

Grande Ronde Satellite Facilities O&M

Annual Report

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ABSTRACT

There was only one planned acclimation period at the Catherine Creek Acclimation Facility (CCAF) in 2007. A total of 71,293 smolts were delivered from Lookingglass Hatchery (LGH) to the acclimation facility on 12 March. This group contained progeny of both the captive (30.3%) and conventional broodstock programs. The size of the fish at delivery was 26.7 fish/lb. Volitional releases began 26 March 2007 and ended 11 April with an estimated total of 23,761 fish leaving the raceways. This was 33.2% of the total fish released. Fish remaining in the raceways after volitional release were forced out. The size of the fish just before the volitional release was 22.9 fish/lb. and the size of the fish remaining just before the forced release was 26.9 fish/lb. The total mortality for the acclimation period was 25 (0.03 %). The total number of fish released from the acclimation facility was 71,268 (21,572 captive and 49,696 conventional).

There were two planned acclimation periods at the Upper Grande Ronde Acclimation Facility (UGRAF) in 2007. A total of 20,620 smolts were delivered from LGH to the acclimation facility on 12 March. This group was comprised entirely of progeny from the captive broodstock program. The size of the fish at delivery was 23.2 fish/lb. Volitional releases began 19 March 2007 and ended 25 March with an estimated total of 2,392 fish leaving the raceways. This was 11.6% of the total fish released. Fish remaining in the raceways after volitional release were forced out. The size of the fish just before the volitional release was 22.3 fish/lb. and the size of the fish remaining just before the forced release was 23.2 fish/lb. There was no mortality for the acclimation period. The total number of fish released during the early acclimation period was 20,620.

A total of 118,840 smolts were delivered from LGH to the acclimation facility on 26 March for the late acclimation period. This group was comprised entirely of progeny from the conventional broodstock program. The size of the fish at delivery was 21.7 fish/lb. Volitional releases began 2 April 2007 and ended 11 April with an estimated total of 28,718 fish leaving the raceways. This was 24.2% of the total fish released. Fish remaining in the raceways after volitional release were forced out. The size of the fish just before the volitional release was 20.9 fish/lb. and the size of the fish remaining just before the forced release was 20.7 fish/lb. The total mortality for the late acclimation period was 37. The total number of fish released during the late acclimation period was 118,803.

The Catherine Creek Adult Capture Facility (CCACF) was put into operation on 1 March 2007. The first adult summer steelhead was captured on 12 March. A total of 128 adult summer steelhead were trapped and released from 12 March to 9 May 2007. Peak arrival at the trap was the week of 25 March. The first adult spring Chinook salmon was captured at CCACF on 14 May 2007. A total of 242 spring Chinook salmon were trapped from 14 May to 25 June 2007. The catch was comprised of 70 adults and 7 jacks unmarked, 78 adult and 24 jacks marked (captive broodstock), and 59 adult and 4 jacks marked (conventional broodstock). Peak arrival at the trap was the week of 3 June for both the unmarked and marked fish.

Broodstock were collected systematically at CCACF over the entire return from 3 June to 22 June 2007. There were 65 adults and 3 jacks collected for brood in Catherine Creek. The broodstock was comprised of 28 unmarked and 37 conventional adults and 1 unmarked and 2

conventional jacks. Only conventional hatchery adults were retained for broodstock, no captive broodstock returns were collected for broodstock.

Four weekly spawning surveys were conducted below the weir on Catherine Creek beginning 26 June 2007. During these surveys one dead and two live fish were observed. The trap was removed from Catherine Creek on 31 July 2007.

The Upper Grande Ronde Adult Collection Facility (UGRACF) was moved to a new trapping location ten miles downstream for the 2007 trapping season. The trap was put into operation on 2 March 2007. The first adult summer steelhead was captured on 4 April. A total of 63 unmarked adult summer steelhead were trapped and released from 4 April to 18 May 2007. Peak arrival at the trap was the week of 6 May. The first adult spring Chinook salmon was captured at UGRACF on 18 May 2007. A total of 73 spring Chinook salmon were trapped from 18 May to 27 June 2007. The catch was comprised of 33 adults and no jacks unmarked, no captive broodstock, and 35 adult and 5 jacks marked (conventional broodstock). Peak arrival at the trap for unmarked and marked fish was 3 June.

Broodstock were collected systematically at UGRACF over the entire return from 18 May to 27 June 2007. There were 51 adults and two jacks collected for brood from the upper Grande Ronde River. The broodstock was comprised of 17 unmarked and 34 conventional adults and two conventional jacks. Only conventional hatchery adults were retained for broodstock.

On the Upper Grande Ronde River three surveys were conducted from the weir to 1 mile below the weir on 21 and 28 June, and 5 July 2007. During the first two surveys no fish were observed. The maximum stream temperatures increased from 25.8°C on 21 June to 28.9°C on 4 July. During the survey on 5 July, five adult salmon and 13 hatchery jacks were recovered dead below the weir. Included in this group was one natural adult male that had previously been captured and passed at the weir.

For 2007, a total of 45 females, 25 males, and 5 jacks were spawned from the Catherine Creek stock spring Chinook salmon at LGH. The peak spawning date occurred on 29 August. A total of 31 females, 21 males, and 7 jacks from the Grande Ronde stock were spawned. The peak spawning date occurred on 11 September. A total of 23 females, 15 males, and 23 jacks from the Lookingglass Creek stock were spawned. Peak spawning date occurred on 6 September. In addition, a total of 73 fish (34 females, 33 males, and 6 jacks) were passed above the Lookingglass Hatchery weir to spawn naturally.

CTUIR assisted the captive broodstock program with the collection of parr from the Upper Grande Ronde River. The collection goal of 150 parr from the Grande Ronde River was achieved in 2007. CTUIR also assisted with the spawning of the captive broodstocks (Catherine Creek, Upper Grande Ronde, and Lostine River) at Bonneville Hatchery in 2007.

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INTRODUCTION

Anadromous salmonid stocks have declined in both the Grande Ronde River Basin (Lower Snake River Compensation Plan (LSRCP) Status Review Symposium 1998) and in the entire Snake River Basin (Nehlsen et al. 1991), many to the point of extinction. The Grande Ronde River Basin historically supported large populations of fall and spring Chinook (*Oncorhynchus tshawytscha*), sockeye (*O. nerka*), and coho (*O. kisutch*) salmon and steelhead trout (*O. mykiss*) (Nehlsen et al. 1991). The decline of Chinook salmon and steelhead populations and extirpation of coho and sockeye salmon in the Grande Ronde River Basin was, in part, a result of construction and operation of hydroelectric facilities, over fishing, and loss and degradation of critical spawning and rearing habitat in the Columbia and Snake River basins (Nehlsen et al. 1991).

Hatcheries were built in Oregon, Washington and Idaho under the Lower Snake River Compensation Plan (LSRCP) to compensate for losses of anadromous salmonids due to the construction and operation of the lower four Snake River dams. Lookingglass Hatchery (LGH) on Lookingglass Creek, a tributary of the Grande Ronde River, was completed under LSRCP in 1982 and has served as the main incubation and rearing site for Chinook salmon programs for Grande Ronde and Imnaha rivers in Oregon. Despite these hatchery programs, natural spring Chinook populations continued to decline resulting in the National Marine Fisheries Service (NMFS) listing Snake River spring/summer Chinook salmon as "threatened" under the federal Endangered Species Act (1973) on 22 April 1992.

Continuing poor escapement levels and declining population trends indicated that Grande Ronde River basin spring Chinook salmon were in imminent danger of extinction. These continuing trends led fisheries co-managers in the basin to initiate the Grande Ronde Endemic Spring Chinook Salmon Supplementation Program (GRESCESSP) in order to prevent extinction and preserve options for use of endemic fish stocks in future artificial propagation programs. The GRESCESSP was implemented in three Grande Ronde River basin tributaries; the Lostine River, the upper Grande Ronde River, and Catherine Creek. The GRESCESSP employs two broodstock strategies utilizing captive and conventional brood sources. The captive brood program began in 1995, with the collection of parr from the three tributary areas. The conventional broodstock component of the program began in 1997 with the collection of natural adults returning to these tributary areas.

Although LGH was available as the primary production facility for spring Chinook programs in the Grande Ronde Basin, there were never any adult or juvenile satellite facilities developed in the tributary areas that were to be supplemented. An essential part of the GRESCESSP was the construction of adult traps and juvenile acclimation facilities in these tributary areas. Weirs were installed in 1997 for the collection of adult broodstock for the conventional component of the program. Juvenile facilities were built in 2000 for acclimation of the smolts produced by the captive and conventional broodstock programs as release sites within the natural production areas of their natal streams. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) operate both the juvenile acclimation and adult trapping facilities located on Catherine Creek and the upper Grande Ronde River under this project. The Nez Perce Tribe (NPT) operate the facilities on the Lostine River under a sister project.

Hatcheries were also built in Oregon, Washington and Idaho under the LSRCF to compensate for losses of summer steelhead due to the construction and operation of the lowest four Snake River dams. Despite these harvest-driven hatchery programs, natural summer steelhead populations continued to decline as evidenced by declining counts at Lower Granite Dam since 1995 (Columbia River Data Access in Real Time, DART) and low steelhead redd counts on index streams in the Grande Ronde Basin. Because of low escapement the Snake River summer steelhead were listed as threatened under the Endangered Species Act of 1973 by the National Marine Fisheries Service (NMFS) on 18 August, 1997. Co-managers have also discontinued off-station releases of juvenile Willowa stock (non-endemic) hatchery summer steelhead into Catherine Creek in 1998 and the upper Grande Ronde River in 1999.

Data are lacking on summer steelhead adult return numbers, stray rates, and the genetic make-up of populations that return to tributaries of the Grande Ronde River basin, Catherine Creek and the upper Grande Ronde River specifically. The adult fish weirs in place on Catherine Creek and the upper Grande Ronde River are also used to collect data on summer steelhead populations in those areas.

METHODS

Juvenile Acclimation

The Catherine Creek Acclimation Facility (CCAF) is located at river mile (rm) 52.5 of Catherine Creek (Figure 1). Catherine Creek originates in the Wallowa Mountains and flows north to northwest entering the Grande Ronde River at rm 117. The Upper Grande Ronde Acclimation Facility (UGRAF) is located at rm 170.5 of the Grande Ronde River (Figure 1). The Grande Ronde River originates in the Elkhorn Mountains and flows north to northeast 183 rm, before entering the Snake River.

Each facility consists of 4 portable raceways lined with vinyl fabric (Figures 2 and 3). Each raceway is 86 ft long, 8 ft wide, and the water depth is kept at around 3 ft (2,064 ft³). The water supply for CCAF is pumped directly from Catherine Creek into the raceways using a screened submersible pump powered by a diesel powered electrical generator. The water supply for UGRAF is diverted from the Grande Ronde River into the raceways by gravity using a screened cement intake structure located about 600 ft upstream from the raceways. For both facilities the water is drained from each raceway through an 8 inch pipe back to the river below the water intake. A 26 ft travel trailer is placed at each facility to provide onsite housing for facility operators, who provide 24 hour watch and maintenance of the facility. Each facility is designed to hold 31,250 fish per raceway at 20 fish/lb and a density of 0.76 lbs/ft³. Maximum flow design for the facilities is 625 gpm/raceway.

In 2007 there is only one acclimation period at CCAF and two at the UGRAF. Fish are transported to the facilities from LGH by ODFW in tanker trucks. The proposed acclimation periods run from the first week of March to mid-April. This time period is chosen to mimic the timing of the spring outmigration of the natural spring Chinook in the system. The fish are fed three days per week only when water temperatures are above 3°C at a rate ranging from 0.2 to 2.4 % body weight per day (BWD) depending on the water temperature during the acclimation period (Moore-Clark feed rate guidelines, November 1999). Fish are allowed to volitionally leave the raceways beginning six to seven days after delivery to the facilities. Fish remaining in the raceways at the end of the volitional period are forced from the raceway in the afternoon. A portion of the fish at both facilities are tagged with passive integrated transponders (PIT) each year by ODFW for survival estimation to Snake and Columbia River dams. PIT tag detectors are installed on the exit pipes before the volitional release to monitor the outmigration. Mortalities are removed daily, scanned, and saved for ODFW pathology. The total number of fish released is estimated using ODFW Fish Liberation Reports and acclimation mortality records. Lengths and weights are taken at both facilities before the volitional migration begins and just before the forceout, by netting 50 fish from each raceway. Project personnel conduct maintenance and repair activities on facility grounds and the equipment as needed to operate each of the facilities.

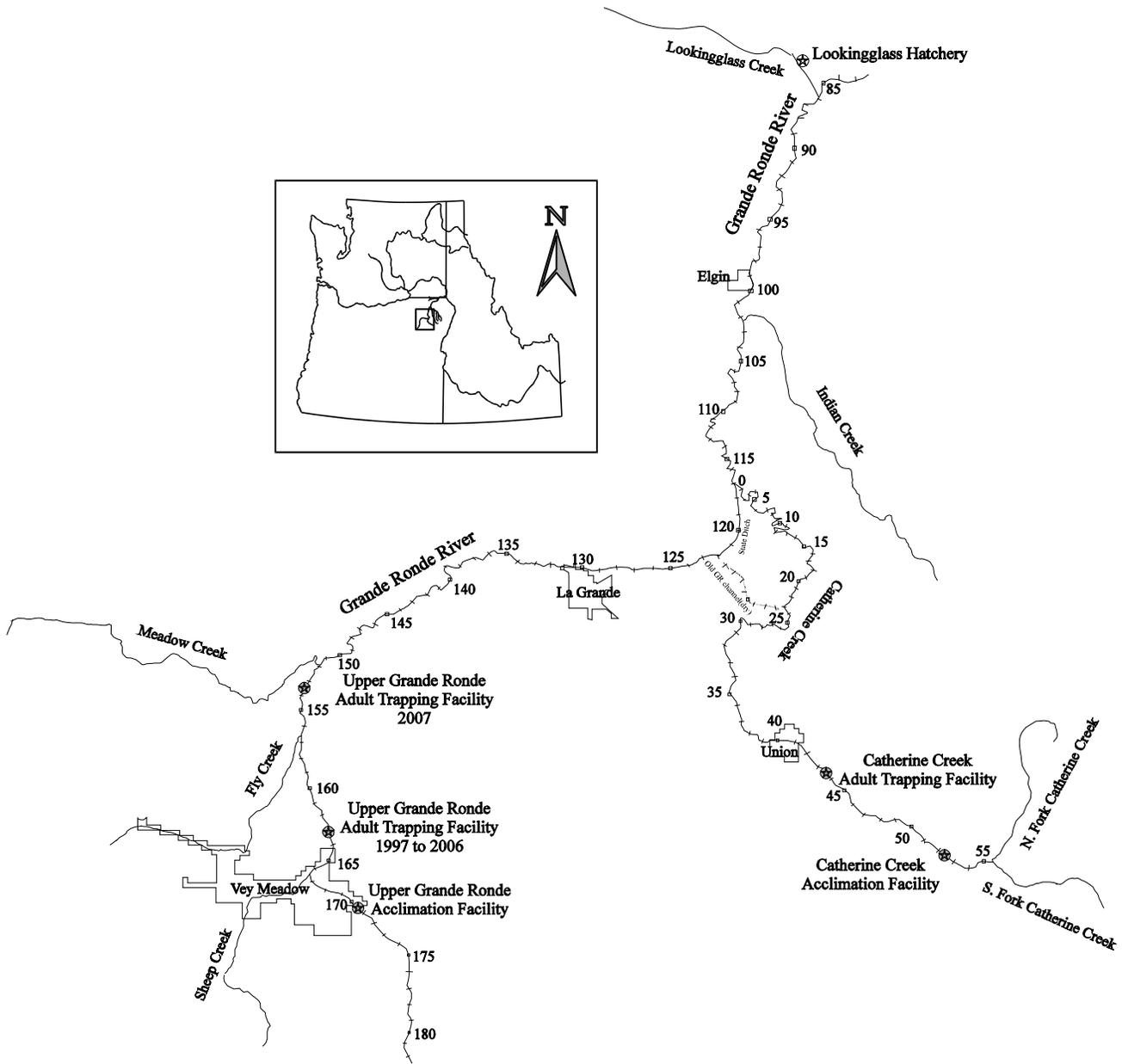


Figure 1. Map of the upper Grande Ronde River basin showing locations (rm) of Lookingglass Hatchery and Catherine Creek and Upper Grande Ronde juvenile acclimation and adult capture facilities.

