Lower Granite Dam Smolt Monitoring Program

Annual Report
2003 - 2004

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2003 LOWER GRANITE DAM
SMOLT MONITORING PROGRAM

ANNUAL REPORT

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The 2003 fish collection season at Lower Granite Dam Juvenile Fish Facility (LGR) was characterized by water temperatures, total flows and spill that were below the five year average, low levels of debris, and increased smolt collection numbers compared to 2002 with the exception of unclipped sockeye/kokanee. There were 6,183,825 juvenile salmonids collected. Of these, 6,054,167 were transported to release sites below Bonneville Dam, 5,957,885 by barge and 96,282 by truck. An additional 102,340 fish were bypassed back to the river, primarily due to research projects with another 62,122 bypassed through the PIT-tag bypass system. According to the PTAGIS database, 152,268 PIT-tagged fish were detected at Lower Granite Dam. Of these, Smolt Monitoring Staff recorded 345 PIT-tagged raceway and sample mortalities. Of the 6,183,825 total fish collected, 113,290 were PIT-tagged or radio tagged and 380 were sacrificed by researchers. The collection included 836,885 fish that had hatchery marks other than clipped fins (elastomer, freeze brands or Coded Wire Tags). An estimated 54,857 incidental fish were collected with an additional 8,730 adult salmonids removed from the separator.

Introduction

The Smolt Monitoring Program (SMP) is designed to provide a consistent, real-time database on fish passage and document the migration characteristics of the many stocks of salmon and steelhead in the Columbia Basin. Each SMP site collects daily data on fish passage, river conditions (river flow, spill and flow through the powerhouse) and other site-specific data required by Fish Passage Center (FPC) during the migration season. The FPC staff oversees and guides the SMP sampling program. Fish Passage Center uses this SMP data to work with fishery managers to seek appropriate flow and spill measures to enhance smolt passage and survival as identified in the hydro system's operations requirements set forth in NMFS Biological Opinion and in the Northwest Power Planning Council's Fish and Wildlife Program (NMFS, 1995) .

Lower Granite Dam is located on the Snake River approximately 173 kilometers upstream of its confluence with the Columbia River. Lower Granite Dam is the first of eight dams and the first of four juvenile fish collection facilities on the Snake River that migratory juvenile salmonids from the upper Snake River and its tributaries encounter on their way to the ocean. All four collection and transportation sites on the Snake River are operated by the Corps of Engineers. Most of the fish collected are transported in barges and trucks to release locations below Bonneville Dam on the Columbia River where they complete the remaining 225 kilometer journey to the ocean. Some smolts are bypassed back to the river at LGR to continue their downstream migration through the hydro system. Some smolts migrate past LGR or may be collected at facilities below LGR and transported or migrate past the remaining dams, 694 kilometers to the Pacific Ocean.

At Lower Granite Dam, SMP staff collected and recorded data by inspecting a sample of each day's total smolt collection. Staff technicians and biologists identify and record the following information for each fish sampled; species, descaling, diseases and hatchery marks (fin clips, coded-wire tags, elastomer tags, fin erosion on steelhead and freeze brands). Lengths, weights, injuries, and external signs of disease and/or stress are taken on a sub-sample of up to one hundred fish of each species, daily. The staff also collects daily river flow and river temperature data, river turbidity, monitors and assists on-site research activities, conducts daily juvenile fishway inspections, monitors dam operations as they pertain to fish passage conditions, maintains records of sample and collection data, transmits daily reports to the FPC and the Corp of Engineers and

prepares annual reports. The SMP has been active at LGR since 1984 and operated by the Washington State Department of Fish and Wildlife (WDFW) since 1988.

River Conditions

Flow

Flows in the Snake River at LGR were the third highest since 1999 (Table 1). Flows exceeded 100 kcfs for 20 consecutive days this season from May 25 to June 13 and peaked at 210.77 kcfs June 1. Annual peak flows and the corresponding dates for previous years were: 192.63 kcfs May 27, 1999; 115.03 kcfs April 24, 2000; 90.51 kcfs May 17, 2001 and 136.81 kcfs June 1, 2002. Flows in 2002 exceeded 100 kcfs 20 days also, but not consecutively. In 2001 flows did not exceed 100 kcfs on any day and flows exceeded 100 kcfs for only 10 days in 2000. In 2003 river flows for the last few days of March were between 36.43 kcfs and 57.3 kcfs. Flows in April averaged 70.37 kcfs, and ranged between 47.78 kcfs and 83.45 kcfs. In May, river flows averaged 91.27 kcfs and ranged between 63.34 kcfs and 192.4 kcfs. River flows averaged 93.47 kcfs in June compared to the 1999-2002 average of 83.04 kcfs. Flows decreased in July with a low of 26.88 kcfs July 27 and averaged 32.93 kcfs for the month. Flows averaged 26.24 kcfs in August and 21.06 kcfs in September. Average daily flows in October were as low as 15.62 kcfs October 27 and peaked at 18.25 kcfs October 1 and averaged 15.67 kcfs for the month (Figure 1). National Marine Fisheries Service Biological Opinion, Action 40 identifies that spill will occur at LGR when seasonal average flows are projected to meet or exceed 85 kcfs. Flows in 2003 exceeded 80 kcfs on 33 days, 90 kcfs on 22 days, 100 kcfs on 20 days, 110 kcfs on 15 days, 120 kcfs on 11 days and 130 on ten days.

