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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 2008. A total of 116,967 smolts were delivered from Lookingglass Hatchery (LGH) to the acclimation facility on 10 March. This group contained progeny of only the conventional broodstock program. The size of the fish at delivery was 19.9 fish/lb. Volitional releases began 24 March 2008 with an estimated total of 41,134 fish leaving the raceways. This was 35.2% of the total fish released. Fish remaining in the raceways after volitional release were forced out on 14 April. The size of the fish just before the volitional release was 21.5 fish/lb. and the size of the fish remaining just before the forced release was 17.9 fish/lb. The total mortality for the acclimation period was 85 (0.07 %). The total number of fish released from the acclimation facility was 116,882.

There were two planned acclimation periods at the Upper Grande Ronde Acclimation Facility (UGRAF) in 2008. A total of 127,552 smolts were delivered from LGH to the facility on 11 March for the early acclimation period. This group was comprised entirely of progeny from the conventional broodstock program. The size of the fish at delivery was 21.8 fish/lb. Volitional releases began 17 March 2008 with an estimated total of 29,065 fish leaving the raceways. This was 22.8% of the total fish released. Fish remaining in the raceways after volitional release were forced out on 24 March. The size of the fish remaining just before the forced release was 22.0 fish/lb. There were 61 mortalities for the acclimation period. The total number of fish released during the early acclimation period was 127,491.

A total of 132,501 smolts were delivered from LGH to the acclimation facility on 25 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 20.9 fish/lb. Volitional releases began 7 April 2008 with an estimated total of 10,880 fish leaving the raceways. This was 8.2% of the total fish released. Fish remaining in the raceways after volitional release were forced out on 14 April. 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 60. The total number of fish released during the late acclimation period was 132,441.

The Catherine Creek Adult Capture Facility (CCACF) was put into operation on 3 March 2008. The first adult summer steelhead was captured on 14 March. A total of 121 adult summer steelhead were trapped and released from 14 March to 28 May 2008. Peak arrival at the trap was the week of 15 April. The first adult spring Chinook salmon was captured at CCACF on 27 May 2008. A total of 345 spring Chinook salmon were trapped from 27 May to 2 September 2008. The catch was comprised of 90 adults and 5 jacks of natural origin, 110 adults and 4 jacks from captive broodstock, and 37 adults and 99 jacks from conventional broodstock. Peak arrival for adults at the trap was the week of 24 June for the natural and captive groups and 1 July for the conventional group.

Broodstock were collected systematically at CCACF over the entire return from 16 June to 17 July 2008. There were 51 adults and 4 jacks collected for brood in Catherine Creek. The broodstock was comprised of 18 unmarked and 33 conventional adults and 4 conventional jacks. No captive broodstock returns were collected for broodstock.

Two spawning surveys were conducted below the weir on Catherine Creek beginning 17 June 2008. During these surveys no dead and two live fish were observed. The trap was removed from Catherine Creek on 9 September 2008.

The Upper Grande Ronde Adult Collection Facility (UGRACF) was moved ten miles downstream after the 2006 trapping season. This is the second season of trapping at the new location. The UGRACF was put into operation on 5 March 2008. The first adult summer steelhead was captured on 12 March. A total of 31 unmarked adult summer steelhead were trapped and released from 12 March to 5 May 2008. Peak arrival at the trap was the week of 29 April. The first adult spring Chinook salmon was captured at UGRACF on 23 June 2008. A total of 133 spring Chinook salmon were trapped from 23 June to 21 July 2008. The catch was comprised of 17 adults and 4 jacks of natural origin, 5 jacks from captive broodstock, and 9 adults and 98 jacks from conventional broodstock. Peak arrival at the trap for unmarked and marked fish was 8 July.

Broodstock were collected systematically at UGRACF over the entire return from 23 June to 21 July 2008. There were 18 adults and 3 jacks collected for brood from the upper Grande Ronde River. The broodstock was comprised of 9 unmarked and 9 conventional adults and 3 conventional jacks. No captive broodstock returns were retained for broodstock.

On the Upper Grande Ronde River two surveys were conducted from the weir to one mile below the weir on 17 and 24 July 2008. During the surveys no fish were observed. The trap was removed from the Upper Grande Ronde River on 9 September 2008.

In 2008, a total of 32 females, 21 males, and 4 jacks were spawned from the Catherine Creek stock spring Chinook salmon at LGH. A total of 12 females, 10 males, and 3 jacks from the Grande Ronde stock were spawned. A total of 76 females, 69 males, and 6 jacks from the Lookingglass Creek stock were spawned. Peak spawning date for all three stocks occurred on 3 September. In addition, a total of 188 fish (101 females, 78 males, and 9 jacks) were passed above the Lookingglass Hatchery weir to spawn naturally.

CTUIR assisted the captive broodstock program with the transfer of 150 Grande Ronde stock fry from Lookingglass Hatchery to Wallowa Hatchery. The collection goal of 150 natural parr from the Grande Ronde River was not achieved in 2008 due to low redd numbers in 2007 so fry from the conventional program were substituted. CTUIR also assisted with the spawning of the captive broodstocks (Catherine Creek, Upper Grande Ronde, and Lostine River) at Bonneville Hatchery in 2008.

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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 in the Grande Ronde and Imnaha rivers in Northeast 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 (GRESCSSP) in order to prevent extinction and preserve options for use of endemic fish stocks in future artificial propagation programs. The GRESCSSP was implemented in three Grande Ronde River basin tributaries; the Lostine River, the upper Grande Ronde River, and Catherine Creek. The GRESCSSP 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 GRESCSSP 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 LSRCP 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 Wallowa 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 ft^3). 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/ft^3. Maximum flow design for the facilities is 625 gpm/raceway. Either one or two acclimation periods are conducted based on the total number of fish produced and/or broodstock groups for that particular year. The proposed acclimation period runs from the mid-March to mid-April. If two acclimation periods are needed, then the period is split in half with the first group released at the end of March. This time period is chosen to mimic the spring outmigration timing for natural smolts in the system.

Fish are transported to the facilities from LGH by ODFW in tanker trucks. The fish are fed three days per week only when water temperatures are above 3^oC at a rate ranging from 0.2 to 2.4 % body weight per day (BWD) depending on the water temperature during the acclimation period (Bio-Oregon feed rate guidelines, November 2006). 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.

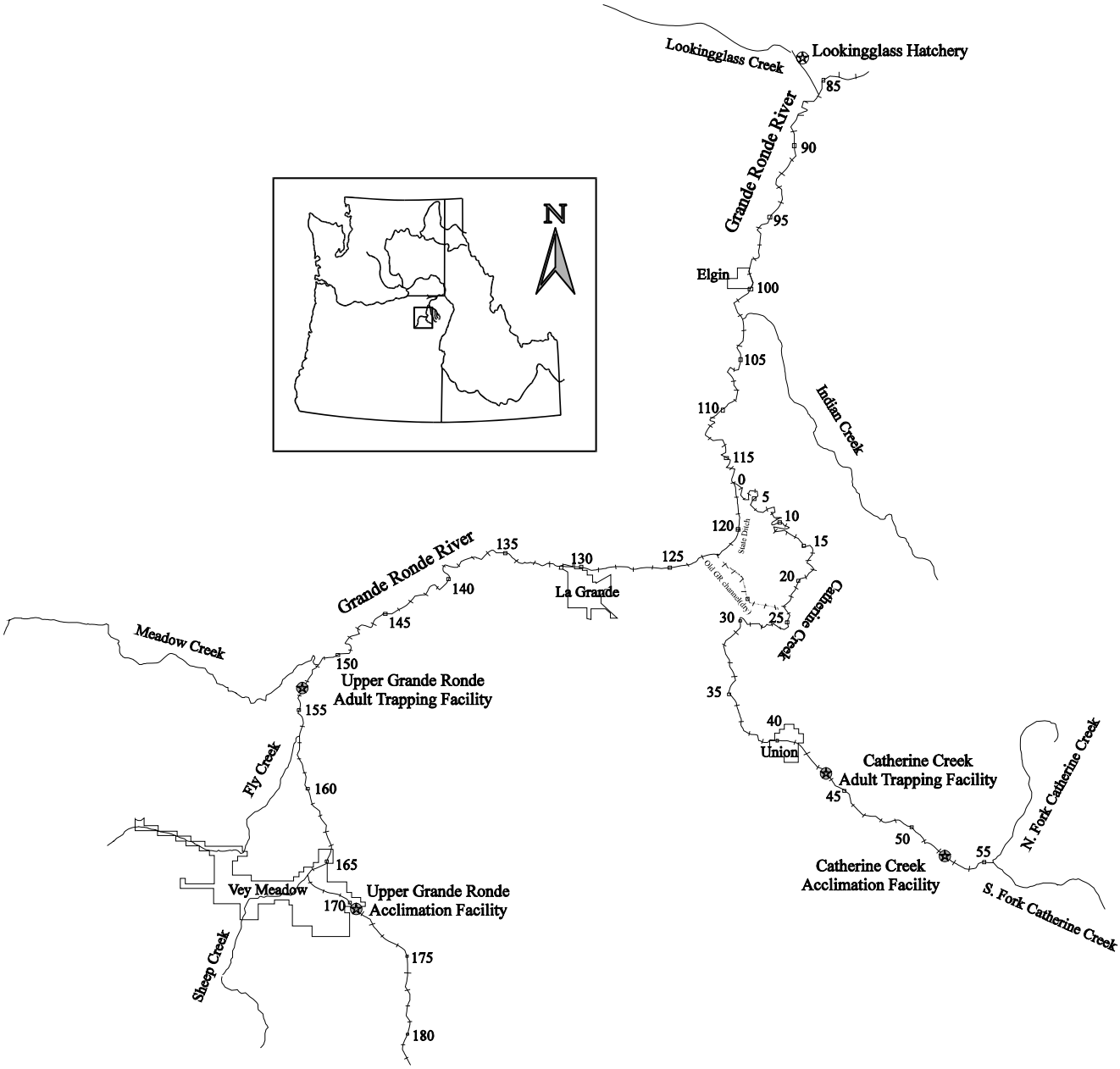

Figure 1. Map of the upper Grande Ronde River basin showing locations (rm) of Lookingglass Hatchery and Catherine Creek and Upper Grande Ronde juvenile acclimation and adult capture facilities.

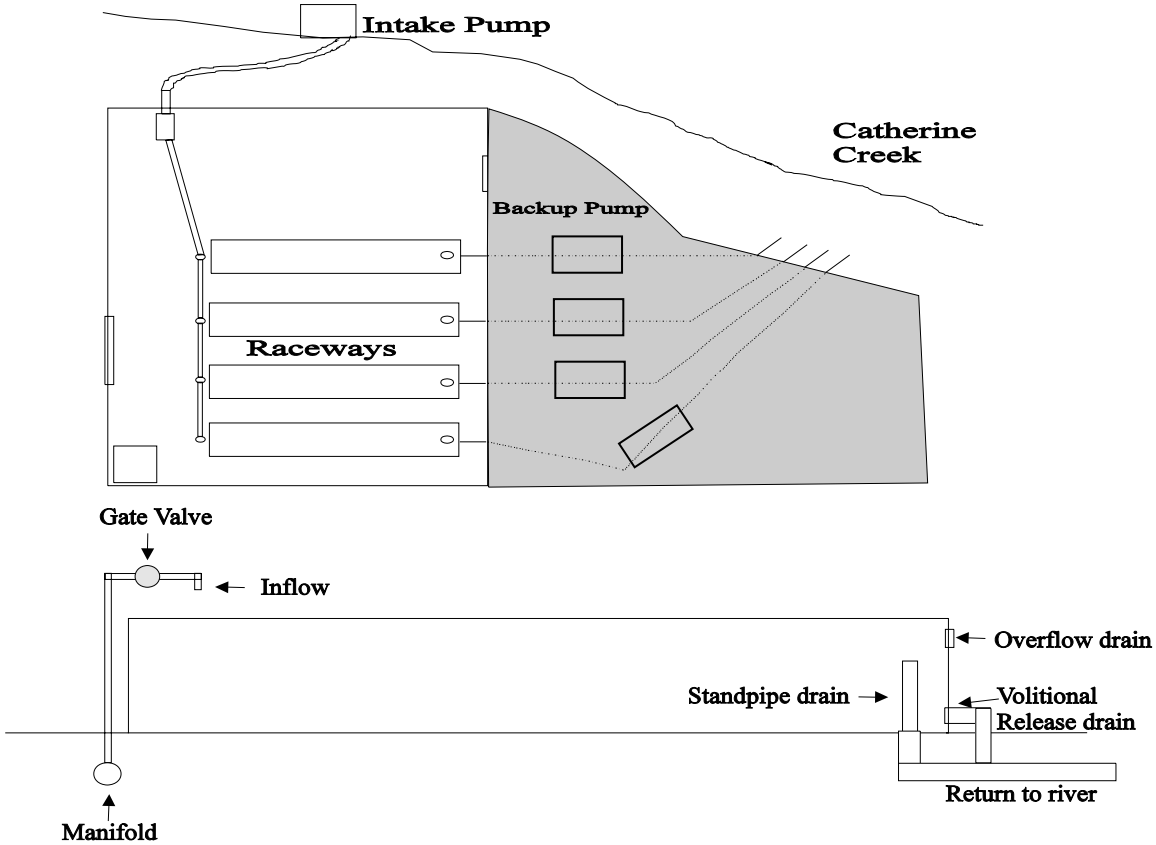

Figure 2. Photo and diagram of the Catherine Creek acclimation facility. PIT tag reader boxes in the shaded area are underground.