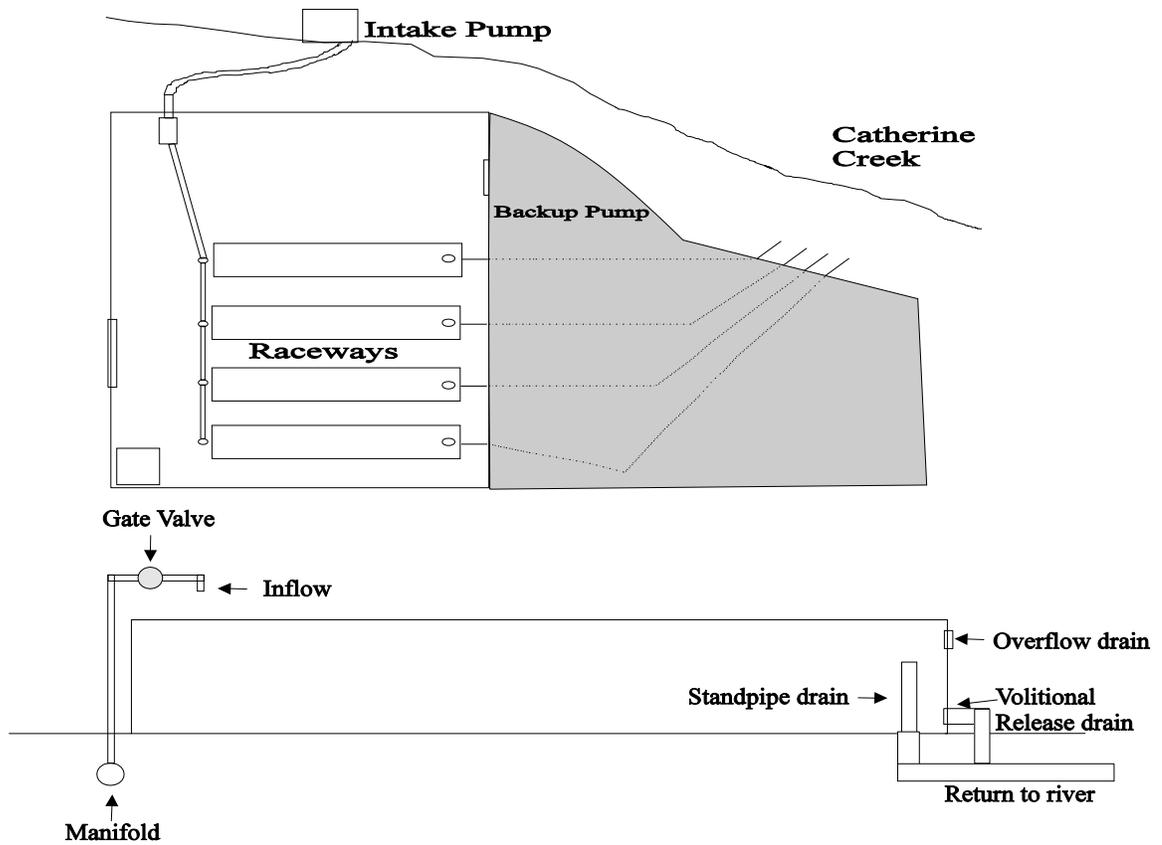


Figure 2. Photo and diagram of the Catherine Creek acclimation facility. PIT tag reader boxes in the shaded area are underground.

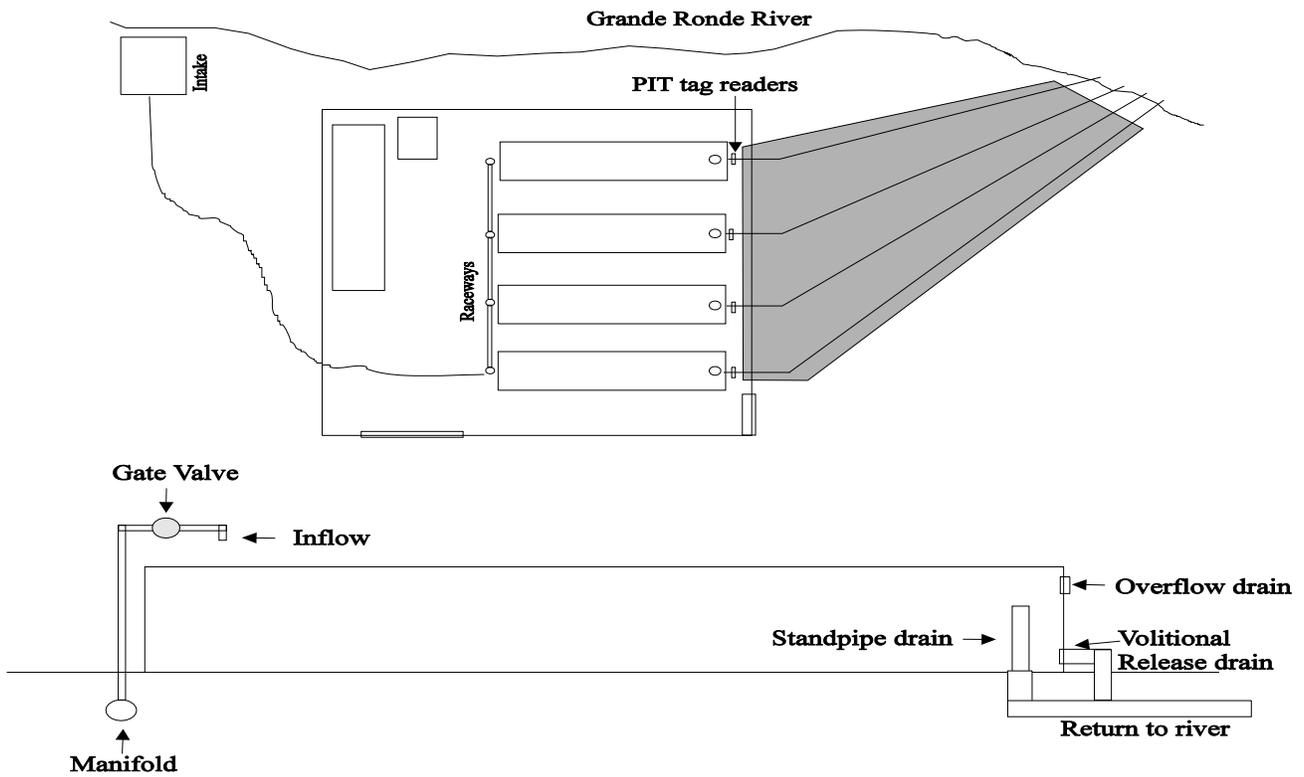


Figure 3. Photo and diagram of the Upper Grande Ronde acclimation facility. The lines passing through the shaded area represent underground return pipes.

Adult Collections

The Catherine Creek Adult Collection Facility (CCACF) is located at rm 43.5 of Catherine Creek (Figure 1). The facility consists of a hydraulic weir which is attached at the bottom sill of a full channel width pool and chute type ladder (Figure 4). Trapping of adult summer steelhead and spring Chinook salmon is accomplished by directing adults into an off channel trap (fyke opening) and holding area that is 25 ft long, 6 ft wide, and the depth is kept at about 6 ft (900 ft³).

The Upper Grande Ronde Adult Collection Facility (UGRACF) is located at rm 153.5 of the Grande Ronde River (Figure 1). This is a new trap location than was used from 1997-2006. The facility consists of a floating weir that spans the entire stream effectively blocking upstream passage (Figure 4). Trapping of summer steelhead and spring Chinook salmon is accomplished by directing adults (age 4 and 5) and jacks (age 3) into a trapbox (fyke opening) located in the main channel near the bank that is 11 ft long, 10 ft wide, and the depth of the water in the trapbox is normally about 2.5 ft (275 ft³). The designed adult spring Chinook salmon holding capacities for these facilities is 90 at CCACF and 28 at UGRACF using 10 ft³/adult.

A travel trailer is placed at each facility after the completion of the acclimation periods to allow for 24hr 7 day a week operation of the facility by facility operators. Each of the traps is checked daily and water temperatures are taken with a pocket thermometer before the trap is operated. An Onset™ recording thermometer is also installed in the trap boxes for hourly temperature readings. Handling events only occurred when water temperatures were below 18.3°C. Later in the season, as water temperatures rise, fish are processed earlier in the day when water temperatures are lower, in order to reduce stress. If and when the maximum water temperatures exceeded 21.1°C for three consecutive days, trapping would be discontinued and fish would be allowed to pass freely until water temperatures dropped (2007 LSRCP AOP).

During the trap checks fork lengths from both summer steelhead and spring Chinook salmon are measured to the nearest mm. A paper punch is used to mark fish and collect tissues for genetics samples. A single punch on the right opercle plate is used to mark the fish that are released upriver as having been trapped. Tissues from opercle punches and one additional caudal punch are collected for genetics evaluation. Tissue samples are preserved in labeled vials with 95% ethanol. Each fish is examined externally for marks, injuries or other physical conditions, and a preliminary determination of sex is made. Summer steelhead are enumerated and passed upstream. Spring Chinook salmon are collected and transported to LGH for broodstock, outplanted in another stream, or enumerated and passed upstream. Fish passed upstream are allowed to recover from handling before release. Summer steelhead kelts encountered are counted and allowed to pass downstream over the weir if alive and sampled (length, weight, and otolith) if dead. Any spring Chinook salmon mortality recovered is also sampled. Fish species captured incidentally are released upstream.

Spring Chinook broodstock collection at the Catherine Creek facility is based on a sliding scale developed by co-managers in the basin (NMFS 1995, Appendix Table 1, GRSCHMP 2002). The sliding scale was developed to allow for increases and decreases in the number of returning naturally- and hatchery-produced fish and to provide a basin specific approach to broodstock and

natural escapement management. The scale is based on preseason population estimates and regulates the percentage of natural and hatchery broodstock to be retained and hatchery/wild ratios above the weir. When the ratios are applied above the weir and surplus fish are the result, these fish can be used for Lookingglass Hatchery broodstock or outplanted in Lookingglass Creek or Indian Creek. Fish collected for broodstock are taken systematically by sex and age (adult/jack). Progeny from the captive broodstock program are not to be incorporated into the conventional hatchery broodstock. This sliding scale management does not apply to the Upper Grande Ronde River.

Hatchery jack management above the weirs for Catherine Creek and the Upper Grande Ronde River is not to exceed a total of one jack for every ten adult male spring Chinook passed (10%). The priority for hatchery jacks released above the weir will be for conventional jacks. When surplus jacks arrive at the weirs they are sacrificed for data collection (coded wire tag) and if the fish quality is good then the fish are saved for ceremonial and subsistence uses.

Fish collected for broodstock and transported to LGH before 15 July 2006, received prophylactic dorsal sinus injections of oxytetracycline and erythromycin upon loading. Dosage of each antibiotic is based on estimated age length data (3 year fish <601mm, 4 year fish 601-799mm, 5 year fish >799). For the erythromycin injection (200mg/ml), 3-year-old fish received 0.25cc, 4-year-old fish 0.50cc, and 5-year-old fish 1.00cc. The oxytetracycline (200mg/ml) is one-half of the erythromycin injections. Injections are not given to fish taken for broodstock after 15 July due to the fact that the broodstock would be reinjected at LGH the first week in August. Fish collected and transported after reinjection would again receive injections prior to transfer.

Adults that are to be transported to LGH for holding and spawning are given tags that will identify individual fish at the time of spawning. The Catherine Creek stock is marked with a PIT tag injected into the operculum tissue (cheek muscle). The Grande Ronde stock is marked with a thin flexible tag (Floy Laminated Flex Tag™) stapled to the operculum. The fish are transferred from the trap to the CTUIR transport vehicle by using a water-filled tube. Broodstock are transported from each weir site to LGH using 300 gallon fiberglass tanks mounted on flatbed trailers. The tanks are each equipped with an aerator and oxygen tank. Transport time to LGH from the weir site is about 1.0 to 1.5 hours. Target dissolved oxygen level in the tank during transport is 11 mg/l. Dissolved oxygen levels are checked mid way through the transport.

The possible effects of the weirs on fish behavior is evaluated by walking or snorkeling a one-mile segment of the stream immediately downstream of the weirs once a week when water levels and clarity allow for viewing fish. Live fish, carcasses, and evidence of spawning activities (redds, test digs) are recorded. When fish are accumulating in this section below the weir and daily average stream temperatures exceed 70°F (21.1°C) for three consecutive days, efforts will be made to collect and transport these fish either for broodstock (if needed) or above the weir into cooler water. ODFW staff, directed standard spawning ground surveys (Parker et al. 1995) on segments upstream and downstream of the weir in August and September and the same information is collected.



Figure 4. Photos of the Catherine Creek (top) and the Upper Grande Ronde (bottom) adult broodstock collection facilities.

Project personnel conduct maintenance and repair activities on facility grounds and the equipment as needed to operate the facilities.

Broodstock Activities

Lookingglass Hatchery

Assistance is provided to ODFW for the spawning of the Lookingglass Creek, Catherine Creek and Upper Grande Ronde River conventional broodstocks held at LGH. The Lookingglass Creek and Catherine Creek stocks are held in the outdoor adult holding pond at LGH, while the Upper Grande Ronde River broodstock are held in the captive brood building. All stocks are checked for ripeness once a week over a five week period beginning around the middle of August. Ripe females and an equal number of ripe males are placed in smaller tanks within the building where they are kept separate from the non-ripe fish for spawning. A spawning matrix is developed immediately based on the number of ripe females and males and the sex ratio of the entire population. The most common matrix used is three females crossed with two males.

On each spawning day, the ripe females are anesthetized in the main hatchery or captive brood building using MS 222. Females are anesthetized and spawned as family groups (usually two fish). The fish are again checked for ripeness before being dispatched by a blow to the head. The fish are placed in a rack and bled by cutting the tails. The body cavity is then opened over a bucket to catch the eggs. The eggs are then poured into a large Ziploc bag and placed in a small cooler with ice. The males are anesthetized then live spawned at the main hatchery or captive brood building. The milt is placed into cups and also placed in the cooler with the eggs. The males are marked ("T" anchor tags) and recycled back into the brood pond until the end of the spawning season. The cooler is then taken to the main hatchery building for completion of the matrix. Once the gametes are mixed, ODFW staff place the eggs in incubators located in the main hatchery building.

Captive Broodstock

Assistance is provided to ODFW for the collection of parr from the Grande Ronde basin. These juveniles are used for the captive broodstock program (Carmichael 2008). Assistance is also provided to ODFW for the spawning of the Grande Ronde Basin captive broodstocks at Bonneville Hatchery (Carmichael 2007).

RESULTS AND DISCUSSION

Juvenile Acclimation

The CCAF received 71,293 smolts from LGH on 12 March 2007 (Table 1). This group contained progeny of both the captive (30.3%) and conventional broodstock programs. The average size of the fish at delivery was 26.7 fish/lb (Table 2). The densities in the raceways ranged from 0.29 to 0.42 lbs/ft³. The variability in the raceway densities was due to the densities at LGH and the way they were loaded onto the transport truck. The fish were allowed to volitionally leave the raceways beginning 26 March 2007 and remaining fish were forced out of the facility on 11 April after 1200 hours. During the volitional release period there was a total of 6,334 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (29.3%, 20,915), an estimated 23,761 fish left during this time, this was 33.3% of the fish released from the facility (Table 3). Of the fish that left, only 17.5% left the first 5 days of the 17 day volitional release (Figure 5). Over half (54.7%) of the fish leaving the raceways left during the last five days of the release. Hourly detections of PIT-tagged fish showed peaks in detections at 1400 hours (9.7%) and a second peak at 1800 hours (20.6%) (Figure 6). The fish were fed a total of 287.5lbs of food for the acclimation period. The total number of fish that were released from the acclimation facility in 2007 was 71,268. The size of the fish just before the volitional release began was 22.9 fish/lb. The size of the fish that were forced from the facility was 26.9 fish/lb.

The total mortality for the acclimation period was 25 (0.03 %). There was no significant fish health problems detected in the Catherine Creek conventional or captive broodstock mortalities from the acclimation site. One BKD mortality was detected at Lookingglass Hatchery from the conventional production fish in December 2006. There were no detections of virus throughout rearing at Lookingglass Hatchery. Ten mortalities from raceways 1-3 (conventional broodstock) were examined. Two of ten (20%) had kidney adhesions and internal fungus. All ELISA values were ≤ 0.094 OD units indicating that these fish did not have a BKD problem. All samples collected for virus were negative. Five mortalities from raceway 4 (captive broodstock) were examined. One of five (20%) kidney cultures had a heavy level of mixed bacterial growth. All ELISA values were ≤ 0.108 OD units indicating these fish did not have a BKD problem. All samples collected for virus were negative.

The UGRAF received 20,620 smolts from LGH on 12 March 2007 for the early acclimation group (Table 1). This group was comprised entirely of progeny from the captive broodstock program. The average size of the fish at delivery was 23.2 fish/lb (Table 2). The densities in the raceways were 0.22 lbs/ft³. The fish were allowed to volitionally leave the raceways beginning 19 March 2007 and the remaining fish were forced from the facility on 25 March after 1200 hours. During the volitional release period there was a total of 191 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (2.4%, 499), an estimated 2,392 fish left during this time, this was 11.6% of the fish released from the facility (Table 3). Of the fish that left, 83.86% left the first three days of the six day volitional release (Figure 7). Hourly detections of PIT-tagged fish showed two peaks of detection at 1200 hours (15.7%) and 1700 hours (16.8%) (Figure 8). The fish were fed a total of 8.8lbs of food for the acclimation period. The total number of fish that were released from the acclimation facility in 2007 from the early

group was 20,620. The size of the fish just before the volitional release began was 22.3 fish/lb. The size of the fish that were forced from the facility was 23.2 fish/lb.