The Snake River projects were drafted to minimum operation pool (MOP) April 3. Lower Granite pool was drafted to 733-734 feet above mean sea level (MSL) and Little Goose pool to 633-634 feet above MSL. Little Goose pool was refilled to 636-637 feet above MSL September 4 and remained that way throughout the fish sampling season in order to improve adult fish passage operations at LGR. Lower Granite reservoir was refilled in November.

Spill

Spill for juvenile fish passage began on April 3 at LGR and continued until June 20. Spill for testing the Removable Spillway Weir (RSW) began April 14 and continued until May 30. There was no spill after June 20 except for maintenance and emergency spill due to line outages. Spillway discharge was higher than anticipated this season due to turbine unit #1 being off-line.

Table 1. Comparison of average monthly river flow and spill at LGR, 1999-2003.

Month	1999	2000	2001	2002	99 to 02 Average	2003
	Flow (kcfs)					
April[1]	97.5	83.5	35.6	70.9	71.9	67.2
May	110.8	84.1	63.1	80.1	84.6	91.3
June	135.8	64.4	36.5	95.4	83.0	93.5
July	55.5	38.6	26.6	39.5	40.1	32.9
August	38.2	26.3	24.0	29.5	29.5	26.2
September	23.0	21.6	14.5	21.7	20.2	21.1
October	23.4	22.6	15.2	16.9	19.6	15.7
	Spill (kcfs)					
April[1]	30.2	17.6	0.0	18.9	16.5	18.5
May	41.9	21.6	0.0	28.7	23.0	29.6
June	46.4	20.7	0.0	34.7	25.5	24.0
July	0.5	0.0	0.0	6.5	1.7	0.2
August	0.3	0.0	0.6	<0.1	0.2	0.3
September	0.0	0.0	<0.1	<0.1	<0.1	0.0
October	0.0	0.6	<0.1	0.0	0.2	0.3

[1] Includes March 26-31

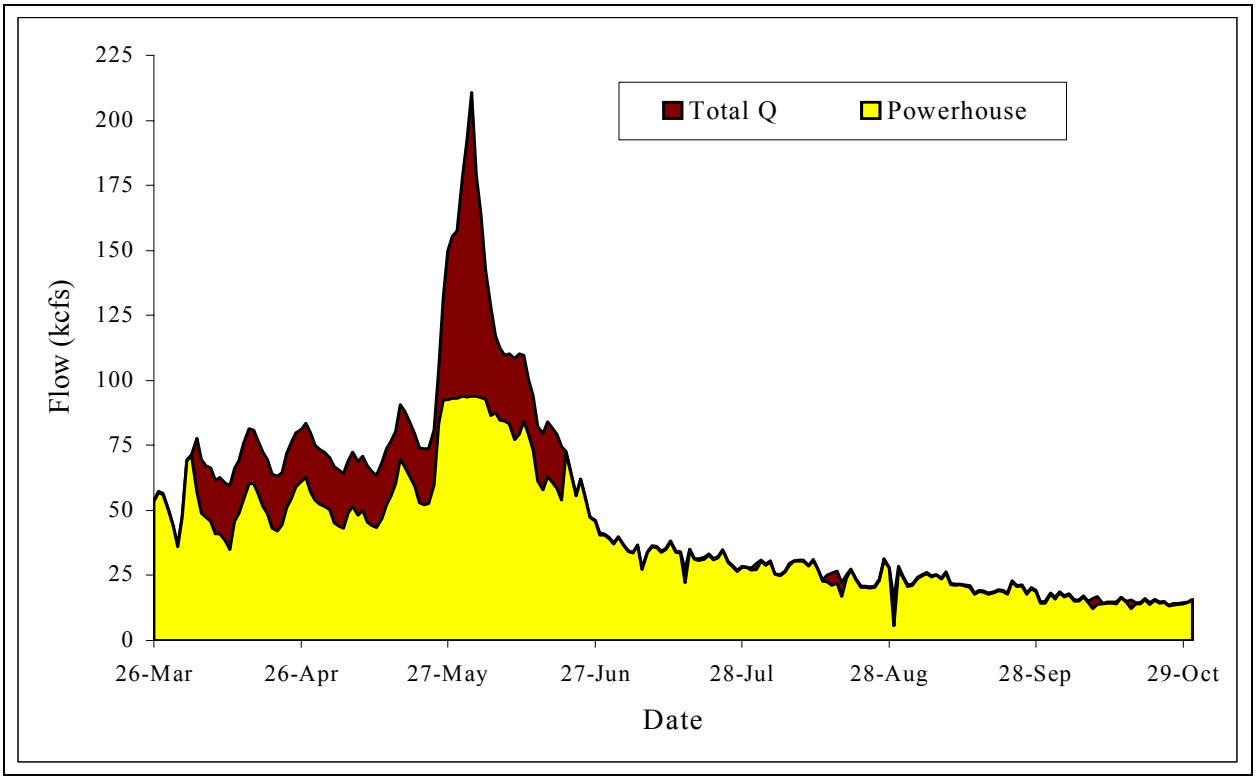

Figure 1. Daily average powerhouse discharge and spill at LGR, 2003.

