

STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE

**PRIEST RAPIDS COMPLEX
JOHN DAY MITIGATION**

**OPERATIONS AND MAINTENANCE
ANNUAL REPORT**
July 1, 2014 – June 30, 2015



Prepared For
U.S. Army Corps of Engineers

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Introduction

The U.S. Army Corps of Engineers (USACE) is required to provide mitigation for the loss of fall Chinook salmon spawning habitat caused by the inundation associated with the construction and operation of John Day and The Dalles dams. Specifically, the USACE funds hatchery production of upriver-bright (URB) and tule fall Chinook smolts to replace lost natural production. This hatchery production is known as John Day/The Dalles Mitigation (JDM).

In 1992, the Washington Department of Fish and Wildlife (WDFW) and the USACE, in agreement with Grant County Public Utility District (GCPUD), began rearing and releasing 1.7 million JDM fall Chinook salmon at the Priest Rapids Hatchery (PRH). USACE funding for this program initially was limited to purchasing fish food.

In 1996, a cooperative agreement was signed by USACE, WDFW, the National Marine Fisheries Service (NMFS) and U.S. Bureau of Reclamation (USBR) to share the facilities at Ringold Springs Rearing Facility (RSRF) to increase JDM fall Chinook salmon releases upstream of McNary Dam and the Snake River. The USACE agreed to provide funds to transfer 3.5 million (M) pre-smolts from Bonneville Hatchery (operated by Oregon Dept. of Fish & Wildlife) and to acclimate and release them at RSRF. Subsequent releases demonstrated that RSRF could successfully rear fall Chinook smolts for the JDM program. The RSRF program continues today at the original production level, however, the abundant gravity water supply will support substantially more capacity and is currently being studied by USACE for expansion.

In May 2008, Washington, Oregon, Idaho, federal fishery agencies, and the Columbia River Treaty Tribes agreed to a new, *U.S. v. Oregon* 10-year Columbia River Fish Management Plan (CRFMP), which is a detailed harvest and hatchery fish production plan. The CRFMP parties jointly develop harvest sharing and hatchery management plans that are entered as orders of the court and are binding on the parties.

In 2009, the WDFW entered into a new funding agreement with the USACE for the production of upriver bright (URB) fall Chinook salmon at both PRH and RSRF. WDFW will produce JDM fish for USACE provided adequate funding, eggs and PRH hatchery space are available annually. Current goals at PRH include rearing and releasing approximately 1.7M smolts on-station. Also, the Hatchery Scientific Review Group (HSRG) finalized their work on the mainstem Columbia River and recommended that the PRH broodstock be used for the RSRF program rather than Bonneville Hatchery mid-Columbia bright fall Chinook. PRH has been trapping adults, spawning, incubating and transferring approximately 3.7 - 4.0M eyed eggs to Bonneville Hatchery for the RSRF program since the fall of 2008.

Project Location



Figure 1. Project Area Map.

The Hanford Reach is a 56-mile segment of the Columbia River located between the upstream end of McNary Dam reservoir and Priest Rapids Dam. It is the only sizeable non-impounded reach of the mainstem Columbia River upstream of Bonneville Dam. Fall Chinook salmon continued to successfully use Hanford Reach spawning and rearing habitat as other production areas became inundated by reservoirs. The Hanford Reach produces the most significant natural production of URB fall Chinook salmon in the mainstem Columbia River. Broodstock collection, adult holding, spawning, incubation, rearing, and release occur at the PRH on the Columbia River at river mile (RM) 397. Release of acclimated sub-yearling smolts from the RSRF occurs at river mile (RM) 352.

Facilities



Figure 2. RSRF shop and residence, 9-acre pond, vinyl raceways, and fish trap.

