
PRIEST RAPIDS HATCHERY

**A COMPILATION AND SUMMARY OF
IHOT AUDIT FOR FALL CHINOOK**

JULY 1998

**HATCHERY EVALUATION REPORT
SUMMARY FOR**

**Priest Rapids Hatchery
- URB Fall Chinook**

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

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Executive Summary

This report compiles a summary of the findings of the Hatchery Evaluation Report for URB Fall Chinook at Priest Rapids 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 just below Priest Rapids Dam along the Columbia River and is operated by the Washington Department of Fish and Wildlife. The hatchery is used for adult collection, incubation, and rearing of URB fall chinook.

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) 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.

Priest Rapids Hatchery - URB Fall Chinook Results

The Priest Rapids facility includes six ponds for adult holding and rearing, 12 vinyl-lined raceways, and incubation facilities. The Priest Rapids Hatchery is operated to mitigate fishery impacts caused by the Priest Rapids Project (Priest Rapids and Wanapum dams).

The Priest Rapids Hatchery - URB Fall Chinook program was in compliance with most of the performance measures. In the area of program objectives, the hatchery did not have a goal for green-egg to eyed-egg and eyed-egg to fry survival. The audit found that the hatchery was not in compliance with the screen approach criteria and mesh size, water quality sampling requirements, and pathology-free water criteria. The hatchery was not meeting all of the alarm and feed preparation requirements. The hatchery exceeds its flow and loading criteria for incubation. The hatchery needs to develop specific incubation and rearing standards for the IHOT Operations Plan. The hatchery needs to develop a smoltification goal and implement a monitoring program. The hatchery did not have a Genetics Monitoring and Evaluation Program.

The specific areas in which the Priest Rapids Hatchery - URB Fall Chinook program requires remedial actions based on the IHOT performance measures are listed below. These remedial actions are listed in alphabetical order without intent of ranking or otherwise assigning priority:

- Change protocols to ship representative samples of eggs to Klickitat and Umatilla hatcheries
- Check water flow alarms daily
- Collect water temperature data
- Conduct IHOT QA/QC tests for feed preparation
- Develop approved genetics M&E program
- Develop green-egg to eyed-egg and eyed-egg to fry survival goal
- Develop smoltification goal and monitor
- Develop specific incubation and rearing standards for the IHOT Operations Plan
- Follow IHOT loading and flow criteria for incubation
- Modify or replace intake to meet IHOT screen criteria
- Monitor DO and TPG and record
- Provide chilling and heating for incubation
- Provide more incubators or change IHOT incubation criteria
- Review IHOT criteria for adult holding and rearing temperature criteria
- Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants

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

Facility Description

| | |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name: | Priest Rapids Fish Hatchery |
| Stock/Species: | URB Fall Chinook |
| Operating Agency: | Washington Department of Fish and Wildlife |
| Funding Agency: | Grant County PUD US Army Corps of Engineers |
| Location: | The hatchery is located just below Priest Rapids Dam along the Columbia River. |
| Address: | P.O. Box 937 Mattawa, WA 99349 |
| Hatchery Manager: | Mr. Paul Pedersen |
| Phone: | (509) 932-4481 |
| Fax: | (509) 932-5188 |
| Purpose: | The Priest Rapids Hatchery is operated as mitigation for fishery impacts caused by the Priest Rapids Project (Priest Rapids and Wanapum dams). |
| Production Goal: | URB Fall Chinook Produce 100,000 lb of subyearling URB fall chinook for on-station release Produce 1.7 million URB fall chinook smolts as part of John Day mitigation Provide URB chinook eggs to other facilities that rear this stock. |
| Water Supply: | Water is supplied to the hatchery from the Columbia River and wells. The majority of the water is supplied by gravity flow from the Columbia River (44,883 gpm) with the wells supplying 8,000 gpm. |
| Facilities: | |
| Adult Holding: | 6 concrete adult holding ponds - 26,250 cf each |
| Incubation: | 80 full stacks of vertical tray incubators (1,280 trays) |
| Early Rearing: | None |
| Raceways: | 12 vinyl-lined starter raceways - 1,600 cf each |
| Rearing Ponds: | 6 concrete ponds - 26,500 cf each |
| 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 Priest Rapids Hatchery - URB Fall Chinook

This section presents the corrective actions required to bring the Priest Rapids Hatchery - URB Fall Chinook 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 are desirable for either operational or safety considerations.