Temperature

This season's temperatures were below average at the beginning of the season and above average at the end of the season. Facility water temperature was 7.2°C (44.9°F) at the beginning of the fish collection season March 26 and remained below 15.6°C (60.1°F) until June 16 (Appendix 1, Table 5). The facility water temperature did not reach 20.0C (68.0°F) until July 7 and peaked July 31 at 22.6°C (72.7). The highest water temperatures recorded in the previous three years did not exceed 21.5C (70.7°F). Facility water temperatures did not drop below 15.6°C (60.0°F) until October 21 and then decreased to 13.4°C (56.1°F) on the last day of sampling (October 31).

Temperature units (TUs), the number of degrees Fahrenheit above 32°F, are one measure of the relative temperature over a period of time. The 1,590 TUs recorded for the spring migration, April 1 through June 20, was the second lowest since 1992 and was 5.8% less than the 1992-2002 average of 1,553 TUs (Figure 3). Conversely, the summer/fall total of 4,579 TUs from June 21-October 31, 2003 was the second highest in the last eleven years and is 9.7% greater than the 2002 TU total of 4,337 (Figure 4). From April 1 through October 31, 2003, the season total of 6,168 TUs was 9.1% greater than the 2002 total of 5,655 TUs and was 2.4% greater than the 1992-2002 average of 6,025 TUs (Figure 2).

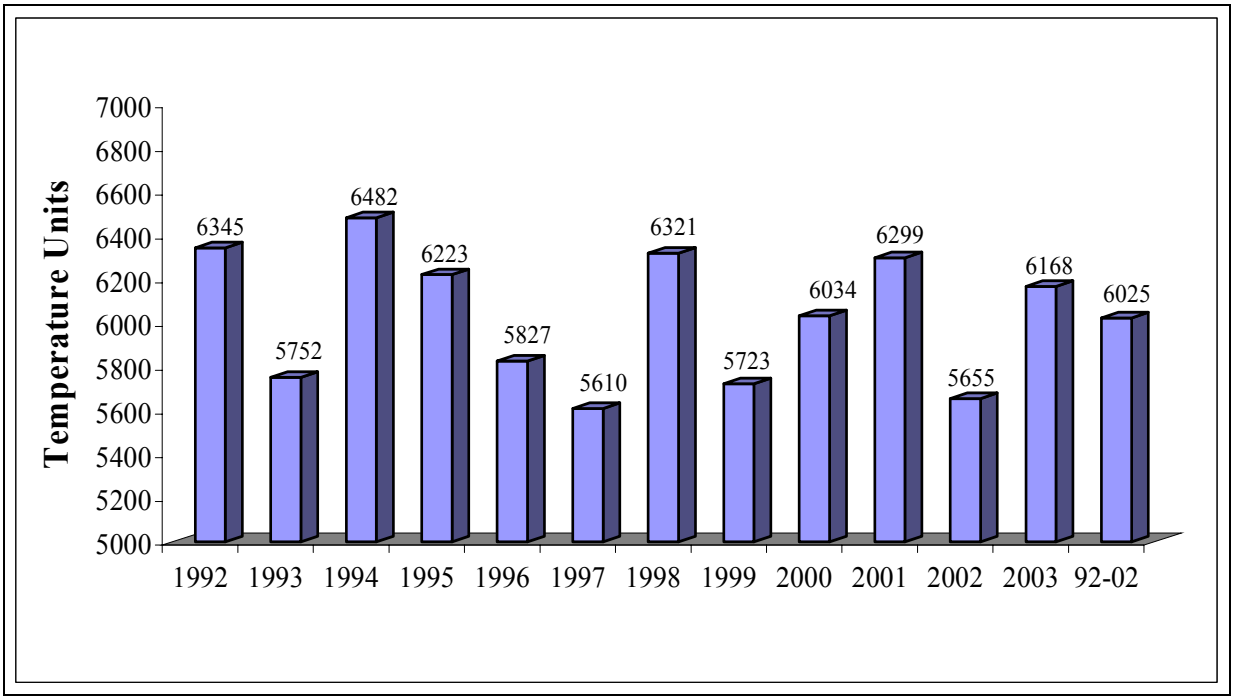

Figure 2. Cumulative temperature units at LGR April 1 to October 31, 1992-2003.

