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NIAGARA SPRINGS HATCHERY

A COMPILATION AND SUMMARY OF  
IHOT AUDITS FOR SUMMER STEELHEAD

JULY 1998

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**HATCHERY EVALUATION REPORT  
SUMMARY FOR**

**Niagara Springs Fish Hatchery  
- Summer Steelhead**

**A Summary of the Independent Audit Based on  
Integrated Hatchery Operations Team (IHOT) Performance  
Measures**

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## Executive Summary

This report presents a summary of the findings of the Hatchery Evaluation Report for Summer Steelhead at the Niagara Springs Hatchery. The original Hatchery Evaluation Report, prepared by Montgomery Watson, includes the complete findings. Details on the audit compliance status are included in the original report. The Hatchery Evaluation Report was based upon an audit 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 in the Snake River Canyon, 10 miles south of the town of Wendell, Idaho. The hatchery is operated by the Idaho Department of Fish and Game and used for incubation and rearing of summer steelhead.

### Background

The hatchery 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’ sources.
- 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.

## **Niagara Springs Hatchery - Summer Steelhead Results**

The Niagara Springs facility includes 14 concrete raceways, 7 nursery inserts for early rearing, and incubation facilities. Niagara Springs is owned and financed by Idaho Power Company as required under the terms of their Federal Energy Regulatory Commission license for the operation of the Hells Canyon hydroelectric complex.

The hatchery was in general compliance with most of the performance measures. The audit found that the hatchery was not in compliance with the temperature criteria, water quality and contaminant monitoring criteria, water hardness criteria, pathogen-free water supply criteria, flow alarm requirements, predation control facilities, hauling requirements, incubation facilities, and early rearing facilities, which are all facilities requirements. The hatchery also exceeded its loading and density criteria for early rearing and needed to develop loading and density criteria for the IHOT Operation Plan. The hatchery also did not have an approved Genetics Monitoring and Evaluation Program in place.

The specific areas in which the Niagara Springs 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:

- Conduct IHOT QA/QC feed tests
- Develop acclimation sites for release sites
- Develop approved genetics and monitoring plan
- Develop DI and FI goals for IHOT Operations Plan
- Develop smoltification goal and monitoring programs
- Do not leave buckets of feed exposed to heat or light
- Document smolt-to-adult survival
- Follow IHOT disinfection protocols for vehicle cab
- Install 32 more upwelling incubators and circular vats (1800 sf of additional building space); consider replacements of vats with enclosed rectangular nurse raceways
- Install bird netting over raceways
- Install chillers for incubation (400 gpm)
- Install flow alarms as appropriate for a gravity flow water supply
- Insulate bulk storage facilities
- Monitor DO during hauling
- Monitor TGP
- Need more fishery contribution evaluations for Hells Canyon releases
- Obtain additional transportation trucks to comply with IHOT hauling standards
- Obtain copies of transfer/release records
- Remove fish from spring, block upstream passage, and install bird netting over springs
- Run analysis for contaminants

- Run analysis for missing water chemistry parameters

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

## Facility Description

<b>Name:</b>	Niagara Springs Hatchery
<b>Stock/Species:</b>	Summer Steelhead
<b>Operating Agency:</b>	Idaho Department of Fish and Game
<b>Funding Agency:</b>	Idaho Power Company
<b>Location:</b>	In the Snake River Canyon, 10 miles south of the town of Wendel, Idaho. The elevation of the facility is 3,000 feet above sea level.
<b>Address:</b>	Idaho Department of Fish and Game Niagara Springs Fish Hatchery 2131 Niagara Springs Road Wendell, ID 83355
<b>Hatchery Manager:</b>	Mr. Jerry Chapman
<b>Phone:</b>	(208) 536-2283
<b>Fax:</b>	(208) 536-5137
<b>Purpose:</b>	Niagara Springs is owned and financed by Idaho Power Company as required under the terms of their Federal Energy Regulatory Commission license for the operation of the Hells Canyon hydroelectric complex. The mitigation goals for the hatchery are to (1) enhance steelhead run in the Snake River below Hells Canyon Dam, and (2) relocate part of this run to the Salmon River and its tributaries.
<b>Production Goal:</b>	<b>Summer Steelhead</b>  Produce 900,000 smolts (200,000 lb) for release into the Salmon River and its tributaries.  Produce 900,000 smolts (200,000 lb) for release into the Snake River below Hells Canyon Dam.
<b>Water Supply:</b>	The hatchery's water supply is by gravity flow from Niagara Spring, with a constant water temperature of 58 °F. Flow increases from 30 cfs in June to 120 cfs in March.
<b>Facilities:</b>	
Adult Holding:	none

