

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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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 2015 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 Priest Rapids Hatchery. Beginning in 1992, 1.7 million sub-yearling fall Chinook smolts (50 fish per pound) have also been reared and released at Priest Rapids Hatchery 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 JDM 3.5 million 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. The 2014-15 production cycle was the last season that the seasonal employees were required to live in the old PRH bunkroom during egg and sac-fry incubation when assigned to emergency standby. This is because of the housing relocation to the nearby Desert Aire residential development of three of the full-time hatchery specialists. This allows them to provide a nearly immediate response (five minute commute) to emergency alarms. Previous housing for the full-time hatchery specialists was located twenty minutes from the hatchery outside the standby response time for incubating eggs and fry.

Trapping of returning fall chinook salmon takes place approximately one mile south of the main facility, and fish are transported by truck to three AHPs 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 volunteer angler broodstock collection. Sorting, surplus of fish not required for broodstock and spawning of fish selected for broodstock 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 by truck 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 used by the PUD for rearing of study fish in the base of the old AHP may possibly be utilized by WDFW in the future.

2014 Brood Fall Chinook

Adult Holding and Egg Take

The 2014 Priest Rapids fall Chinook adult collection at the [Jackson Creek] adult volunteer trap (AVT) consisted of 67,233 adults and 12,239 jacks. In addition, this was the fifth year that we used the Priest Rapids Dam “Off Ladder Adult Fish Trap” (OLAFT) and the third year to collect unmarked adults from the Angler Broodstock Collection (ABC) program to attempt to integrate more natural-origin (NOR) fish into the PRH broodstock to meet hatchery reform genetic guidelines. The adipose fin intact (NOR and unmarked hatchery fish) that came from the OLAFT and ABC consisted of 1,269 adults. The adults retained for spawning from the AVT were held in AHPs 1, 2, and 3 while the fish collected from the OLAFT and ABC were combined into AHP 4. A total of 1,805 males, and 3,563 females were utilized for the egg take. A total of 32,376 males, 27,263 females, and 11,264 jacks were surplused. The total number of marked fish recoveries (coded wire tag) was 16,002. The season’s adult pond mortality totaled 275 males, 912 females, and 0 jacks.

Steelhead Incidental Take & Mortalities

PRH collects fall chinook broodstock with ESA permit coverage provided by Section 10(a)(1)(b) incidental take permit# 1347, which was extended indefinitely by the National Marine Fisheries Service on September 20, 2013. This permit allows the incidental take of ESA “threatened” steelhead during trapping of unlisted UCR fall chinook. The associated Biological Opinion (BiOP) and Permit 1347 estimated an annual take of 10 steelhead, where “take” is defined as “...wound, kill, trap, capture or collect...”. When the permit was originally issued in Oct. 2003, the AVT was considered the primary source of broodstock and no steelhead take limit was set because it was believed that few steelhead would stray into and ascend 0.67 miles of Jackson Creek to the off-river AVT. The OLAFT was designated the secondary collection location and was limited to the 10 steelhead take limit listed in the permit. In 2014, a total of 22 steelhead

were trapped at the AVT, of which 17 were strays from Ringold Hatchery (AD+RV fin clips), four were UCR hatchery steelhead (AD clip only) and one was unmarked (presumed wild). All steelhead were transported and released upstream of Priest Rapids Dam except for three Ringold Hatchery mortalities.

Summary of AVT Steelhead Incidental Take

Origin	Males Released	Females Released	Male Mortalities	Female Mortalities	Total
Ringold Springs Hat. (AD+RV)	8	6	2	1	17
UCR Hat. (AD Only)	3	1	0	0	4
Natural-Origin (unmarked)	0	1	0	0	1
Total	11	8	2	1	22

Total green egg take was 14,321,818. Egg mortality from green-to-eyed stage totaled 1,926,333 (13.4%). A total of 7,461,847 eyed eggs were retained for PRH programs (GCPUD and USACE). A total of 4,884,638 eyed eggs were shipped to other facilities:

- 3,998,950 eyed eggs shipped to Bonneville Hatchery (ODFW) for USACE John Day mitigation (later shipped back to Ringold Hatchery for acclimation and release)
- 374,000 eyed eggs to Umatilla Hatchery
- 487,838 unfed fry to Prosser Hatchery
- 19,400 eyed eggs shipped to Yakima Basin Environmental Education (Salmon-in-the-Classroom or SC)
- 4,200 eyed eggs shipped to Franklin County conservation district (SC)
- 250 eyed eggs shipped to Quincy High School (SC)
- 49,000 eggs culled

In 2014, PRH supplied 90 male and 90 female chinook carcasses to the Yakima Basin Environmental Education Program (YBEEP) for local school science class anatomy study. The Benton and Franklin County Conservation Districts received 110 males and 110 females for the same purpose. The Shoshone-Bannock tribe picked up 435 males, 279 female and 69 jacks for ceremonial and subsistence purposes. One male and one female carcass went to the Mattawa

Elementary School for class dissection. The Pacific Northwest National Laboratory received 354 males and 324 females for a Whoosh Innovations, Inc. fish transport study.