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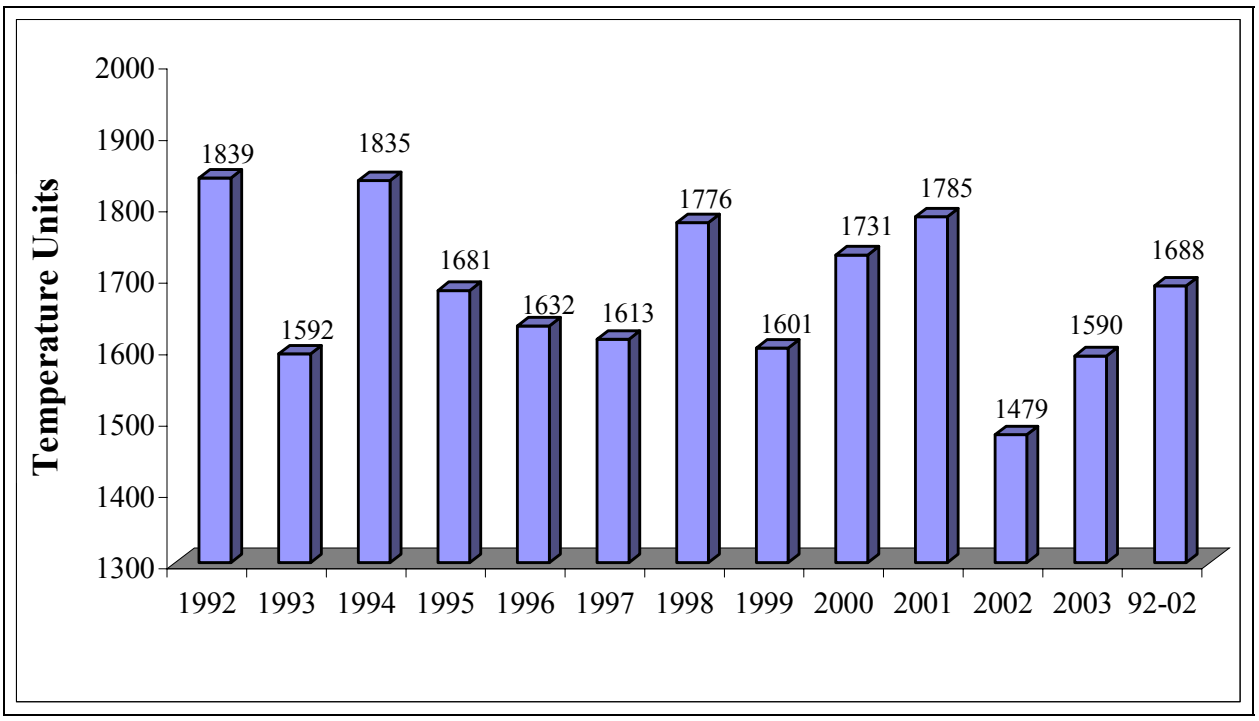

Figure 3. Cumulative temperature units at LGR April 1 to June 20, 1992-2003.