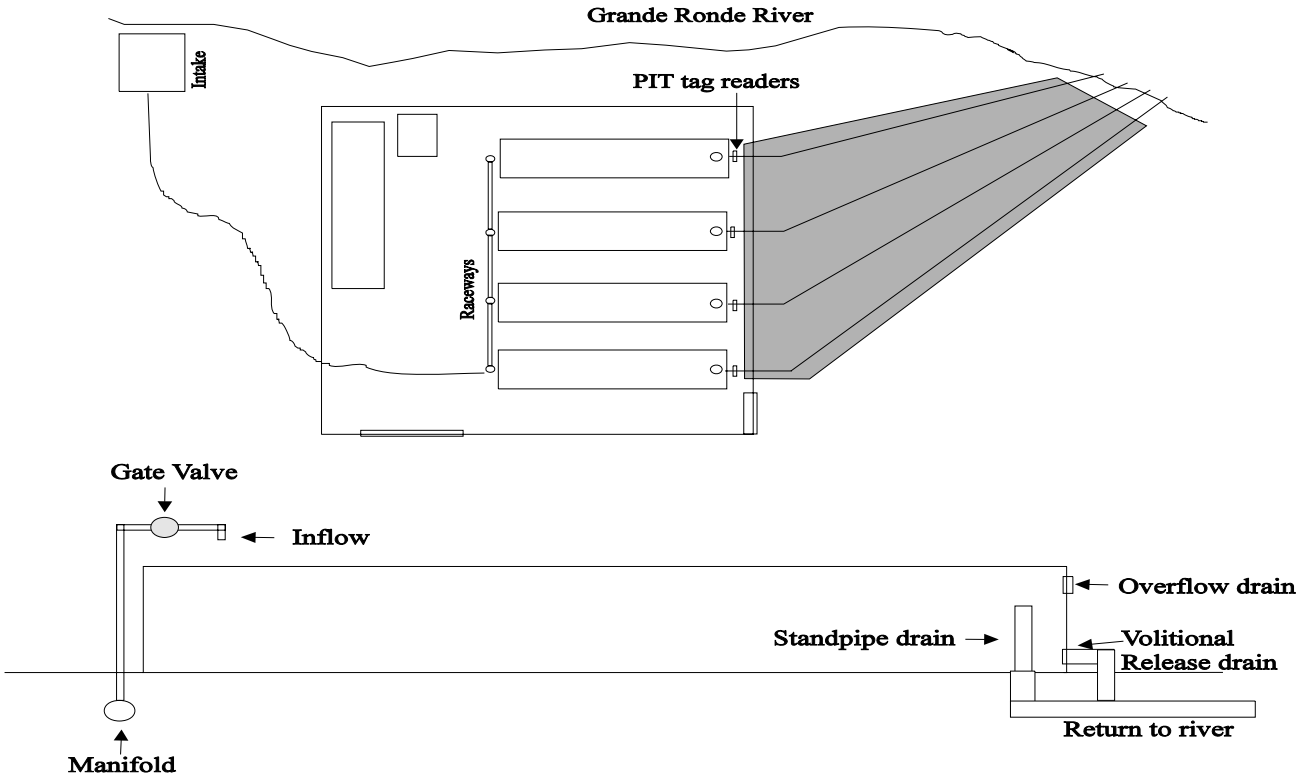

Figure 3. Photo and diagram of the Upper Grande Ronde acclimation facility. The lines passing through the shaded area represent underground return pipes.

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 ft^3).

The Upper Grande Ronde Adult Collection Facility (UGRACF) is located at rm 153.5 of the Grande Ronde River (Figure 1). 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 ft^3). The designed adult spring Chinook salmon holding capacities for these facilities is 90 at CCACF and 28 at UGRACF using 10 ft^3/adult.

A travel trailer is placed at each facility after the completion of the acclimation periods to allow for 24 hour/7 day a week operation during the peak trapping periods. 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 occur when water temperatures are below 18.3^{o}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 exceed 21.1^{o}C for three consecutive days, trapping would be discontinued and fish would be allowed to pass freely until water temperatures dropped (2008 LSRCP AOP).

During the trap checks no anesthetic is used due to possible harvest of the fish above the weir. 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 genetic samples. A single punch on the right opercle plate is used to mark the fish that are released upriver as having been trapped. Tissue 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 ratio above the weir. When the ratio is 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 (adult/jack) from across the run. Progeny from the captive broodstock program are not to be incorporated into the Catherine Creek conventional hatchery broodstock but may be used for broodstock in the Lookingglass Creek program.

This sliding scale management does not apply to the upper Grande Ronde River. For the upper Grande Ronde River, escapement and broodstock collection guidelines were agreed to by the co-managers as part of the Grande Ronde Spring Chinook Hatchery Management Plan (GRSCHMP 2002). Up to 50% of the natural fish returning to the weir may be retained for brood and as many conventional origin adults as needed to meet the broodstock goal. No captive brood progeny adults are used for broodstock. There are no restrictions on hatchery/wild ratio above the weir.

Hatchery jack management above the weirs is the same for both Catherine Creek and the upper Grande Ronde River. The goal is not to exceed a total of one jack for every ten adult male spring Chinook passed (10%). All natural origin jacks are passed upriver along with enough conventional jacks to meet the target. Surplus jacks that arrive at the weirs are sacrificed for data collection (coded wire tag) and distributed for ceremonial and subsistence uses. Jack management in the Catherine Creek broodstock is 1 jack for every 10 males (10%) while the Grande Ronde broodstock can be a high as 1 jack for every 5 males (20%). The high percentage in the Grande Ronde stock is due to the very low adult number and the possible need for more males in the broodstock.

All fish collected for broodstock and transported to LGH 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 (100mg/ml), 3-year-old fish received 0.50cc, 4-year-old fish 1.0cc, and 5-year-old fish 2.0cc. The oxytetracycline (200mg/ml) is given at one-quarter of the erythromycin injections.

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 fish are 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 conducts 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.

Project personnel conduct maintenance and repair activities on facility grounds and 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. The spawning matrix used was one female spawned with two males with the males being recycled back to the brood pond for use later in a second matrix. Using the male in two different matrices is essentially a 2x2 matrix, where each male spawns one-half of 2 females.

On each spawning day, the ripe females are anesthetized in the main hatchery or captive brood building using MS 222. Females are spawned as family groups (one female with 2 males). The fish are again checked for ripeness before being dispatched by a blow to the head. The females are placed in a rack and bled by cutting the tails. The body cavity is then opened over a colander to catch the eggs. The eggs are then split into two buckets. The males are anesthetized then live spawned at the main hatchery or captive brood building into small cups. The males are marked with "T" anchor tags so they can be easily identified in the circular brood tank as having already spawned (Grande Ronde only) and given a left opercle punch each time it is spawned and returned to the brood pond. The goal is to spawn each male at least twice (two family groups). The eggs and milt are mixed, rinsed, and water hardened in the main hatchery building for completion of the matrix. Once the gametes have water hardened, ODFW staff places 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 2008).

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

RESULTS AND DISCUSSION

Juvenile Acclimation

The CCAF received 116,967 smolts from LGH on 10 March 2008 (Table 1). This group contained progeny of only the conventional program. The average size of the fish at delivery was 19.9 fish/lb (Table 2). The densities in the raceways ranged from 0.64 to 0.68 lbs/ft^3. 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 24 March 2008 and any remaining fish were forced out of the facility on 14 April after 1200 hours. During the volitional release period there was a total of 7,725 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (17.9%, 20,948), an estimated 41,134 fish left during this time, this was 35.2% of the fish released from the facility (Table 3). Of the fish that left, only 4.3% left the first 5 days of the 21 day volitional release (Figure 5). Most of the fish (82.5%) leaving the raceways left during the last five days of the release. Hourly detections of PIT-tagged fish showed that the fish left the facility between 0900 and 2300 hours. The peaks in detections were at 1500 hours (13.1%) and 1900 hours (12.1%) (Figure 6). The fish were fed a total of 548.5lbs of food for the acclimation period. The total number of fish that were released from the acclimation facility in 2008 was 116,882. The size of the fish just before the volitional release began was 21.5 fish/lb. The size of the fish that were forced from the facility was 17.9 fish/lb.

The total mortality for the acclimation period was 85 (0.07 %). ODFW fish pathology detected some ongoing bacterial kidney disease (BKD) in mortalities from the acclimation site. At Lookingglass Hatchery this group of fish had some low-level BKD in the months prior to transfer, though losses were at normal levels. Seven of 19 (36.8%) mortalities examined in 2008 prior to transfer for acclimation had BKD ELISA values ≥ 2.000 OD units. There were no detections of virus throughout rearing at Lookingglass Hatchery. Twenty mortalities were examined from the CCAF. Five of 20 (25%) had APS bacteria. Five of 20 (25%) had BKD ELISA values ≥ 1.000 OD units indicating that some of these fish did have a BKD problem at release; all other fish had BKD ELISA values ≤ 0.114 OD units. All samples collected for virus were negative.

The UGRAF received 127,552 smolts from LGH on 11 March 2008 for the early 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 21.8 fish/lb (Table 2). The densities in the raceways ranged from 0.72 to 0.74 lbs/ft^3. 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 17 March 2008 and the remaining fish were forced from the facility on 24 March after 1200 hours. During the volitional release period there was a total of 227 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (0.8%, 997), an estimated 29,065 fish left during this time, this was 22.8% of the fish released from the facility (Table 3). Of the fish that left, 92.5% left the first three days of the six day volitional release (Figure 7). Hourly detections of PIT-tagged fish showed that the fish left the facility between 1400 and 2300 hours. The peaks in detections were at 1600 hours (22.9%) and 2000 hours (14.1%) (Figure 8). The fish were not fed due to the low water temperatures. The total number of fish that were released from the acclimation facility in

2008 from the early group was 127,491. The size of the fish that were forced from the facility was 22.0 fish/lb.

There were 61 mortalities during the early acclimation period. There was no significant fish health problems detected from the mortalities. However, it should be noted that there were some BKD mortalities at Lookingglass Hatchery in the months prior to transfer, though losses were at normal levels. Seven of 20 (35%) mortalities examined in 2008 prior to transfer to acclimation had BKD ELISA values ≥ 2.000 OD units. There were no detections of virus throughout rearing at Lookingglass Hatchery. Ten mortalities from the first acclimation were examined. One of 10 (10%) had a low level of aeromonad-pseudomonad (APS) bacteria. All ELISA values were ≤ 0.069 OD units indicating that these fish did not have a BKD problem at release. All samples collected for virus were negative.

The UGRAF received 132,501 smolts from LGH on 25 March 2008 for the late acclimation group (Table 1). This group was also comprised entirely of progeny from the conventional broodstock program. The average size of the fish at delivery was 20.9 fish/lb (Table 2). The densities in the raceways were 0.77 lbs/ft^3. The fish were allowed to volitionally leave the raceways beginning 7 April 2008 and the remaining fish were forced from the facility on 14 April after 1200 hours. During the volitional release period there was a total of 82 PIT-tagged fish scanned. Based on the number of PIT-tagged fish in the population (0.8%, 995), an estimated 10,880 fish left during this time, this was 8.2% of the fish released from the facility (Table 3). Of the fish that left, 36.6% left the first three days of the seven day volitional release (Figure 9). Hourly detections of PIT-tagged fish showed that the fish left the facility between 1400 and 2300 hours. There was a single peak in detections at 1800 hours (29.3%) (Figure 10). The fish were fed a total of 38.0 lbs of food for the acclimation period. The total number of fish that were released from the acclimation facility in 2008 from the late group was 132,441. 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 60 (0.05 %). Ten mortalities from the second acclimation were examined. Two of 10 (20%) had low-moderate levels of APS bacteria. One of 10 (10%) had a kidney adhesion and a heavy level of internal fungus. All ELISA values were ≤ 0.058 OD units indicating that these fish did not have a BKD problem at release. All samples collected for virus were negative.

Hourly water temperature was taken at both facilities in 2008 (Figures 11-14). The water temperature at CCAF ranged from 0.0^{o}C to 9.1 ^{o}C during the acclimation period and was usually at the lowest temperature around 0700 with the peak temperatures around 1600. The water temperature at UGRAF for the early acclimation ranged from -5.8^{o}C to 2.6 ^{o}C and was lowest around 0600 and highest around 1800. Water temperature for the late acclimation ranged from -5.9^{o}C to 5.8^{o}C and was lowest around 0600 with the peak temperatures around 1400.

Maintenance and repair activities were conducted at both acclimation facilities in 2008. Facility maintenance work at the CCAF consisted of snow removal, work on the intake site, overhaul of the travel trailer and improvement of the outflow pipes. 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 2008.

	Raceway			
Catherine Creek Single Accl.	1	2	3	4
No. of fish	29,254	29,255	28,414	30,044
Total lbs.	1,391	1,391	1,324	1,400
Mortality	29	24	26	6
Density lbs/ft^3	0.67	0.67	0.64	0.68
lbs/gpm	4.35	4.35	4.14	4.38
Flow gpm	320	320	320	320
Treatment	Conv.	Conv.	Conv.	Conv.
Grande Ronde Early Accl.	#1			
No. of fish	31,825	31,825	32,718	31,184
Total lbs.	1,521	1,521	1,554	1,481
Mortality	22	15	12	12
Density lbs/ft^3	0.74	0.74	0.75	0.72
Lbs/gpm	4.75	4.75	4.85	4.63
Flow gpm	320	320	320	320
Treatment	Conv.	Conv.	Conv.	Conv.
Grande Ronde Late Accl.	#2			
No. of fish	31,791	31,791	34,459	34,460
Total lbs.	1,589	1,589	1,594	1,594
Mortality	10	22	13	15
Density lbs/ft^3	0.77	0.77	0.77	0.77
lbs/gpm	2.27	2.27	2.28	2.28
Flow gpm	320	320	320	320
Treatment	Conv.	Conv.	Conv.	Conv.

Table 2. Group, number, size, and receive and release dates of fish acclimated at Catherine Creek and the Upper Grande Ronde facilities in 2008.

Facility	Group	# Received	Size (fish/lb)	Acclimation dates	Volitional release began	# released
CCAF	Single	116,967	19.9	3/10-4/14	3/24	116,882
UGRAF	Early	127,552	21.8	3/11-3/24	3/17	127,491
UGRAF	Late	132,501	20.9	3/25-4/14	4/7	132,441

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 2008.

