

Washington Department of Fish & Wildlife  
**PRIEST RAPIDS HATCHERY**  
Funded by Grant County Public Utility District  
and  
U.S. Army Corps of Engineers

# **OPERATIONS AND MAINTENANCE ANNUAL REPORT**

Reporting Period July 1, 2016 to June 30, 2017



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# Introduction

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Priest Rapids Hatchery (PRH) was designed as a mitigation facility for fall Chinook after Priest Rapids and Wanapum Dams were constructed, and is funded by the Grant County Public Utility District (GCPUD) and by the U.S. Army Corps of Engineers (USACE) for the John Day Mitigation (JDM) portion of the production. It has been in continuous operation since September 1963, and is operated by the Washington Department of Fish and Wildlife (WDFW). It is part of the WDFW's Priest Rapids Hatchery Complex, which also includes the Ringold, Meseberg, Naches and Columbia Basin hatcheries.

The annual release goal for GCPUD in 2017 is 5.6 million sub-yearling smolts (at a target size of 50 fish per pound) or 112,000 pounds. All of the trapping, spawning and rearing takes place at PRH. Beginning in 1992, 1.7 million sub-yearling fall Chinook smolts have also been reared and released at PRH (50 fish per pound) as part of USACE John Day Mitigation. Up to 13.5 million eggs are taken annually to meet all PRH production goals and for other programs, including the 3.5 million sub-yearling smolt release program at Ringold Hatchery.

PRH is staffed with four full-time hatchery specialists (12 months), one full time maintenance mechanic (12 months), three career-seasonal hatchery specialists (10 months), and two to four non-permanent hatchery technicians (4 months). Non-perm and seasonal staff are utilized during trapping, spawning, and rearing to handle heavy workloads related to the size of the adult return.

Trapping of returning fall Chinook salmon takes place approximately one-mile south of the main facility, and fish are transported by truck to three adult holding ponds. One additional adult pond is utilized to hold presumed natural-origin fall chinook, which come from the Priest Rapids Dam Off -Ladder Trap (OLAFT) and from the [volunteer] Angler Broodstock Collection program (ABC). Spawning occurs adjacent to the holding ponds, and eggs are transferred by buckets to the incubation room in the main hatchery building. After hatch, fish are transferred via fish pump to raceways, where they are introduced to feed and raised until marking occurs. Once marking starts fish are then moved to the five rearing ponds for final rearing and then released in May and June.

In addition to the incubation room, the main building is comprised of two offices, three bathrooms, conference room, electrical room, mechanical room, fertilization room, lab room and feed room. Other buildings on station include a walk-in freezer and utility room, a large shop with two semi-open covered bays for storage and enclosed shop area, seven wells providing 6,650 gallons per minute of pathogen-free well water, a river-water intake, three degassing towers, and a multitude of other plumbing and electrical buildings.

# 2016 Brood Fall Chinook

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## Adult Holding and Egg Take

The 2016 Priest Rapids fall Chinook adult collection at the PRH [Jackson Creek] volunteer trap consisted of 27,920 adults and 866 jacks. In addition, this was the seventh year that we used the OLAFT and the fifth year to collect unmarked adults from the ABC program to integrate more natural-origin (NOR) fish into the PRH broodstock to meet hatchery reform and broodstock management guidelines. The adipose fin intact (NOR and unmarked hatchery fish) that came from the OLAFT and ABC consisted of 773 adults. The adults retained for spawning from the volunteer trap were held in ponds 1, 2, and 3, while the fish collected from the OLAFT and ABC were combined into adult holding pond 4. A total of 1,552 males, and 3,478 females were utilized for the seasons egg take. A total of 12,750 males, 9,901 females, and 838 jacks were surplused. The total number of marked fish recoveries (coded wire tag) was 4,877. Of the fish collected at the PRH volunteer trap, adult pond mortality totaled 388 males, and 444 females (17.4%). Fish collected at the OLAFT and Hanford reach consisted of 773 adults of which 121 were mortalities (15.7%).

