

STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE

**PRIEST RAPIDS COMPLEX
JOHN DAY MITIGATION**

**OPERATIONS AND MAINTENANCE
ANNUAL REPORT**
July 1, 2013 – June 30, 2014



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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 with an authorized release of 3.5M. 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 treaty tribes agreed to a new, *U.S. v. Oregon* 10-year Columbia River Management Agreement, which is a detailed harvest and hatchery fish production plan. The parties jointly develop harvest sharing and hatchery management plans that are entered as orders of the court and are binding on the parties. The current 3.5M acclimation/release at RSRF is captured in the hatchery production portion of the Management Agreement in Table B5.

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 3.7M 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 un-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 contains the most significant area of URB fall Chinook salmon production in the mainstem Columbia River and are considered a higher quality food fish compared to the lower Columbia River tule fall Chinook salmon.

Broodstock collection, adult holding, spawning, incubation, rearing, and release occur at the PRH on the Columbia River at river mile (RM) 397. Release of sub-yearling smolts from the RSRF is 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-lined, metal, above-grade raceways. The gravity water supply for the 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.



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 at PRH is located on the Jackson Creek hatchery outlet channel about one mile from the Columbia River. The trap was extensively modified in 2013 during the PRH reconstruction and additional modifications were completed prior to the 2014 adult return to fix deficiencies identified during the first year of operation. An adjustable finger-weir is used to control fish entry into the trap and a “pescalator” (Archimedes screw fish lift) is used to remove fish from the trap for broodstock use 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 Broodstock

The 2013 trapping season occurred at three locations: 1) the Jackson Creek volunteer trap, 2) at the Priest Rapids Dam Off-Ladder Adult Fish Trap (OLAFT), which is located on the east side of the dam and 3) the Hanford Reach via the Angler Broodstock Collection (ABC) program. The OLAFT's primary function is to conduct research for migrating adult salmon and steelhead; however it is also being used to trap natural-origin broodstock for the hatchery.

The 2013 PRH fall Chinook collection at the volunteer trap consisted of 38,820 adults and 3,012 jacks (Appendix 1). Fish were held in four holding ponds and the season pond mortality was 2,413(5.8%).

The 2013 PRH fall Chinook collection at the OLAFT and the Hanford Reach ABC program consisted of 1174 adults. These fish were held in their own pond and the season mortality was 208 fish (17.72%).

Total egg take was 13,276,000 green eggs. A total of 7.1M eyed eggs were retained for all the PRH programs, including the 1.7M smolt on-site JDM production. A total of 3.7M 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
10/28/13	385,000	53	97	0
10/29/13	752,000	111	195	0
10/30/13	257,000	45	83	1
10/31/13	314,000	41	80	0
11/4/13	1,635,000	218	423	1
11/5/13	1,136,000	166	302	1
11/12/13	2,741,000	373	748	0
11/13/13	1,742,000	239	461	0
11/18/13	2,387,000	336	666	0
11/19/13	780,000	113	225	1
11/25/13	1,051,000	142	275	0
12/2/13	96,000	18	28	0
TOTAL	13,276,000	1,855	3,473	4

NOTE: 110 non-viable females are included in this table.

Rearing Summary

In addition to GCPUD hatchery production, 1,666,713 USACE - JDM fish were reared and released from the channel ponds June 12 - 25, 2014. They averaged 48.9 fish per pound (FPP), for a total of 34,084 pounds released. These fish were adipose fin-clipped and 40,000 fish were PIT-tagged by GCPUD and USACE – JDM. In addition, USFWS PIT-tagged 2,984 prior to release.

For this reporting period, the staff noticed an elevated mortality during early rearing while fish were in the raceways. The average mortality from past records for the same rearing period has been 2%. For this season, the mortality reached 8%. Due to the increased loss, PRH staff were not able to meet the USACE production goal of 1,700,000, but came close by releasing 98% of the goal. WDFW's fish health division performed necropsy and found no known causes for the elevated mortality.

Table 2. Production Summary – JDM @ PRH

Fry Pondered

Total number of fry pondered	1,742,000
Total pounds of fry pondered	1,742 lbs.