		Feed	Total	Temp. ^oC		DO mg/l		Volitional migration	
Facility	Group	fed(lb.)	mort. (%)	Min.	Max.	Min.	Max.	Number	%
CCAF	Single	548.5	85 (0.07)	0.0	9.1	9.0	12.4	43,128	35.2
UGRAF	Early	0.0	61 (0.05)	-5.8	2.6			29,065	22.8
UGRAF	Late	38.0	60 (0.05)	-5.9	4.3			10,880	8.2

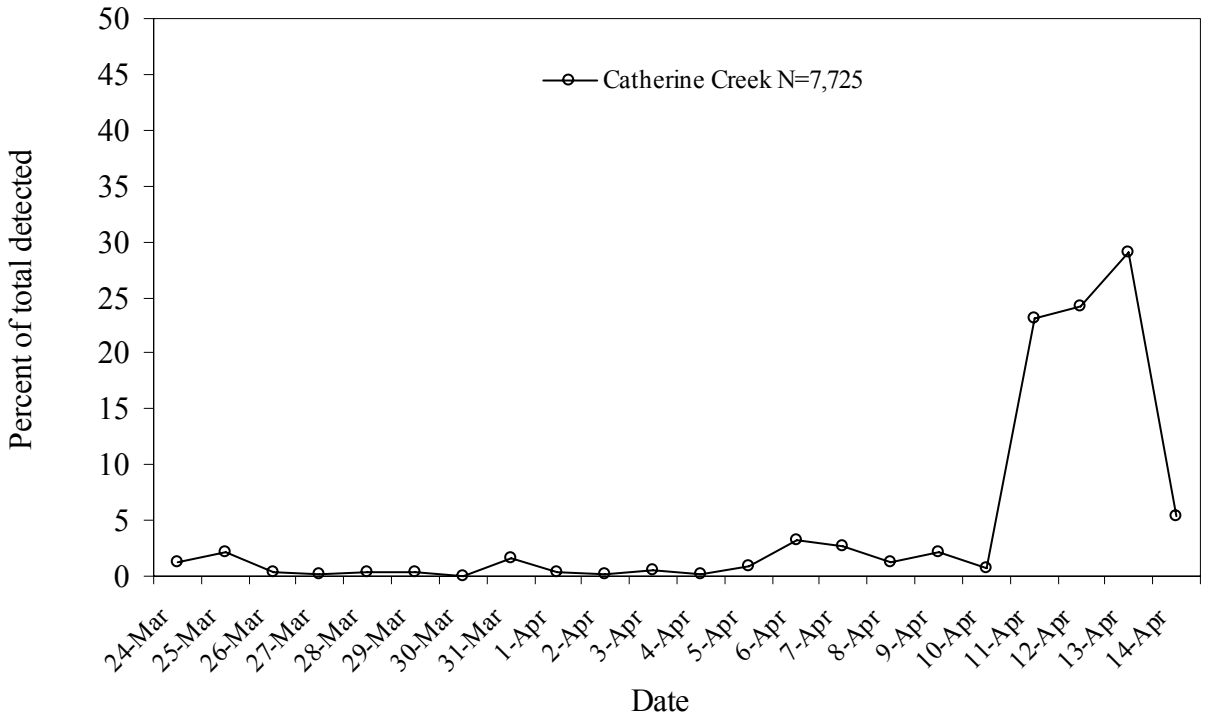

Figure 5. Daily PIT tag detections of fish leaving the raceways during the volitional release period at the Catherine Creek acclimation facility in 2008.

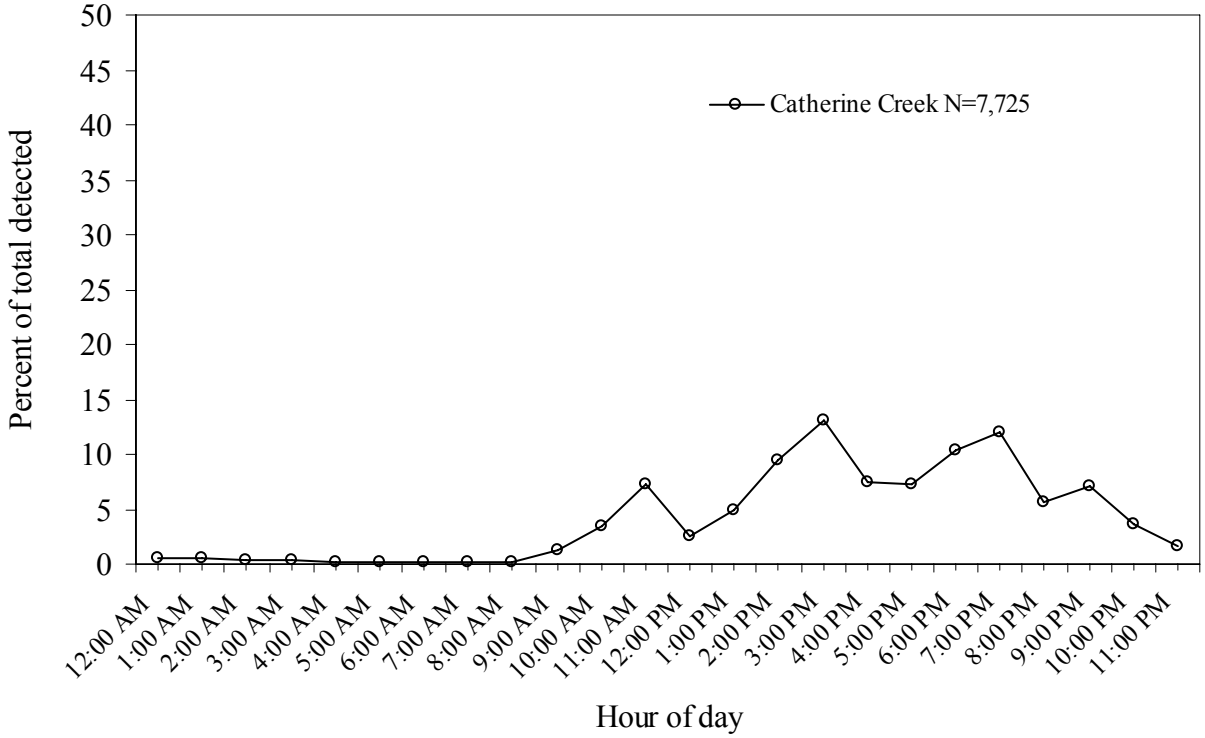

Figure 6. Hourly PIT tag detections of fish leaving the raceways during the volitional release period at the Catherine Creek acclimation facility in 2008.

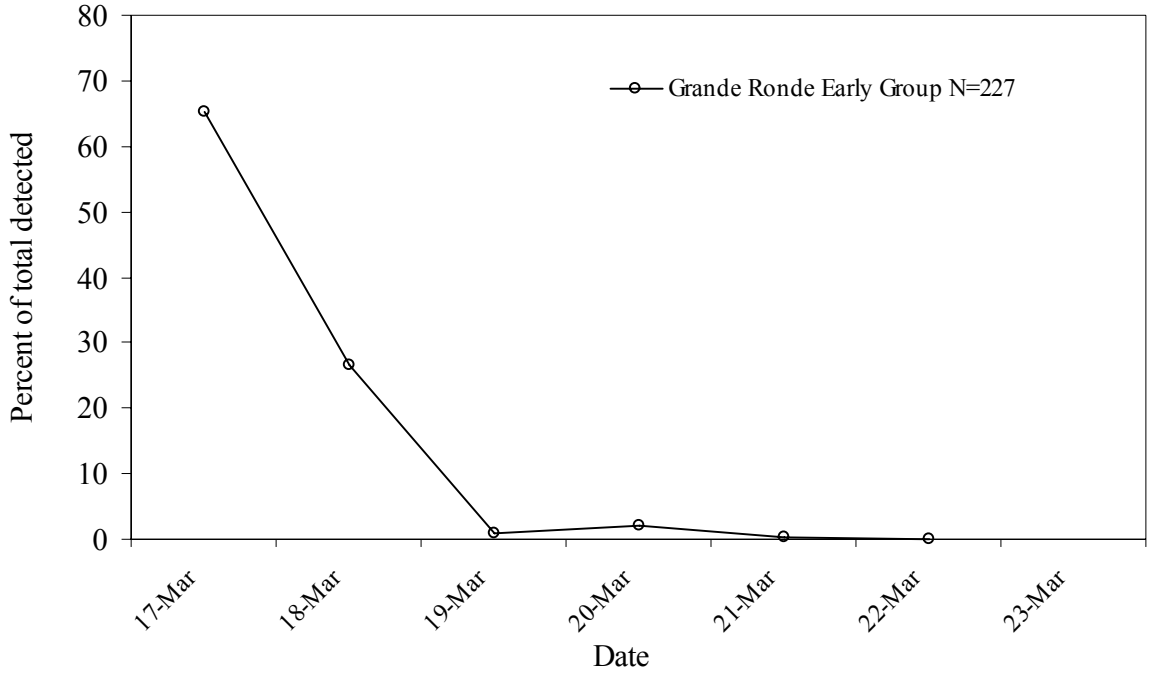

Figure 7. Daily PIT tag detections of fish leaving the raceways during the early volitional release period at the Grande Ronde acclimation facility in 2008.

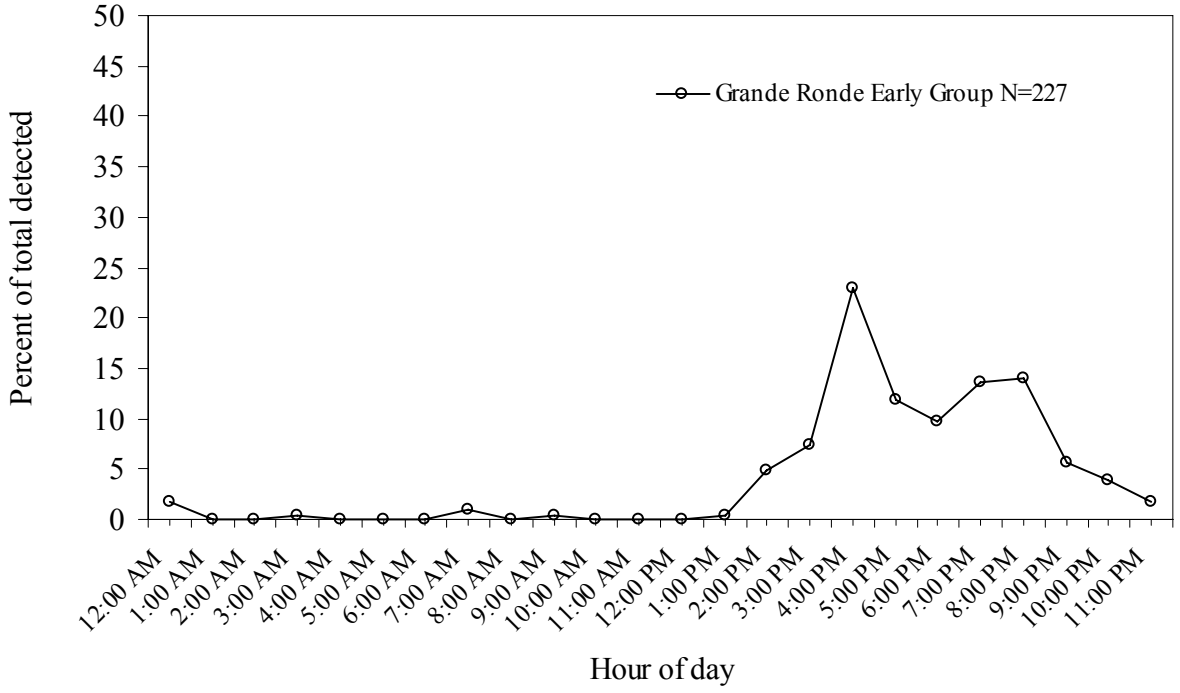

Figure 8. Hourly PIT tag detections of fish leaving the raceways during the early volitional release period at the Grande Ronde acclimation facility in 2008.

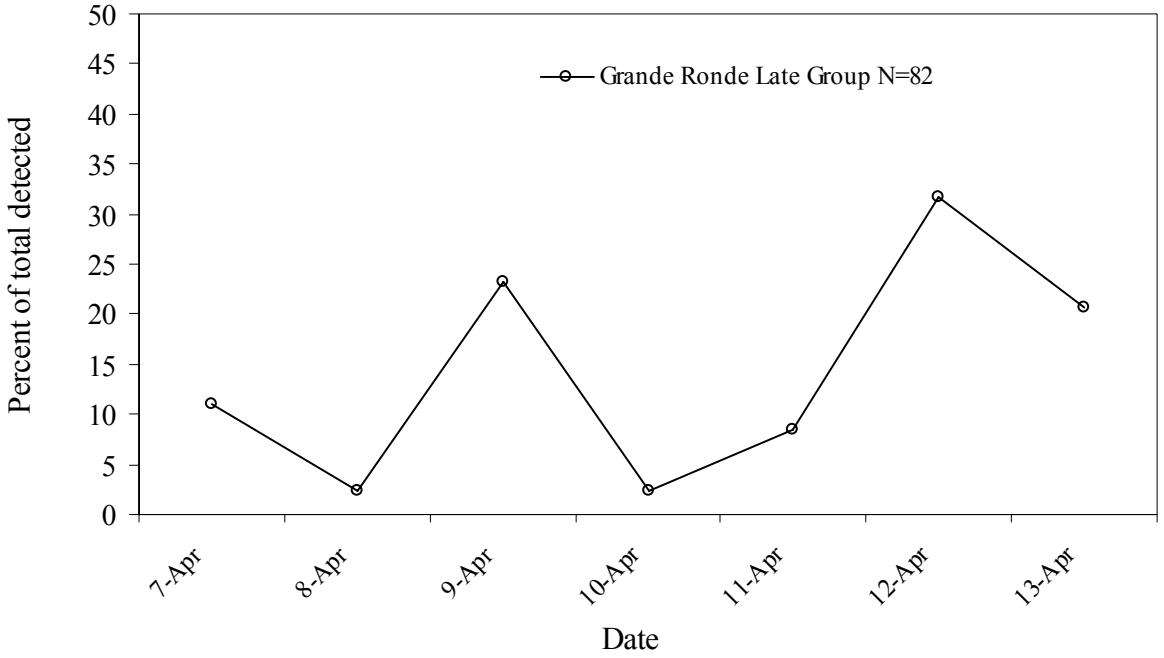

Figure 9. Daily PIT tag detections of fish leaving the raceways during the late volitional release period at the Grande Ronde acclimation facility in 2008.

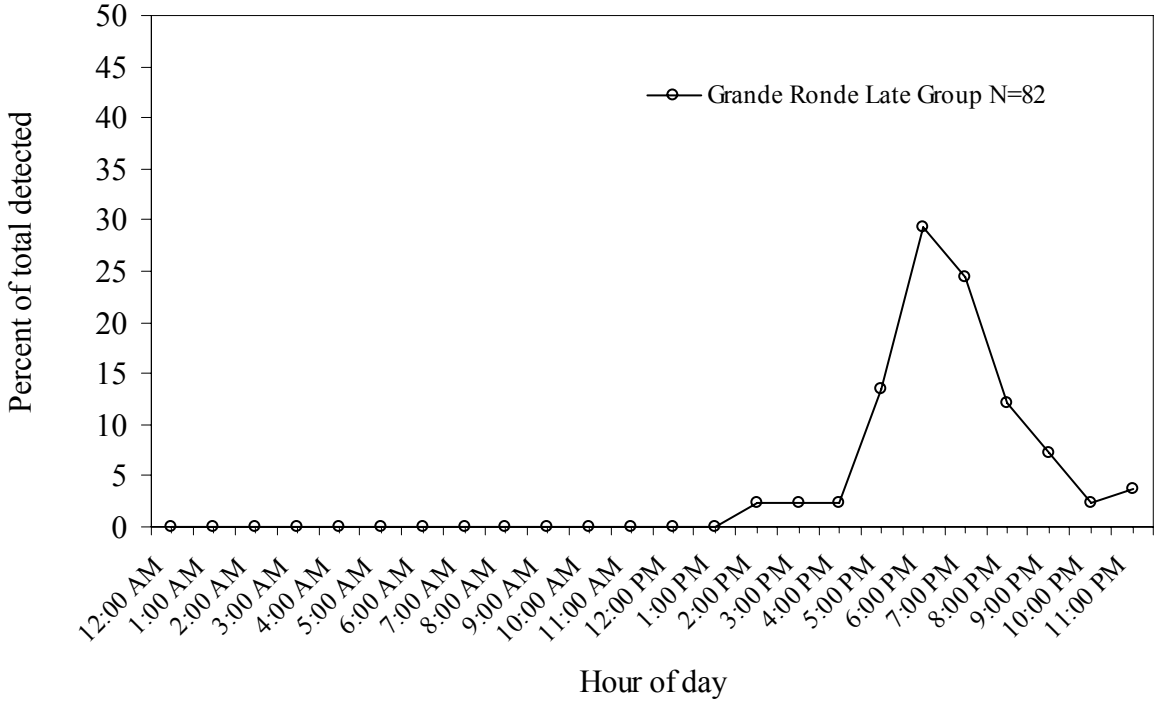

Figure 10. Hourly PIT tag detections of fish leaving the raceways during the late volitional release period at the Grande Ronde acclimation facility in 2008.