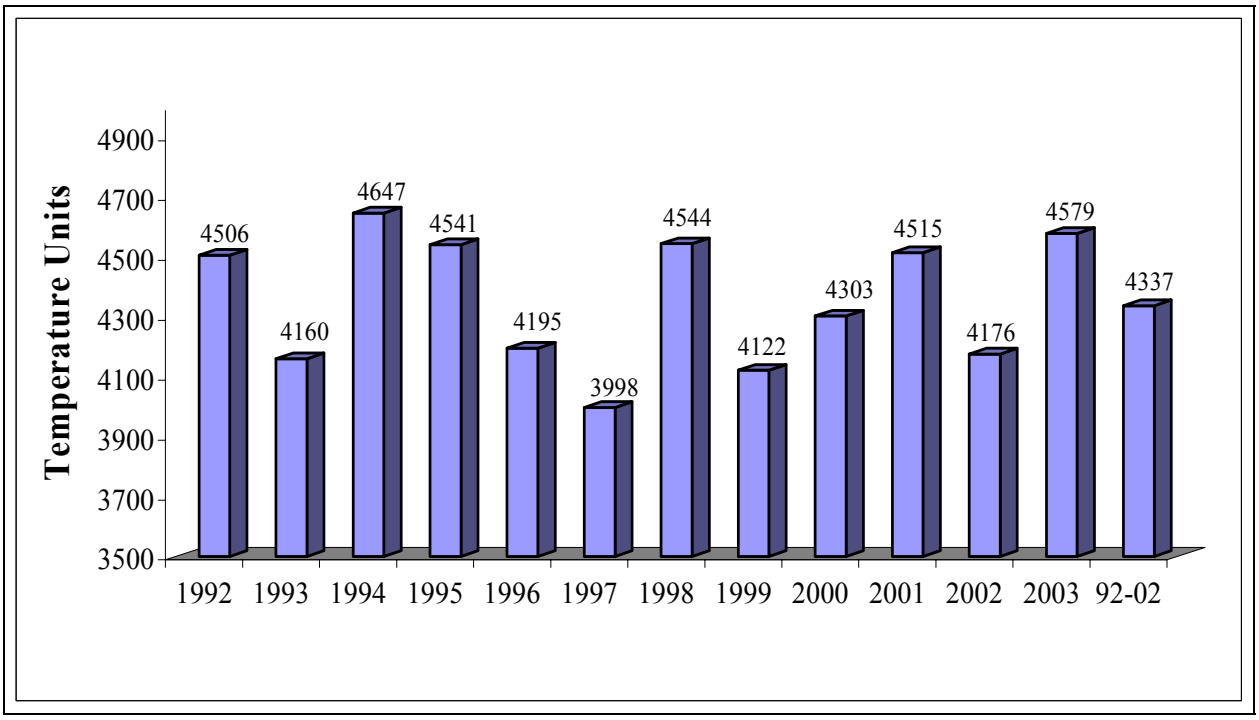

Figure 4. Cumulative temperature units at LGR from June 21 to October 31, 1992-2003.

Debris

We have measured the volume of small woody debris collected in the sample tank daily since 1998. Additionally, we made daily estimates of floating debris in the forebay and recorded forebay debris removal events, trash rack raking events and de-watering screen-cleaning events. Daily facility debris loads were estimated based on daily sample tank accumulations and sample rates. The volume of woody debris too large to pass through the separator bars was not estimated.

A total of 1057 cubic feet of small woody debris passed through the fish facility in 2003. This is a 1072% increase over the 2002 total of 90 cubic feet of small woody debris. Daily debris accumulation averaged 4.8 cubic feet per day. This is the largest volume of debris recorded since 1998 when we started recording this data and ends a declining trend in total debris observed since 1998 (Table 2 and Figure 5).

Table 2. Debris levels at LGR, 1998-2003.

	Peak Flows in	Cubic Feet of Debris in the Sample		Cubic Feet of Debris in the Collection	
Year	Cubic Feet/Sec.	Daily Ave.	Season Total	Daily Ave.	Season Total
1998	214	0.68	150.1	4.27	939.3
1999	193	0.47	107.7	3.17	728.9
2000	115	0.16	34.7	0.96	211.8
2001	90	0.13	29.6	0.79	173.8
2002	137	0.03	6.6	0.41	90.2
98-02 ave.	149.8	0.29	65.7	1.92	428.8
2003	210	0.16	35.6	4.80	1,056.76