Incubation:	20 upwelling incubators
Early Rearing:	20 circular vats
	7 nursery inserts - 350 cf each
Raceways:	14 concrete raceways - 9,000 cf each
Rearing Ponds:	none
Satellite Facilities:	none



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 Niagara Springs Hatchery - Summer Steelhead**

This section presents the corrective actions required to bring the Niagara Springs Hatchery - Summer Steelhead program into compliance with the 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 ( $\pm 40\%$ ).

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 Niagara Springs 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		
Reduce water hardness	----	5e
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Develop goal for smolt-to-adult survival and monitor performance	----	4h
Conduct IHOT QA/QC feed tests	----	12
Do not leave buckets of feed exposed to heat or light	----	12
Develop DI and FI goals for IHOT Operations Plan		19
Develop smoltification goal and monitoring programs		22a1
Follow IHOT disinfection protocols for vehicle cab		23
Need more fishery contribution evaluations for Hells Canyon releases		24
Obtain copies of transfer/release records		31
Develop approved genetics and monitoring plan	----	
<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 DO during hauling	----	23

<sup>1</sup> PMs are performance measures that were extracted from the IHOT 1995 report.

Remedial Action Required	Cost	PMs <sup>1</sup>
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Install chillers for incubation (400 gpm)	\$190,000	5a
Block upstream passage into springs	\$5,000	5h
Install flow alarms as appropriate for a gravity flow water supply	\$5,000	6
Install 32 more upwelling incubators and circular vats (1800 sf) of additional building space; consider replacements of vats with enclosed rectangular nursely raceways	\$210,000	4e,4f, 8,9
Install bird netting over raceways	\$200,000	11
Insulate bulk storage facilities	10,000	12
Obtain additional transportation trucks to comply with IHOT hauling standards	\$60,000	15
Develop acclimation sites for release sites		
5 acclimation sites at \$1,000,000	\$5,000,000	
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Remove fish from spring and install bird netting over springs	----	5h

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<sup>1</sup> 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 Niagara Springs Hatchery - Summer Steelhead program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries (Table 4). 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:  
Niagara Springs Hatchery - Summer Steelhead<sup>1</sup>**

Year	Fisheries <sup>2</sup> (Broodyear)	Spawning Grounds <sup>2</sup> (Broodyear)	Hatchery <sup>2</sup> (Broodyear)	Total Combined Contribution <sup>3</sup> (Broodyear)	Smolt to Adult Survival (percent)
1981					
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989	---	---	810		---
1990	547	---	2,159		0.28
1991	2,503		2,333		0.56
1992					

<sup>1</sup> Combined information for Pahsimeroi and Oxbow Hatcheries

<sup>2</sup> Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.

<sup>3</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. The total expenditures for the Niagara Springs Hatchery are presented in Table 5 by program. The detailed breakdown of program expenditures at this hatchery is presented in a separate table (Table 6).

**Table 5. Annual Operating Expenses - Niagara Springs Hatchery**

<b>Program</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
1. Summer Steelhead	\$676,398	\$688,683	\$628,363
2.			
3.			
4.			
5.			
<b>Total Hatchery Costs</b>	<b>\$676,398</b>	<b>\$688,683</b>	<b>\$628,363</b>

**Table 6. Detailed Expenditures at Niagara Springs Hatchery by Program**

**Summer Steelhead**

<b>Component</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs <sup>1</sup>	\$319,805	\$344,904	\$308,245
Lumped Third Party Costs	\$356,593	\$343,958	\$320,138
<b>Total Hatchery Costs</b>	<b>\$676,398</b>	<b>\$688,683</b>	<b>\$628,363</b>
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	100%	100%	100%
<b>Program Costs</b>	<b>\$676,398</b>	<b>\$688,683</b>	<b>\$628,363</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.