The RSRF 9-acre earthen rearing pond gravity water supply is primarily from the “18-inch Diversion” and “Lower Diversion”, which divert spring water collected in the ditch along the upstream side of the Ringold Road visible in Fig. 2. The pond has one outlet with direct discharge into the hatchery creek (visible at right). Visible above the 9-acre pond are the 14 vinyl raceways. The gravity water supply for the vinyl raceways comes from the “Main Diversion”, which also diverts from the collection ditch above the county road. The raceways can provide re-use water for the 9-acre pond or discharge directly into the hatchery outlet creek. These ponds are in need of replacement.



Figure 3. RSRF 9-acre pond, outlet structure, fish trap, 2 concrete raceways and 32 blue round tanks.

RSRF's adult fish trap consists of two picket weirs constructed in the hatchery outlet creek (visible in Fig. 3). The downstream weir has a vee-shaped fish entrance which allows upstream movement of fish while preventing downstream movement.

Two concrete raceways are located next to an array of blue plastic round tanks. The concrete raceways were constructed with USACE funding following the signing of the 1996 cooperative agreement. The original purpose was to study the relative smolt-to-adult survival of fall Chinook produced in concrete raceways compared to the 9-acre earthen rearing pond. These raceways are still used primarily for fall Chinook and the round tanks are primarily used for warm water species. The water supply for all these rearing vessels comes from the Lower Diversion.



Figure 4. RSRF – Walter’s Ponds and the 5-Acre Pond (upper left), USBR Ringold irrigation wasteway (center), and the five Meseberg warmwater ponds (right).

Ringold’s 5-acre rearing pond is a horseshoe-shaped earthen pond. The gravity water supply, known as the “Steelhead Diversion”, is also located next to the county road, but is separate from the RSRF Main Diversion and Lower Diversion. This pond has a concrete flume downstream of the outlet structure which allows the use of an electronic fish counter for enumerating steelhead smolts at release.

The Meseberg Warm Water facility has 5 rearing ponds. The water supply for these ponds comes from the Lower Diversion. Two of these ponds are lined and the others have earth bottoms.



Figure 5. Priest Rapids Hatchery and the original spawning channel.

The original spawning channel at PRH was constructed to voluntarily attract adult fall Chinook and provide natural spawning habitat. Fish failed to use the channel as designed and this resulted in modifications to the channel and ultimately 5 rearing ponds were constructed in the upper end of the channel. These ponds are used today for Grant County PUD's mitigation obligation as well as rearing 1.7M fall Chinook for the USACE.