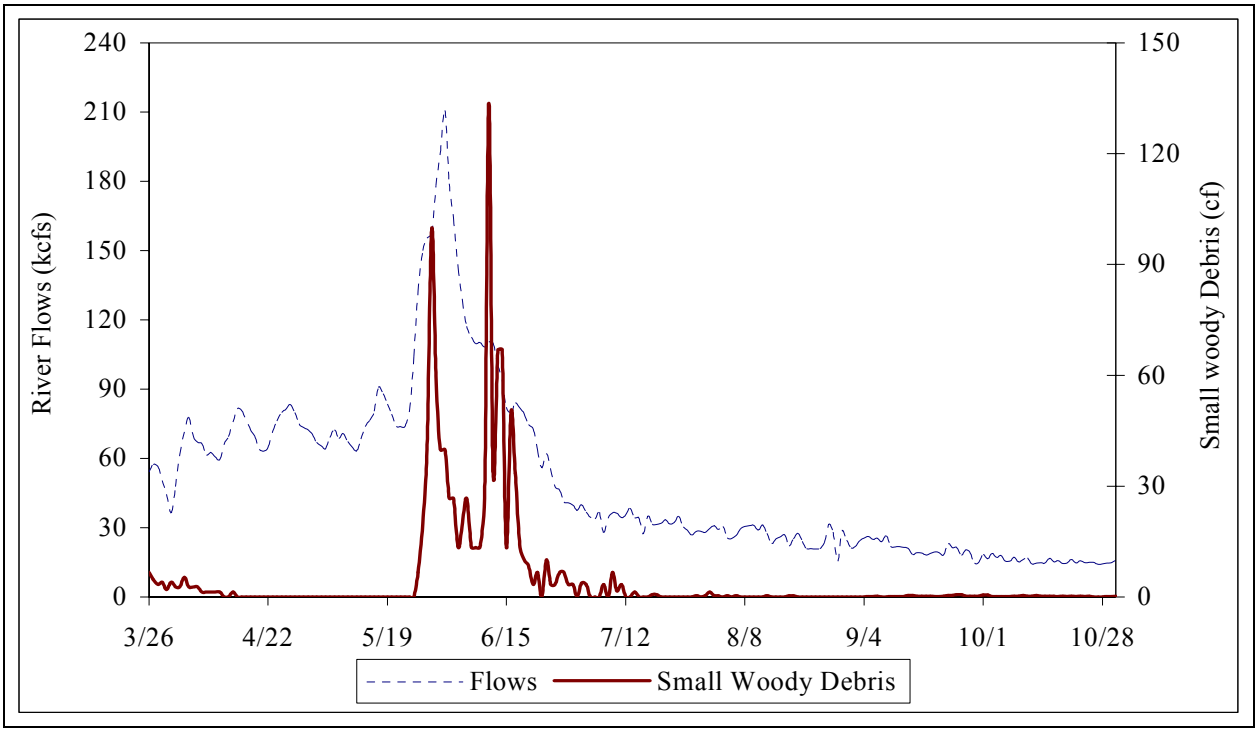

Figure 5. Estimated daily small woody debris accumulation in the juvenile fish bypass system and river flows at LGR, 2003.

Debris peaks at the juvenile fish facility usually occur when the facility is first watered up, after reservoir fluctuations, turbulent weather events and high river flows during spring runoff. This year debris accumulation at the juvenile fish facility followed this trend, peaking at startup on March 26, on May 29 as flows increased and June 11, ten days after the season's peak flows. Late in the season high winds blew leaves into the river that accumulated at the juvenile fish facility. Debris accumulations (leaves) were severe enough that the separator was dewatered four times this past season for debris removal.

Towing debris away from the powerhouse with the use of log booms has not been done since 1999 when the floating woody debris in the forebay reached a maximum estimated area of four acres between June 17 and early July. Floating debris reached a maximum of two acres this year. However, with the Removable Spillway Weir (RSW) attached to spillbay one, towing debris using the log booms was not needed because when the RSW was operated, floating debris was flushed down river.

Lower Granite Juvenile Fish Facility primary dewatering structure consists of an inclined screen of stainless steel mesh supported by heavy bar screen just upstream from the porosity control perforated plate for the separator. There is no mechanical cleaning device on this screen. Corp of Engineers staff clean this screen with a long handled brush or scraper at periods ranging from every hour to once or twice per day depending on amount of debris accumulation. When the incline screen on the separator system becomes severely clogged with debris, it is necessary to go into temporary bypass mode by closing the dewatering valve below the screen and opening the 72-inch bypass valve. This takes pressure off of the incline screen and allows debris to either float off or be brushed off easily. Typically, it takes 20 minutes to complete this procedure during which time fish are bypassed back to the river. Fish were bypassed during 36 cleaning events in 1999, none in 2000, one in 2002 and ten in 2003.

On May 28, 2003 due to debris removal operations in the LGR forebay, the facility experienced very heavy debris movement across the inclined screen on the separator. It was necessary to go into temporary bypass mode to clear fine debris off the inclined screen four times between 0930 and 1600 hours. High debris levels between June 6 and June 12 resulted in five bypass events of 20 minutes each. Each event was approximately 20 minutes duration. A sixth attempt to clear debris from the inclined screen was made at approximately 1500 hours on June 12. The bypass gate did not open on the first attempt and then opened approximately five inches and froze in place. Testing of the controller of the this 72 inch separator dewatering gate resulted in the gate freezing at approximately 20% open on June 30. Due to fish passing under the gate and no way to repair it without dewatering, the primary bypass gate was open and the system dewatered on Tuesday, July 1 at 0700 hours. The dewatering gate was disconnected from the controller and lowered to the closed position by cable. From 0700 to 0900 fish were bypassed to the river. In order to complete repairs to the malfunctioning dewatering gate the facility was dewatered by closing the primary bypass gate and collection gallery orifices. This prevented fish from entering the fish collection facility and from being bypassed while repairs were conducted. An estimated 1,600 mortalities were recorded due to the dewatering of the separator. Repairs to the dewatering gate continued between 0915 and 1330 hours, July 1. The fish collection system was watered up and in full operation by 1400 hours, July 1.

Additional repairs to the dewatering gate continued on July 15 when the collection system was put into primary bypass mode, bypassing fish through the outfall pipe between 0700 and 0930 hours. During this time the makeup water and collection gallery orifices were shut down and the primary bypass gate was closed, preventing further bypass of fish during the

repairs. Repairs to the dewatering gate were conducted between 1000 and 1630 hours after which water-up activities began. The primary bypass gate was opened between 1700 and 1800 hours as the makeup water and orifices were opened and the separator was fully watered up. At 1800 hours the collection activities resumed.

Turbidity

Turbidity (water clarity) was measured daily using a secchi disk, a six-inch black and white disk attached to the end of a two-meter rod with graduations in tenths of feet. Measurements were taken between 10 A.M. and noon from the surface of the fish ladder adjacent to the adult fish viewing windows. Visibility and flow relationships were similar to those observed in 2002 and 2001 when peak flows carrying suspended solid particle materials resulted in reduced visibility. Visibility and fish collection also followed the pattern of increased fish collection during periods of increased turbidity (Figures 6 and 7).