There was no mortality during the early acclimation period. There were also no detections of BKD or virus throughout the rearing period at Lookingglass Hatchery. Ten fish were grab-sampled from the first acclimation. One of ten (10%) had a low level of aeromonad-pseudomonad bacteria. All ELISA values were ≤ 0.087 OD units indicating that these fish did not have a BKD problem. All samples collected for virus were negative.

The UGRAF received 118,840 smolts from LGH on 26 March 2007 for the late acclimation group (Table 1). This group was comprised entirely of progeny from the conventional broodstock program. The average size of the fish at delivery was 21.7 fish/lb (Table 2). The densities in the raceways ranged from 0.56 to 0.77 lbs/ft³. The variability in the raceway densities was due to the densities at LGH and the way they were loaded onto the transport truck. The fish were allowed to volitionally leave the raceways beginning 2 April 2007 and the remaining fish were forced from the facility on 11 April after 1200 hours. During the volitional release period there was a total of 361 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (1.3%, 1,494), an estimated 28,718 fish left during this time, this was 24.2% of the fish released from the facility (Table 3). Of the fish that left, 59.6% left the first four days of the ten day volitional release (Figure 9). Hourly detections of PIT-tagged fish showed two peaks of detection at 1500 hours (21.9%) and 1900 hours (16.1%) (Figure 10). The fish were fed a total of 120.4 lbs of food for the acclimation period. The total number of fish that were released from the acclimation facility in 2007 from the late group was 118,803. The size of the fish just before the volitional release began was 20.9 fish/lb. The size of the fish that were forced from the facility was 20.7 fish/lb.

The total mortality for the late acclimation period was 37 (0.03 %). There was no significant fish health problems detected in the conventional or captive broodstock mortalities provided to ODFW Fish Pathology from the acclimation site. There were no detections of BKD or virus throughout the rearing period at Lookingglass Hatchery. Twelve conventional mortalities from the second acclimation were examined. No significant levels of systemic bacteria were detected. All ELISA values were ≤ 0.081 OD units indicating that these fish did not have a BKD problem. All samples collected for virus were negative

Hourly water temperatures were taken at both facilities in 2007 (Figures 11-14). The water temperature at CCAF ranged from 0.3°C to 8.8 °C during the acclimation period and was usually at the lowest temperature around 0600 with the peak temperatures around 1500. The water temperature at UGRAF ranged from -0.1°C to 6.9 °C during the acclimation period and was usually at the lowest temperature around 0600 with the peak temperatures around 1500.

Maintenance and repair activities were conducted at the acclimation facilities in 2007. Facility maintenance work at the CCAF consisted of snow removal, work on the intake site, overhaul of the travel trailer and removal of large conifers in the compound. Facility maintenance work at the UGRAF consisted of snow removal, removal of gravel from intake area, and complete overhaul of the travel trailer.

Table 1. Raceway fish density and flow data for Catherine Creek and the Upper Grande Ronde acclimation facilities before volitional release in 2007.

Catherine Creek Single Accl.	Raceway			
	1	2	3	4
No. of fish	16,569	16,570	16,570	21,584
Total lbs.	606	606	606	869
Mortality	4	1	8	12
Density lbs/ft ³	0.29	0.29	0.29	0.42
lbs/gpm	1.73	1.73	1.73	2.48
Flow gpm	350	350	350	350
Treatment	Conventional	Conventional	Conventional	Captive
Grande Ronde Early Accl.	#1			
No. of fish	EMPTY	10,310	10,310	EMPTY
Total lbs.		444	444	
Mortality		0	0	
Density lbs/ft ³		0.22	0.22	
Lbs/gpm		0.63	0.63	
Flow gpm		700	700	
Treatment		Captive	Captive	
Grande Ronde Late Accl.	#2			
No. of fish	29,993	24,368	34,731	29,748
Total lbs.	1,405	1,149	1,593	1,334
Mortality	4	6	15	12
Density lbs/ft ³	0.68	0.56	0.77	0.65
lbs/gpm	4.01	3.28	4.55	3.81
Flow gpm	350	350	350	350
Treatment	Conventional	Conventional	Conventional	Conventional

Table 2. Group, number, size, and receive and release dates of fish acclimated at Catherine Creek and the Upper Grande Ronde facilities in 2007.

Facility	Group	# Received	Size (fish/lb)	Acclimation dates	Volitional release began	# released
CCAF	Single	71,293	26.7	3/12-4/11	3/26	71,268
UGRAF	Early	20,620	23.2	3/12-3/25	3/19	20,620
UGRAF	Late	118,840	21.7	3/26-4/11	4/2	118,803

Table 3. Group, feed fed, mortality, temperature, dissolved oxygen, and estimated volitional migration of fish acclimated at Catherine Creek and the Upper Grande Ronde facilities in 2007.

Facility	Group	Feed fed(lb.)	Total mort. (%)	Temp. °C		DO mg/l		Volitional migration	
				Min.	Max.	Min.	Max.	Number	%
CCAF	Single	287.5	25 (0.03)	0.3	8.8	9.6	12.3	23,761	33.3
UGRAF	Early	8.8	0 (0.00)	-0.1	5.4	8.7	12.7	2,932	11.6
UGRAF	Late	120.4	37 (0.03)	-0.1	6.9	8.5	11.9	28,718	24.2

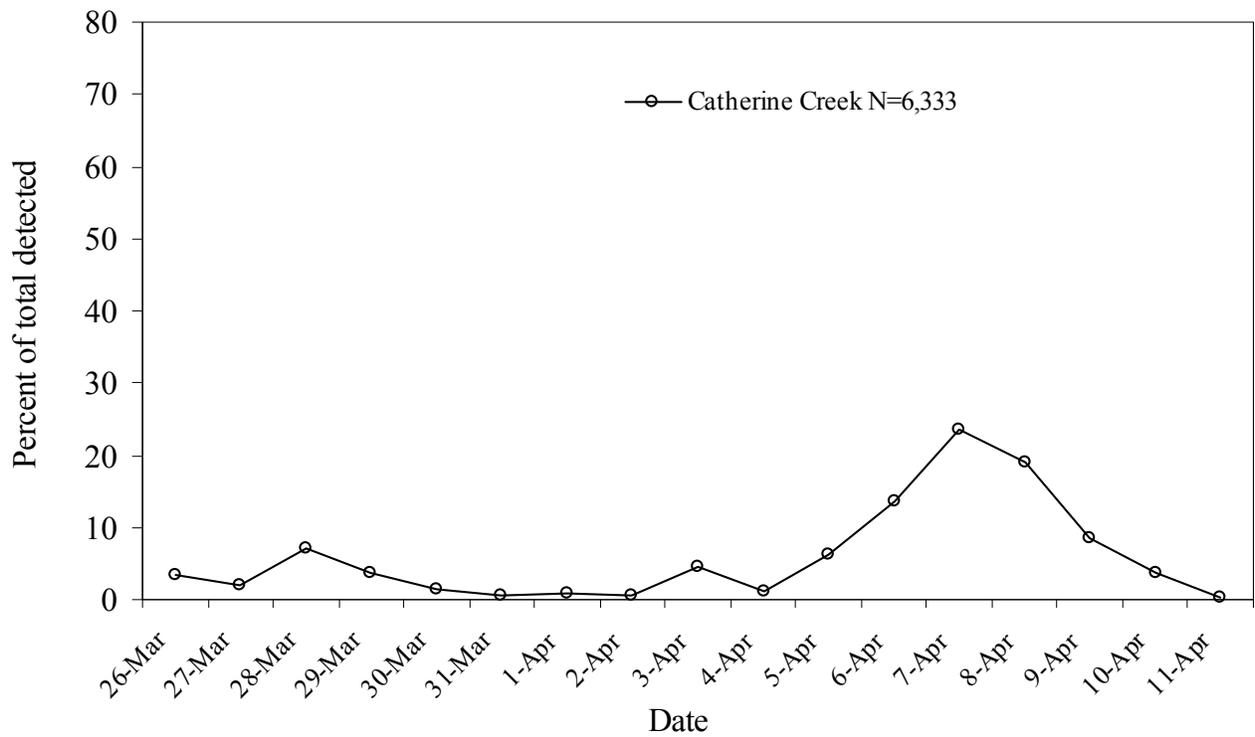


Figure 5. Daily PIT tag detections of fish leaving the raceways during the volitional release period at the Catherine Creek acclimation facility in 2007.

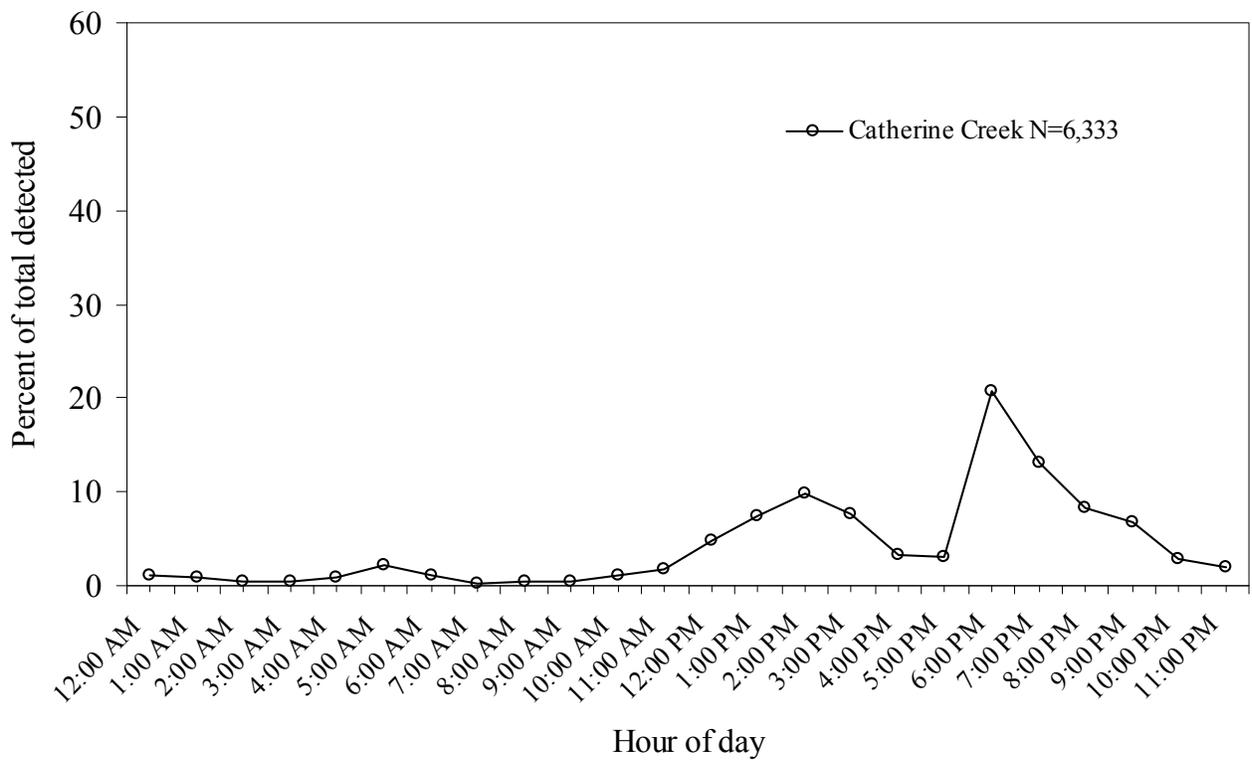


Figure 6. Hourly PIT tag detections of fish leaving the raceways during the volitional release period at the Catherine Creek acclimation facility in 2007.

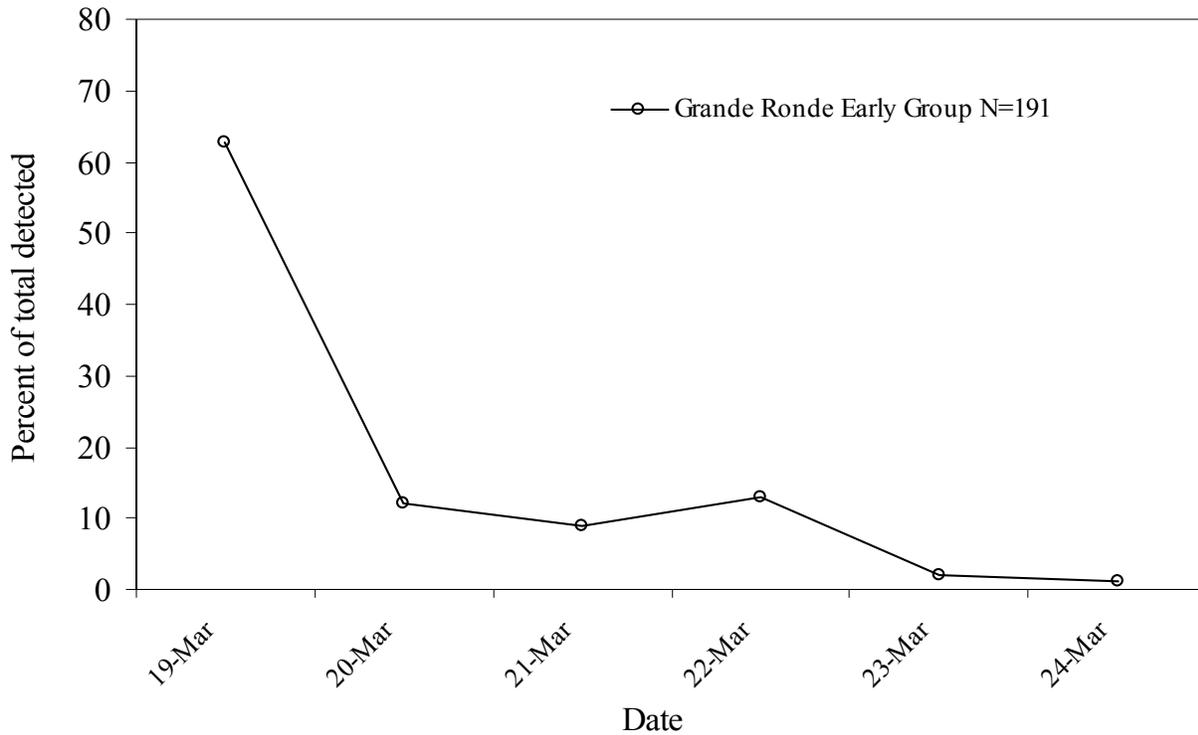


Figure 7. Daily PIT tag detections of fish leaving the raceways during the early volitional release period at the Grande Ronde acclimation facility in 2007.

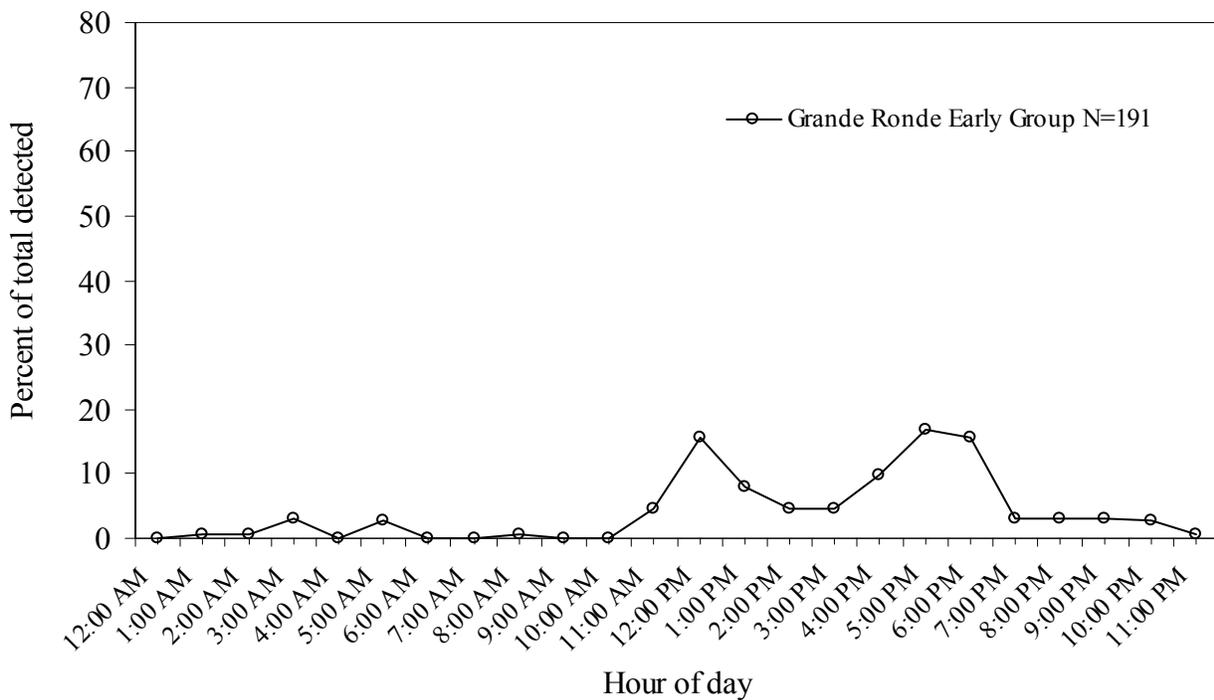


Figure 8. Hourly PIT tag detections of fish leaving the raceways during the early volitional release period at the Grande Ronde acclimation facility in 2007.