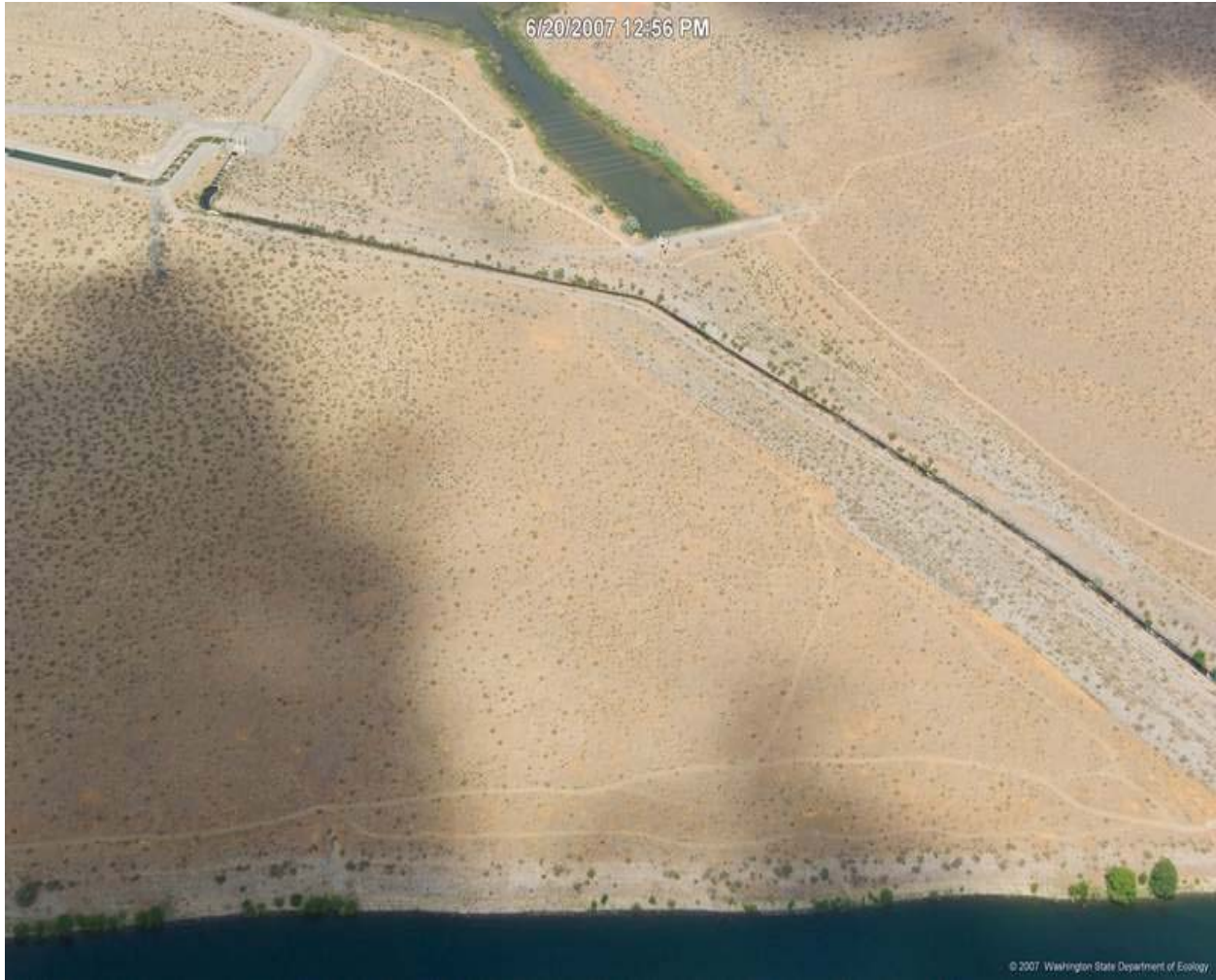


Figure 6. Existing volunteer trap at Priest Rapids Hatchery on Jackson Creek outlet channel.

The adult volunteer trap (AVT) at PRH is located on the Jackson Creek hatchery outlet channel about one mile from the Columbia River. The AVT was reconstructed in 2013 and modified further in 2014 to improve trapping/fish handling operations. Fish access into the trap is controlled by an adjustable finger weir. Two movable crowders are used to push fish into a pescalator which lifts fish [in water] from the trap and discharges them into a fish transport tank truck. Fish are then transported about a mile to the adult holding ponds next to the incubation building to be held for broodstock or to be surplus.



Figure 7. Jackson Creek (hatchery outlet and adult volunteer channel) at Columbia River mile 397.

Fish Culture Activities (PRH)

Adult Trapping and Brood Stock Collection

The 2014 trapping season occurred at three locations: 1) the Jackson Creek volunteer trap, 2) the Priest Rapids Dam Off-Ladder Adult Fish Trap (OLAFT), which is located on the east side of the dam, and 3) by volunteer anglers fishing the Hanford Reach (angler broodstock collection or ABC). The OLAFT's primary function is to conduct research for migrating adult salmon and steelhead; however it is also being used to collect presumptive natural-origin brood stock for the hatchery.

The 2014 PRH fall Chinook collection at the volunteer trap consisted of 67,325 adults and 12,239 jacks (Appendix 1). Fish were held in four holding ponds and the season pond mortality was 1,187 (1.5%).

The 2014 PRH fall Chinook collection at the OLAFT and the Hanford Reach ABC totaled 1,269 adults. These fish were held in their own pond and the season mortality was 169 fish (13.3%).