Rearing to Fingerling Stage

Number of sub-yearling smolts released	1,666,713
Total pounds released	34,084
Percent survival from ponding to release	95.68
Average size (fish/lbs.)	48.9

Food Fed and Weight Gain

Total pounds of food fed	19,867
Conversion rate	0.61 to 1
Total pounds gained	32,342

Length Frequency Data (Average)

Mean (mm.)	92.9
Standard Deviation	6.9
Coefficient of Variation	7.4

Fish Health Summary

On February 28, 2014, the Fish Health Specialist (FHS) examined 10 fish from raceway E2 and C2. No external lesions or parasites were observed. Gills were clear of bacteria and/or parasites

and internal organs were normal. The overall diagnosis was that the BY12 fish were “healthy”.

On March 27, 2014, the FHS examined 8 fish from raceway C5. Fish were emaciated “pinheaded”. No external lesions or parasites were observed. Gills were clear of bacteria and/or parasites and internal organs were normal. The overall diagnosis was that the BY13 fish were having dropout syndrome and to monitor mortality.

On April 23, 2014, the FHS examined 7 fish from raceway bank A and E. No external lesions or parasites were found. Gills were clear of bacteria and/or parasites. Few fish were pinheaded. Other internal organs were normal. The overall diagnosis of fish was dropout syndrome and the FHS collected samples for a histology exam and the FHS recommended monitoring mortality.

On May 29, 2014, the FHS examined 6 fish from rearing pond A and E. 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 and to release the fish as planned in June 2014.

Release Summary

Fish releases occurred between June 12 and June 25, 2014. 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. 2013 PRH Release Summary

POND	DATE	LOCATION	NUMBER	WEIGHT	FISH / LB.
RPE	6/12/13	Columbia R.	1,415,787	28,544	49.6
RPD	6/16/13	Columbia R.	1,396,339	28,790	48.5
RPC	6/18/13	Columbia R.	1,435,043	28,874	49.7
RPB	6/23/13	Columbia R.	1,539,650	32,414	47.5
RPA	6/25/13	Columbia R.	1,479,894	30,140	49.1
	TOTALS		7,266,713	148,762	48.9

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

Fish Culture Activities (RSRF)

Adult Trapping and Broodstock

Trapping of returning fall chinook was performed at Ringold Springs Rearing Facility (RSRF) on a daily basis from mid-September through the mid-December, 2013. RSRF fish move volitionally through a picket weir (with a V-notch) into Spring Creek Channel where an upstream picket weir contains the adults. Weekly efforts (see appendix 1) to collect the adults from the trap consist of seining the fish to one corner of the trap and sorting them by gender into totes. Sampling of each fish is done by a M&E 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 to be analyzed from every twentieth fish to determine the age class and to gain knowledge of an average fork length for each age class. All fall Chinook that return to RSRF are surplused, meaning no fish are used as broodstock. Initially, the broodstock for the RSRF program was Bonneville Hatchery URB fall Chinook, but it was changed to Priest Rapids/Hanford Reach stock in 2008 based upon recommendations by the Hatchery Scientific Review Group (HSRG). This broodstock is preferred and will be used exclusively for the RSRF JDM production because it is derived from native, locally-adapted Hanford Reach natural-origin and hatchery-origin fish.

The return of 16,438 adults and 530 jacks was trapped at RSRF. Mortality was disposed of in the local landfill and the remainder surplused for human consumption (food banks). One male was donated to Washington Department of Health and the remainder supplied to WDFW's surplus contractor, American-Canadian Fisheries, Inc. to process for distribution to WA state Northwest Harvest food banks.

Brood information relative to origin, fish size, and condition can be found in the 2013 M&E report.

Table 4. RSRF Trapping Summary

Adults	Males	Females	Jacks
Spawn Study	30	30	0
Mortality	64	37	2
Carcass Distribution	11,616	4,661	528
Total	11,710	4,728	530

Rearing Summary

In May 2014, we received 3,418,046 Priest Rapids stock fall chinook at ≈ 137 fish/pound from ODFW's Bonneville Fish Hatchery. The fish were distributed into two, earthen rearing ponds, the 9-acre pond received 2,546,635 and the 5-acre received 1,077,650. They were sampled often and a computerized growth projection program assisted in establishing the feeding rate. Fish

releases occurred from the 9-acre and 5-acre ponds from June 13-26, 2014. These fish were 100% adipose fin-clipped in addition to 200,000 AD+CWT.