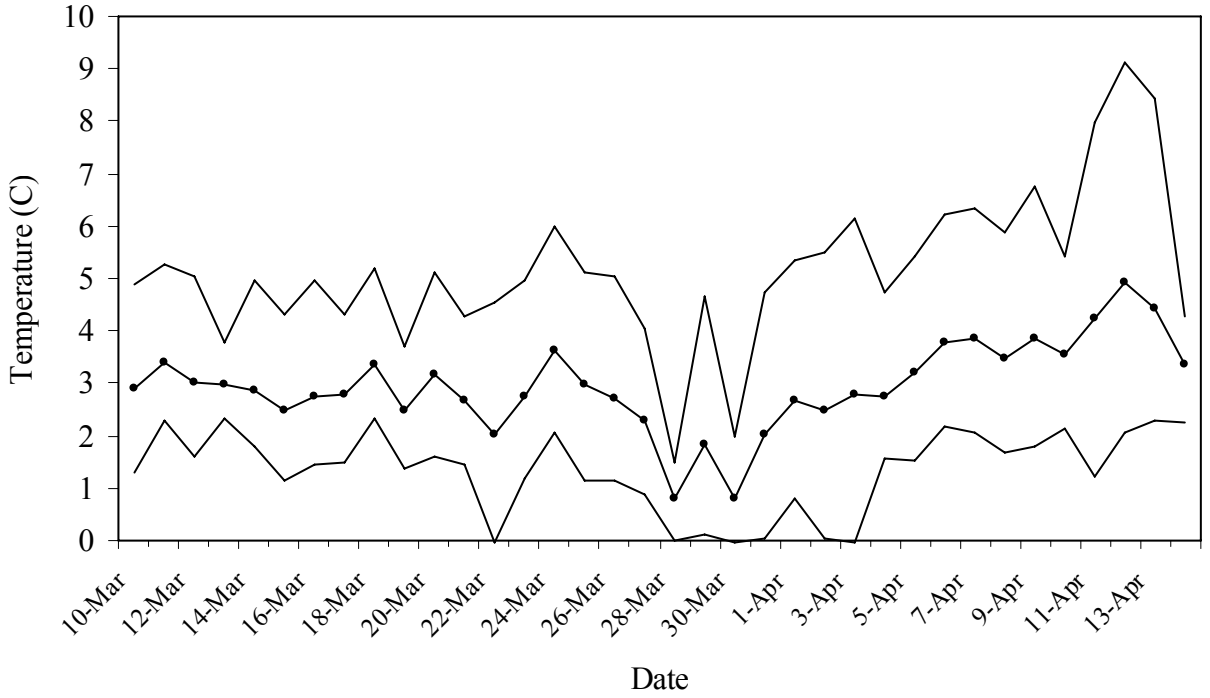

Figure 11. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Catherine Creek juvenile acclimation facility in 2008.

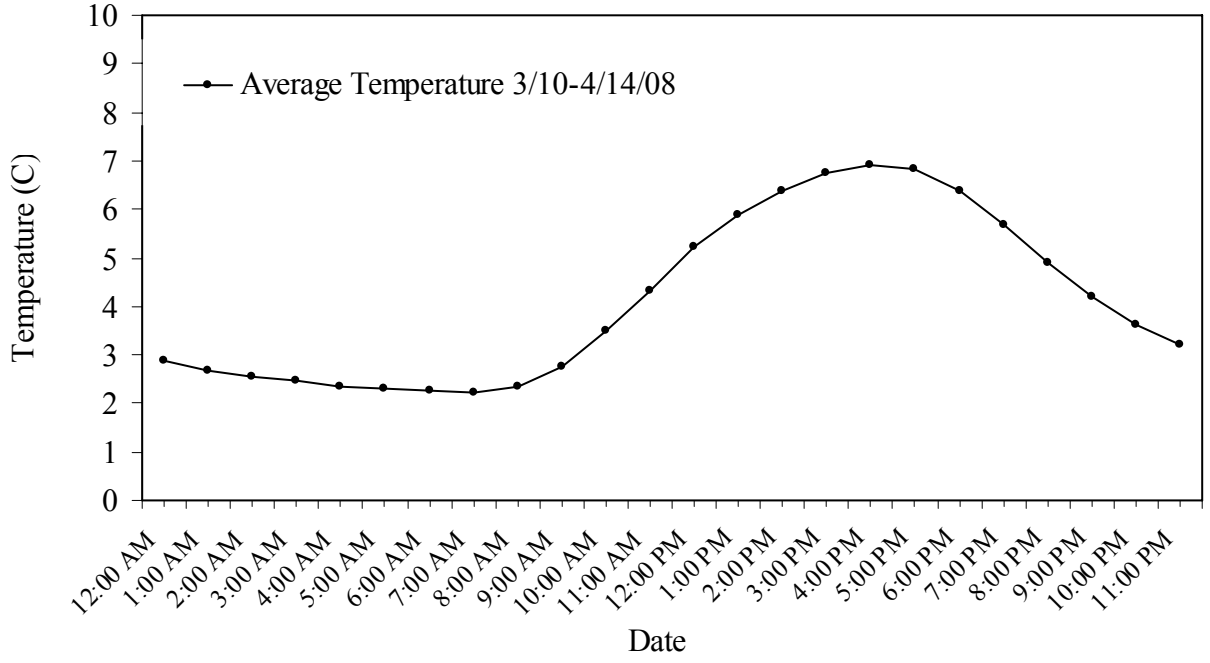

Figure 12. Average hourly water temperature at the Catherine Creek juvenile acclimation facility in 2008.

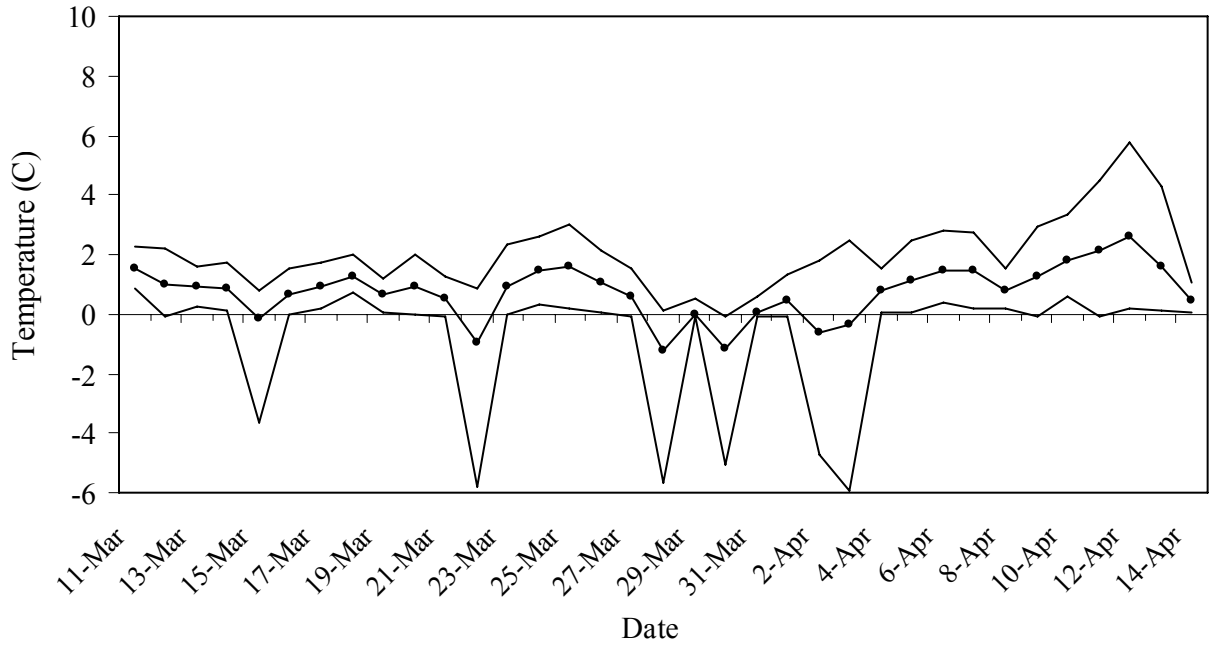

Figure 13. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Upper Grande Ronde juvenile acclimation facility in 2008.

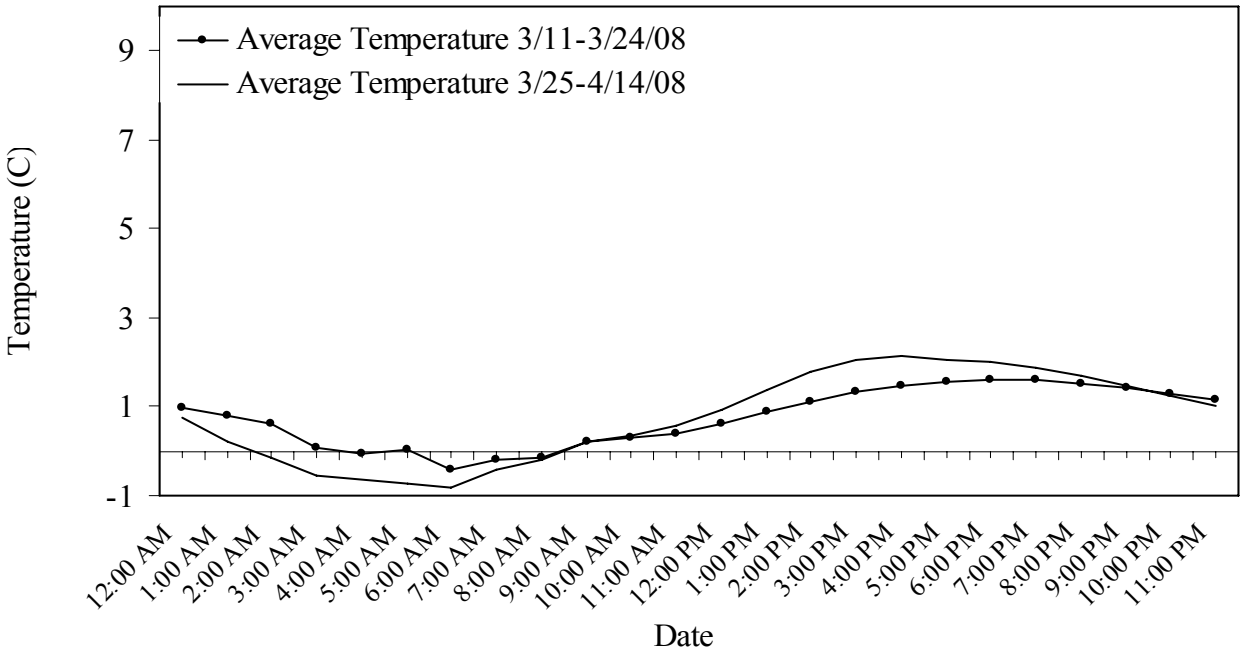

Figure 14. Average hourly water temperature at the Upper Grande Ronde juvenile acclimation facility in 2008.

Adult Collections

The CCACF was put into operation on 3 March 2008. The first adult summer steelhead was captured on 14 March. A total of 121 unmarked adult summer steelhead were trapped and released from 14 March to 28 May 2008 (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 15 April (39.7%). Three previously trapped fish, as indicated by the presence of an opercle mark, were re-trapped and released, and 10 previously trapped kelts were recovered dead on the weir. There were no kelts recovered on the weir that were not previously punched. There were 11 kelts that were passed downstream over the weir that were still alive.

The first adult spring Chinook salmon was captured at CCACF on 27 May 2008. A total of 345 spring Chinook salmon were trapped from 27 May to 2 September 2008 (Table 5). Three different groups of fish from the same stock returned to Catherine Creek in 2008; natural adults (unmarked with no coded wire tag), captive broodstock progeny (adults ad-clipped only, jacks ad-clipped + VIE), and conventional broodstock progeny (adults ad-clipped with Visual Implant Elastomer (VIE), jacks ad-clip only). The total catch was made up of 90 adults and 5 jacks of natural origin fish, 110 adults and 4 jacks of captive broodstock progeny and 37 adults and 99 jacks of conventional broodstock progeny. A total of 186 adult (110 captive, 4 conventional, 72 natural) and 11 jack (6 conventional, 5 natural) spring Chinook salmon were released above the weir to spawn naturally. Peak arrival for adults at the trap was the week of 24 June for the natural and captive groups and 1 July for the conventional group (Figure 16). By the week of 1 July over 80% of the adult fish had been trapped for all three groups. The peak arrival for jacks was the week of 1 July for all groups. There was no mortality in the trap in 2008. No carcasses were recovered on the weir. 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.

The sliding scale management plan (Appendix Table 1) is a tool used to determine spring Chinook salmon disposition in Catherine Creek. 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. It is difficult to make mid-season changes 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 2008 was 272 (115 natural + 144 captive + 13 conventional). Based on these predictions the sliding scale called for retaining 20% of the adult returning natural population. Since the predicted total return was more than 250 fish the percent of adults released above the weir that can be of hatchery origin should be less than or equal to 70%. Adults that are not passed above the weir or taken for Catherine Creek broodstock have three possible dispositions: transported to Lookingglass Creek for a fishery/natural spawning, taken as broodstock for the Lookingglass Hatchery program, or outplanted into Indian Creek. The actual number of captive broodstock hatchery adults trapped was 110 which was 76.4% of the predicted number and all were passed upstream. The natural adult return was 90 fish which was 78.3% of the predicted number. The conventional adult return

was 37 fish which was 284.6% of the predicted number. The hatchery percentage of adult fish released above the weir in 2008 was 61.3% (114). 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 4 jacks for every 25 males (16%) and released above the weir at a rate of 11 jacks for every 79 males (13.9%).

