hatchery monitoring visits being conducted by a qualified fish health specialist as described below?</b></p> <p>Conduct visit at least monthly</p> <p>Monitoring conducted by qualified fish health specialist</p> <p>Examine a representative sample of healthy and moribund fish from each lot.</p> <p>Review fish culture practices with hatchery manager.</p> <p>Report finding and results of necropsies on standard form.</p> <p>Recommend appropriate drug or chemical treatment.</p> <p>Summarize fish health status or stock prior to release or transfer to another facility.</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>			<p>Review of records/Discussion</p>	
<p><b>all of the functions of the hatchery yearly monitoring visits being completed as described below?</b></p> <p>usually examine each broodstock for the presence of detectable viral pathogens.</p> <p>usually screen each salmon broodstock for the presence of <i>Aeromonas salmonicida</i>.</p> <p>conduct inspection by or under the supervision of qualified health specialist.</p>	<p>✓</p> <p>✓</p> <p>✓</p>			<p>No broodstock on station</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 there any sources of pathogen-free water, especially for incubation and early rearing?</b></p> <p>Are the hatchery sanitation procedures understood and being followed as described below?</p> <p>Disinfect/water harden eggs in iodophor?</p> <p>Are foot baths containing disinfectant placed at the incubation facility's entrance and exit?</p> <p>Is equipment and rain gear utilized in broodstock handling or spawning sanitized prior to its use elsewhere in the hatchery?</p> <p>Is equipment used to collect dead fish sanitized prior to its use in another pond and/or lot of fish?</p> <p>Is equipment, including vehicles used to transfer fish between facilities, disinfected prior to use with any other fish lots or at any other location?</p> <p>Are rearing vessels sanitized after fish are removed and prior to introducing a new fish lot or stock?</p> <p>Are dead fish properly disposed of?</p>		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>			<p>Discussion; upper intake that provides incubation and early rearing water is pathogen free.</p> <p>No broodstock at this hatchery</p> <p>5 separate brooms</p>	

Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
	N/A	Yes	?	No		
<p><b>water quality parameters being followed?</b></p> <p>Are the following water quality parameters within criteria? (PM #5a-5h)</p> <p>Water temperature Dissolved gases Chemistry Turbidity Alkalinity and hardness Nitrite Contaminants</p> <p>to PM #21</p>		✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	<p>Review of records/Discussion Review of records/Discussion</p>	<p>Use chillers for incubation Monitor TGP Run analysis for missing parameters</p> <p>Run analysis for missing parameters</p>
<p><b>incubation and rearing standards being followed?</b></p> <p>Are the incubation practices being following the IHOT incubation criteria? (PM #18)</p> <p>Are the rearing practices following the IHOT criteria? (see PM #19)</p> <p>to rearing practices PM #18-PM #19</p>		✓		✓	<p>Review of records/Discussion Review of records/Discussion</p>	<p>See PM #19</p>
<p><b>egg and fish transfer/release requirements met?</b></p>		✓			<p>Discussion. Inspection, documentation and permitting done by the state. A copy of the smolt release forms are kept at the hatchery. Egg transfer forms are not.</p>	<p>Hatchery should obtain copies of transfer/release records.</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 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 and Lower Snake River Compensation Program	
<p><b>Is the hatchery operating under a current hatchery operational plan?</b></p> <p>Refer to operational plan PM # 2</p>		✓			IHOT Operations Plan and Hatchery Operations & Maintenance Manual	
<p><b>Is a hatchery monitoring and evaluation plan in place?</b></p> <p>Refer to hatchery monitoring and evaluation plan PM # 3</p>		✓				
<p><b>Do 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?</b></p> <p>Does the hatchery program meet the requirements for the following?</p> <p>Species protocols (PM #4a)</p> <p>Stock protocols (PM #4a)</p> <p>Broodstock collection location protocols (PM #41)</p> <p>Broodstock numbers protocols (PM #42)</p> <p>Broodstock collection strategy protocols (PM #41)</p> <p>Spawning protocols (PM #42)</p> <p>Egg-take protocols (PM #42)</p>		✓			<p>Review of records/Discussion</p> <p>Review of records/Discussion</p> <p>No adult collection or spawning at this hatchery</p>	