RSRH staff expended substantial effort to minimize avian predation by utilizing propane cannons, an electric fence around the pond perimeter to deter wading birds (e.g. herons, egrets), and pyrotechnics (hand-held revolvers that project “screamers” and “bird bangers”).

Table 5. Production Summary

Fry Pondered

Total number of sub-yearling pre-smolts pondered	3,418,046
Total pounds pondered	24,949

Rearing to Fingerling Stage

Estimated number of smolts released	3,362,379
Total pounds released	56,616
Percent survival from pondering to release	98.4
Average size (fish/lb.) of smolts released	59.4

Food Fed and Weight Gain

Total pounds of food fed	26,752
Conversion rate	0.84 to 1
Total pounds of gain	31,667

Length Frequency Data (Average)

Mean (mm.)	88.40
Standard Deviation	5.943
Coefficient of Variation	6.39

Adult Holding and Incubation Study

It was recommended by WDFW Fish Health and USACE that RSRF staff conduct a study in brood year 2013 to determine the capability to trap and hold adult broodstock, spawn and incubate eggs on the existing spring water source (15-16° C) and compare survival with eggs shipped from Priest Rapids Hatchery and incubated on-site with chilled spring water (11° C).

Staff collected 60 chinook in the RSRF volunteer trap from the earliest returning adults on September 18 to determine if they could be held in 15-16° spring water until gamete maturation. These adults were held in a rectangular concrete raceway and treated with a formalin drip (167 parts per million) for one hour, every other day to prevent fungus.

Adults were sorted for maturation and spawned accordingly starting October 24th through November 6th. Only 14 females and males were spawned because of the limited incubation

space available. Minimal adult losses (5%) occurred during the holding period.

The incubation of eggs was performed in Heath trays (i.e. in two “half stacks”). Each tray had a divider to separate two female’s gametes to maximize incubation space. This also was done to split each fertilized female’s eggs for the comparison of mortalities with a chilled stack and an ambient spring water stack. Each stack was treated daily for 15 minutes with formalin (1:600) to aid in the prevention of fungus up to hatching. Chilled water averaged 10.9° C and all eggs in the “chilled” group had hatched by December 26th.

Ambient Spring Water Incubation Group (15-16°):

- Total green eggs taken: 28,580
- Green egg-to-eyed egg survival: 67.4% (19,250 eyed eggs)
- Eyed egg-to-swim up fry survival: 54.3% (10,450 fry)
- **Overall survival to swim-up fry: 36.6%**
- It was noted by Fish Health staff that evidence of coagulated yolk was likely the cause of higher losses in this ambient temperature group.

Chilled Spring Water Incubation Group (11°):

- Total Green eggs taken: 28,094
- Green egg-to-eyed egg survival: 86.7% (24,360 eyed eggs)
- Eyed egg-to-swim up fry survival: 89.8% (21,100 fry)
- **Overall survival to swim-up fry: 75.1%**

In conclusion, it appears that holding adults on ambient temperature spring water has little effect on survival to spawning. Furthermore, it seemed to have no negative effect on adult maturation timing or gamete viability at the time of spawning. However, survival of incubating green eggs seems to be affected (i.e. coagulated yolk losses). Survival from green egg-to-swim-up fry was about 50% lower for the ambient [temperature] incubation group compared to the chilled incubation group (i.e. 10,450 vs. 21,100 fry from the same number of fertilized green eggs). Cold water (10-11° C) from either groundwater or refrigeration chillers are necessary to efficiently incubate eggs and achieve production objectives without substantial losses.

Fish Health Summary

On May 21, 2014 the Fish Health Specialist (FHS) examined 6 fish from both the 9-acre and the 5-acre ponds. No external parasites or lesions were found. Gills were normal without bacteria and/or parasites and internal organs were normal. The overall diagnosis of fish was “Healthy”. It was recommended to release fish as planned in late June.

On June 18, the FHS diagnosed the Tokul Creek steelhead being reared adjacent to the 9-acre pond in the vinyl raceways with *Ichthyophtherius* (“Ich”). Concerned that this external parasite may have been introduced into the 9-acre pond through re-use of water, the FHS conducted an examination on June 20. The diagnosis was that the fall chinook smolts in the 9-acre pond had been infected with Ich and the recommendation was to release fish immediately (a week earlier

than planned). RSRF staff retained 554 smolts in an isolated trough to assess the potential mortality rate for migrating fall chinook smolts. On July 16, the FHS examined 7 of the 535 surviving fish and diagnosed them to be free of Ich; hence they were released into the river. Why these were “Ich free” is unknown, but the fiberglass trough they were held in was cleaned periodically (unlike the earthen 9-acre pond) and the environment may not have been suitable for the parasite to reproduce.