Maintenance and Capital projects

There were several important improvements and modifications made by GCPUD to the PRH during brood year 2014. Some of these included upgrading the finger weir and the adult volunteer trap (AVT) crowder #1 (AVT1). The “face plate” on AVT1 was removed and replaced to lower the tolerances around AVT1 and AVT2 so that fish cannot swim under and around them. Similar work was performed on all the adult holding pond (AHP) crowders. Other work included maintenance of the hatchery alarm system, modifying the stairway to the sorting/spawning deck to satisfy safety concerns, replacing the AHP crowder drive cables with Amsteel cables that coil and uncoil properly, graveling the road between the AVT and the main hatchery area, modifying the release gates on adult transport trucks to address safety concerns, and purchasing new screen material for the rearing ponds. WDFW staff also covered multiple locations with safety grating to prevent personnel falls. A new air-water separator was installed at the AVT to prevent condensation from building in air lines. A new circuit board was installed at the lift station that moves solids and wastes to abatement ponds. Multiple improvements were also made in the AHP center channel. For example, a ramp was installed in front of the electro-anesthesia box to better guide fish into it, the drive mechanism of the center channel crowder was rewired to provide the correct amount of force needed to crowd adult fish, the strut supporting the center channel crowder was modified to allow smooth operation, and multiple limit switches were reconfigured to allow proper operation of various moving mechanical parts.

The upgrades made during the 2014 brood year greatly improved operation of the facility, however there are still improvements scheduled in the near future. Some of these include the chemical storage building on the east side of the AHP’s being wired for power, screens with larger diameter perforated plate being installed in all raceways, and installing drain systems at the AVT and hatchery working area. Also included for improvement are the drains in the incubation building, reconstruction of the center channel crowder, and the sorting table on the spawning deck.

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 ml per 10 lbs. of body weight. Total use of Liquamycin was 3.8 liters for the season. This treatment was for the prevention of columnaris and furunculosis bacterial disease. Total use of formalin on adults and eggs totaled 2,420 gallons. Formalin was used to prevent fungus on adults and eggs.

Rearing and Release

The GCPUD mitigation target production for release in 2015 was 112,000 pounds or 5.6 million age 0 smolts averaging 50 fish per pound (fpp). Actual production totaled 104,249 pounds with 5.4 million hatchery x natural-origin (genetic cross) fish released from rearing ponds A-E with an average size of 51.8 fpp (refer to chart on page 9). The numerical and poundage GCPUD production shortfall for BY2014 was 3.6% and 6.9%, respectively.

Release into the Columbia River occurred June 12-25, 2015. Prior to release, 604,850 smolts were adipose fin-clipped and coded wire tagged (AD+CWT), 604,861 were coded wire tagged only (CWT only) and 1,091,608 were adipose clipped only (AD only). In addition, 40,000 were PIT-tagged by GCPUD and 2,990 were PIT-tagged by the U.S. Fish and Wildlife Service (USFWS) for fish migration studies. A total of 3,088,751 fish were released with no marks or tags.

In addition to GCPUD mitigation production, 333,203 hatchery x natural-origin and 1,306,243 hatchery x hatchery (1,639,446 total) age 0 smolts were reared and released from the rearing ponds during the same period for the USACE to fulfill a portion of their John Day Mitigation obligation. All (100%) of the USACE fish were mass-marked (adipose fin clipped) prior to release. A total of 31,650 pounds were released (51.8 fpp). The USACE mitigation target production for release in 2015 was 34,000 pounds or 1.7 million age 0 smolts averaging 50 fish per pound (fpp). The numerical and poundage USACE production shortfall was 3.6% and 6.9%, respectively, the same as the GCPUD shortfall because the production for both entities is commingled. In channel rearing ponds A and B, we experienced elevated mortality just prior to release. The WDFW fish health specialist diagnosed these fish with columnaris disease, an external infection caused by the mxyobacterial, *Chondrococcus columnaris*, which is commonly found in Columbia R. and heavily prevalent at water temperatures above 65°F.