Total green egg take was 12,411,530. Egg mortality from green to eyed stage totaled 1,257,680 (10.2%). A total of 7,295,413 eyed eggs were retained for PRH programs (GCPUD and USACE). A total of 3,858,437 eyed eggs were shipped to other facilities:

- 3,834,144 eyed eggs shipped to Bonneville Hatchery (ODFW) for USACE John Day mitigation (later shipped back to Ringold Hatchery for acclimation and release)
- 20,866 eyed eggs shipped to Yakima Basin Environmental Education “Salmon in the classroom” (SC)
- 3,171 eyed eggs shipped to Franklin County conservation district (SC)
- 256 eyed eggs shipped to Quincy High School (SC)

In 2016, PRH supplied 120 male and 120 female chinook carcasses to the Yakima Basin Environmental Education Program for local school science class anatomy study. Benton County Conservation received 35 males and 35 Females, Franklin County Conservation Districts received 22 males and 22 females, and Grant County Conservation District picked up 1 male and 1 female, for the same purpose. The Shoshone-Bannock tribe came and picked up 106 males, 66 females and 11 jacks for ceremonial and subsistence purposes. Also the Yakima Nation tribe came and picked up 1,250 males, 175 females, and 90 jacks for the same purpose. PRH shipped 143 males, 109 females and 21 jacks to Community Services of Moses Lake (food bank).

## Maintenance and Capital projects

There were several improvements and modifications made by GCPUD to the PRH during brood year 2016. Some projects that have been completed consist of asphaltting and installing drain systems at the adult volunteer trap. Installing trench drains at the monitoring and evaluation area. Widening the floor drains in the incubation room, reconfiguring the sorting table on the adult sorting-spawn deck and reconstruction of the center channel crowder at the adult holding pond area.

In addition to these upgrades, WDFW staff also helped with the installation, maintenance, and upgrades of projects around the PRH. This included adding more Heath stacks to the incubation room, re-decking a dirt section at AHP1, and installing a false wall in AHP 3 so fish can be pushed out easily. Chutes were installed on the sorting table to move fish faster to totes below on the ground. WDFW staff also tagged and painted valves around the facility. New netting was installed over Channel Pond D to help prevent bird predation. Sight tubes were installed on the aeration towers to aide in visually determining the water levels in the towers.

## Prophylactic Treatment of Eggs and Adults

Total use of Formalin was 3,135 gallons to prevent fungus on adults and eggs.

## Rearing and Release

Production of brood year 2016 age 0 fall Chinook smolts for GCPUD mitigation was 109,911 pounds. A total of 5,374,672 fish were released May 23 - June 19, 2017 from Channel Rearing Ponds A-E with an average size of 48.9 fish per pound (refer to chart on page 8). Prior to release, 605,037 smolts were adipose clipped and coded wire tagged, 605,363 were coded wire tagged only and 1,085,447 were adipose clipped only. In addition, 40,000 were pit tagged by GCPUD and 2,999 were PIT-tagged by United States Fish and Wildlife Service (USFWS) for fish migration/ survival studies. A total of 3,035,826 GCPUD smolts were released with no visible marks or tags.

In addition to GCPUD mitigation production, 1,631,588 smolts (33,366 pounds) were released to fulfill a portion of their USACE JDM obligation. All (100%) of the USACE fish were mass-marked (adipose fin clipped and otolith) prior to release.

Just prior to release, a WDFW pathologist diagnosed the fish with *Ichthyophthirius multifiliis* (Ich). However, the overall diagnosis for the population as a whole was “healthy and ready for release.” The pathologist’s recommendations were to monitor fish mortality and behavior and release fish on schedule. The fish released at PRH are also 100 percent otolith-marked prior to

ponding. This is accomplished at the green egg-to-eyed egg stage by warming and cooling the water in the incubators.

## Summary of Adult Returns to PRH Adult Volunteer Trap

Date of first trapping	09/10/16
Date of last trapping	12/5/16
Number of males trapped	14,467
Number of females trapped	13,362
Number of jacks trapped	884
Total Fish trapped	28,713
Peak date of return	10/18/16
Total adult mortality	1,012

## Summary of Adults Surplused

WEEK	MALES	FEMALES	JACKS
9/12/16 – 9/18/16	315	258	38
9/19/16 – 9/25/16	716	590	57
9/26/16 – 10/2/16	919	608	72
10/3/16 – 10/9/16	1252	501	77
10/10/16 – 10/16/16	2341	227	134
10/17/16 – 10/23/16	2361	1439	115
10/24/16 – 10/30/16	3162	4122	167
10/31/16 – 11/6/16	813	1105	95
11/7/16 – 11/13/16	702	844	65
11/14/16 – 11/20/16	141	167	16
11/21/16 – 11/27/16	25	39	2
11/28/16 – 12/5/16	3	1	0
<b>TOTAL</b>	<b>12,750</b>	<b>9,901</b>	<b>838</b>