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 subbasin 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	Develop smoltification goal and monitoring program
Rearing density (PM #22a2)				✓	Review of records/Discussion	Review operations and density criteria
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 subbasin?</b>				✓	Discussion	See PM #22b
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>✓</p>				<p>Existing Program; does not apply</p>	
<p><b>a new program, was the donor selection outlined 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>Are there a genetics monitoring and evaluation program in place?</b></p> <p>Is a genetics monitoring and evaluation program available?</p> <p>Does the plan address the following elements listed in IHOT:</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>Discussion. Many components of an IHOT genetics monitoring and evaluation program are being monitored.</p>	<p>Develop approved genetics monitoring and evaluation program.</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 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 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 Magic Valley Hatchery - Summer 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		
Improve adult returns	----	4h
Install security alarms and use telephone pagers	----	6
Insulate bulk storage facilities	----	12
<b>Type 2</b> - 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

<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.

<b>Remedial Action Required</b>	<b>Cost</b>	<b>PMs<sup>1</sup></b>
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		
Monitor TGP	----	5b
Run analysis for missing water chemistry parameters	----	5c
Run analysis for contaminants	----	5g
Monitor oxygen concentration during hauling	----	23
<b>Type 4</b> - 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	
<b>Type 5</b> - 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

<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 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 <sup>1</sup> (Broodyear)	Spawning Grounds (Broodyear)	Hatchery <sup>1</sup> (Broodyear)	Total Combined Contribution <sup>2</sup> (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					

<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 Magic Valley Hatchery - Summer 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 - 5e).

**Table 5. Annual Operating Expenses: Magic Valley Hatchery - Summer Steelhead**

Hatchery	1994	1995	1996
1. Magic Valley Hatchery	\$610,245	\$555,532	\$587,340
2. Pahsimeroi Hatchery <sup>(a)</sup>	----	----	----
3. Sawtooth Hatchery <sup>(a)</sup>	----	----	----
4. Dworshak Hatchery <sup>(a)</sup>	----	----	----
5. Clearwater Hatchery <sup>(a)</sup>	----	----	----
<b>Total Program Costs</b>	<b>\$610,245</b>	<b>\$555,532</b>	<b>\$587,340</b>

(a) Overlap in operations and programs precludes identification of Magic Valley component

The total expenditures for the Magic Valley Hatchery are presented in Table 6 by program. The detailed breakdown of program expenditures at this hatchery is presented in a separate table (Table 6a).

**Table 6. Annual Operating Expenses - Magic Valley Hatchery**

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

**Table 5a. Annual Operating Expenses: Magic Valley Hatchery -  
Summer Steelhead**

**Expenditure Occurring at Magic Valley Hatchery**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
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 <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$610,245</b>	<b>\$555,532</b>	<b>\$587,340</b>
<b>Source of Funds</b>			
U.S. Fish & Wildlife	<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>\$610,245</b>	<b>\$555,532</b>	<b>\$587,340</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: Magic Valley Hatchery -  
Summer Steelhead**

**Expenditure Occurring at Pahsimeroi Hatchery<sup>(a)</sup>**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>			
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>			

(a) Overlap in operations and programs precludes identification of Magic Valley component

<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 5c. Annual Operating Expenses: Magic Valley Hatchery -  
Summer Steelhead**

**Expenditure Occurring at Sawtooth Hatchery<sup>(a)</sup>**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>			
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>			

(a) Overlap in operations and programs precludes identification of Magic Valley component

<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 5d. Annual Operating Expenses - Magic Valley Hatchery -  
Summer Steelhead**

**Expenditure Occurring at Dworshak NFH Hatchery<sup>(a)</sup>**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>			
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>			

(a) Overlap in operations and programs precludes identification of Magic Valley component

<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 5e. Annual Operating Expenses - Magic Valley Hatchery - Summer Steelhead**

**Expenditure Occurring at Clearwater Hatchery<sup>(a)</sup>**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>			
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>			

(a) Overlap in operations and programs precludes identification of Magic Valley component

<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 6a. Detailed Expenditures at Magic Valley Hatchery by Program**

**Summer Steelhead**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
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 <sup>1</sup>			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$610,245</b>	<b>\$555,532</b>	<b>\$587,340</b>
<b>Source of Funds</b>			
	<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>\$610,245</b>	<b>\$555,532</b>	<b>\$587,340</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.