

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

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Mike Lewis, Project Leader
Glen Pearson, Hatchery Supervisor

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Introduction

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 2016 was 5.6 million sub-yearling smolts (at a target size of 50 fish per pound or fpp) 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 fpp), as part of USACE John Day Mitigation, for a total release of 7.3 million smolts. Up to 13.5 million eggs are taken annually to meet all PRH production goals and for other programs, including the 3.5 million JDM sub-yearling smolt release program at Ringold Hatchery.

PRH is staffed with four full-time hatchery specialists, three career-seasonal hatchery technicians (10 months) and four seasonal technicians (4 months). Seasonal staff is utilized during trapping, spawning, and rearing to handle heavy workloads.

Trapping of returning fall Chinook salmon takes place approximately one mile south of the main facility, and fish are transported by truck to the adult holding ponds. Three adult ponds are used for hatchery returns and one adult pond is utilized for wild fall chinook, which come from the Priest Rapids Dam Off-Ladder Adult Fish Trap (OLAFT) and by 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 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. Eight raceways and two

holding areas have been used by GCPUD for rearing of study fish in the base of the old adult holding pond.

2015 Brood Fall Chinook

Adult Holding and Egg Take

The 2015 Priest Rapids fall Chinook adult collection at the PRH [Jackson Creek] volunteer trap consisted of 60,836 adults and 3,498 jacks. In addition, this was the sixth year that we used the OLAFT and the fourth 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 program consisted of 989 adults and 4 jacks. 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 1,703 males, and 3,842 females were utilized for the seasons egg take. A total of 32,493 males, 22,018 females, and 3,417 jacks were surplused. The total number of marked fish recoveries (coded wire tag) was 11,089. The season's adult mortality totaled 517 males, 818 females, and 82 jacks.

Total green egg take was 13,556,790. Egg mortality from green-to-eyed stage totaled 1,122,057 (8.2%). A total of 7,555,452 eyed eggs were retained for PRH programs (GCPUD and USACE). A total of 4,778,947 eyed eggs were shipped to other facilities:

- 4,212,443 eyed eggs shipped to Bonneville Hatchery (ODFW) for USACE JDM (later shipped back to Ringold Hatchery for smolt acclimation and release)
- 502,405 eyed eggs to Klickitat Hatchery (Yakama Nation)
- 11,049 unfed fry to Pacific Northwest National Laboratory
- 18,200 eyed eggs shipped to Yakima Basin Environmental Education Program (YBEEP)
- 2,900 eyed eggs shipped to Franklin County Conservation District (educational)
- 1,150 eyed eggs shipped to Grant County Conservation District (educational)
- 30,800 eggs shipped to Cryoocyte, Inc. for research purposes

In 2015, PRH also supplied 120 male and 120 female chinook carcasses to the YBEEP for local school science class anatomy study. Benton County Conservation District received 40 males and 40 females and Franklin County Conservation District received 23 males and 23 females for the same educational purpose. The Shoshone-Bannock Tribe from southeast Idaho picked up 312 males, 166 female and 47 jacks for ceremonial and subsistence (C&S) purposes. Also, the Yakama Nation picked up 2,132 males, 1,336 females, and 235 jacks for C&S use.

Maintenance and Capital projects

There were several improvements and modifications made by GCPUD to the PRH during brood year 2015 and several new projects that are currently in progress. Projects that have been completed include: 1) electrification of the chemical storage building on the east side of the adult holding ponds, and 2) screens with larger diameter perforated plate being installed in all raceways and channel ponds.

Projects that are currently in progress include: 1) asphaltting and installing drain systems at the adult volunteer trap, 2) installing trench drains at the monitoring and evaluation area, 3) widening the floor drains in the incubation room to match the flow capacity, 4) reconfiguring the sorting table on the adult sorting-spawn deck, and 5) reconstruction of the center channel crowder at the adult holding pond area.

In addition to these GCPUD upgrades, WDFW staff also helped with the installation, maintenance, and upgrades of projects around the PRH. These included the installation of hand rails to provide fall protection at various locations on the hatchery grounds. A jump barrier was installed between adult holding ponds 3 and 4 to prevent presumed wild brood stock from becoming intermixed with known hatchery-origin broodstock. Prototype netting was installed over channel pond E to prevent/minimize bird predation.

Prophylactic Treatment of Eggs and Adults

Approximately 2,000 early arriving adults selected for spawning were injected with Liquamycin (LA-200), prior to transfer to holding ponds. The injection dose was 0.5 cc per 10 lbs. of fish. Total use of Liquamycin was 2,100 milliliters for the season. This treatment was for the prevention of Columnaris and Furunculosis. Total use of Formalin on adults and eggs totaled 2,157 gallons. Formalin was used to prevent fungus on adults and eggs.

Rearing and Release

Production of brood year 2015 age 0 fall Chinook smolts for GCPUD mitigation was 114,989 pounds. A total of 5,599,543 fish were released June 16-23, 2016 from Channel Rearing Ponds A-E with an average size of 48.7 fpp (refer to table on page 9). Prior to release, 605,429 smolts were adipose clipped and coded-wire tagged, 605,056 were coded-wire tagged only and 1,093,980 were adipose clipped only. In addition, 40,000 were PIT-tagged by GCPUD and 3,000 were PIT-tagged by United States Fish and Wildlife Service (USFWS) for fish migration/survival studies. A total of 3,295,535 GCPUD smolts were released with no marks or tags. In addition to GCPUD mitigation production, 1,641,623 smolts (33,699 pounds) were released to fulfill a portion of the USACE JDM obligation. All (100%) of the USACE fish were mass-marked (adipose fin clipped) prior to release.