Total egg take was 14,321,818 green eggs. A total of 7,461,847 eyed eggs were retained for all the PRH programs, including the 1.7M smolt on-site JDM production. A total of 4,884,638 eyed eggs were shipped to Bonneville Hatchery for the RSRF JDM program.

Table 1. Spawning Summary.

DATE SPAWNED	NUMBER OF EGGS TAKEN	NUMBER OF MALES	NUMBER OF FEMALES	NUMBER OF 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 table 1.

Rearing Summary

In addition to GCPUD hatchery production, **1,639,446 USACE - JDM smolts were reared and released from the channel ponds June 12 - 25, 2015**. They averaged 51.8 fish per pound (FPP), for a total of 31,650 pounds released. These fish were 100% adipose fin-clipped and 40,000 fish were PIT-tagged by GCPUD and USACE – JDM. USFWS also PIT-tagged 2,990 smolts prior to release.

During this reporting period, PRH experience elevated mortality during the final stage of rearing in Channel ponds A and B just prior to release. The average mortality from previous years has been about 2%. This season, the channel pond mortality reached 2.7%. Due to the increased loss, PRH staff missed meeting the USACE production goal of 1,700,000 by 60,554 smolts (3.6% shortfall). WDFW’s fish health division performed a necropsy and found *Columnaris sp.*, an external bacterial infection commonly found in Columbia River water prevalent at water temperatures above 65 degrees.

Table 2. Production Summary

Fry Pondered

Total number of fry pondered	1,736,749
Total pounds of fry pondered	1,737 lbs.

Rearing to Fingerling Stage

Number of sub-yearling smolts released	1,639,446
Total pounds released	31,650
Percent survival from ponding to release	97.3
Average size (fish/lbs.)	51.8

Food Fed and Weight Gain

Total pounds of food fed	20,761
Conversion rate	0.61 to 1
Total pounds gained	29,913

Length Frequency Data (Average)

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

Fish Health Summary

On February 6, 2015, WDFW’s Fish Health Specialist (FHS) examined eight fish from raceway E4 and E5. No external lesions or parasites were observed. Gills were clear of bacteria or

parasites and internal organs were normal. A slight elevation in mortality for these initial ponded raceways was examined and noted. This was due to coagulated yolk syndrome (white fins). The overall diagnosis was that the fish were “healthy”. On March 26, the FHS examined eight fish from raceway B1 and six fish from raceway D1. No external lesions or parasites were observed. Gills were clear of bacteria or parasites and internal organs were normal. On April 21, the FHS examined nine fish each from raceways D1 and D2. No external lesions or parasites were found. Gills were clear of bacteria or parasites. Other internal organs were normal. The overall diagnosis was “generally healthy” with a few fish with dropout syndrome. On May 28, the FHS examined six fish from channel rearing ponds B and D. No external lesions or parasites were found. Gills were normal without bacteria or parasites and internal organs were normal. The overall diagnosis was that the fish were healthy. On June 22, 2015, seven fish were examined from rearing pond A and five fish from rearing pond B. No external lesions or parasites were found. Gills with areas of white-yellow dead tissue were observed. Columns of long “rod shaped” bacteria were found on skin. Internal organs were normal. The FHS diagnosed these fish with *Columnaris* and his recommendations were to release ponds A and B as scheduled. Also to reduce feeding levels to pond A to 1.0% body weight per day, and maintain as much well water (flow source) to this pond as possible to cool water temperatures as much as possible to limit the infection before release.

Release Summary

Fish releases occurred between June 12 and June 25, 2015. Table 3 provides data specific to rearing pond, dates, number of fish released, weight of the fish, and fish size. All fish released from PRH are volitionally released through the hatchery outlet channel (i.e. Jackson Creek).

Table 3. 2014 PRH Release Summary

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

Note: This table includes releases for both the USACE’s and GCPUD’s programs.