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 AVT

Date of first trapping	09/08/14
Date of last trapping	12/1/14
Number of males trapped	34,952
Number of females trapped	32,281
Number of jacks trapped	12,239
Total Fish trapped	79,472
Peak date of return	10/27/14
Total adult mortality	3,191

Summary of Adults Surplused

WEEK	MALES	FEMALES	JACKS
9/8/14 - 9/14/14	257	339	39
9/15/14 – 9/21/14	2196	1658	403
9/22/14 – 9/28/14	6689	4893	1929
9/29/14 – 10/5/14	2707	1718	1304
10/6/14 – 10/12/14	3782	1010	2369
10/13/14 – 10/19/14	2459	984	1326
10/20/14 – 10/26/14	3104	1937	902
10/27/14 – 11/2/14	7561	8333	1600
11/3/14 – 11/9/14	2005	4091	894
11/10/14 – 11/16/14	1326	1474	396
11/17/14 – 11/23/14	226	671	85
11/24/14 – 12/1/14	73	158	17
TOTAL	32,385	27,266	11,264

Summary of Brood Stock Retained for Spawning

WEEK	AVT	OLAFT	ABC*
9/8/14 - 9/14/14	153	117	0
9/15/14 - 9/21/14	318	209	0
9/22/14 - 9/28/14	345	233	0
9/29/14 - 10/5/14	546	228	0
10/6/14 - 10/12/14	2185	120	0
10/13/14 - 10/19/14	1179	17	0
10/20/14 - 10/26/14	949	2	305
10/27/14 - 11/2/14	0	29	0
11/3/14 - 11/9/14	0	9	0
11/10/14 - 11/16/14	0	0	0
11/17/14 - 11/23/14	0	0	0
11/24/14 - 12/1/14	0	0	0
TOTAL	5,675	964	305

* ABC fish were collected over a three day period, October 24 - 26, 2014

Spawning Summary

DATE SPAWNED	NUMBER OF EGGS TAKEN	MALES	FEMALES	JACKS
10/28/14	1,778,353	233	432	0
10/29/14	626,459	98	162	0
11/4/14	2,792,460	359	677	0
11/5/14	2,901,542	367	726	0
11/12/14	2,027,270	262	502	0
11/13/14	1,845,558	176	472	0
11/18/14	2,031,253	270	515	0
11/25/14	318,923	40	77	0
TOTAL	14,321,818	1805	3563	0

NOTE: 105 non-viable females are included in this chart.

Egg/Unfed Fry Shipment Summary

NUMBER OF EGGS	RECEIVED BY
3,998,950	Bonneville Hatchery (ODFW) for USACE
374,000	Umatilla Hatchery (CTUIR)
487,838	Unfed Fry-Prosser Hatchery
250	Quincy High School
19,400	Yakima Basin Environmental Education
4,200	Franklin Conservation District
4,884,638	TOTAL

2014 Priest Rapids Fall Chinook (Grant County PUD and USACE John Day Mitigation Combined)

Egg Handling Record

Number of eggs retained for rearing	7,461,847
Number of eggs shipped	4,396,800
Total egg mortality	1,926,333
Total number of eggs (adjusted egg take)	14,321,818

Breakdown of Therapeutics Used

Total Formalin used	2,420 gallons
Total Liquamycin (LA-200) used on adults	3.8 liters

Spawn to Fry Stage

Percent survival from green-to-eyed egg stage	89.0
Percent survival eyed egg-to-fry ponding	98.1
Total number of fry ponded	7,460,263
Total pounds of fry ponded	7,460

Rearing to Age 0 Smolt Stage

Number of smolts planted	7,039,543
Total pounds of smolts planted	135,899
Percent survival from fry ponding-to-plant	97.3
Average size (fish/lbs.) of smolts planted	51.8

Food Fed and Weight Gain

Total pounds of food fed	89,179
Conversion rate	.60 to 1
Total pounds of gain	128,604

Length Frequency Data (at release)

Mean (mm)	90.63
Standard Deviation (mm)	5.77
Coefficient of Variation	6.32

Release Data - All Brood Year 2014 Fall Chinook

POND	DATE	LOCATION	NUMBER	WEIGHT	FISH / LB.
E	6/12/15	Columbia R.	1,425,371	29,030	49.1
D	6/15/15	Columbia R.	1,457,198	29,739	49.0
C	6/18/15	Columbia R.	1,400,956	28,019	50.0
B	6/22/15	Columbia R.	1,444,918	26,011	55.5
A	6/25/15	Columbia R.	1,311,100	23,645	55.4
	TOTALS		7,039,543	135,899	51.8