The adult broodstock collected and transported from CCACF consisted of 18 unmarked (20.0% of the natural return) and 33 conventional broodstock (22.4% of the conventional return). None of the captive broodstock returns were collected for broodstock. Adult broodstock was collected systematically over the entire return from 16 June to 17 July 2008. Every 5th natural adult male and female sampled was taken to LGH for broodstock. Four conventional jacks were taken to LGH. Only enough conventional returns were taken to maintain the percentage of hatchery fish in the broodstock to no more than 80%. Strays from Catherine Creek (two adults) that swam back to Lookingglass Hatchery were also incorporated into the Catherine Creek broodstock. The unmarked adult portion in the broodstock was 34.0%. The hatchery adult portion of the entire broodstock was 66.0%. The broodstock fish taken at the weir (55) were tagged in the opercle plate with a Floy Flex Tag. Only 29 of 55 fish tagged at the weir retained the tag until spawning (52.7%). The estimation of sex for adult fish at the weir based on fish retained for brood was 93.1% accurate. The two fish that were not sexed correctly were fish that were originally called males but were actually females.

Two spring Chinook spawning surveys were conducted below the weir on Catherine Creek on 17 and 24 June 2008. During these surveys two live fish were observed below the weir. The trap was removed from Catherine Creek on 9 September. The weir was kept in later in 2008 to prevent late arriving fish from being recovered on the spawning ground without an opercle punch. Surveys conducted by ODFW in 2008 resulted in 99 redds counted above the weir and 2 redds below the weir. A total of 54 adult carcasses were recovered above the weir which was 29.0% of the total adults passed above the weir (186). Of the 54 carcasses recovered above the weir, 51 were punched fish resulting in a trap efficiency of 94.4%. The population estimate above the weir in 2008 was 198 fish (2008 Spawning Ground Survey Results, ODFW, unpublished). The spring runoff in 2008 was extremely high. The high flows began around 7 May and continued until 15 June requiring a high level of maintenance to keep the weir up and operating. Considering the flow conditions, the trap operated very effectively as shown by the high trap efficiency rate.

Hourly water temperatures were taken at the CCACF in 2008 (Figures 17 and 18). The water temperature at CCACF during the operation of the adult collection facility ranged from -0.1^{o}C on 29 March to 22.7 ^{o}C on 17 August and was usually at the lowest temperature around 0700 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 2008. Maintenance work at the CCACF consisted of hydraulic weir components maintenance, maintenance of weir, rock removal from the pickets and fish way, and weed abatement.

Table 4. Summer steelhead trap capture data from the Catherine Creek adult collection facility in 2008. Trapping began 3 March and ended 9 September

Week	Trap capture		Kelt	
	First time	Reruns	Not punched[a]	Punched
18-Mar	6			
25-Mar	2			
1-Apr	0			
8-Apr	4			
15-Apr	48			
22-Apr	28			2
29-Apr	12	1		1
6-May	15	1		1
13-May	1			2
20-May	2			3
27-May	2			1
3-Jun	1	1		
10-Jun	0			
	121	3		10

[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.*

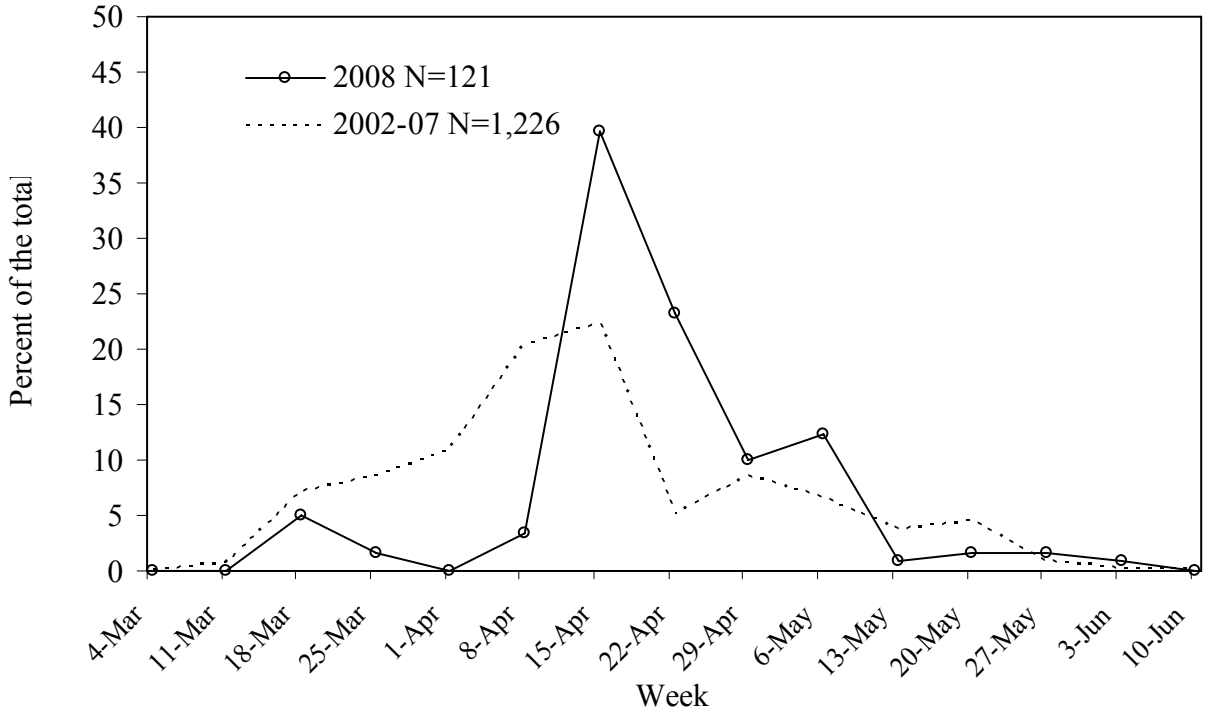

Figure 15. Summer steelhead arrival timing at the Catherine Creek adult collection facility in 2008 and mean arrival timing from 2002 to 2007.

Table 5. Spring Chinook salmon trap capture, transport, and mortality data for the Catherine Creek stock at the adult collection facility in 2008. Trapping began 3 March and ended 9 September.

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		0						
27-May	1		0		0						
3-Jun	0		0		0						
10-Jun	0		0		1						
17-Jun	15		11		1		2				
24-Jun	39	2	51	2	13	17	8		13	1	
1-Jul	24	2	30	2	16	48	5		16	3	
8-Jul	9	1	11		4	31	2		4		
15-Jul	0		3		0	1					
22-Jul	1		1		1		1				
29-Jul	0		1		0	2					
5-Aug	0		0		0						
12-Aug	0		0		0						
19-Aug	0		0		1						
26-Aug	0		1		0						
2-Sep	1		1		0						
	90	5	110	4	37	99	18	0	33	4	0

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

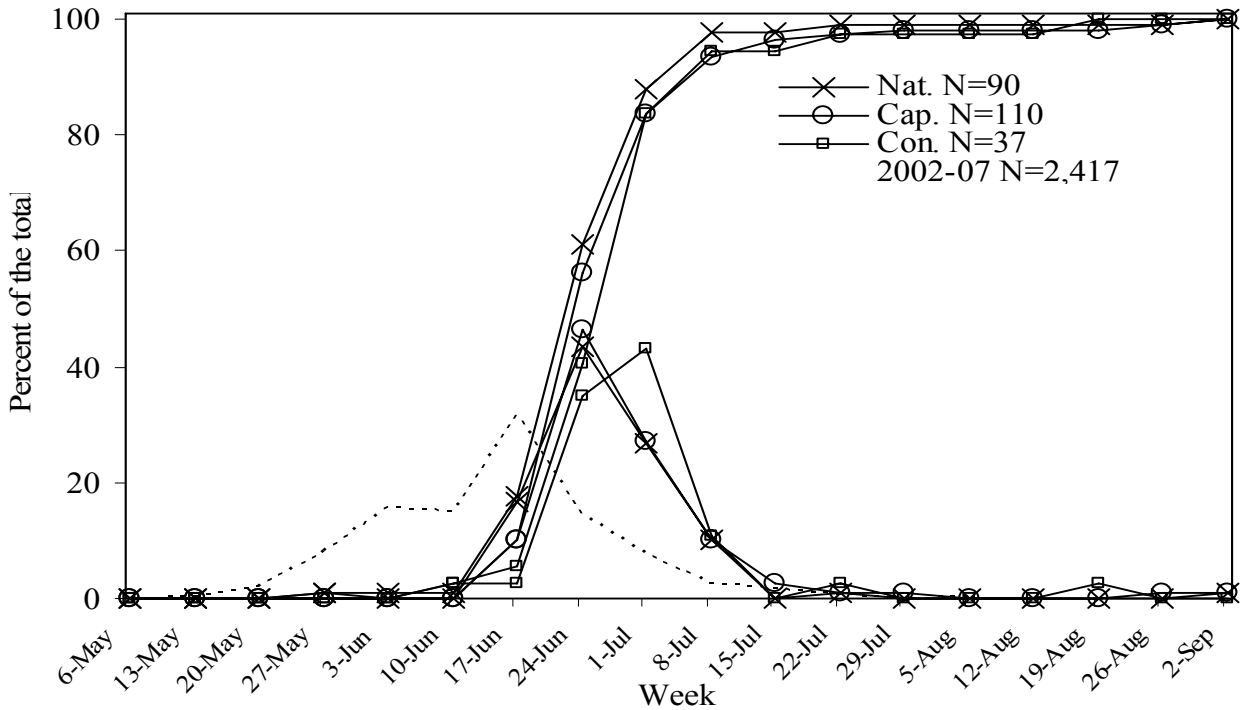

Figure 16. Arrival timing of age 4 and 5 spring Chinook salmon at the Catherine Creek adult collection facility in 2008 and mean arrival timing from 2002 to 2007.

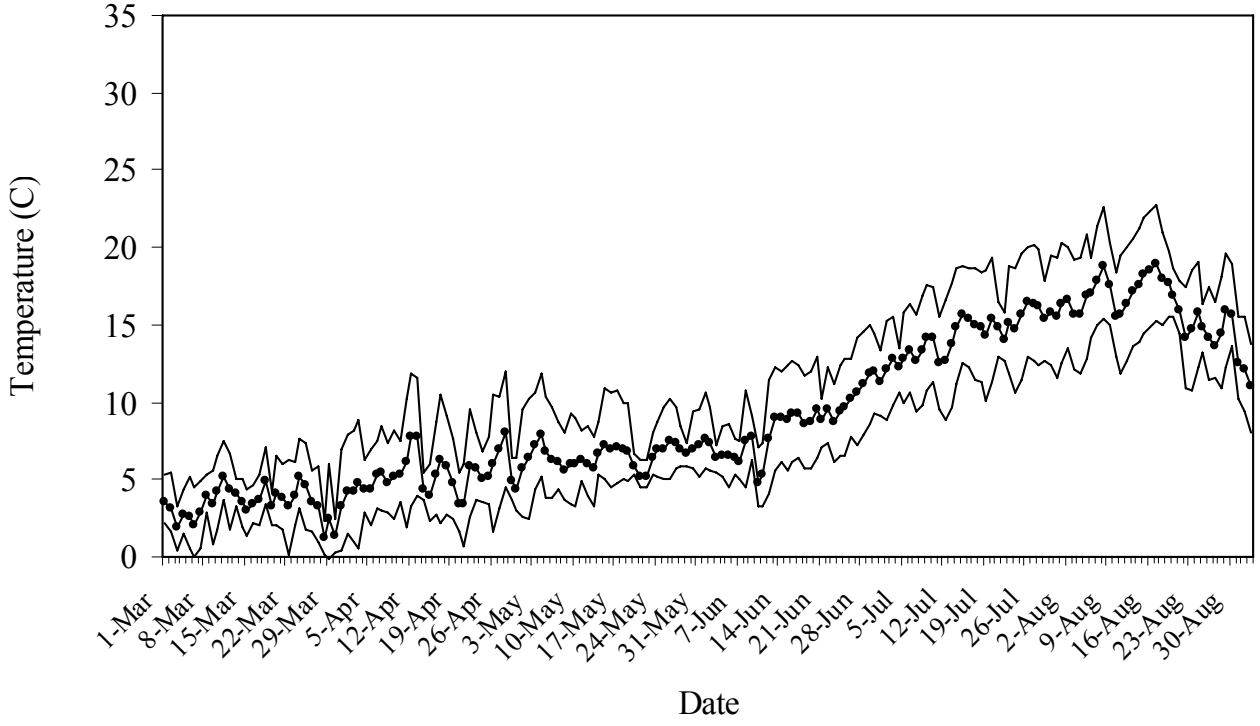

Figure 17. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Catherine Creek adult collection facility in 2008.

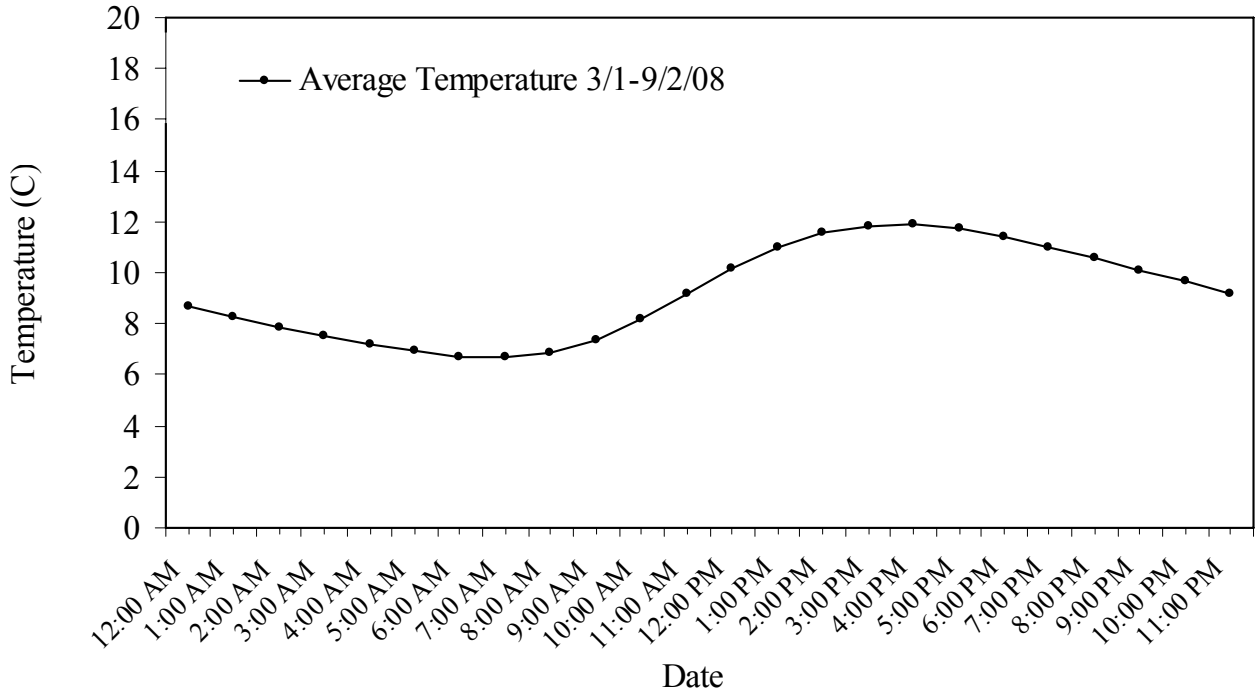

Figure 18. Average hourly water temperature at the Catherine Creek adult collection facility in 2008.