Fish Culture Activities (RSRF)

Adult Trapping

Trapping at RSRF occurred on a daily basis from mid-September through the mid-December, 2014. RSRF fish swim up Spring Creek through a picket weir with a V-entrance into the trap section of the creek where an upstream weir contains the adults. Working the trap consisted of seining the fish to one corner and sorting them by gender into totes. Bio-sampling is performed by a crew checking for a coded-wire tag and any visual marks. The fish are categorized as AD-ONLY, AD+CWT, CWT-ONLY and UM (unmarked). Scales and lengths were collected from every 20th fish to determine the age class and average fork length for each age class. All fall Chinook that return to RSRF are donated (surplused), meaning none are used as broodstock. Initially the broodstock for the program was Bonneville Hatchery URB fall Chinook, but it was switched to Priest Rapids Hatchery in 2008 to more closely match the natural Hanford Reach population.

The 2014 return consisted of 13,397 adults and 2,256 jacks. The few trap mortalities were disposed of in the local landfill and the live adult collection was donated under our surplus contract with Northwest Harvest. Information relative to origin, fish size, and condition can be found in the 2014 M&E report.

Table 4. RSRF Trapping Summary

Adults	Males	Females	Jacks	Totals
Mortality	27	70	22	119
Carcass Distribution	6,305	6,995	2,234	15,534
Total	6,332	7,065	2,256	15,653

Rearing Summary

In May 2015, RSRF received 3,642,895 Priest Rapids stock fall Chinook at approximately 134 FPP from ODFW's Bonneville Hatchery. The fish were distributed into two rearing ponds; the 9-acre pond received 2,544,525 and the 5-acre pond received 1,098,370. They were sampled often and a computerized growth projection program assisted in establishing the feeding rate. Fish releases occurred from the two rearing ponds beginning on June 22nd thru July 3rd. These USACE JDM fish were 99.8% adipose marked based on mark quality control sampling.

RSH staff expended significant effort deterring avian predators while the fish were rearing in the two acclimation/release ponds. In addition to the use of propane orchard cannons, an electric fence around the perimeter of the ponds to deter wading birds and hand-held revolvers that project "screamers" and bird "bangers" were used to reduce avian predation.

Table 5. Production Summary

Fry Pondered

Total number of fry pondered	3,642,895
Total pounds of fry pondered	27,186

Rearing to Fingerling Stage

Number of fingerlings released	3,585,166
Total pounds of fingerlings released	75,161
Percent survival from pondering to release	98.4%
Average size (fish/lb.) of fingerlings released	47.7

Food Fed and Weight Gain

Total pounds of food fed	32,560
Conversion rate	0.68 to 1
Total pounds of gain	47,975

Length Frequency Data (Average)

Mean (mm)	95.5
Standard Deviation	5.7
Coefficient of Variation	6.0

Fish Health Summary

On June 2, the Fish Health Specialist examined seven fish each from both the 9-acre and the 5-acre ponds. No external parasites or lesions were found. Gills were normal without bacteria or parasites and internal organs were normal. The overall diagnosis of fish was "healthy". It was recommended to release fish as planned. During the release of both rearing ponds, 60 fish from each were sacrificed and internal digestion tracks examined by hatchery staff for New Zealand Mud Snails (NZMS) to confirm whether or not the fish were eating and carrying the snails in their gut. No NZMS were detected in the sample.

Maintenance and Capital Projects

Work Performed by WDFW Maintenance Crew

1. No work performed by WDFW Maintenance Crew during this reporting period.

Work Performed by the RSRF Staff

1. Spread additional gravel around hatchery grounds.
2. Placed two large boundary posts one hundred feet from each side of the hatchery (Spring) creek to restrict fishing activity at the mouth of the creek in an effort to attract more hatchery fish to the trap and reduce illegal fishing.
3. In-stream work removing aquatic vegetation and silt in the primary spring water collection ditch along the county road.
4. Continued noxious weed spraying efforts.
5. Placed “shot rock” to sides and floor of trap for structure integrity.
6. Added six additional ecology blocks below the trap and cleaned out large rocks that were an impediment to attracting more hatchery fish into the trap.
7. Tractor disking of both dewatered earthen rearing ponds for disease and weed control.
8. Regular maintenance to 9-acre earthen pond outlet structure drum screen and stop logs; rebuilt drum screen on 5-acre pond.
9. Suspended cable around the perimeter of the 9-acre pond to create continuous attachment points for additional monofilament line and flash tape to deter avian predators from flying in and landing on the pond.