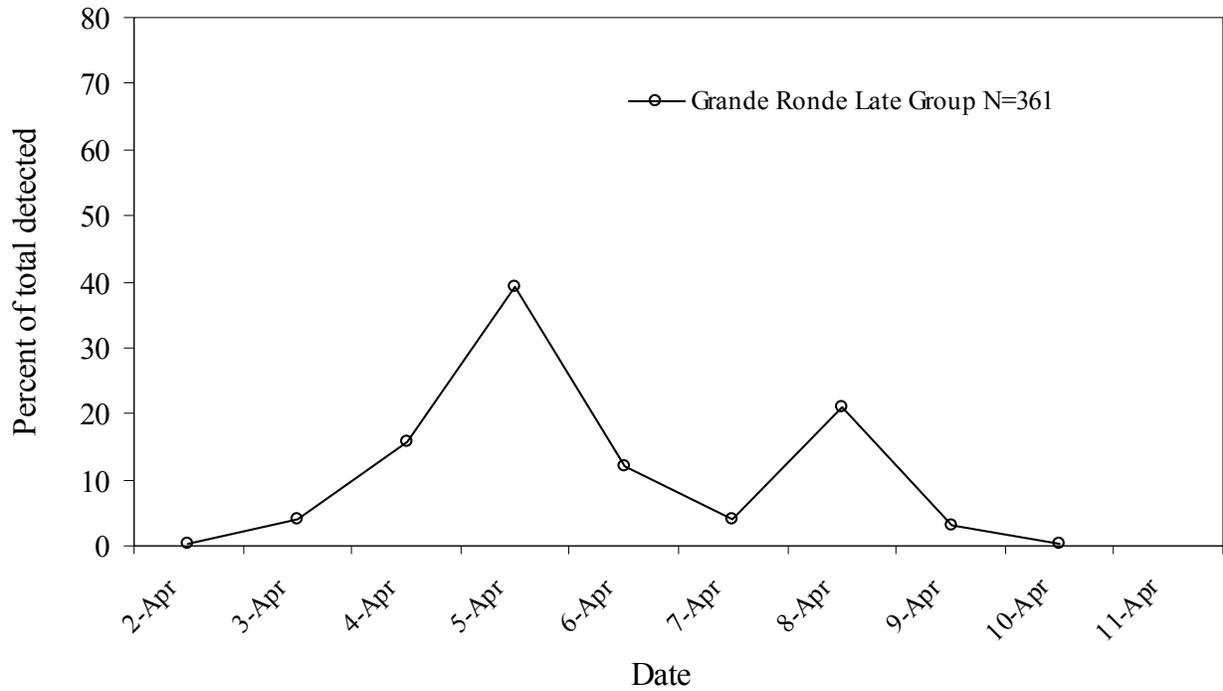


Figure 9. Daily PIT tag detections of fish leaving the raceways during the late volitional release period at the Grande Ronde acclimation facility in 2007.

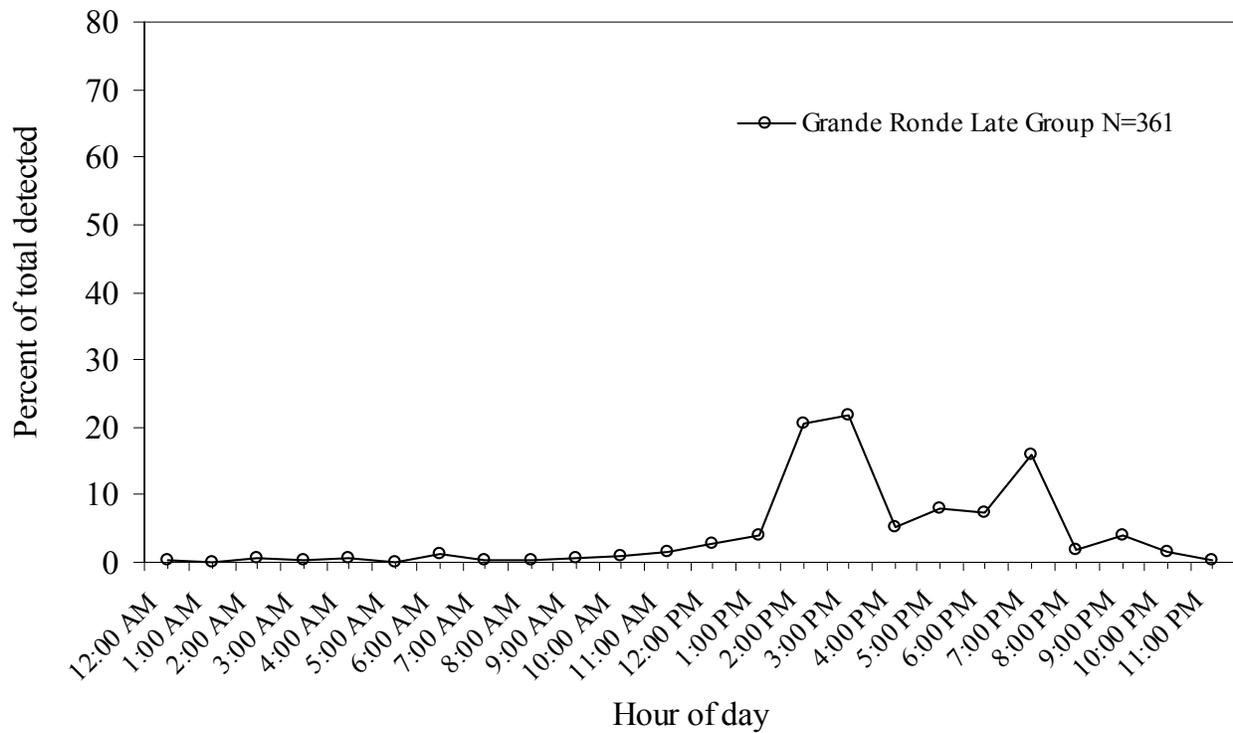


Figure 10. Hourly PIT tag detections of fish leaving the raceways during the late volitional release period at the Grande Ronde acclimation facility in 2007.

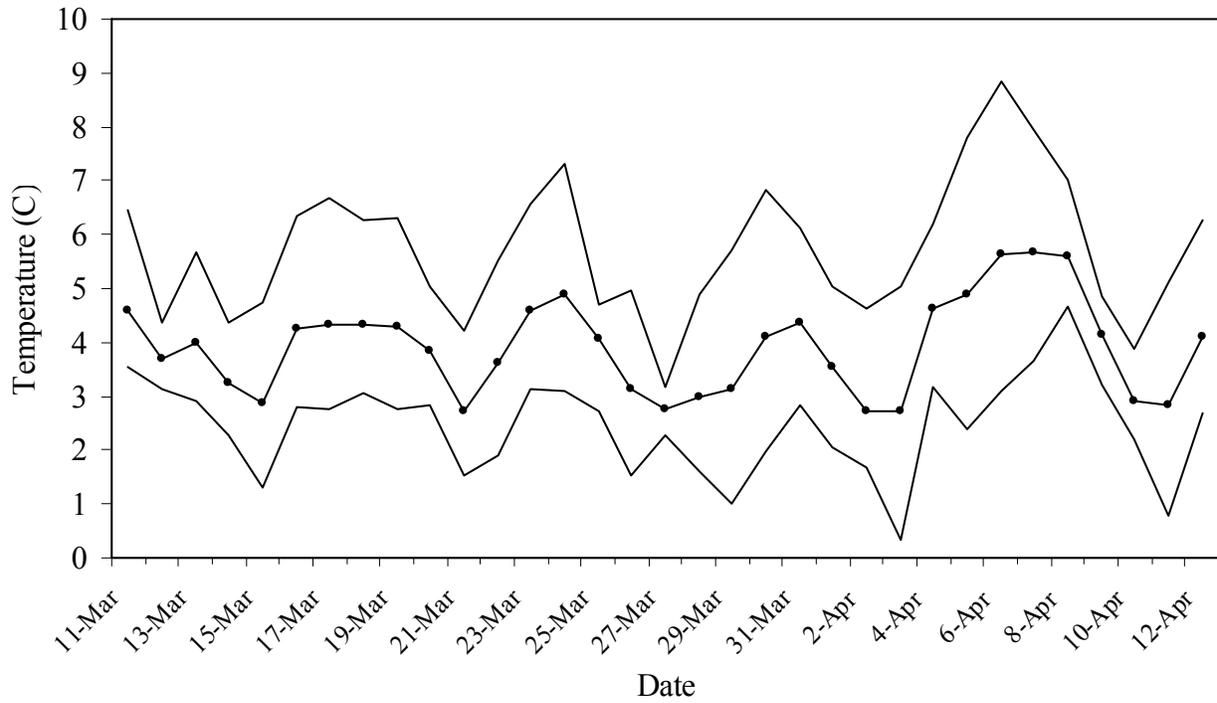


Figure 11. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Catherine Creek juvenile acclimation facility in 2007.

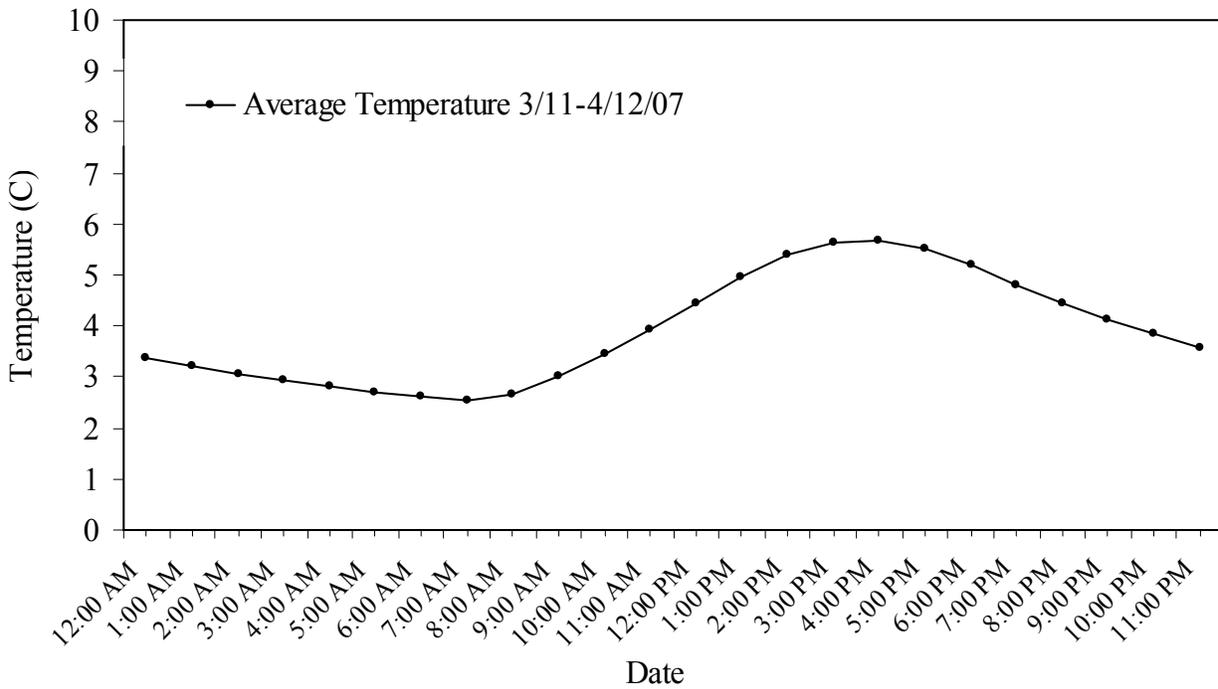


Figure 12. Average hourly water temperature at the Catherine Creek juvenile acclimation facility in 2007.

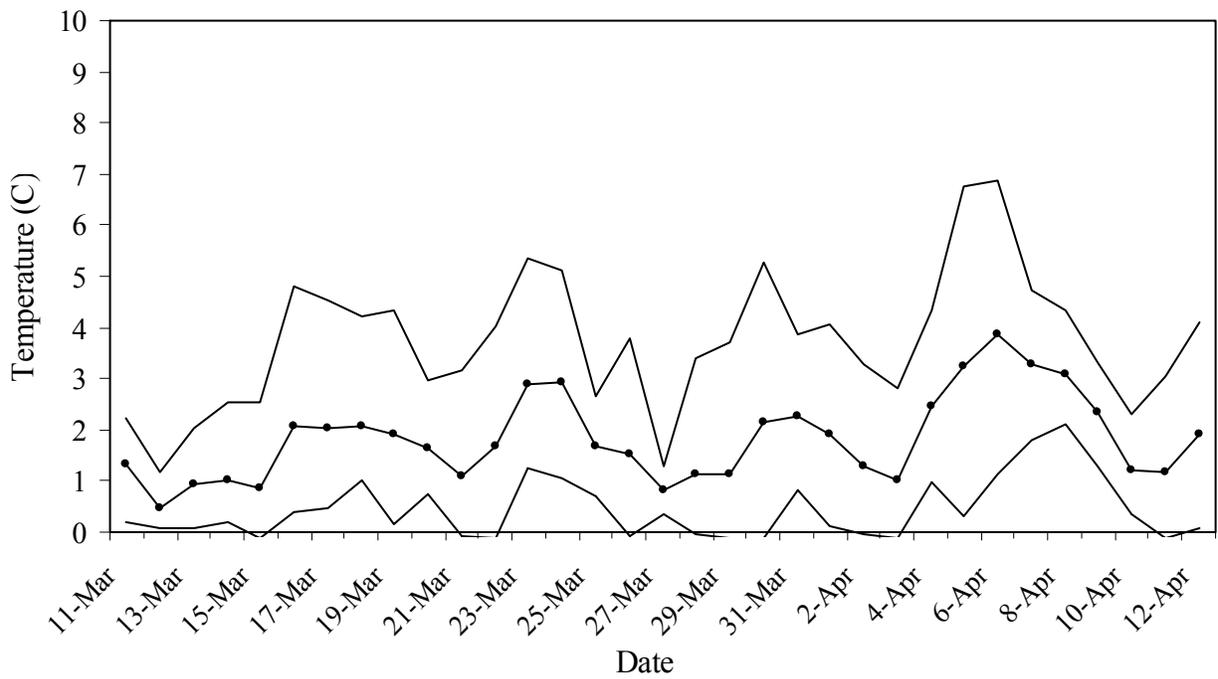


Figure 13. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Upper Grande Ronde juvenile acclimation facility in 2007.

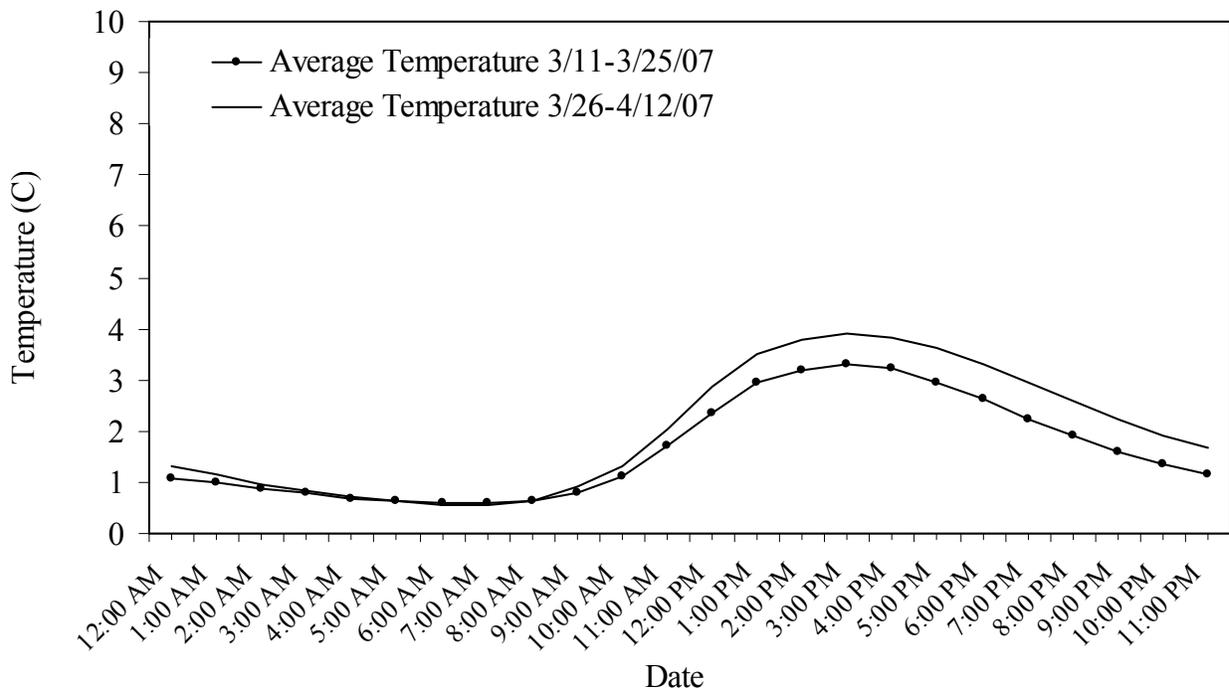


Figure 14. Average hourly water temperature at the Upper Grande Ronde juvenile acclimation facility in 2007.