This season we recorded only one distinctive increase in turbidity which corresponded to increased river flows. On June 1, during the spring migration, river flows peaked at 210.8 kcfs and visibility reached its lowest at 0.9 feet. Unlike 2002 when visibility reached its lowest on April 17 at 0.8 feet which corresponded to increased flows and fish collection, the low visibility of 2003 did not correspond to an increase in fish collection. From June 2 to June 23 visibility increased from 0.9 feet to 4.9 ft, and declined to 3.7 on June 24 when collection numbers increased from 16,000 to 60,000 smolts without a decrease in visibility or flows. From June 24 until October visibility continued to improve remaining at or near six feet. In October and early November, visibility declined due to wind storms that deposited silt in the river (Figures 6 and 7).

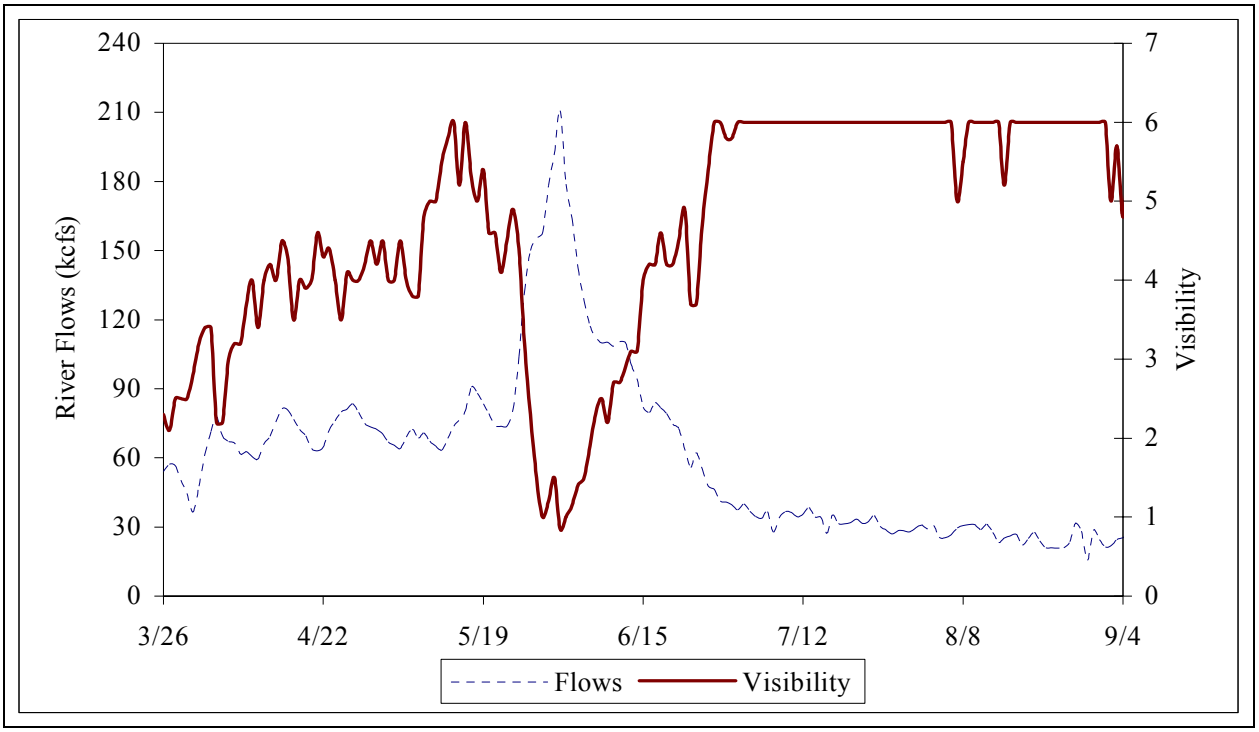

Figure 6. Fish ladder visibility and river flows at LGR, 2003.