The UGRACF was moved ten miles downstream after the 2006 trapping season. This is the second season of trapping at the new location. There are 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 5 March 2008. The first adult summer steelhead was captured on 12 March. A total of 31 unmarked adult summer steelhead were trapped and released from 12 March to 5 May 2008 (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 29 April (32.3%). Six previously trapped fish, as indicated by the presence of an opercle mark, were trapped and released, and no kelts were passed alive or recovered dead on the weir.

The first adult spring Chinook salmon was captured at UGRACF on 23 June 2008. A total of 133 spring Chinook salmon were trapped from 23 June to 21 July 2008 (Table 7). Three different groups of fish from the same stock returned to the upper Grande Ronde River in 2008; natural adults (unmarked with no coded wire tag), conventional broodstock progeny (no adipose-clip with CWT), and captive broodstock progeny (adipose clip with CWT). The total catch was made up of 17 adults and 4 jacks of natural origin, 9 adults and 98 jacks from conventional broodstock, and 5 jacks from captive broodstock. A total of 8 adult (all natural, five female, three male) and 10 jack (6 conventional, 4 natural) spring Chinook salmon were released above the weir to spawn naturally. Extra jacks were released early in the run because the weir was blown out and many adults probably escaped above the weir before the weir was fixed. Peak arrival for adult fish at the trap was the week of 8 July for both the hatchery and natural production (Figure 20). Cumulative catch at the trap showed that by the week of 8 July, 83.3%

of the adult natural fish had been trapped compared to 100% of the conventional adults. The peak arrival for the jacks was the week of 1 July for both the natural and conventional groups.

The predicted adult spring Chinook salmon return to the upper Grande Ronde River for 2008 was 240 (114 natural + 6 captive + 120 conventional). There is no sliding scale used for the upper 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 9 (all conventional) which was 7.5% of the predicted number and none were passed upstream. The number of natural adults trapped was 17 fish which was 14.9% of the predicted number and 8 were released upstream. Jacks were collected for broodstock at a rate of 3 jacks for every 8 males (37.5%) and released above the weir at a rate of 10 jacks for every 8 males (125.0%). Extra jacks were released early in the run because the weir was blown out and many adults probably escaped above the weir before the weir was fixed.

The broodstock collected and transported from UGRACF consisted of both natural and hatchery fish. Broodstock was collected systematically over the entire return from 23 June to 21 July 2008. Every other natural adult male and female sampled was taken to LGH for broodstock and all adult conventional hatchery returns were taken to the hatchery. A total of 9 adult natural fish and 9 adult and 3 jack hatchery fish (conventional broodstock) were transported to LGH for broodstock. Strays from Grande Ronde River (7 adults, 22 jacks) that swam back to Lookingglass Hatchery were also incorporated into the Grande Ronde broodstock. The natural adults collected for broodstock comprised 50.0% of the total adult natural return while 100% of the adult hatchery fish trapped were collected for brood. The male: female sex ratio observed for these conventional fish was 1.3:1.0 (not including jacks). The broodstock collected at the weir (21) were tagged in the opercle plate with a Floy Flex Tag. Twenty of the 21 fish tagged at the weir retained the opercle tag until spawning (95.2%). The estimation of sex for adult fish at the weir based on fish retained for brood was 90.0% accurate. The two fish that were not sexed correctly were fish that were originally called females but were actually males.

On the upper Grande Ronde River two spring Chinook surveys were conducted from the weir to one mile below the weir on 17 and 24 July 2008. During these surveys no fish were observed. The trap was removed from the upper Grande Ronde River on 28 July 2008. Surveys conducted by ODFW in 2008 resulted in 27 redds above the weir and 5 below the weir. Vey Meadow, which is privately owned and contains about four miles of spawning habitat, was not surveyed in 2008 (landowner denied permission). There were a total of 25 adult carcasses recovered above the weir which was 312.5% of the total trapped and passed (8). None of the 25 fish recovered were opercle punched (increasing opercle recovery to 1 fish gives 4.0% trap efficiency). The population estimate above the weir in 2008 was 117 (2008 Spawning Ground Survey Results, ODFW, unpublished). The spring runoff in 2008 was extremely high. The high flows began around 7 May and continued until 15 June. The far bank picket wall portion of the weir was washed out on 16 May (Photos, Appendix Table 19). We were not able to work in the river to fix the far side of the trap until 6 June, which historically (2007) at this site saw the passage of 66.7% of the natural return and 80% of the hatchery return. Even after that date there were still damaged portions of the weir that we could not fix until the flows dropped as evidenced by the very low trapping efficiency.

Hourly water temperatures were taken at the UGRACF in 2008. The water temperature during operation of the adult collection facility from 17 June to 29 July ranged from 7.8°C to 24.6°C on 19 June and 27 July respectively (Figure 21). The hourly temperatures at the adult trap during the period of operation showed that the lowest water temperature usually occurred at 0700 and the highest water temperature usually occurred at 1600 hours (Figure 22). The time of day that the trap was checked and the fish were handled was based on water temperature.

Table 6. Summer steelhead trap capture data from the Upper Grande Ronde adult collection facility in 2008. Trapping began 5 March and ended 29 July.

Week	Trap capture		Kelt	
	First time	Reruns	Not punched[a]	Punched
18-Mar	2			
25-Mar	1			
1-Apr	3			
8-Apr	6			
15-Apr	0			
22-Apr	4			
29-Apr	10	2		
6-May	5	3		
13-May	0	1		
20-May	0			
27-May	0			
3-Jun	0			
10-Jun	0			
	31	6	0	0
	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.*

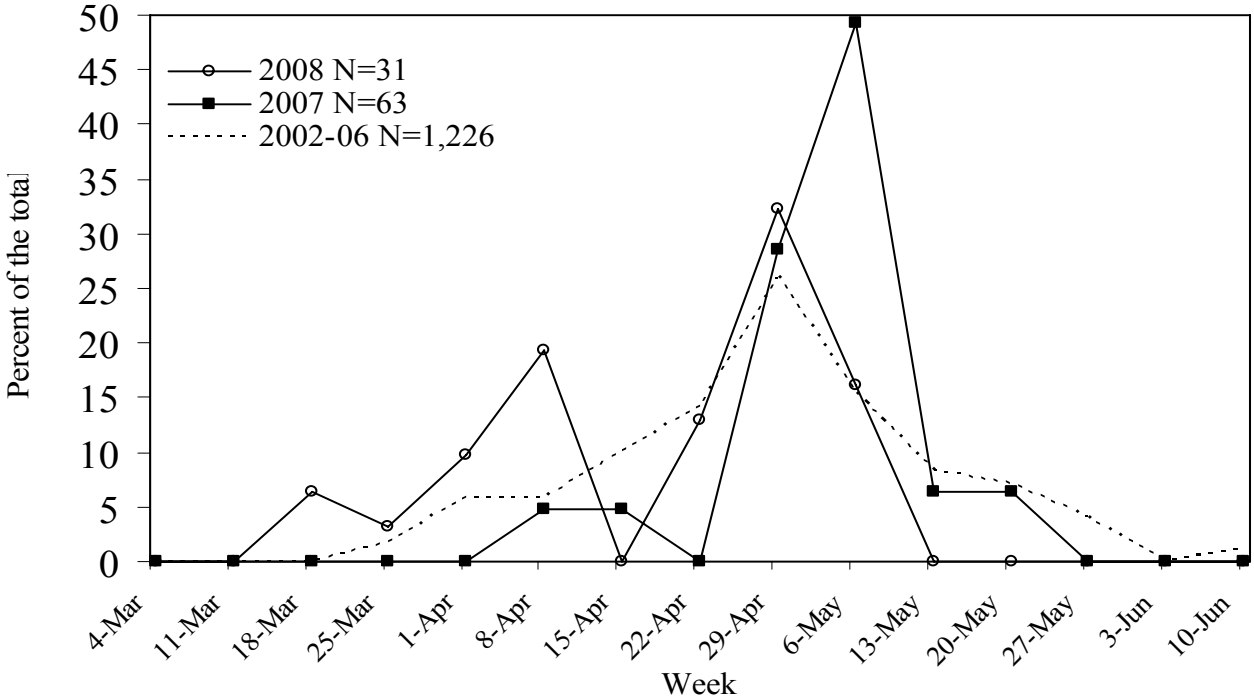

Figure 19. Summer steelhead arrival timing at the Grande Ronde adult collection facility in 2007 and 2008 (rm 153.5) and mean arrival timing from 2002 to 2006 (rm 163).

Table 7. Spring Chinook salmon trap capture, transport, and mortality data for the Grande Ronde River stock at the adult collection facility in 2008. Trapping began 5 March and ended 29 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		0						
27-May	0		0		0						
3-Jun	0		0		0						
10-Jun	0		0		0						
17-Jun	0		0		0						
24-Jun	2		0		0	10					
1-Jul	6	2	0	2	3	47	4		3	3	
8-Jul	6	2	0		6	30	3		6		
15-Jul	2		0	3	0	9	1				
22-Jul	1		0		0	2	1				
29-Jul	0		0		0						
	17	4	0	5	9	98	9	0	9	3	0

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

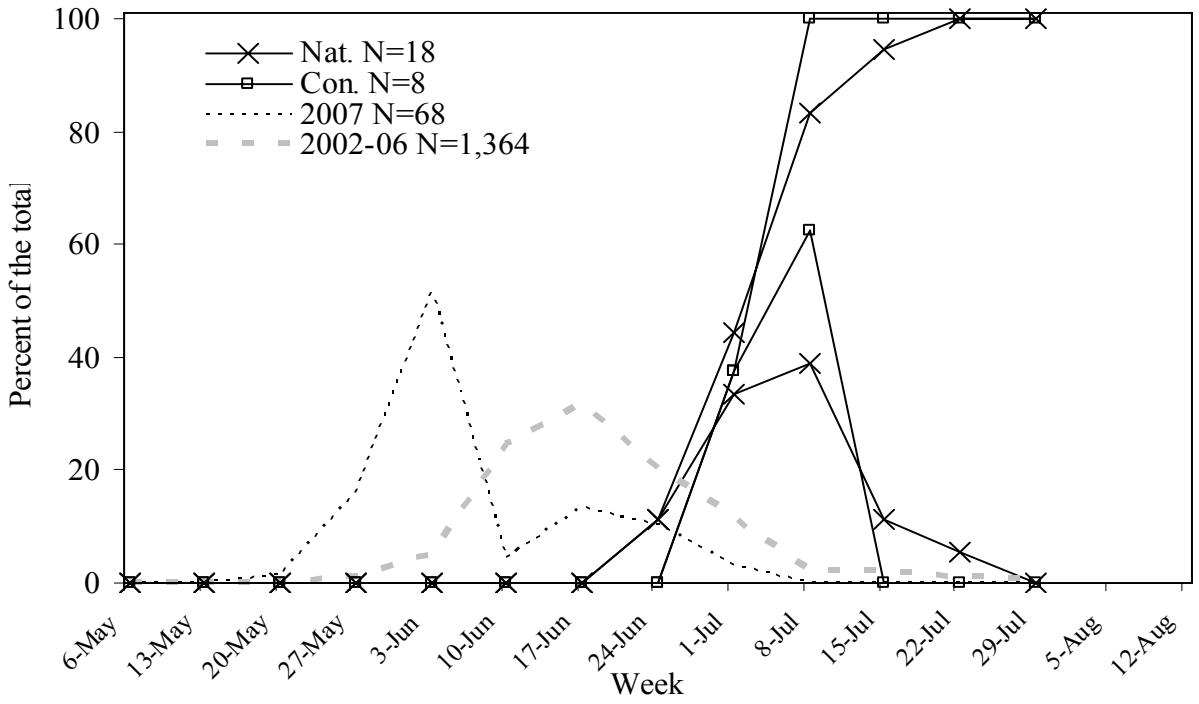

Figure 20. Arrival timing of age 4 and 5 spring Chinook salmon at the Upper Grande Ronde adult collection facility in 2007 and 2008 (rm 153.5) and mean arrival timing from 2002 to 2006 (rm 163).