Adult Collections

The CCACF was put into operation on 1 March 2007. The first adult summer steelhead was captured on 12 March. A total of 128 unmarked adult summer steelhead were trapped and released from 12 March to 9 May 2007 (Table 4, Figure 15). No adipose-clipped fish were captured at the trap. Peak arrival for unmarked fish at the trap was the week of 25 March (20.3%). Three previously trapped fish, as indicated by the presence of an opercle mark, were re-trapped and released, and 22 previously trapped kelts were recovered dead on the weir. There were no kelts recovered on the weir that were not previously punched. There were 18 kelts that were passed downstream over the weir that were still alive.

The first adult spring Chinook salmon was captured at CCACF on 14 May 2007. A total of 242 spring Chinook salmon were trapped from 14 May to 1 July 2007 (Table 5, Figure 14). Three different groups of fish from the same stock returned to Catherine Creek in 2007; natural adults (unmarked with no coded wire tag), captive broodstock progeny (ad-clipped), and conventional broodstock progeny (ad-clipped with Visual Implant Elastomer (VIE)). The total catch was made up of 70 adult, and 7 jack natural fish, 78 adult and 24 jack captive broodstock progeny and 59 adult and 4 jack conventional broodstock progeny. A total of 142 adult (78 captive, 22 conventional, 42 natural) and 7 jack (1 captive, 6 natural) spring Chinook salmon were released above the weir to spawn naturally. Peak arrival for adults at the trap was the week of 3 June for all three groups. By the week of 17 June, 90.0% of the adult natural fish had been trapped compared to 92.0% and 83.1% of the captive and conventional fish respectively. The peak arrival for jacks was the week of 17 June for all groups. There was no mortality in the trap in 2007. Seven carcasses (two unmarked males, two ad-clipped males, three ad-clipped females) were recovered on the weir. The carcasses had been previously handled at the trap. Due to the low adult return to Catherine Creek this year, there were no surplus captive broodstock adults hauled to LGH for Lookingglass Creek broodstock or outplanted.

On 30 May 2007 two water diversion dams (Davis Dams) on Catherine Creek (rm 35.5) were discovered to not be operating properly. Several of the lower dam boards had broken and were attracting fish away from the fish passage ladders. The ladders were also missing a few dam boards as well. The dams and ladders were repaired on 31 May and the large capture of fish on 3 June (118, 48.8% of entire run) was the likely result of the repairs. The return to CCACF in 2007 was two weeks earlier than the average return from 2002 to 2006 (Figure 16). Had there not been a problem with the passage at the diversion the run could have been even earlier. The earlier arrival timing is most likely due to the low flows in the Grande Ronde River in 2007.

The sliding scale management plan (Appendix Table 1) is a tool used to determine spring Chinook salmon disposition in the Grande Ronde River Basin. There are, however, some concerns with the implementation of the scale and its application to Catherine Creek as discussed in McLean et al. 2004 and 2005. Weir management decisions regarding broodstock collection percentages and wild:hatchery escapement ratios are made using preseason forecasts and total returns to the tributary. There is substantial error associated with these forecasts which can change these percentages or ratios during the return. The changes needed would be difficult to make mid-trapping without seriously affecting the cross section of the run collected for brood or released above the weir.

The predicted adult spring Chinook salmon return to Catherine Creek for 2007 was 218 (150 natural + 21 captive + 47 conventional). Based on these predictions the sliding scale called for retaining 40% of the adult returning natural population. Since the predicted total return was less than 250 fish the percent of adults released above the weir that can be of hatchery origin was decided in other forums but could be more than 70%. Fish that are not passed above the weir or taken for Catherine Creek broodstock have four possible dispositions: transported to Lookingglass Creek for a fishery/natural spawning, taken as broodstock for the Lookingglass Hatchery program, outplanted into Indian Creek, or sacrificed for tribal subsistence. The actual number of captive broodstock hatchery adults trapped was 78 which was 371.4% of the predicted number and all were passed upstream. The natural adult return was 70 fish which was 46.7% of the predicted number. The conventional adult return was 59 fish which was 125.57% of the predicted number. The percentage of hatchery fish above the weir in 2007 was 70.4%. There were no hatchery fish outplanted to Lookingglass Creek, taken as broodstock for the Lookingglass program, or outplanted into Indian Creek. Jacks were collected for broodstock at a rate of one jack for every ten males in the broodstock.

The adult broodstock collected and transported from CCACF consisted of 28 unmarked and 37 conventional broodstock. None of the captive broodstock returns were collected for broodstock. Adult broodstock was collected systematically over the entire return from 3 June to 22 June 2007. Every 4th and 5th natural adult male and female sampled was taken to LGH for broodstock. One unmarked jack was collected for every ten adult males that were taken to LGH. Enough conventional returns were taken to maintain the percentage of hatchery fish in the broodstock to no more than 70%. Strays from Catherine Creek (seven adults and two jacks) that swam back to Lookingglass Hatchery were incorporated into the Catherine Creek broodstock also. The unmarked adult portion of the broodstock was 40.0% of the adult natural return trapped (Appendix Table 4). The hatchery adult portion of the entire broodstock was 61.6%. The estimation of the sex of the adult fish at the weir was 92.1% accurate based on the accuracy of sex estimation in the broodstock collected. Of the seven fish that were not sexed correctly, two were fish that were originally called females but were actually males, and five were fish that were originally called males but were actually females.

Four weekly spring Chinook spawning surveys were conducted below the weir on Catherine Creek beginning 26 June 2007. During these surveys one dead fish and two live fish were observed below the weir. The trap was removed from Catherine Creek on 31 July. Surveys conducted by ODFW above and below the weir in 2007 resulted in 57 redds counted above the weir and 2 redds counted below the weir. A total of 19 adult carcasses were recovered above the weir which was 13.4% of the total trapped and passed above the weir (142) and 1 fish was recovered below the weir (not previously trapped). There were 17 punched fish (2 unpunched) in the recovery above the weir (89.5% trap efficiency) (2007 Spawning Ground Survey Results, ODFW, unpublished).

Table 4. Summer steelhead trap capture data from the Catherine Creek adult collection facility in 2007. Trapping began 1 March and ended 31 July.

Week	Trap capture		Kelt	
	First time	Reruns	Not punched ^a	Punched
18-Mar	18			
25-Mar	26			
1-Apr	13			1
8-Apr	2			
15-Apr	25	1		
22-Apr	11			2
29-Apr	21	2		
6-May	10			
13-May	2			6
20-May	0			9
27-May	0			
3-Jun	0			1
10-Jun	0			2
17-Jun	0			
24-Jun	0			
1-Jul	0			
8-Jul	0			
15-Jul	0			
22-Jul	0			1
	128	3	0	22

^a *These fish were kelts recovered on or near the weir that were not previously opercle punched at the weir. Punched fish were previously trapped then recovered as a kelt carcass on or near the weir.*

Hourly water temperatures were taken at the CCACF in 2007 (Figures 17 and 18). The water temperature at CCACF during the operation of the adult collection facility ranged from -0.1°C on 2 March to 25.9 °C on 23 July and was usually at the lowest temperature around 0600 with the peak temperature around 1600. The period of low water temperature set the time of day that the trap was checked and the fish worked up.

Maintenance and repair activities were conducted at the facility in 2007. Maintenance work at the CCACF consisted of hydraulic weir components maintenance, maintenance of weir, rock removal from the pickets, and weed abatement.

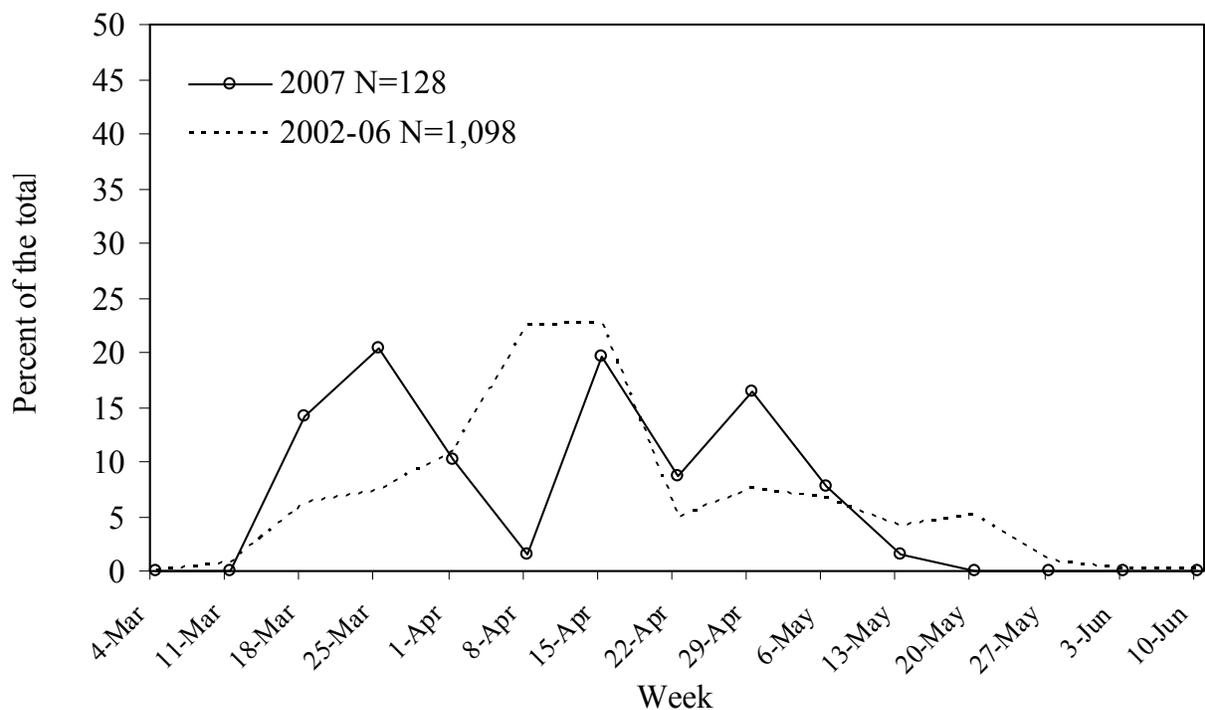


Figure 15. Summer steelhead arrival timing at the Catherine Creek adult collection facility in 2007 and mean arrival timing from 2002 to 2006.

Table 5. Spring Chinook salmon trap capture, transport, and mortality data for the Catherine Creek stock at the adult collection facility in 2007. Trapping began 1 March and ended 31 July.

Week	Trap capture ^a						Broodstock hauled				Trap mort
	Nat.	(jack)	Capt.	(jack)	Conv.	(jack)	Nat.	(jack)	Conv.	(jack)	
6-May	0		0		0						
13-May	0		0		0						
20-May	1		0		0						
27-May	1		1		2						
3-Jun	44	3	43	3	33	1	19		13	1	
10-Jun	3		9	2	4	1			4		
17-Jun	14	3	19	13	10	1	5	1	10		
24-Jun	6	1	4	5	10	1	4		10	1	
1-Jul	1		2	1	0						
8-Jul	0		0		0						
15-Jul	0		0		0						
22-Jul	0		0		0						
29-Jul	0		0		0						
	70	7	78	24	59	4	28	1	37	2	0

^a Age 4 and 5 spring Chinook salmon (age 3 fish). Nat. = Naturally-produced, Capt. = Captive broodstock program, Conv. = Conventional broodstock program.

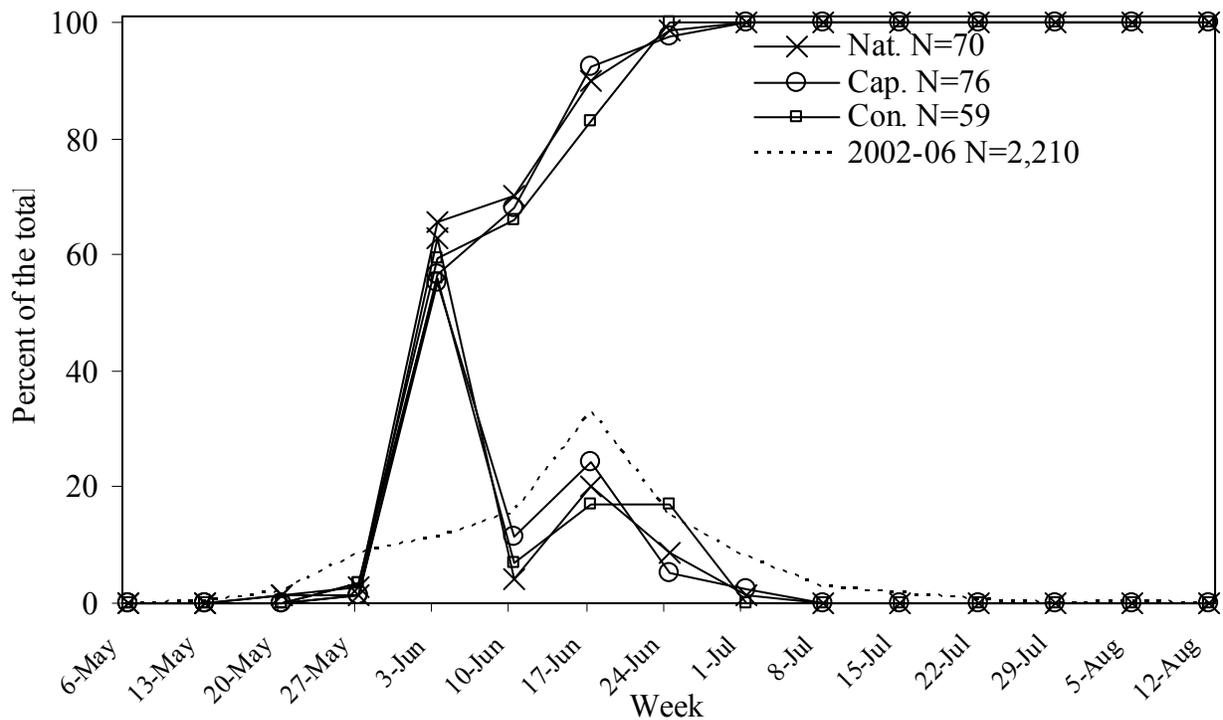


Figure 16. Arrival timing of age 4 and 5 spring Chinook salmon at the Catherine Creek adult collection facility in 2007 and mean arrival timing from 2002 to 2006.

The UGRACF was moved ten miles downstream after the 2006 trapping season. There is about ten miles of spawning habitat located below the old weir location that was being utilized by returning fish. By moving the trap downstream below this spawning habitat a more representative sample of the entire population could be trapped. The UGRACF was put into operation on 2 March 2007. The first adult summer steelhead was captured on 4 April. A total of 63 unmarked adult summer steelhead were trapped and released from 4 April to 18 May 2007 (Table 6, Figure 19). No adipose-clipped fish were captured at the trap. Peak arrival for unmarked fish at the trap was the week of 6 May (49.2%). Three previously trapped fish, as indicated by the presence of an opercle mark, were trapped and released, and 16 previously trapped kelts were recovered dead on the weir. There were two kelts recovered on the weir that were not previously punched. There were two kelts that were passed downstream over the weir that were still alive.

The first adult spring Chinook salmon was captured at UGRACF on 18 May 2007. A total of 73 spring Chinook salmon were trapped from 18 May to 27 June 2007 (Figure 20, Table 7). Two different groups of fish from the same stock returned to the upper Grande Ronde River in 2007; natural adults (unmarked with no coded wire tag) and conventional broodstock progeny (no adipose-clip with CWT). The total catch was made up of 33 adult natural fish and 35 adult and 5 jack conventional broodstock spring Chinook salmon. There were no captive broodstock adults or jacks in the catch in 2007, as only 1,020 smolts from the 2003 broodyear and 76 smolts from the 2004 broodyear were released. Captive broodstock from the 2002 broodyear should have returned in 2007 (78,716 smolts released) but the broodyear crashed as only 1 fish from that

broodyear returned at all. Peak arrival for adult fish at the trap was the week of 3 June for both the hatchery and natural production. By the week of 24 June, 97.0% of the adult natural fish had been trapped compared to 97.1% of the conventional fish. The peak arrival for the jacks was the week of 17 June for the conventional group. There was a mortality discovered in the trap on 27 May 2007 (816 mm, male, conventional).

The predicted adult spring Chinook salmon return to the Upper Grande Ronde River for 2007 was 77 (56 natural + 6 captive + 15 conventional). There is no sliding scale used for the Grande Ronde River. Up to 50% of the natural return and up to 100% of the conventional hatchery return can be collected for broodstock. The actual number of hatchery adults trapped was 35 (all conventional) which was 233.3% of the predicted number and none were passed upstream. The natural adult return was 33 fish which was 58.9% of the predicted number and 16 were released upstream. The percentage of hatchery fish above the weir in 2007 was 00.0%. Only five jacks were collected in 2007 and two of these were taken for broodstock.