Summary

The hatchery operations during this reporting period should be considered typical for these facilities. The 2014 year class fall Chinook handled the release well. The extremely large earthen ponds at RSRF continue to be challenging to staff in preventing avian predation. We will continue normal fish culture practices to include frequent growth sampling and monitoring feed practices, adjusting as needed.

Expenditures (PRH)

Actual FY15 Expenditures By Object	Amount (\$)
A - Salaries and Wages	140,721
B - Employee Benefits	51,996
E - Goods and Other Services	437,189
G - Travel	2,096
J - Capital Outlays	13,688
Direct Budget Subtotal	645,690
T - Agency Indirect @ 25.76%	154,593
Grand Total	800,283

Budget (RSRF)

USACOE JDM @ Ringold Springs							
OPERATIONS AND MAINTENANCE BUDGET REQUEST							
July 1, 2014 through June 30, 2015							
Final: 15-May-14							
					Direct	Indirect	Grand Total
A. Salaries							
	Complex Manager	0.8 SM	Pos # 70068842	Mkel Lewis	4,759	1,335	
	Hatchery Specialist 4	4 SM	Pos # 70069329	Mike Erickson	16,856	4,730	
	Hatchery Specialist 3	4 SM	Pos # 70068706	Richard French	14,524	4,075	
	Hatchery Specialist 2	4 SM	Pos # 70068708	Kyle Huwe	13,336	3,742	
	Hatchery Specialist 2	4 SM	Pos # 70068856	Bruce Ault	13,336	3,742	
				Salaries SubTotal	62,811	17,625	80,436
B. Benefits							
	Complex Manager	0.8 SM	Pos # 70068842	Mkel Lewis	1,358	381	
	Hatchery Specialist 4	4 SM	Pos # 70068842	Mike Erickson	6,096	1,711	
	Hatchery Specialist 3	4 SM	Pos # 70069329	Richard French	5,700	1,599	
	Hatchery Specialist 2	4 SM	Pos # 70068706	Kyle Huwe	5,528	1,551	
	Hatchery Specialist 2	4 SM	Pos # 70068708	Bruce Ault	5,528	1,551	
				Benefits SubTotal	24,210	6,793	31,003
E. Goods and Services							
	Supplies and Materials				6,000	1,684	
	Communications				1,700	477	
	Utilities				2,100	589	
	Repairs and Maintenance				0	0	
	Rentals and Leases				320	90	
	Vehicle Maint and operating costs				3,600	1,010	
	NPDES Permit				1,166	327	
	Personnel Services				480	135	
	Training (Pesticide Licencing/CDL)				300	84	
	Formalin				0	0	
	Kelly Services (Security Guards)				0	0	
				SubTotal	15,666	4,396	20,062
	USACE	Fish Food			36,000	N/A	
				Goods & Services SubTotal	51,666	4,396	56,062
G. Travel							
	Lodging, Per Diem, and Mileage				0	0	
				Travel SubTotal	0	0	0
J. Capital Equipment							
	Fork Lift				20,000	N/A	20,000
				Capital Projects and Equipment SubTotal	20,000	0	20,000
K. Contract Services							
	Computer rental				0	0	
				Contract Services SubTotal	0	0	0
T. Indirect							
	28.06% of Total Excluding Fish Food						
				GRAND TOTAL	158,687	28,814	187,501

Figure 9. Ringold Springs Operating Budget

Expenditures (RSRF)