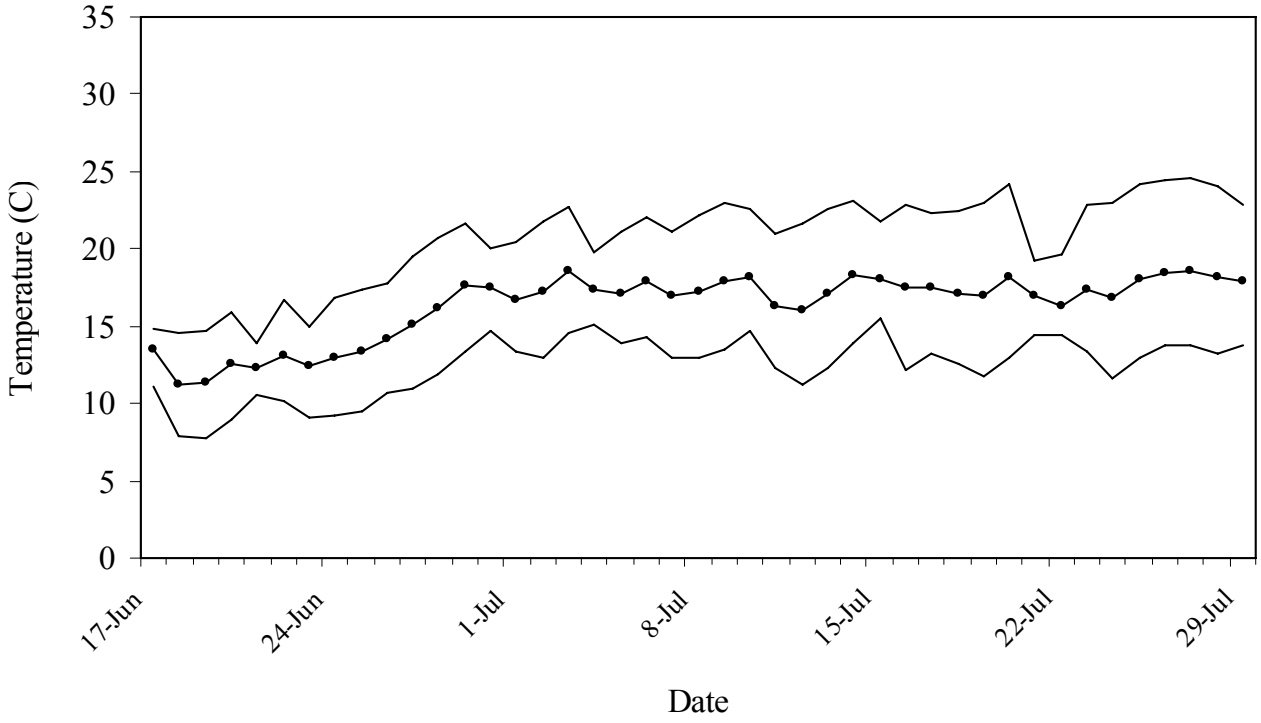

Figure 21. Daily maximum, minimum, and average water temperatures (recorded hourly) at the Upper Grande Ronde adult collection facility in 2008.

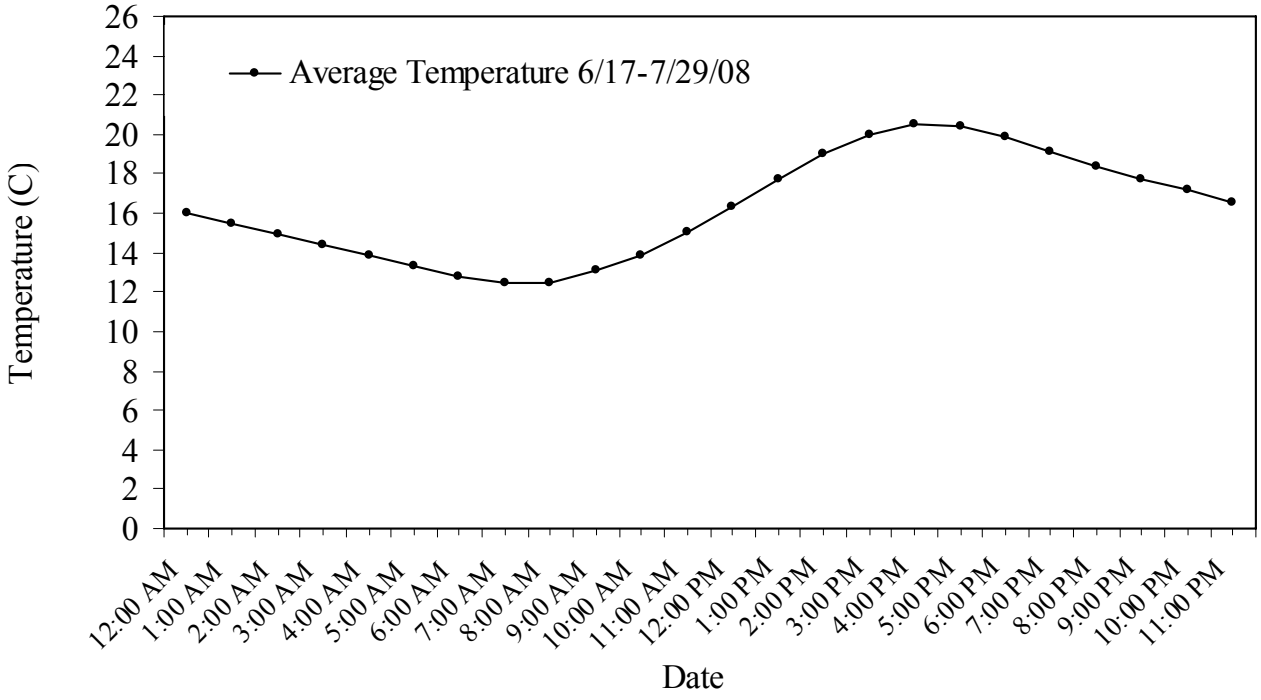

Figure 22. Average hourly water temperature at the Upper Grande Ronde adult collection facility in 2008.

Maintenance and repair activities were conducted at the facility in 2008. Maintenance work at the UGRACF consisted of installation, removal, and repair of the floating weir panels, and gravel removal from under the weir panels and in front of the trapbox during the instream work window.

Broodstock Activities

Lookingglass Hatchery

A total of 32 females, 21 males and 4 jacks were spawned from the Catherine Creek stock spring Chinook salmon at LGH in 2008 (Tables 8-10). There were no pre-spawning mortalities at the hatchery. Peak spawning date at LGH occurred on 3 September 2008. The last spawning date was 8 September. Two female adult spring Chinook salmon positively identified as Catherine Creek production (green VIE) returned to the Lookingglass Creek trap and were included in the Catherine Creek broodstock. All 32 females had ELISA values of 0.165 OD units or less.

A total of 12 females, 10 males, and 3 jacks (25 collected) were spawned from the Upper Grande Ronde stock spring Chinook salmon at LGH in 2008 (Tables 11-13). There was one pre-spawn male mortality at the hatchery. Peak spawning date at LGH occurred on 3 September 2008. A total of 29 fish (7 adults and 22 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. Four of the seven adults were females and used in the production. The males and jacks were not used because the CWT information was not available at spawning and the extra males were not needed. All 12 females spawned had ELISA values of 0.097 OD units or less.

A total of 76 females, 69 males, and 6 jacks were spawned for the Lookingglass Hatchery program in 2008 (Tables 14-16). These fish are Catherine Creek stock spring Chinook salmon that are returning to Lookingglass Creek. There were also three pre-spawn mortalities at the hatchery (1 female, 2 male). Peak spawning date at LGH occurred on 3 September 2008. All 76 females spawned had ELISA values of 0.181 OD units or less. A total of 188 fish (101 females, 78 males, and 9 jacks) were passed above the hatchery weir in 2008 to spawn naturally (Boe et al. 2009).

Captive Broodstock

The goal for parr collection in the upper Grande Ronde for the Captive Broodstock program was not achieved in 2008. Due to the very low redd counts in 2007 (one), no parr were found in the stream. There is a chance that a rotary screw trap operated by ODFW may catch some migrants which could be used in the program. To replace the natural parr for the program an additional 150 conventional progeny (juveniles from the Grande Ronde conventional program held at Lookingglass Hatchery) were taken to Wallowa Hatchery as fry. Details of the collection can be obtained in Carmichael 2009. Assistance was also provided to ODFW for the spawning of the Grande Ronde Basin captive broodstocks at Bonneville Hatchery in 2008. Details of the spawning operation can be obtained in Carmichael (2009).

Table 8. Spawning information from Catherine Creek spring Chinook salmon female broodstock at Lookingglass Hatchery in 2008.

Date	Natural n=11					Hatchery n=21				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug		0					0			
20-Aug		1					0			
27-Aug		1					5			
3-Sep		5					9			
8-Sep		4					7			
Totals	0	11	0	0	0	0	21	0	0	0

Table 9. Spawning information from Catherine Creek spring Chinook salmon male broodstock at Lookingglass Hatchery in 2008.

Date	Natural n=7					Hatchery n= 14				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug										
20-Aug		1					1			
27-Aug		5					6			
3-Sep		8					12			
8-Sep		5		2			13			
Totals	0	19	0	2	0	0	32	0	0	0

Table 10. Spawning information from Catherine Creek spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2008.

Date	Natural n=0					Hatchery n=4				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug										
20-Aug										
27-Aug							1			
3-Sep							4			
8-Sep							3			
Totals	0	0	0	0	0	0	8	0	0	0

Table 11. Spawning information from Grande Ronde spring Chinook salmon female broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 4					Hatchery n= 8				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug		1								
20-Aug							1			
27-Aug		1					1			
3-Sep		1					3			
8-Sep		1					2			
12-Sep		0					1			
Totals	0	4	0	0	0	0	8	0	0	0

Table 12. Spawning information from Grande Ronde spring Chinook salmon male broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 5					Hatchery n= 8				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12						1				
13-Aug		1					1			
20-Aug		1					1			
27-Aug		1					2			
3-Sep		2					2			2
8-Sep		4					4		1	
12-Sep		1		4			1		1	
Totals	0	10	0	4	0	1	11	0	2	2

Table 13. Spawning information from Grande Ronde spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 0					Hatchery n= 25				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug										
20-Aug										
27-Aug							1			21
3-Sep							3			1
8-Sep							1			
12-Sep									1	
Totals	0	0	0	0	0	0	5	0	1	22

Table 14. Spawning information from Lookingglass Creek spring Chinook salmon female broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 0					Hatchery n= 77				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12						1				
13-Aug										
20-Aug							3			
27-Aug							19			
3-Sep							46			
8-Sep							8			
Totals	0	0	0	0	0	1	76	0	0	0

Table 15. Spawning information from Lookingglass Creek spring Chinook salmon male broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 11					Hatchery n= 58				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug										
20-Aug		2					4			
27-Aug		8					20			
3-Sep		11				2	53		3	1
8-Sep		1		8			14	5	11	
Totals	0	22	0	8	0	2	91	5	14	1

Table 16. Spawning information from Lookingglass Creek spring Chinook salmon jack broodstock at Lookingglass Hatchery in 2008.

Date	Natural n= 1					Hatchery n= 5				
	Morts	Spawned	DPS	KPS	KNS	Morts	Spawned	DPS	KPS	KNS
Till 8/12										
13-Aug										
20-Aug										
27-Aug		1								
3-Sep							5			
8-Sep							1		1	
Totals	0	1	0	0	0	0	6	0	1	0

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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 2000 to 2007 release years.

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
CC 07	Single	71,293	26.7	0.32	3/12-4/11	3/26	71,268
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
GR 07	Early	20,620	23.2	0.22	3/12-3/25	3/19	20,620
GR 07	Late	118,840	21.7	0.67	3/26-4/11	4/2	118,803

[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 2000 to 2007 release years.

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
CC 07	Single	288	25 (0.03)	0.3	8.8	9.6	12.3	23,761	33.3
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	3	9 (0.05)	-0.7	4.5	10.3	12.3	10,461	55.1
GR 07	Early	9	0 (0.00)	-0.1	5.4	8.7	12.7	2,932	11.6
GR 07	Late	120	37 (0.03)	-0.1	6.9	8.5	11.9	28,718	24.2

[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 1998 to 2006 broodyears.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped[a]			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	0	0.00
2003	Acc.	Smolt	Conventional	104,349	2	28[b]	1	0.03
2004	Acc.	Smolt	Captive	76	0	0		
2004	Acc.	Smolt	Conventional	18,901	23[b]	8[c]		
2005	Acc.	Smolt	Captive	20,620	5			
2005	Acc.	Smolt	Conventional	118,803	98			
2006	Acc.	Smolt	Captive	127,491				
2006	Acc.	Smolt	Conventional	132,441				

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.*

c *The weir was blown out in 2008, resulting in very low weir catch.*

Appendix Table 5. Release and return summary for spring Chinook salmon from Catherine Creek 1998 to 2006 broodyears.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped[a]			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	8	0.10
2003	Acc.	Smolt	Conventional	120,753	7	55	2	0.10
2004	Acc.	Smolt	Captive	45,604	24	99		
2004	Acc.	Smolt	Conventional	23,216	4	34		
2005	Acc.	Smolt	Captive	21,572	4			
2005	Acc.	Smolt	Conventional	49,696	97			
2006	Acc.	Smolt	Conventional	116,882				

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 2000 to 2006 broodyears.

Brood year	Release location	Life stage	Rearing type	Number released	Returns trapped[a]			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	15	0.14
2004	Hat.	Smolt	Cap/Conv	113,418	57	202		
2005	Hat.	Smolt	Cap/Conv	0	0			
2006	Hat.	Smolt	Cap/Conv	24,000				

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 1997 to 2008 (does not include jack salmon).

Year	Adults captured			Passed above	Est. above	Trap eff.	Redds		Adult broodstock taken		
	Nat.	Capt.	Conven.				Above	Below	Nat.	Capt.	Conven.
1997	9	--	--	9	--	--	22	6	0	0	0
1998	33	--	--	39	88	30.4	35	2	0	0	0
1999	1	--	--	1	--	--	0	0	0	0	0
2000	17	--	--	15	30	50.0	8	12	0	0	0
2001	38	--	--	29	29	85.7	7	8	21	0	0
2002	101	3	--	54	54	88.9	19	2	48	0	0
2003	119	4	--	63	95	78.9	24	19	71	0	0
2004	28	376	--	386	453	91.1	134	51	15	0	0
2005	14	197	60	204	205	100.0	52	38	7	0	59
2006	51	8	140	50	51	100.0	14	4	26	0	123
2007	33	0	35	16	16	100.0	1	0	17	0	34
2008	17	0	9	8	117	4.0	32	5	9	0	9

Appendix Table 8. Adult trapping, broodstock and redd counts for spring Chinook salmon from Catherine Creek 1997 to 2008 (does not include jack salmon).

Year	Adults captured			Passed above	Est. above	Trap eff.	Redds		Adult broodstock taken		
	Nat.	Capt.	Conven.				Above	Below	Nat.	Capt.	Conven.
1997	2	--	--	2	--	--	40	6	0	0	0
1998	28	--	--	28	85	23.5	34	0	0	0	0
1999	16	--	--	16	58	27.8	38	2	0	0	0
2000	22	--	--	22	45	33.3	26	8	0	0	0
2001	78	--	--	57	459	14.8	131	2	21	0	0
2002	161	132	--	247	413	61.2	156	2	35	0	0
2003	248	235	--	431	474	95.1	165	2	50	0	0
2004	83	575	--	190	209	94.6	94	2	16	0	0
2005	56	108	28	131	155	98.0	72	2	10	0	20
2006	103	120	62	221	266	83.3	115	2	20	0	43
2007	70	78	59	142	159	90.0	57	2	28	0	37
2008	90	110	37	186	198	94.4	100	1	18	0	33

Appendix Table 9. Adult trapping, broodstock and redd counts for spring Chinook salmon from Lookingglass Creek 2004 to 2008 (does not include jack salmon)(Trap operated by ODFW Lookingglass Hatchery).