The broodstock collected and transported from UGRACF consisted of both natural and hatchery fish. Broodstock was collected systematically over the entire return from 18 May to 27 June 2007. Every other natural adult male and female sampled was taken to LGH for broodstock. A total of 17 adult natural fish and 34 adult and 2 jack hatchery fish (conventional broodstock) were transported to LGH for broodstock. The natural adult portion of the broodstock was 51.5% of the adult natural return trapped while the adult hatchery portion was 100.0% of the adult hatchery return trapped. The estimation of the sex of the adult fish at the weir was 88.2% accurate based on the accuracy of the sex estimation in the broodstock collected. Three fish that were originally called females were males and three fish originally called males were females. The male: female sex ratio observed for these conventional fish was 0.62: 1 (not including jacks).

On the Upper Grande Ronde River three spring Chinook surveys were conducted from the weir to one mile below the weir on 21 and 28 June, and 5 July 2007. During the first two surveys no fish were observed. The maximum stream temperatures increased from 25.8°C on 21 June to 28.9°C on 4 July. During the survey on 5 July, five adult salmon and 13 hatchery jacks were recovered dead below the weir. This mortality event was most likely due to the extreme stream temperature recorded prior to the event. Included in this group was one natural adult male that had previously been captured and passed at the weir. Surveys conducted by ODFW above and below the weir in 2007 resulted in one redd counted above the weir and no redds counted below the weir. Vey Meadow, which is privately owned and contains about four miles of spawning habitat, was not surveyed in 2007 (landowner denied permission). Only one adult carcass was recovered above the weir which was 6.7% of the total trapped and passed (15). The one fish recovered above the weir was opercle punched (100.0% trap efficiency) for a population estimate of 15 fish (2007 Spawning Ground Survey Results, ODFW, unpublished).

Hourly water temperature was taken at the UGRACF in 2007. The water temperature during operation of the adult collection facility from 2 March to 13 July ranged from -0.1°C to 29.9°C on 3 March and 5 July respectively (Figure 21). The hourly temperatures at the adult trap during the period of operation showed that the lowest water temperatures usually occurred between 0700 and 0800 hours and the highest water temperatures usually occurred between 1600 and

1700 hours (Figure 22). The period of low water temperature set the time of day that the trap was checked and the fish worked up

Maintenance and repair activities were conducted at the facility in 2007. Maintenance work at the UGRACF consisted of installation and removal of the floating weir panels, gravel removal from under the weir panels and in front of the trapbox during the instream work window, out building painting, and set up of utilities for the new site.

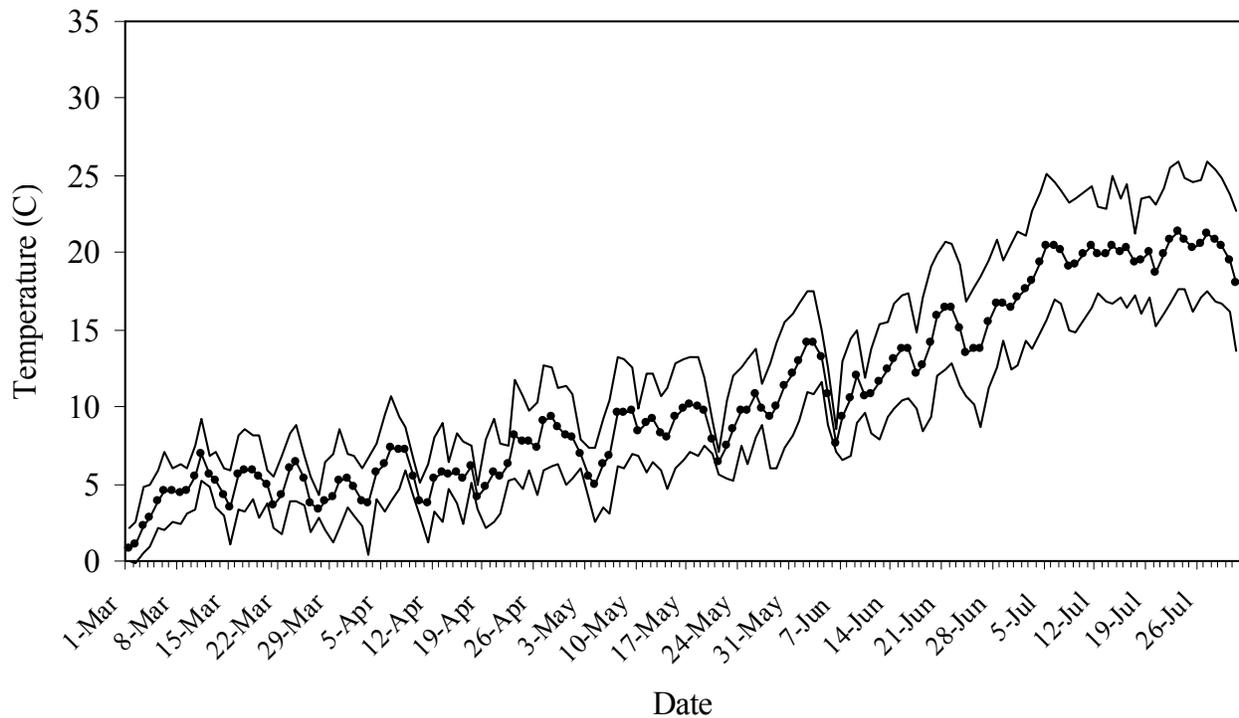


Figure 17. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Catherine Creek adult collection facility in 2007.

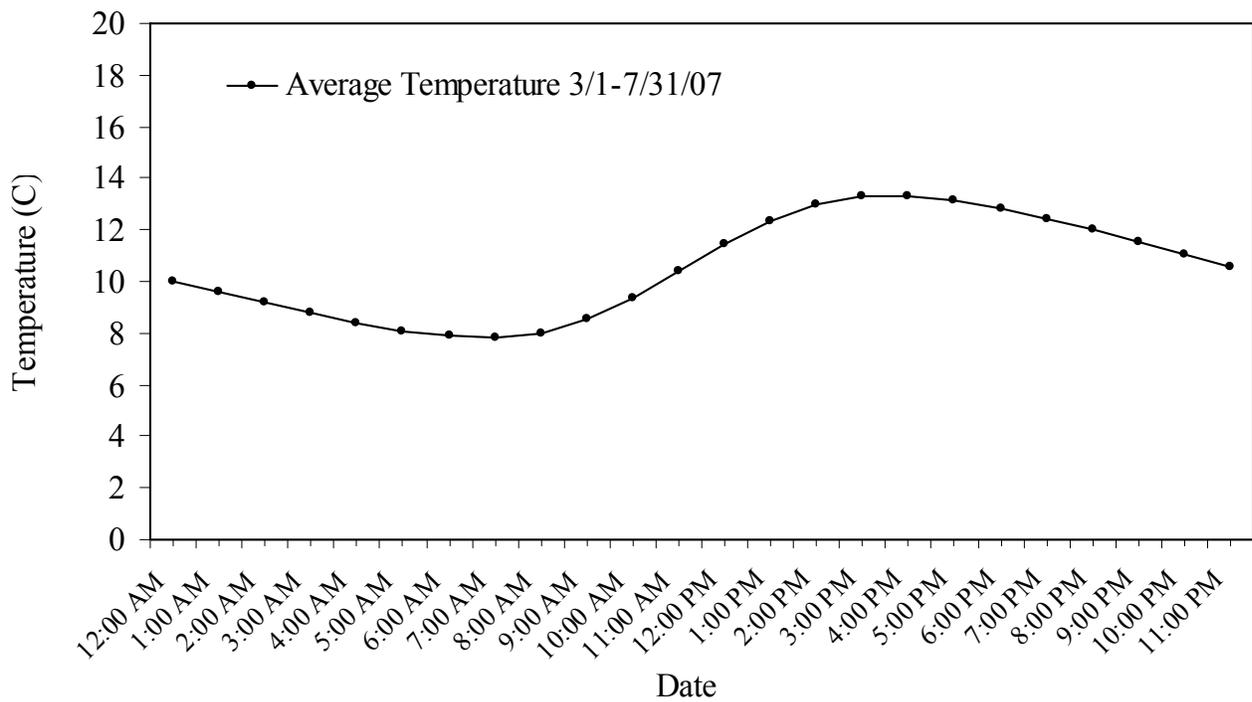


Figure 18. Average hourly water temperature at the Catherine Creek adult collection facility in 2007.

Table 6. Summer steelhead trap capture data from the Upper Grande Ronde adult collection facility in 2007. Trapping began 2 March and ended 13 July.

Week	Trap capture		Kelt	
	First time	Reruns	Not punched ^a	Punched
8-Apr	3			
15-Apr	3			
22-Apr	0			
29-Apr	18			
6-May	31	1		
13-May	4	2		1
20-May	4		1	1
27-May	0			9
3-Jun	0		1	5
	63	3	2	16

^a *These fish are kelts recovered on or near the weir that were not previously opercle punched at the weir. Punched fish were previously trapped then recovered as a kelt carcass on or near the weir.*

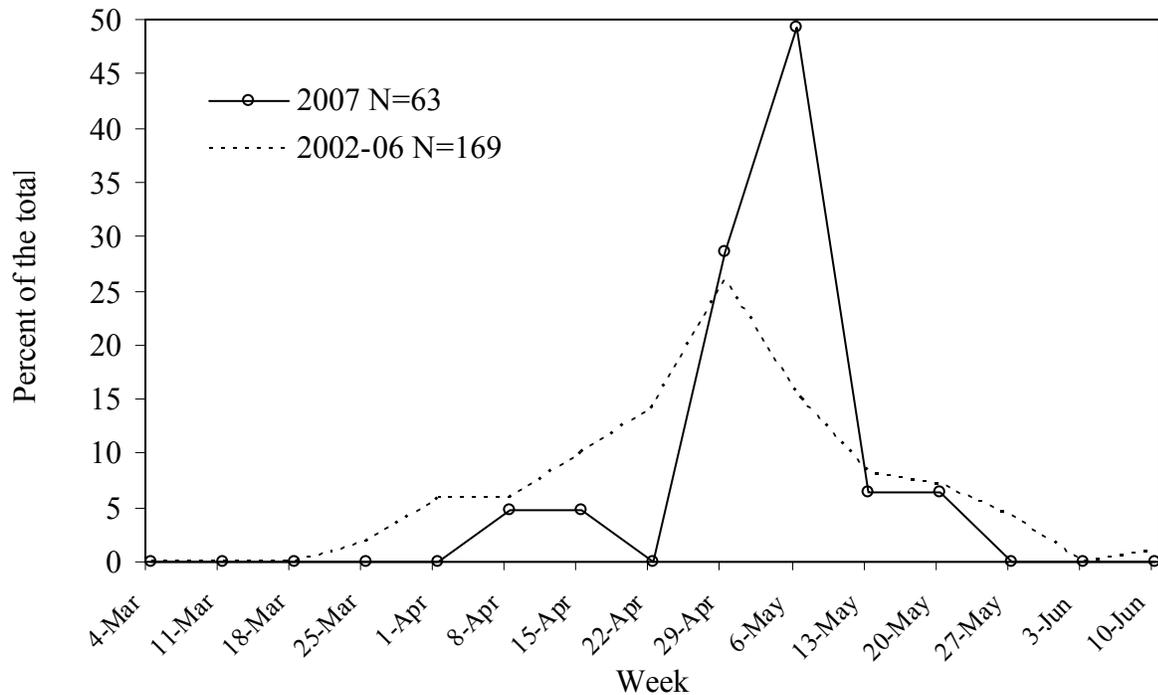


Figure 19. Summer steelhead arrival timing at the Grande Ronde adult collection facility in 2007 (rm 153.5) and mean arrival timing from 2002 to 2006 (rm 163).

Table 7. Spring Chinook salmon trap capture, transport, and mortality data for the Grande Ronde River stock at the adult collection facility in 2007. Trapping began 2 March and ended 13 July.

Week	Trap capture ^a						Broodstock hauled				Trap Mort
	Nat.	(jack)	Capt.	(jack)	Conv.	(jack)	Nat.	(jack)	Conv.	(jack)	
6-May	0		0		0						
13-May	0		0		0						
20-May	0		0		1				1		
27-May	6		0		5		2		4		1
3-Jun	15		0		20		6		20		
10-Jun	1		0		2		1		2		
17-Jun	6		0		3	2	4		3	2	
24-Jun	4		0		3	1	3		3		
1-Jul	1		0		1	2	1		1		
8-Jul	0		0		0						
15-Jul	0		0		0						
	33	0	0	0	35	5	17	0	34	2	1

^a Age 4 and 5 spring Chinook salmon (age 3 fish). Nat. = Naturally-produced, Capt. = Captive broodstock program, Conv. = Conventional broodstock program.

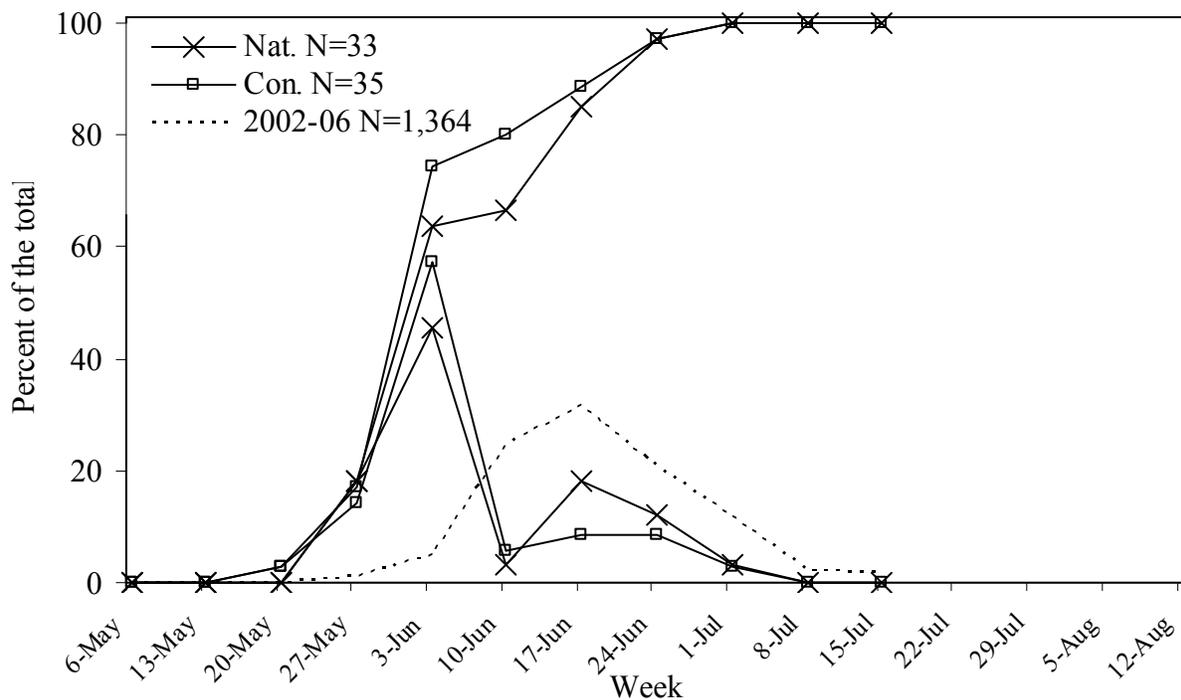


Figure 20. Arrival timing of age 4 and 5 spring Chinook salmon at the Upper Grande Ronde adult collection facility in 2007 (rm 153.5) and mean arrival timing from 2002 to 2006 (rm 163).

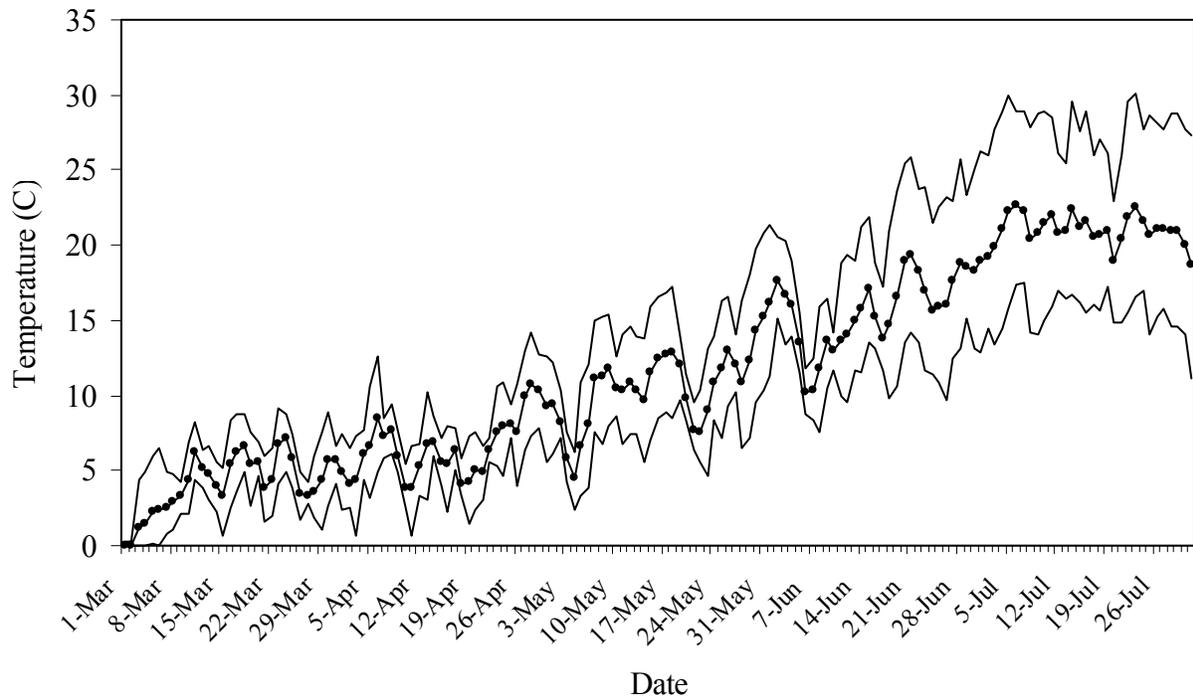


Figure 21. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Upper Grande Ronde adult collection facility in 2007.