Actual FY15 Expenditures By Object	Amount (\$)
A - Salaries and Wages	57,279
B - Employee Benefits	21,463
E - Goods and Other Services	56,738
G - Travel	2,246
J – Capital Outlays	20,856
Direct Budget Subtotal	158,582
T – Agency Indirect @ 25.76%	30,682
Grand Total	189,264

Appendix 1: Weekly Escapement Estimates

Table 6. Escapement Estimates for Priest Rapids Hatchery Fall Chinook

Stock ID	Date of Report	Lethal Spawned	Adults Shipped	Mortality	On Hand	Jack Total	Comments
Priest Rapids(H)	9/8/14-9/14/14	0	595	63	153	39	First report for season
Priest Rapids(W)	9/8/14-9/14/14	0	0	1	116	0	
Priest Rapids(H)	9/15/14-9/21/14	0	3854	261	465	403	
Priest Rapids(W)	9/15/14-9/21/14	0	0	1	324	0	
Priest Rapids(H)	9/22/14-9/28/14	0	11582	460	770	1929	
Priest Rapids(W)	9/22/14-9/28/14	0	0	0	557	0	
Priest Rapids(H)	9/29/14-10/5/14	0	4425	550	1259	1304	
Priest Rapids(W)	9/29/14-10/5/14	0	0	2	790	0	
Priest Rapids(H)	10/6/14-10/12/14	0	4791	262	3396	2369	
Priest Rapids(W)	10/6/14-10/12/14	0	0	1	909	0	
Priest Rapids(H)	10/13/14-10/19/14	0	3443	219	4453	1326	
Priest Rapids(W)	10/13/14-10/19/14	0	0	0	926	0	
Priest Rapids(H)	10/20/14-10/26/14	0	5038	256	5315	902	
Priest Rapids(W)	10/20/14-10/26/14	0	0	5	1228	0	
Priest Rapids(H)	10/27/14-11/2/14	867	15891	358	4327	1600	
Priest Rapids(W)	10/27/14-11/2/14	58	0	1	1198	0	
Priest Rapids(H)	11/3/14-11/9/14	1957	6093	160	2768	894	
Priest Rapids(W)	11/3/14-11/9/14	172	0	10	1025	0	
Priest Rapids(H)	11/10/14-11/16/14	1041	2799	218	794	396	
Priest Rapids(W)	11/10/14-11/16/14	371	0	34	620	0	
Priest Rapids(H)	11/17/14-11/23/14	415	897	118	83	85	
Priest Rapids(W)	11/17/14-11/23/14	370	0	69	181	0	
Priest Rapids(H)	11/24/14-11/30/14	42	187	64	0	14	
Priest Rapids(W)	11/24/14-11/30/14	75	0	45	0	0	
Priest Rapids(H)	12/1/14	0	44	30	0	3	Final in season estimate

Table 6. Escapement Estimates for Ringold Springs Rearing Facility Fall Chinook

Stock_ID	Date of report	Lethal Spawned	Adults Shipped	Mortality	On hand	Jack total	Comments
Priest Rapids	9/8/14-9/14/14	0	9	0	0	1	First report of the season.
Priest Rapids	9/15/14-9/21/14	0	0	0	0	0	
Priest Rapids	9/22/14-10/28/14	0	2156	0	0	278	
Priest Rapids	9/29/14-10/5/14	0	2455	0	0	448	
Priest Rapids	10/6/14-10/12/14	0	1561	0	0	398	
Priest Rapids	10/13/14-10/19/14	0	1686	2	0	302	
Priest Rapids	10/20/14-10/26/14	0	1190	4	0	205	
Priest Rapids	10/27/14-11/2/14	0	1589	4	0	189	
Priest Rapids	11/3/14-11/9/14	0	1785	22	0	247	
Priest Rapids	11/10/14-11/16/14	0	591	12	0	117	
Priest Rapids	11/17/14-11/23/14	0	226	27	0	54	
Priest Rapids	11/24/14-11/30/14	0	47	22	0	15	
Priest Rapids	12/1/14-12/5/14	0	5	4	0	2	Final in-season estimate.