## Summary of Brood Stock Collection from Adult Volunteer Trap (AVT), Off Ladder Trap (OLAFT), Angler Brood Collection (ABC)

WEEK	AVT	OLAFT	ABC
9/12/16 – 9/18/16	87	66	0
9/19/16 – 9/25/16	191	105	0
9/26/16 – 10/2/16	303	200	0
10/3/16 – 10/9/16	975	40	0
10/10/16 – 10/16/16	955	36	0
10/17/16 – 10/23/16	845	5	0
10/24/16 – 10/30/16	926	6	0
10/31/16 – 11/6/16	482	32	280
11/7/16 – 11/13/16	0	3	0
11/14/16 – 11/20/16	0	0	0
11/21/16 – 11/27/16	0	0	0
11/28/16 – 12/5/16	4	0	0
<b>TOTAL</b>	<b>4,768</b>	<b>493</b>	<b>280</b>

\* ABC fish were collected over a three-day period. Starting on October 28<sup>th</sup>, 2016 and ending on October 30<sup>th</sup>, 2016.

## Spawning Summary

DATE SPAWNED	NUMBER OF EGGS TAKEN	NUMBER OF MALES	NUMBER OF FEMALES	NUMBER OF JACKS
10/24/16	672,854	93	180	0
10/25/16	572,641	80	164	0
10/31/16	2,637,024	362	717	0
11/1/16	2,439,926	349	723	0
11/2/16	1,122,063	162	320	0
11/7/16	2,727,291	194	771	0
11/8/16	764,878	111	213	0
11/14/16	1,150,499	158	307	0
11/21/16	261,459	33	66	0
11/28/16	42,428	6	11	0
12/5/16	20,467	4	6	0
<b>TOTAL</b>	<b>12,411,530</b>	<b>1,552</b>	<b>3,478</b>	<b>0</b>

NOTE: 77 non-viable females are included in this chart.

## Egg Shipment Summary

NUMBER OF EGGS	RECEIVED BY
3,834,144	Bonneville Hatchery (ODFW)
20,866	Yakima Basin Environmental Education
3,171	Franklin Conservation District
256	Quincy High School
<b>3,858,437</b>	<b>TOTAL</b>



## **2016 Priest Rapids Fall Chinook (Grant County PUD and USACE John Day Mitigation Combined)**

### **Egg Handling Record**

Number of eggs retained for rearing	7,295,413
Number of eggs shipped	3,858,437
Total egg mortality	1,257,680
Total number of eggs (adjusted egg take)	12,411,530

### **Breakdown of Therapeutics Used**

Total Formalin used	3,135 gallons
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### **Spawn-to-Fry Stage**

Percent survival from green to eyed egg	89.8
Percent survival eyed egg to ponding	99.8
Total number of fry ponded	7,283,881
Total pounds of fry ponded	7,283 lbs.

### **Fry-to Smolt Stage**

Number of smolts planted	7,006,260
Total pounds planted	143,622
Percent survival from ponding to plant	96.2
Average size planted (fish/lbs.)	48.9

### **Food Fed and Weight Gain**

Total pounds of food fed	88,763
Conversion rate	0.5 - 0.7
Total pounds of gain	136,339

## Length Frequency Data at Release

Mean (mm)	89.32
Standard Deviation (mm)	5.5
Coefficient of Variation	6.18

## Release Summary - All Brood Year 2016 Fall Chinook

POND	DATE	LOCATION	NUMBER	WEIGHT	FISH / LB.
RPE	5/23/17	Columbia R.	1,401,157	27,636	50.7
RPD	5/25/17	Columbia R	1,455,960	26,666	54.6
RPC	6/9/17	Columbia R.	1,450,785	32,529	44.6
RPB	6/12/17	Columbia R.	1,487,339	30,292	49.1
RPA	6/19/17	Columbia R.	1,211,019	26,499	45.7
	<b>TOTALS</b>		<b>7,006,260</b>	<b>143,622</b>	<b>48.9</b>