Maintenance and Capital Projects

Work Performed by WDFW Maintenance Crew

1. Replaced the domestic pump house that supplies water to the shop and residence #2 after wildfire from neighboring property destroyed it.

Work Performed by the RSRF Staff

1. Spread additional gravel around hatchery grounds.
2. Cleaned up burned vegetation from the Sept. 2013 wildfire that spread to the hatchery grounds from the adjacent property.
3. In-stream work removing aquatic vegetation and silt in the primary spring water collection channel along the county road.
4. Continued noxious weed spraying.
5. Bladed in new road below county road to gain access for controlling weeds.
6. Restructured ecology blocks at trap to support Spring Creek banks to eliminate erosion.
7. Placed “shot rock” to sides and floor of trap for structure integrity.
8. Constructed dock for the 5-acre pond to aid in releasing fish from the ODFW tankers into deeper water and serve as a working platform for crew to sample fish.
9. Tractor disking of both dewatered earthen rearing ponds for disease and weed control prior arrival of fall chinook from Bonneville Hatchery.
10. Regular maintenance to earthen pond outlet structure drum screens and stop logs.
11. Installed four additional center posts and additional monofilament line with flash tape on the 9-acre pond to aid in avian predation deterrence.

Summary

The hatchery operations during this reporting period should be considered typical for this facility other than the 9-acre pond becoming infected with *Ichthyophtherius* from the infested steelhead in the vinyl raceways that were transferred to RSRF from Tokul Creek Hatchery near Snoqualmie, WA without knowledge they had Ich. Despite the Ich, we believe the BY2013 fall chinook handled the release well and likely survived at near-normal rates during downstream migration. Once in marine waters, this freshwater protozoan parasite would have died. Fish from off-station will no longer be reared in adjacent raceways during JDM fall chinook rearing in the 9-acre pond unless they are certified by WDFW Fish Health to be free of parasites or disease.

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. The decision made to release BY 2013 early was also driven by an inability to effectively treat for parasites in such a large rearing pond.

Expenditures (PRH)

Total for Program Index By Staff

Allotment:	27.27	27.27	0.00	27.27
Actual:	22.92	22.92	0.00	22.92
Variance:	4.35	4.35	0.00	4.35

By FTE

Total for Program Index By FTE

Allotment:	2.27	2.27	0.00	1.14
Actual:	1.91	1.91	0.00	1.91
Variance:	0.36	0.36	0.00	(0.77)

By Account/Expenditure Authority

001 - General Fund

020 - GF-Federal-Salaries and Expenses

	565,132	565,132	0	565,132
	495,481	495,481	0	495,481
	69,651	69,651	0	69,651

Total for Program Index By Account/Expenditure Authority

Allotment:	565,132	565,132	0	565,132
Actual:	495,481	495,481	0	495,481
Variance:	69,651	69,651	0	69,651

By Object

A - Salaries and Wages

	92,015	92,015	0	92,015
	94,261	94,261	0	94,261
	(2,246)	(2,246)	0	(2,246)

B - Employee Benefits

	37,297	37,297	0	37,297
	38,841	38,841	0	38,841
	(1,544)	(1,544)	0	(1,544)

E - Goods and Other Services

	435,820	435,820	0	435,820
	361,055	361,055	0	361,055
	74,765	74,765	0	74,765

G - Travel

	0	0	0	0
	222	222	0	222
	(222)	(222)	0	(222)

J - Capital Outlays

	0	0	0	0
	1,102	1,102	0	1,102
	(1,102)	(1,102)	0	(1,102)

Total for Program Index By Object

Allotment:	565,132	565,132	0	565,132
Actual:	495,481	495,481	0	495,481
Variance:	69,651	69,651	0	69,651

Expenditures (RSRF)