Year	Adults captured			Passed above	Est. above	Trap eff.	Redds		Adult broodstock taken	
	Nat.	Hat.	Stray				Above	Below	Nat.	Hat.
2004	73	37	0	100	100	100.0	49	49	0	136
2005	24	26	5	45	43	100.0	29	10	0	0
2006	10	41	17	41	44	76.5	28	28	0	0
2007	13	108	17	66	66	100.0	32	21	0	41
2008	49	274	9	179	185	97.0	102	40	11	135

Appendix Table 10. Daily summer steelhead trapping data from the Catherine Creek adult collection facility in 2008.

DATE	TOTAL	Trapped		Sacrifice/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
14-Mar	5	0	5	0	0	0	0
17-Mar	1	0	1	0	0	0	0
21-Mar	2	0	2	0	0	0	0
MAR	8	0	8	0	0	0	0
2-Apr	1	0	1	0	0	0	0
7-Apr	3	0	3	0	0	0	0
9-Apr	9	0	9	0	0	0	0
11-Apr	2	0	2	0	0	0	0
14-Apr	37	0	37	0	0	0	0
16-Apr	16	0	16	0	0	0	0
18-Apr	9	0	9	0	0	0	0
20-Apr	3	0	3	0	0	0	0
23-Apr	1	0	1	0	0	0	0
25-Apr	1	0	1	0	0	0	0
28-Apr	10	0	10	0	0	0	0
29-Apr	0	0	0	0	0	0	0
30-Apr	9	0	9	0	0	0	0
APR	101	0	101	0	0	0	0
2-May	4	0	4	0	0	0	0
5-May	2	0	2	0	0	0	0
6-May	0	0	0	0	0	0	0
7-May	1	0	1	0	0	0	0
9-May	0	0	0	0	0	0	0
10-May	0	0	0	0	0	0	0
14-May	2	0	2	0	0	0	0
27-May	2	0	2	0	0	0	0
28-May	1	0	1	0	0	0	0
MAY	12	0	12	0	0	0	0
8-Jun	0	0	0	0	0	0	0
9-Jun	0	0	0	0	0	0	0
13-Jun	0	0	0	0	0	0	0
JUN	0	0	0	0	0	0	0
Total	121	0	121	0	0	0	0

Appendix Table 11. Daily spring Chinook salmon trapping data from the Catherine Creek adult collection facility in 2008.

Date	Total	Trapped				Sacrified/mortality				Brood collected			
		Adults		Jacks		Adults		Jacks		Adults		Jacks	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
27-May	1	0	1	0	0	0	0	0	0	0	0	0	0
MAY	1	0	1	0	0	0	0	0	0	0	0	0	0
10-Jun	1	1	0	0	0	0	0	0	0	0	0	0	0
13-Jun	2	2	0	0	0	0	0	0	0	0	0	0	0
16-Jun	15	7	8	0	0	0	0	0	0	0	2	0	0
17-Jun	10	3	7	0	0	0	0	0	0	0	0	0	0
18-Jun	21	7	13	1	0	0	0	0	0	1	3	0	0
19-Jun	8	6	1	1	0	0	0	0	0	0	0	0	0
20-Jun	7	4	3	0	0	0	0	0	0	2	1	0	0
21-Jun	19	12	7	0	0	0	0	0	0	0	0	0	0
22-Jun	18	12	6	0	0	0	0	0	0	5	3	0	0
23-Jun	27	16	8	3	0	0	0	0	0	5	1	1	0
24-Jun	24	7	1	14	2	0	0	14	0	0	0	0	0
25-Jun	25	8	7	10	0	0	0	10	0	3	1	0	0
26-Jun	15	6	1	6	2	0	0	6	0	0	0	0	0
27-Jun	44	20	12	12	0	0	0	12	0	9	3	0	0
30-Jun	38	12	4	22	0	0	0	17	0	4	1	3	0
JUN	274	123	78	69	4	0	0	59	0	29	15	4	0
2-Jul	19	4	2	13	0	0	0	13	0	0	1	0	0
5-Jul	31	9	6	15	1	0	0	15	0	4	1	0	0
7-Jul	6	2	1	3	0	0	0	3	0	0	0	0	0
9-Jul	4	3	0	1	0	0	0	1	0	0	0	0	0
13-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Jul	1	1	0	0	0	0	0	0	0	0	0	0	0
17-Jul	1	0	1	0	0	0	0	0	0	0	1	0	0
21-Jul	1	1	0	0	0	0	0	0	0	0	0	0	0
28-Jul	3	1	0	2	0	0	0	2	0	0	0	0	0
JUL	66	21	10	34	1	0	0	34	0	4	3	0	0
15-Aug	1	1	0	0	0	0	0	0	0	0	0	0	0
22-Aug	1	1	0	0	0	0	0	0	0	0	0	0	0
28-Aug	1	1	0	0	0	0	0	0	0	0	0	0	0
2-Sep	1	0	1	0	0	0	0	0	0	0	0	0	0
AUG	4	3	1	0	0	0	0	0	0	0	0	0	0
Total	345	147	90	103	5	0	0	93	0	33	18	4	0

Appendix Table 12. Daily summer steelhead trapping data from the Upper Grande Ronde adult collection facility in 2008.

Date	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
12-Mar	1	0	1	0	0	0	0
14-Mar	1	0	1	0	0	0	0
19-Mar	1	0	1	0	0	0	0
26-Mar	3	0	3	0	0	0	0
MAR	6	0	6	0	0	0	0
4-Apr	4	0	4	0	0	0	0
7-Apr	2	0	2	0	0	0	0
16-Apr	1	0	1	0	0	0	0
18-Apr	3	0	3	0	0	0	0
23-Apr	2	0	2	0	0	0	0
25-Apr	1	0	1	0	0	0	0
28-Apr	7	0	7	0	0	0	2
APR	20	0	20	0	0	0	2
2-May	3	0	3	0	0	0	1
5-May	2	0	2	0	0	0	2
12-May	0	0	0	0	0	0	1
MAY	5	0	5	0	0	0	4
Total	31	0	31	0	0	0	6

Appendix Table 13. Daily spring Chinook salmon trapping data from the Upper Grande Ronde adult collection facility in 2008.

		Trapped				Sacrificed/mortality				Brood collected			
		Adults		Jacks		Adults		Jacks		Adults		Jacks	
Date	Total	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
23-Jun	7	0	2	5	0	0	0	5	0	0	0	0	0
24-Jun	5	0	0	5	0	0	0	5	0	0	0	0	0
27-Jun	16	1	1	14	0	0	0	5	0	1	1	3	0
28-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0
30-Jun	44	2	5	35	2	0	0	35	0	2	3	0	0
JUN	72	3	8	59	2	0	0	50	0	3	4	3	0
1-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Jul	15	0	2	11	2	0	0	11	0	0	0	0	0
4-Jul	13	3	1	9	0	0	0	9	0	3	1	0	0
7-Jul	16	3	3	10	0	0	0	10	0	3	2	0	0
9-Jul	6	0	0	6	0	0	0	6	0	0	0	0	0
10-Jul	3	0	0	3	0	0	0	3	0	0	0	0	0
11-Jul	2	0	1	1	0	0	0	1	0	0	0	0	0
14-Jul	3	0	1	2	0	0	0	2	0	0	1	0	0
16-Jul	2	0	1	1	0	0	0	1	0	0	1	0	0
17-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Jul	1	0	0	1	0	0	0	1	0	0	0	0	0
JUL	61	6	9	44	2	0	0	44	0	6	5	0	0
14-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0
29-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
Total	133	9	17	103	4	0	0	94	0	9	9	3	0

Appendix Table 14. Daily summer steelhead trapping data from the Lookingglass Creek adult collection facility in 2008.

Date	Total	Trapped		Sacrificed/mortality		Recaptures at trap	
		Hat.	Nat.	Hat.	Nat.	Hat.	Nat.
17-Mar	1	0	1	0	0	0	0
24-Mar	11	0	11	0	0	0	0
26-Mar	6	2	4	2	0	0	0
31-Mar	1	0	1	0	0	0	0
MAR	19	2	17	2	0	0	0
2-Apr	2	0	2	0	0	0	0
4-Apr	4	2	2	2	0	0	0
7-Apr	5	0	5	0	0	0	0
9-Apr	4	1	3	1	0	0	0
11-Apr	3	0	3	0	0	0	0
14-Apr	9	0	9	0	0	0	0
16-Apr	4	0	4	0	0	0	0
18-Apr	3	0	3	0	0	0	0
21-Apr	8	0	8	0	0	0	0
23-Apr	3	0	3	0	0	0	1
25-Apr	7	0	7	0	0	0	0
28-Apr	4	0	4	0	0	0	0
30-Apr	8	0	8	0	0	0	0
APR	64	3	61	3	0	0	1
2-May	3	0	3	0	0	0	3
5-May	13	0	13	0	0	0	0
7-May	1	0	1	0	0	0	0
9-May	3	0	3	0	0	0	0
12-May	2	0	2	0	0	0	0
15-May	1	0	1	0	0	0	0
MAY	23	0	23	0	0	0	3
4-Jun	1	0	1	0	0	0	0
7-Jun	19	1	18	1	0	0	0
9-Jun	5	0	5	0	0	0	2
12-Jun	1	0	1	0	0	0	0
13-Jun	2	0	2	0	0	0	2
16-Jun	1	0	1	0	0	0	2
JUN	29	1	28	1	0	0	6
Total	135	6	129	6	0	0	10

Appendix Table 15. Daily spring Chinook salmon trapping data from the Lookingglass Creek adult collection facility in 2008.

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.
7-Jun	1	1	0	0	0	0	0	0	0	1	0	0	0
12-Jun	2	1	1	0	0	0	0	0	0	1	1	0	0
16-Jun	15	14	1	0	0	0	0	0	0	14	1	0	0
19-Jun	18	14	4	0	0	0	0	0	0	14	4	0	0
22-Jun	12	11	0	0	1	0	0	0	0	11	0	0	1
23-Jun	11	8	2	1	0	0	0	0	0	8	2	1	0
24-Jun	13	11	2	0	0	0	0	0	0	11	2	0	0
25-Jun	23	20	3	0	0	0	0	0	0	20	3	0	0
26-Jun	12	8	4	0	0	0	0	0	0	8	4	0	0
27-Jun	11	8	3	0	0	0	0	0	0	8	3	0	0
28-Jun	23	21	2	0	0	0	0	0	0	19	2	0	0
29-Jun	5	3	0	2	0	0	0	0	0	3	0	1	0
30-Jun	10	6	2	2	0	0	0	0	0	6	2	1	0
JUN	156	126	24	5	1	0	0	0	0	124	24	3	1
1-Jul	8	6	0	2	0	0	0	0	0	5	0	1	0
2-Jul	27	21	4	2	0	0	0	0	0	20	4	2	0
3-Jul	6	4	2	0	0	0	0	0	0	4	2	0	0
4-Jul	5	5	0	0	0	0	0	0	0	5	0	0	0
5-Jul	3	3	0	0	0	0	0	0	0	3	0	0	0
7-Jul	19	12	2	5	0	0	0	0	0	12	2	3	0
8-Jul	12	10	1	0	1	0	0	0	0	10	1	0	1
9-Jul	11	7	2	2	0	0	0	0	0	7	2	0	0
10-Jul	3	1	0	2	0	0	0	0	0	0	0	1	0
11-Jul	7	5	2	0	0	0	0	0	0	5	2	0	0
12-Jul	1	1	0	0	0	0	0	0	0	0	0	0	0
13-Jul	1	1	0	0	0	0	0	0	0	1	0	0	0
15-Jul	3	3	0	0	0	0	0	0	0	3	0	0	0
16-Jul	12	9	0	2	1	0	0	0	0	7	0	0	1
17-Jul	7	3	1	3	0	0	0	0	0	2	1	1	0
18-Jul	8	7	0	1	0	0	0	0	0	7	0	1	0
21-Jul	3	2	0	1	0	0	0	0	0	2	0	0	0
23-Jul	2	1	0	1	0	0	0	0	0	1	0	1	0
24-Jul	3	3	0	0	0	0	0	0	0	3	0	0	0
27-Jul	1	1	0	0	0	0	0	0	0	1	0	0	0
30-Jul	4	3	1	0	0	0	0	0	0	3	1	0	0
JUL	146	108	15	21	2	0	0	0	0	101	15	10	2

Appendix Table 15 (cont.). Daily spring Chinook salmon trapping data from the Lookingglass Creek adult collection facility in 2008.

3-Aug	2	2	0	0	0	0	0	0	0	2	0	0	0
5-Aug	0	0	0	0	0	0	0	0	0	-126	-21	-5	-2
11-Aug	2	2	0	0	0	0	0	0	0	2	0	0	0
13-Aug	0	0	0	0	0	0	0	0	0	0	-11	0	0
14-Aug	7	4	2	1	0	0	0	0	0	4	2	0	0
18-Aug	6	4	3	-1	0	0	0	0	0	4	3	-1	0
19-Aug	11	9	0	2	0	0	0	0	0	9	0	0	0
21-Aug	2	1	0	1	0	0	0	0	0	1	0	0	0
22-Aug	3	3	0	0	0	0	0	0	0	3	0	0	0
23-Aug	4	3	0	1	0	0	0	0	0	3	0	0	0
25-Aug	13	13	0	0	0	0	0	0	0	13	0	0	0
27-Aug	12	4	3	5	0	0	0	0	0	4	3	2	0
27-Aug	0	0	0	0	0	0	0	0	0	-17	-4	-2	0
29-Aug	5	3	1	1	0	0	0	0	0	3	1	0	0
AUG	67	48	9	10	0	0	0	0	0	-95	-27	-6	-2
4-Sep	1	1	0	0	0	0	0	0	0	1	0	0	0
8-Sep	1	0	1	0	0	0	0	0	0	0	1	0	0
SEP	2	1	1	0	0	0	0	0	0	1	1	0	0
Total	371	283	49	36	3	0	0	0	0	131	13	7	1

Appendix Table 16. Adult summer steelhead trapping summary from the Catherine Creek adult collection facility in 1997-2008.

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
2007	128	0	128	0	0	0	3
2008	121	0	121	0	0	0	0

Appendix Table 17. Adult summer steelhead trapping summary from the Upper Grande Ronde River adult collection facility in 1997-2008.

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
2007	63	0	63	0	0	0	3
2008	31	0	31	0	0	0	6

Appendix Table 18. Adult summer steelhead trapping summary from the Lookingglass Creek adult collection facility in 1997-2008.

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
2007	132	0	132	0	0	0	15
2008	135	6	12	6	0	0	10

Appendix Table 19. Photos of the Grande Ronde weir washing out in 2008 and the attempted repair.