Table 3. Remedial Actions Required at Priest Rapids Hatchery - URB Fall Chinook

| Remedial Action Required | Cost | PMS ¹ |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <p>Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery</p> <p>Increase adult returns</p> | ---- | 4h |
| <p>Type 2 - Remedial actions requiring changes in agency policies or procedures</p> <p>Develop green-egg to eye-egg and eyed-egg to fry survival goal</p> <p>Review IHOT criteria for adult holding and rearing temperature criteria</p> <p>Check water flow alarms daily</p> <p>Conduct IHOT QA/QC tests for feed preparation</p> <p>Develop specific incubation and rearing standards for the IHOT Operations Plan</p> <p>Follow IHOT loading and flow criteria for incubation</p> <p>Develop smoltification goal and monitor</p> <p>Change protocols to ship representative samples of eggs to Klickitat and Umatilla hatcheries</p> <p>Develop approved genetics M&E program</p> | <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> <p>----</p> | <p>4d-4e</p> <p>5a</p> <p>6</p> <p>12</p> <p>18-19</p> <p>18</p> <p>22a1</p> <p>42g</p> <p>43</p> |
| <p>Type 3 - Remedial actions requiring changes in monitoring coverage or interval</p> <p>Monitor DO and TPG and record</p> <p>Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, nitrite, and contaminants</p> | <p>----</p> <p>----</p> | <p>5b</p> <p>5c-5g</p> |

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

| Remedial Action Required | Cost | PMs ¹ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|
| Type 4 - Remedial actions requiring significant capital expenditures Provide chilling and heating for incubation Provide more incubators or change IHOT incubation criteria Modify or replace intake to meet IHOT screen criteria | \$1.2 million \$12,000 \$5.0 million | 5a, 5h 8 10 |
| Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time None | ---- | |

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

Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Priest Rapids Hatchery - URB Fall Chinook program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries. Data is reported by broodyear (Table 4). 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:
Priest Rapids Hatchery - URB Fall Chinook**

| Year | Fisheries ¹ (Broodyear) | Spawning Grounds ¹ (Broodyear) | Hatchery ¹ (Broodyear) | Total Combined Contribution ² (Broodyear) | Smolt to Adult Survival (percent) |
|------|---------------------------------------|----------------------------------------------|--------------------------------------|---------------------------------------------------------|--------------------------------------|
| 1981 | | | | | |
| 1982 | | | | | |
| 1983 | | | | | |
| 1984 | | | | | |
| 1985 | 776 | 119 | 109 | 1,004 | 0.49% |
| 1986 | 357 | 42 | 112 | 511 | 0.25% |
| 1987 | 43 | 21 | 38 | 102 | 0.05% |
| 1988 | 159 | No data provided | 106 | 265 | 0.13% |
| 1989 | 333 | 44 | 213 | 590 | 0.30% |
| 1990 | | | | | |
| 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 Priest Rapids Hatchery are presented in Table 5 by program. The detailed breakdown of the Fall Chinook program expenditures at this hatchery are presented in separate tables (Tables 6).

Table 5. Annual Operating Expenses - Priest Rapids Hatchery

| Program | 1994 | 1995 | 1996 |
|---------------------------------|------------------|------------------|------------------|
| 1. URB Fall Chinook | \$399,709 | \$424,830 | \$447,701 |
| 2. Klickitat URB Program (eggs) | ? | ? | ? |
| 3. Umatilla URB Program (eggs) | ? | ? | ? |
| 4. | | | |
| 5. | | | |
| Total Hatchery Costs | \$399,709 | \$424,830 | \$447,701 |

Table 6. Detailed Expenditures at Priest Rapids Hatchery by Program

URB Fall Chinook

| Component | 1994 | 1995 | 1996 |
|---------------------------------------|------------------|------------------|------------------|
| Personnel Costs | \$197,557 | \$210,499 | \$220,648 |
| Operational Costs | \$158,303 | \$174,580 | \$210,253 |
| Capital Costs | \$28,000 | \$24,400 | \$0 |
| Indirect Costs | | | |
| Lumped Hatchery Costs ¹ | | | |
| Lumped Third-Party Costs ² | \$15,849 | \$15,350 | \$19,800 |
| Total Hatchery Costs | \$399,709 | \$424,830 | \$447,701 |
| Source of Funds | | | |
| Grant County PUD | 96% | 96.4% | 96.2% |
| COE | 4.0% | 3.6% | 3.8% |
| Program Production (lb) | | | |
| Total Production (lb) | | | |
| Program as Percent of Total | 100% | 100% | 100% |
| Program Costs | \$399,709 | \$424,830 | \$447,701 |

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

² Feed purchased through Little White Salmon Hatchery from the COE