Allotment:	134,142	134,142	0	134,142
Actual:	133,976	133,976	0	133,976
Variance:	166	166	0	166
By Object				
A - Salaries and Wages				
	61,317	61,317	0	61,317
	60,378	60,378	0	60,378
	939	939	0	939
B - Employee Benefits				
	25,188	25,188	0	25,188
	24,306	24,306	0	24,306
	882	882	0	882
E - Goods and Other Services				
	47,637	47,637	0	47,637
	48,445	48,445	0	48,445
	(808)	(808)	0	(808)
G - Travel				
	0	0	0	0
	223	223	0	223
	(223)	(223)	0	(223)
J - Capital Outlays				
	0	0	0	0
	625	625	0	625
	(625)	(625)	0	(625)
S - Interagency Reimbursements				
	0	0	0	0
	0	0	0	0
	0	0	0	0
Total for Program Index By Object				
Allotment:	134,142	134,142	0	134,142
Actual:	133,976	133,976	0	133,976
Variance:	166	166	0	166

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)	9/9/13-9/15/13	0	0	6	1	3	First report for season
Priest Rapids(W)	9/9/13-9/15/13	0	0	1	30	0	
Priest Rapids(H)	9/16/13-9/22/13	0	1377	549	580	410	
Priest Rapids(W)	9/16/13-9/22/13	0	0	1	161	0	
Priest Rapids(H)	9/23/13-9/29/13	0	1404	435	1018	355	
Priest Rapids(W)	9/23/13-9/29/13	0	0	0	272	0	
Priest Rapids(H)	9/30/13-10/6/13	0	1456	89	9203	298	
Priest Rapids(W)	9/30/13-10/6/13	0	0	1	136	0	
Priest Rapids(H)	10/7/13-10/13/13	0	765	60	2273	179	
Priest Rapids(W)	10/7/13-10/13/13	0	0	1	439	0	
Priest Rapids(H)	10/14/13-10/20/13	0	3229	40	3698	328	
Priest Rapids(W)	10/14/13-10/20/13	0	0	2	505	0	
Priest Rapids(H)	10/21/13-10/27/13	0	4186	301	5063	310	
Priest Rapids(W)	10/21/13-10/27/13	0	0	4	955	0	
Priest Rapids(H)	10/28/13-11/3/13	566	9583	627	4436	538	
Priest Rapids(W)	10/28/13-11/3/13	68	0	57	972	0	
Priest Rapids(H)	11/4/13-11/10/13	916	4982	517	3676	299	
Priest Rapids(W)	11/4/13-11/10/13	194	0	16	835	0	
Priest Rapids(H)	11/11/13-11/17/13	1530	1891	599	1907	131	
Priest Rapids(W)	11/11/13-11/17/13	291	0	46	505	0	
Priest Rapids(H)	11/18/13-11/24/13	996	544	556	1276	39	
Priest Rapids(W)	11/18/13-11/24/13	223	0	47	235	0	
Priest Rapids(H)	11/25/13-12/1/13	255	239	194	403	1	
Priest Rapids(W)	11/25/13-12/1/13	162	0	14	59	0	
Priest Rapids(H)	12/2/13-12/9/13	17	423	370	0	2	Final in season estimate
Priest Rapids(W)	12/9/13-12/9/13	27	0	18	0	0	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	9/18/13-9/22/13	0	2174	8	60	47	First report of the season. 1 mortality added from adult holding study (female jumper).
Priest Rapids	9/23/13-9/29/13	0	0	0	59	0	
Priest Rapids	9/30/13-10/6/13	0	2822	3	57	134	2 mortality added from adult holding study (both males unknown cause of death).
Priest Rapids	10/7/13-10/13/13	0	0	0	57	0	
Priest Rapids	10/14/13-10/20/13	0	1965	3	57	48	
Priest Rapids	10/21/13-10/27/13	4	1822	0	53	42	
Priest Rapids	10/28/13-11/3/13	14	3281	3	39	122	
Priest Rapids	11/4/13-11/10/13	10	2821	34	29	90	29 on hand killed after adult holding study completed 11/7/13 added into mortality.
Priest Rapids	11/11/13-11/17/13	0	1152	63	0	41	
Priest Rapids	11/18/13-11/24/13	0	234	18	0	5	
Priest Rapids	11/25/13-12/1/13	0	0	0	0	0	
Priest Rapids	12/2/13-2/14/14	0	7	0	0	1	Final in-season estimate.