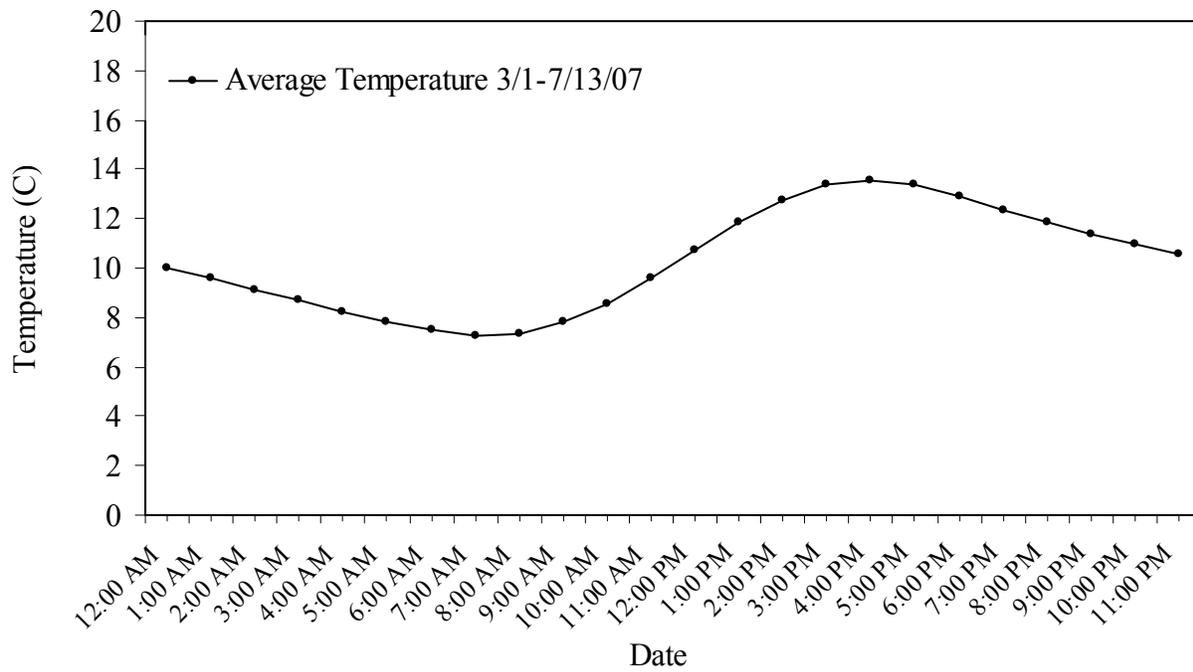


Figure 22. Average hourly water temperature at the Upper Grande Ronde adult collection facility in 2007.

Broodstock Activities

Lookingglass Hatchery

A total of 45 females and 25 males and 5 jacks were spawned from the Catherine Creek stock spring Chinook salmon at LGH in 2007 (Tables 8-10). Four males were spawned more than one time. There were a total of three mortalities (pre-spawn) at the hatchery, two females and one male. Peak spawning date at LGH occurred on 29 August 2007. Only two females had spawned prior to this date. The last spawning date was 11 September. A total of nine fish (seven adult and two jack) positively identified as Catherine Creek production (green VIE) returned to the Lookingglass Creek trap and were also used in the Catherine Creek broodstock. A Catherine Creek adult recovered at the Lostine Trap was also brought to LGH and put into Catherine Creek broodstock. All 45 females had ELISA values of 0.154 OD units or less.

A total of 31 females, 21 males, and 7 jacks were spawned from the Grande Ronde stock spring Chinook salmon at LGH in 2007 (Tables 11-13). A total of three males were used more than one time. There were a total of six pre-spawn mortalities at the hatchery, one female, four males, and one jack. One female was not used due to bad eggs. Peak spawning date at LGH occurred on 11 Sept 2007 with only seven females spawning prior to this date. A total of 21 fish (10 adults and 11 jacks) identified as likely Grande Ronde production (no fin clip with a CWT) returned to the Lookingglass Creek trap and were put into the Grande Ronde broodstock pond. The CWT from each of the swim-in female fish was read before their eggs would be used. A total of five females and 5 jacks were used in the Grande Ronde production. One of the six females was positively identified as Lookingglass Creek production and not used (transferred to appropriate stock). The CWT was lost on another female but was still used in Grande Ronde production. All 31 females spawned had ELISA values of 0.104 OD units or less.

A total of 23 females, 15 males, and 23 jacks were spawned from the Lookingglass Creek stock spring Chinook salmon at LGH in 2007 (Tables 14-16). A total of four males were used more than one time. There were a total of six pre-spawn mortalities at the hatchery, two females, three males, and three jacks. One jack was not used. Peak spawning date at LGH occurred on 6 Sept 2007 with only eight females spawning prior to this date. All 23 females had ELISA values of 0.182 OD units or less. A total of 73 fish (34 females, 33 males, and 6 jacks) were passed above the hatchery weir in 2007 to spawn naturally.

Captive Broodstock

Assistance was provided by the project for the collection of parr for the captive brood program. The goal for parr collection in the Upper Grande Ronde was achieved in 2007. Details of the collection can be obtained in Carmichael 2008. Assistance was also provided to ODFW for the spawning of the Grande Ronde Basin captive broodstocks at Bonneville Hatchery in 2007. Details of the spawning operation can be obtained in Carmichael (2008).

Table 8. Spawning information from Catherine Creek spring Chinook salmon female broodstock at Lookingglass Hatchery in 2007.

Date	Natural n=14					Hatchery n=33				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug										
22-Aug		1				1	1			
29-Aug		9					15			
6-Sep		4					9			
11-Sep		0				1	6			
17-Sep										
Totals	0	14	0	0	0	2	31	0	0	0

Table 9. Spawning information from Catherine Creek spring Chinook salmon male broodstock at Lookingglass Hatchery in 2007. (Recycled males)

Date	Natural n=14					Hatchery n= 12				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug										
22-Aug		1					1			
29-Aug		8					8			
6-Sep	1	1 (3)					2 (1)			
11-Sep		3		10			1	1	10	
17-Sep										
Totals	1	13 (3)	0	10	0	0	12 (1)	1	10	0

Table 10. Spawning information from Catherine Creek spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2007.

Date	Natural n=1					Hatchery n=4				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug										
22-Aug										
29-Aug										
6-Sep		1								
11-Sep				1			4			
17-Sep										
Totals	0	1	0	1	0	0	4	0	0	0

Table 11. Spawning information from Grande Ronde spring Chinook salmon female broodstock at Lookingglass Hatchery in 2007.

Date	Natural n=8					Hatchery n=25				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug							1			
22-Aug										
29-Aug										
6-Sep		2			1		4			
11-Sep		2					12			
17-Sep	1	2					8			
Totals	1	6	0	0	1	0	25	0	0	0

Table 12. Spawning information from Grande Ronde spring Chinook salmon male broodstock at Lookingglass Hatchery in 2007. (Recycled males)

Date	Natural n= 9					Hatchery n= 19				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1	1					1				
16-Aug							2			
22-Aug										
29-Aug										
6-Sep		3				1	3			
11-Sep		4					2			
17-Sep		1 (2)		5		1	6 (1)	3	3	3
Totals	1	8 (2)		5		3	13 (1)	3	3	3

Table 13. Spawning information from Grande Ronde spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2007.

Date	Natural n= 0					Hatchery n= 13				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1						1				
16-Aug										
22-Aug										
29-Aug										
6-Sep										
11-Sep							7			
17-Sep										5
Totals	0	0	0	0	0	1	7	0	0	5

Table 14. Spawning information from Lookingglass Creek spring Chinook salmon female broodstock at Lookingglass Hatchery in 2007.

Date	Natural n= 0					Hatchery n= 25				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1						2				
16-Aug										
22-Aug										
29-Aug							8			
6-Sep							14			
11-Sep							1			
17-Sep										
Totals	0	0	0	0	0	2	23	0	0	0

Table 15. Spawning information from Lookingglass Creek spring Chinook salmon male broodstock at Lookingglass Hatchery in 2007. (Recycled males)

Date	Natural n= 0					Hatchery n= 16				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug										
22-Aug										
29-Aug						1	8			
6-Sep							7 (4)	2		
11-Sep								1	4	
17-Sep										
Totals	0	0	0	0	0	1	15 (4)	3	4	0

Table 16. Spawning information from Lookingglass Creek spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2007.

Date	Natural n= 0					Hatchery n= 27				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/1										
16-Aug						1				
22-Aug										
29-Aug						1				
6-Sep						1	23			
11-Sep										1
17-Sep										
Totals	0	0	0	0	0	3	23	0	0	1

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APPENDIX TABLES

Appendix Table 1. Sliding Scale Management Plan for the Catherine Creek and Upper Grande Ronde Spring Chinook Artificial Propagation Program.

Estimated total adult escapement to the Catherine Creek mouth (hatchery plus natural) ^a	Ratio of hatchery to natural adults at the mouth	Maximum % of natural adults to retain for broodstock	% of conventional hatchery adults to retain for broodstock ^b	% of adults released above the weir that can be of hatchery origin	Minimum % of broodstock of natural origin	% Strays allowed above the weir ^c
UGR	Any	Up to 50	Up to 100	Up to 100	^d	≤5
CC						
<250	Any	40	40	^d	^d	≤5
251-500	Any	20	20	≤70	≥20	≤5
>500	Any	≤20	d	≤50	≥30	≤5

a Pre-season estimate of total escapement
b Conventional hatchery adults only, all captive brood adults released to spawn naturally or outplanted
c For hatchery adults originating from different gene conservation groups (Rapid River stock or strays from outside the Grande Ronde basin)
d Not decision factor at this level of escapement, percentage determined by other criteria
e Not to exceed 130,000 smolt production initially

Appendix Table 2. Group, number, size, and receive and release dates of fish acclimated at Catherine Creek and the Upper Grande Ronde facilities.

Facility/ rel. yr	Group ^a	Number received	Size fish/lb.	Density lbs/f t ³	Acclimation period	Volitional began	Number released
CC 00	Single	37,902	23.6	0.20	2/28-4/18	4/2	37,873
CC 01	Single	137,816	19.6	0.85	3/8-4/16	4/2	136,902
CC 02	Single	180,912	17.4	1.26	2/26-4/15	4/2	180,343
CC 03	Early	105,352	12.8	1.00	3/7-3/23	3/13	105,313
CC 03	Late	24,404	12.6	0.47	3/24-4/14	3/31	24,392
CC 04	Early	92,475	23.1	0.49	3/8-3/22	3/15	92,413
CC 04	Late	70,977	23.4	0.37	3/24-4/12	3/30	70,959
CC 05	Early	130,748	24.0	0.67	3/7-3/27	3/14	130,544
CC 05	Late	59,100	21.8	0.66	3/28-4/7	3/4	59,036
CC 06	Single	68,894	28.6	0.39	3/13-4/12	3/27	68,820
GR 00	Single	1,512	19.4	0.04	2/28-3/14	(none)	1,508
GR 01	Single	2,570	13.9	0.09	2/27-3/27	(none)	2,544
GR 02	Single	201,958	18.4	1.33	2/27-4/15	4/2	151,444
GR 03	Early	110,169	14.2	1.14	3/10-3/23	3/17	110,114
GR 03	Late	127,631	13.6	0.94	3/24-4/14	3/30	127,446
GR 04	Early	78,930	20.3	0.48	3/9-3/22	3/15	78,716
GR 04	Late	70,098	22.4	0.50	3/25-4/12	3/31	70,088
GR 05	Single	105,418	21.0	0.61	3/8-3/14	None	105,369
GR 06	Single	18,986	29.3	0.16	3/13-4/12	3/27	18,977

^a Single= one acclimation period. Early=1st of 2 groups. Late= 2nd of 2 groups.

Appendix Table 3. Group, feed fed, mortality, temperature, dissolved oxygen, and estimated volitional migration of fish acclimated at Catherine Creek and the Upper Grande Ronde facilities.

Facility/ rel. yr	Group ^a	Feed fed	Total mortality (%)	Temp.°C		DO mg/l		Volitional	
				Min.	Max.	Min.	Max.	migration	%
CC 00	Single	474	29 (0.1)	0.2	9.3	8.2	14.4	6,842	18.0
CC 01	Single	1,296	914 (0.7)	0.5	9.6	8.9	13.9	^b	
CC 02	Single	1,968	569 (0.3)	0.0	10.5	7.0	13.3	68,948	38.1
CC 03	Early	345	39 (0.04)	1.1	6.2	10.3	12.2	25,092	23.8
CC 03	Late	73	12 (0.05)	0.7	8.2	9.7	12.6	16,218	66.4
CC 04	Early	179	62 (0.07)	1.8	7.9	10.5	11.7	8,785	9.5
CC 04	Late	115	18 (0.03)	2.1	8.2	10.5	12.4	49,147	69.2
CC 05	Early	209	204 (0.16)	0.1	5.8	9.6	15.4	29,402	22.5
CC 05	Late	60	64 (0.11)	0.6	8.7	8.9	12.7	None	
CC 06	Single	197	74 (0.11)	0.2	7.6	9.0	11.4	28,311	41.1
GR 00	Single	1	4 (0.3)	-0.5	2.7	-	-	(none)	
GR 01	Single	8	26 (1.0)	-0.7	3.8	8.7	12.1	(none)	
GR 02	Single	568	50,514 (25.0)	0.0	3.5	9.2	12.7	68,200	44.9
GR 03	Early	24	55 (0.05)	0.0	4.4	10.0	11.9	31,900	30.0
GR 03	Late	200	185 (0.14)	0.0	6.6	9.0	11.9	37,900	29.7
GR 04	Early	58	214 (0.27)	-0.1	5.9	11.3	14.7	12,889	16.3
GR 04	Late	79	10 (0.01)	-0.1	7.1	10.6	12.3	34,085	48.6
GR 05	Single	10	49 (0.05)	-0.1	3.4	10.3	11.9	None	
GR 06	Single	2.7	9 (0.05)	-0.7	4.5	10.3	12.3	10,461	55.1

^a Single= one acclimation period. Early=1st of 2 groups. Late= 2nd of 2 groups.

^b Problems with PIT tag readers made it impossible to estimate accurately the number of PIT tagged fish leaving volitionally or during forceout from the Catherine Creek facility. Actual PIT tags detected during the volitional release period were 290; tags detected during the forceout were 6,862.

Appendix Table 4. Release and return summary for spring Chinook salmon from the upper Grande Ronde River^a.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped			SAR
					3	4	5	
1998	Acc.	Smolt	Captive	1,508	0	3	0	0.20
1999	Acc.	Smolt	Captive	2,544	1	4	4	0.35
2000	Acc.	Smolt	Captive	151,444	35	321	15	0.24
2000	River	Parr	Captive	75,636	2	51	2	0.07
2001	Acc.	Smolt	Captive	210,637	48	180	7	0.11
2001	Acc.	Smolt	Conventional	26,923	9	60	0	0.26
2001	River	Parr	Captive	32,800	0	0	0	0.00
2002	Acc.	Smolt	Captive	78,716	0	1	0	0.00
2002	Acc.	Smolt	Conventional	70,088	6	140	9	0.22
2003	Acc.	Smolt	Captive	1,022	0	0		
2003	Acc.	Smolt	Conventional	104,349	1	26 ^b		
2004	Acc.	Smolt	Captive	76	0			
2004	Acc.	Smolt	Conventional	18,901	23 ^b			
2005	Acc.	Smolt	Captive	20,620				
2005	Acc.	Smolt	Conventional	118,803				

a Age structure calculated using length data. Adult returns are actual numbers trapped at the weir. When life stage release from the same broodyear could not be determined at the trap (similar marks), CWT data was used to divide the returns by group.

b Two of the 26 fish were recovered just below the weir. Thirteen of the 23 jacks were recovered just below the weir.