Just prior to release, a slightly elevated mortality was noticed in all rearing ponds. A WDFW pathologist diagnosed the fish with small amounts of both *Ichthyophthirius multifiliis* (“Ich”) and Columnaris disease (*Flavobacterium columnare*). However, the overall diagnosis for the population as a whole was “healthy and ready for release” and to not delay release to treat with chemicals. The pathologist’s recommendation was to release fish on schedule so that increasing density (i.e. pounds) in the rearing ponds would not be an issue promoting transmission of disease to more individual fish. 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	09/08/15
Date of last trapping	12/1/15
Number of males trapped	34,510
Number of females trapped	26,326
Number of jacks trapped	3,498
Total Fish trapped	64,334
Peak date of return	10/28/15
Total adult mortality	1,417

Summary of Adults Surplused

WEEK	MALES	FEMALES	JACKS
9/7/15 – 9/13/15	44	47	15
9/14/15 – 9/20/15	1163	744	198
9/21/15 – 9/27/15	2317	1084	288
9/28/15 – 10/4/15	2694	1691	383
10/5/15 – 10/11/15	3633	1852	562
10/12/15 – 10/18/15	4339	1953	399
10/19/15 – 10/25/15	7668	3348	547
10/26/15 – 11/1/15	6051	4445	499
11/2/15 – 11/8/15	2700	3667	240
11/9/15 – 11/15/15	1536	2265	248
11/16/15 – 11/22/15	310	838	34
11/23/15 – 11/29/15	38	71	3
11/30/15 – 12/6/15	0	13	1
TOTAL	32,493	22,018	3,417

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

WEEK	AVT	OLAFT	ABC
9/7/15 - 9/13/15	19	0	0
9/14/15 - 9/20/15	306	34	0
9/21/15 - 9/27/15	737	107	0
9/28/15 - 10/4/15	650	106	0
10/5/15 - 10/11/15	571	31	0
10/12/15 - 10/18/15	591	48	0
10/19/15 - 10/25/15	705	21	0
10/26/15 - 11/1/15	1072	33	508
11/2/15 - 11/8/15	163	82	0
11/9/15 - 11/15/15	1123	5	0
11/16/15 - 11/22/15	68	0	0
11/23/15 - 11/29/15	0	0	0
11/30/15 - 12/6/15	8	0	0
TOTAL	6005	467	508

* ABC fish were collected over a three-day period (10/30 - 11/1)

Spawning Summary

DATE SPAWNED	NUMBER OF EGGS TAKEN	NUMBER OF MALES	NUMBER OF FEMALES	NUMBER OF JACKS
10/26/15	592,485	103	164	0
10/27/15	693,522	99	182	0
11/2/15	1,555,538	218	430	0
11/3/15	2,557,981	360	694	0
11/4/15	744,834	104	206	0
11/9/15	2,703,749	234	822	0
11/10/15	1,141,338	108	324	0
11/11/15	25,802*	0	8*	0
11/12/15	1,993,698	257	572	0
11/16/15	991,443	126	271	0
11/23/15	499,756	79	154	0
11/30/15	52,860	14	15	0
12/7/15	3,784	1	1	0
TOTAL	13,556,790	1703	3843	0

NOTE: 137 non-viable females are included in this chart.

* A fecundity study was done on the eggs from these 8 females; the eggs were culled after the study was complete

Egg Shipment Summary

NUMBER OF EGGS	RECEIVED BY
4,212,443	Bonneville Hatchery (ODFW)
11,049	Pacific Northwest National Laboratory
502,405	Klickitat Hatchery
30,800	Cryoocyte, Inc.
18,200	Yakima Basin Environmental Education
2,900	Franklin Conservation District
1,150	Grant County Conservation District
4,778,947	TOTAL

2015 Priest Rapids Fall Chinook (Grant County PUD and USACE John Day Mitigation Combined)

Egg Handling Record

Number of eggs retained for rearing	7,536,998
Number of eggs shipped	4,778,947
Total egg mortality	1,122,057
Total number of eggs (adjusted egg take)	13,530,988

Breakdown of Therapeutics Used

Total Formalin used	2,157 gallons
Total Liquamycin (LA-200) used on adults	2,100 milliliters

Spawn-to-Fry Stage

Percent survival from green-to-eyed egg	91.7
Percent survival eyed egg-to-ponding	97.4
Total number of fry ponded in raceways	7,648,438
Total pounds of fry ponded (1000 fpp)	7,648 lbs.

Rearing to Sub-yearling Smolt Stage

Number of smolts released	7,241,166
Total pounds of smolts	148,689
Percent survival from fry ponding-to-release	94.7
Average size (fpp) of smolts released	48.7

Food Fed and Weight Gain

Total pounds of food fed	98,500
Conversion rate	0.5 - 0.7
Total pounds of gain	141,041

Length Frequency Data at Release

Mean (mm)	92.22
Standard Deviation (mm)	5.66
Coefficient of Variation	6.12

Release Summary - All Brood Year 2015 Fall Chinook

POND	DATE	LOCATION	NUMBER	WEIGHT	FISH / LB.
RP-E	6/16/16	Columbia R.	1,445,638	31,633	45.7
RP-D	6/18/16	Columbia R	1,451,210	29,082	49.9
RP-C	6/20/16	Columbia R.	1,507,068	30,323	49.7
RP-B	6/22/16	Columbia R.	1,511,615	30,415	49.7
RP-A	6/23/16	Columbia R.	1,325,635	27,333	48.5
	TOTALS		7,241,166	148,689	48.7