Appendix Table 5. Release and return summary for spring Chinook salmon from Catherine Creek^a.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped			SAR
					3	4	5	
1998	Acc.	Smolt	Captive	37,873	29	132	54	0.57
1999	Acc.	Smolt	Captive	136,902	10	181	19	0.15
2000	Acc.	Smolt	Captive	180,343	70	564	24	0.36
2001	Acc.	Smolt	Captive	105,313	30	84	3	0.11
2001	Acc.	Smolt	Conventional	24,392	22	28	2	0.21
2002	Acc.	Smolt	Captive	92,413	19	118	15	0.16
2002	Acc.	Smolt	Conventional	70,959	11	59	4	0.10
2003	Acc.	Smolt	Captive	68,827	0	63		
2003	Acc.	Smolt	Conventional	120,753	7	55		
2004	Acc.	Smolt	Captive	45,604	24			
2004	Acc.	Smolt	Conventional	23,216	4			
2005	Acc.	Smolt	Captive	21,572				
2005	Acc.	Smolt	Conventional	49,696				

a Age structure calculated using length data. Adult returns are actual numbers trapped at the weir.

Appendix Table 6. Release and return summary for spring Chinook salmon from Lookingglass Creek^a.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped			SAR
					3	4	5	
2000	LGC	Parr	Captive	51,864	2	35	1	0.07
2001	LGC	Parr	Captive	17,880	10	21	1	0.18
2002	Hat.	Smolt	Captive	53,195	7	40	10	0.11
2003	Hat.	Smolt	Captive	98,023	22	97		
2004	Hat.	Smolt	Cap/Conv	113,418	57			
2005	Hat.	Smolt	Cap/Conv	0				

a Age structure calculated using length data. Adult returns are actual numbers trapped at the weir. Trap operated by ODFW Lookingglass Hatchery.

Appendix Table 7. Adult trapping, broodstock and redd counts for spring Chinook salmon from the upper Grande Ronde River (does not include jack salmon).

Year	Adults captured			Passed above	Est. above	Redds		Adult broodstock taken		
	Nat.	Capt.	Conven.			Above	Below	Nat.	Capt.	Conven.
1997	9	--	--	9	--	22	6	0	0	0
1998	33	--	--	39	88	35	2	0	0	0
1999	1	--	--	1	--	0	0	0	0	0
2000	17	--	--	15	30	8	12	0	0	0
2001	38	--	--	29	29	7	8	21	0	0
2002	101	3	--	54	54	19	2	48	0	0
2003	119	4	--	63	95	24	19	71	0	0
2004	28	376	--	386	453	134	51	15	0	0
2005	14	197	60	204	205	52	38	7	0	59
2006	51	8	140	50	51	14	4	26	0	123
2007	33	0	35	16	16	1	0	17	0	34

Appendix Table 8. Adult trapping, broodstock and redd counts for spring Chinook salmon from Catherine Creek (does not include jack salmon).

Year	Adults captured			Passed above	Est. above	Redds		Adult broodstock taken		
	Nat.	Capt.	Conven.			Above	Below	Nat.	Capt.	Conven.
1997	2	--	--	2	--	40	6	0	0	0
1998	28	--	--	28	85	34	0	0	0	0
1999	16	--	--	16	58	38	2	0	0	0
2000	22	--	--	22	45	26	8	0	0	0
2001	78	--	--	57	459	131	2	21	0	0
2002	161	132	--	247	413	156	2	35	0	0
2003	248	235	--	431	474	165	2	50	0	0
2004	83	575	--	190	209	94	2	16	0	0
2005	56	108	28	131	155	72	2	10	0	20
2006	103	120	62	221	266	115	2	20	0	43
2007	70	78	59	142	159	57	2	28	0	37

Appendix Table 9. Adult trapping, broodstock and redd counts for spring Chinook salmon from Lookingglass Creek (does not include jack salmon)(Trap operated by ODFW Lookingglass Hatchery).

Year	Adults captured			Passed above	Est. above	Redds		Adult broodstock taken	
	Nat.	Hat.	Stray			Above	Below	Nat.	Hat.
2004	73	37	0	100	100	49	49	0	136
2005	24	26	5	45	43	29	10	0	0
2006	10	41	17	41	44	28	28	0	0
2007	13	108	17	66	66	32	21	0	41

Appendix Table 10. Daily summer steelhead trapping data from the Catherine Creek adult collection facility in 2007.

DATE	TOTAL	Trapped		Sacrifice/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
12-Mar	2	0	2	0	0	0	0
13-Mar	3	0	3	0	0	0	0
14-Mar	10	0	10	0	0	0	0
16-Mar	3	0	3	0	0	0	0
19-Mar	17	0	17	0	0	0	0
21-Mar	6	0	6	0	0	0	0
23-Mar	3	0	3	0	0	0	0
26-Mar	12	0	12	0	0	0	0
28-Mar	1	0	1	0	0	0	0
MAR	57	0	57	0	0	0	0
6-Apr	2	0	2	0	0	0	0
9-Apr	24	0	24	0	0	0	1
11-Apr	1	0	1	0	0	0	0
16-Apr	8	0	8	0	0	0	0
18-Apr	3	0	3	0	0	0	0
20-Apr	0	0	0	0	0	0	0
23-Apr	3	0	3	0	0	0	0
25-Apr	12	0	12	0	0	2	0
27-Apr	6	0	6	0	0	0	0
30-Apr	6	0	6	0	0	0	0
APR	65	0	65	0	0	2	1
2-May	3	0	3	0	0	0	0
4-May	1	0	1	0	0	0	0
9-May	2	0	2	0	0	0	0
10-May	0	0	0	0	0	0	0
13-May	0	0	0	0	0	0	0
14-May	0	0	0	0	0	0	0
15-May	0	0	0	0	0	0	0
16-May	0	0	0	0	0	0	0
17-May	0	0	0	0	0	0	0
18-May	0	0	0	0	0	0	0
19-May	0	0	0	0	0	0	0
28-May	0	0	0	0	0	0	0
MAY	6	0	6	0	0	0	0
4-Jun	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0
12-Jul	0	0	0	0	0	0	0
17-Jul	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0
Total	128	0	128	0	0	2	1

Appendix Table 11. Daily spring Chinook salmon trapping data from the Catherine Creek adult collection facility in 2007.

Date	Total	Trapped				Sacrificed/mortality				Brood collected			
		Adults		Jacks		Adults		Jacks		Adults		Jacks	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
14-May	1	0	1	0	0	0	0	0	0	0	0	0	0
21-May	3	2	1	0	0	0	0	0	0	0	0	0	0
23-May	1	1	0	0	0	0	0	0	0	0	0	0	0
29-May	1	0	1	0	0	0	0	0	0	0	0	0	0
30-May	3	2	1	0	0	0	0	0	0	0	0	0	0
MAY	9	5	4	0	0	0	0	0	0	0	0	0	0
1-Jun	5	3	2	0	0	0	0	0	0	0	0	0	0
3-Jun	118	71	40	4	3	0	0	2	0	15	18	1	0
5-Jun	3	3	0	0	0	0	0	0	0	0	0	0	0
6-Jun	9	5	3	1	0	0	0	1	0	2	0	0	0
7-Jun	1	0	0	1	0	0	0	1	0	0	0	0	0
8-Jun	6	5	0	1	0	0	0	1	0	2	0	0	0
11-Jun	8	2	2	4	0	0	0	4	0	1	1	0	0
12-Jun	5	2	1	0	2	0	0	0	0	1	0	0	1
13-Jun	8	5	2	1	0	0	0	1	0	1	1	0	0
15-Jun	20	11	7	2	0	0	0	2	0	3	3	0	0
17-Jun	19	9	2	7	1	0	0	7	0	4	0	0	0
18-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jun	8	6	0	2	0	0	0	2	0	4	0	0	0
20-Jun	6	2	2	2	0	0	0	2	0	1	1	0	0
22-Jun	13	6	4	2	1	0	0	1	0	5	3	1	0
25-Jun	3	1	1	1	0	0	0	1	0	0	0	0	0
JUN	232	131	66	28	7	0	0	25	0	39	27	2	1
3-Jul	1	1	0	0	0	0	0	0	0	0	0	0	0
JUL	1	1	0	0	0	0	0	0	0	0	0	0	0
3-Sep	1	1	0	0	0	0	0	0	0	0	0	0	0
SEP	1	1	0	0	0	0	0	0	0	0	0	0	0
Total	243	138	70	28	7	0	0	25	0	39	27	2	1

Appendix Table 12. Daily summer steelhead trapping data from the Upper Grande Ronde adult collection facility in 2007.

Date	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
4-Apr	1	0	1	0	0	0	0
6-Apr	2	0	2	0	0	0	0
9-Apr	3	0	3	0	0	0	0
25-Apr	5	0	5	0	0	0	0
27-Apr	13	0	13	0	0	0	0
30-Apr	24	0	24	0	0	0	0
APR	48	0	48	0	0	0	0
2-May	7	0	7	0	0	0	0
4-May	0	0	0	0	0	0	1
7-May	1	0	1	0	0	0	0
9-May	0	0	0	0	0	0	1
11-May	3	0	3	0	0	0	1
14-May	2	0	2	0	0	0	0
16-May	0	0	0	0	0	0	0
18-May	2	0	2	0	0	0	0
21-May	0	0	0	0	0	0	0
27-May	0	0	0	0	0	0	0
29-May	0	0	0	0	0	0	0
30-May	0	0	0	0	0	0	0
MAY	15	0	15	0	0	0	3
1-Jun	0	0	0	0	0	0	0
3-Jun	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0
Total	63	0	63	0	0	0	3

Appendix Table 13. Daily spring Chinook salmon trapping data from the Upper Grande Ronde adult collection facility in 2007.

Date	Total	Trapped				Sacrificed/mortality				Brood collected			
		Adults		Jacks		Adults		Jacks		Adults		Jacks	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
18-May	1	1	0	0	0	0	0	0	0	1	0	0	0
21-May	1	0	1	0	0	0	0	0	0	0	0	0	0
23-May	1	0	1	0	0	0	0	0	0	0	0	0	0
25-May	1	1	0	0	0	0	0	0	0	1	0	0	0
27-May	8	4	4	0	0	1	0	0	0	3	2	0	0
28-May	0	0	0	0	0	0	0	0	0	0	0	0	0
29-May	7	4	3	0	0	0	0	0	0	4	1	0	0
30-May	3	2	1	0	0	0	0	0	0	2	1	0	0
MAY	22	12	10	0	0	1	0	0	0	11	4	0	0
1-Jun	12	5	7	0	0	0	0	0	0	5	3	0	0
3-Jun	13	9	4	0	0	0	0	0	0	9	1	0	0
4-Jun	1	0	1	0	0	0	0	0	0	0	1	0	0
6-Jun	1	1	0	0	0	0	0	0	0	1	0	0	0
8-Jun	1	1	0	0	0	0	0	0	0	1	0	0	0
11-Jun	1	0	1	0	0	0	0	0	0	0	1	0	0
13-Jun	6	3	1	2	0	0	0	0	0	3	0	2	0
15-Jun	4	0	4	0	0	0	0	0	0	0	3	0	0
18-Jun	3	0	3	0	0	0	0	0	0	0	2	0	0
20-Jun	4	3	1	0	0	0	0	0	0	3	1	0	0
22-Jun	1	0	0	1	0	0	0	0	0	0	0	0	0
25-Jun	3	1	0	2	0	0	0	0	0	1	0	0	0
27-Jun	1	0	1	0	0	0	0	0	0	0	1	0	0
JUN	51	23	23	5	0	0	0	0	0	23	13	2	0
5-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
JUL	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0
SEP	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	73	35	33	5	0	1	0	0	0	34	17	2	0

Appendix Table 14. Daily summer steelhead trapping data from the Lookingglass Creek adult collection facility in 2007.

Date	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
2-Apr	14	0	14	0	0	0	0
9-Apr	18	0	18	0	0	0	3
11-Apr	4	0	4	0	0	0	0
16-Apr	13	0	13	0	0	0	0
18-Apr	5	0	5	0	0	0	1
20-Apr	2	0	2	0	0	0	1
23-Apr	2	0	2	0	0	0	1
25-Apr	15	0	15	0	0	0	0
27-Apr	5	0	5	0	0	0	0
30-Apr	11	0	11	0	0	0	2
APR	89	0	89	0	0	0	8
2-May	11	0	11	0	0	0	1
4-May	3	0	3	0	0	0	1
7-May	5	0	5	0	0	0	0
9-May	11	0	11	0	0	0	2
11-May	4	0	4	0	0	0	1
14-May	3	0	3	0	0	0	2
17-May	2	0	2	0	0	0	0
21-May	1	0	1	0	0	0	0
25-May	2	0	2	0	0	0	0
28-May	1	0	1	0	0	0	0
MAY	43	0	43	0	0	0	7
Total	132	0	132	0	0	0	15

Appendix Table 15. Daily spring Chinook salmon trapping data from the Lookingglass Creek adult collection facility in 2007.

Date	Total	Trapped				Sacrificed/mortality				Brood collected			
		Adults		Jacks		Adults		Jacks		Adults		Jacks	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
14-May	1	1	0	0	0	0	0	0	0	1	0	0	0
17-May	1	1	0	0	0	0	0	0	0	1	0	0	0
21-May	9	9	0	0	0	0	0	0	0	8	0	0	0
25-May	9	9	0	0	0	0	0	0	0	9	0	0	0
28-May	22	21	1	0	0	0	1	0	0	18	0	0	0
30-May	4	4	0	0	0	0	0	0	0	4	0	0	0
MAY	46	45	1	0	0	0	1	0	0	41	0	0	0
1-Jun	10	5	1	4	0	0	1	0	0	3	0	3	0
3-Jun	24	15	2	5	2	0	2	0	0	13	0	3	2
5-Jun	12	3	0	9	0	0	0	0	0	3	0	9	0
8-Jun	8	1	0	7	0	0	0	0	0	1	0	6	0
11-Jun	25	14	3	6	2	0	3	4	0	11	0	0	2
13-Jun	13	8	1	4	0	0	1	3	0	8	0	0	0
15-Jun	6	2	1	3	0	0	1	3	0	2	0	0	0
18-Jun	17	7	2	8	0	0	2	7	0	4	0	0	0
20-Jun	17	5	0	12	0	0	0	8	0	5	0	0	0
22-Jun	10	4	0	6	0	0	0	4	0	3	0	0	0
27-Jun	3	1	0	1	1	0	0	1	0	1	0	0	1
JUN	145	65	10	65	5	0	10	30	0	54	0	21	5
2-Jul	3	0	0	2	1	0	0	2	0	0	0	0	1
5-Jul	1	0	0	1	0	0	0	0	0	0	0	0	0
7-Jul	1	1	0	0	0	0	0	0	0	1	0	0	0
9-Jul	1	1	0	0	0	0	0	0	0	1	0	0	0
JUL	6	2	0	3	1	0	0	2	0	2	0	0	1
1-Aug	0	0	0	0	0	0	0	0	0	-66	0	0	-6
6-Aug	1	0	0	1	0	0	0	0	0	0	0	1	0
13-Aug	1	1	0	0	0	0	0	0	0	0	0	0	0
16-Aug	1	1	0	0	0	0	0	0	0	1	0	0	0
18-Aug	1	1	0	0	0	0	0	0	0	1	0	0	0
20-Aug	1	1	0	0	0	0	0	0	0	1	0	0	0
22-Aug	2	2	0	0	0	0	0	0	0	2	0	0	0
24-Aug	5	2	1	2	0	0	1	0	0	1	0	2	0
27-Aug	1	0	1	0	0	0	1	0	0	0	0	0	0
30-Aug	1	1	0	0	0	0	0	0	0	1	0	0	0
AUG	14	9	2	3	0	0	2	0	0	-59	0	3	-6
3-Sep	6	4	0	1	1	0	0	0	0	2	0	1	1
SEP	6	4	0	1	1	0	0	0	0	2	0	1	1
Total	217	125	13	72	7	0	13	32	0	40	0	25	1

Appendix Table 16. Adult summer steelhead trapping summary from the Catherine Creek adult collection facility in 1997-2006.

Year	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	17	7	10	1	1	0	0
2001	203	50	153	50	0	0	0
2002	267	1	266	1	0	0	5
2003	226	2	224	2	1	0	2
2004	181	0	181	0	0	0	7
2005	191	1	190	1	0	0	6
2006	171	0	171	0	0	0	4

Appendix Table 17. Adult summer steelhead trapping summary from the Upper Grande Ronde River adult collection facility in 1997-2006.

Year	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	11	0	11	0	0	0	0
2002	37	0	37	0	0	0	0
2003	56	0	56	0	0	0	1
2004	63	0	63	0	0	0	8
2005	41	0	41	0	0	0	0
2006	0	0	0	0	0	0	0

Appendix Table 18. Adult summer steelhead trapping summary from the Lookingglass Creek adult collection facility in 1997-2006.

Year	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
1997	10	1	9	0	0	0	0
1998	15	4	11	0	0	0	0
1999	40	0	40	0	0	0	0
2000	11	0	11	0	0	0	0
2001	114	1	113	0	0	0	2
2002	260	2	258	2	0	1	42
2003	165	0	165	0	0	0	14
2004	135	3	132	3	0	0	14
2005	206	5	201	5	1	0	20
2006	196	3	193	3	0	0	19