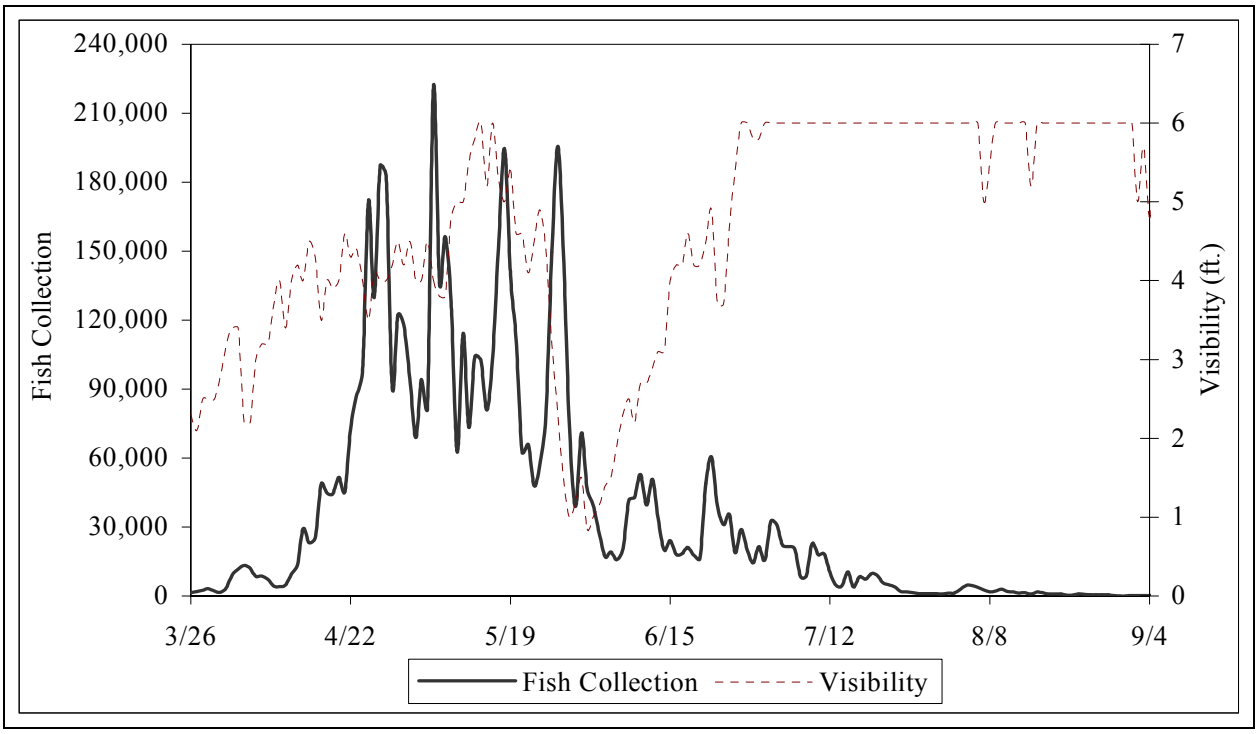

Figure 7. Fish ladder visibility and smolt collection at LGR, 2003.

Sample Program and Summary

Overview

Daily samples of fish from the general collection were counted by hand and examined throughout the season. Sample data included counts by species, weights, lengths and descaling data and were recorded and summarized daily to provide real-time information for the Smolt Monitoring Program and for the Corps of Engineers transportation program. Daily samples were collected over a 24-hour period starting and ending at 0700 and processed between 0730 and 1000 each day. In the latter part of the season when collection numbers declined daily samples were processed every-other-day. At different times during the season researchers utilized anesthetized fish from the sample for marking and study purposes. We sampled a total of 106,503 smolts (Table 4), 1.7% of the total collection this season. Daily sample sizes averaged 484 smolts compared to 470 in 2002 and ranged between 14 and 1963 smolts compare to 35 and 3,314 smolts in 2002.

Daily sample procedure

Fish diverted to the sample tank were held for up to 24 hours prior to examination. The 24-hour sample period started at 0700. At the end of each 24-hour sampling period the entire sample was processed. Screens in the sample holding tank were moved forward to crowd fish to the front of the tank. Once the fish were crowded, small groups of fish were guided into pre-anesthetic chambers through knife gates. Batch sizes typically ranged between 30 and 60 fish per chamber. The fish anesthetic, ethyl m-aminobenzoate methanosulfonate (MS-222®) was added to the chamber to obtain a concentration of about 62 mg/l. At this concentration, about 95 percent of the fish were sedated within three minutes. Once anesthetized, these fish were flushed through the exit valve sending them to the sorting trough inside the lab.

The sorting trough is part of a re-circulating water system with temperature control and aeration. The anesthetic levels in the system are set to keep fish sedated and easy to handle during the sample. Typically, the MS-222 levels averaged between 55-60 mg/L. Sample fish remained in the sorting tank for as little as five seconds and up to five minutes. We strive to process fish within three minutes of entering the tank to minimize the effects of sedation and handling.

All fish handled in the sorting trough were enumerated by species, examined for hatchery marks, and descaling. A detailed sub-sample of up to 100 fish of each species was conducted during each daily sample. In the detailed sub-sample fish were held in a water-filled tray on an electronic balance as we recorded species, individual fish length and weight, unique hatchery marks, descaling, injuries and external symptoms of disease. This detailed sub-sample provides the Corps with fish per pound and species composition data which is used to calculate raceway, barge and truck loading densities. Immediately after sampling, fish were routed in fresh water to the recovery tank on non-transport days or routed directly onto a waiting truck or barge on transport days. The maximum time that any fish was held at the fish facility was 48 hours.

Sample rates

The sample system at LGR includes two primary slide gates located in the bottom of the flumes a few feet downstream of the separator. These slide gates are controlled by a timer calibrated in tenths of a minute. When the slide gates are closed fish are sent to a sample holding tank at the separator. The sample holding tank at the separator has four 4-inch counter tunnel exits connected to a 12 inch pipe leading to the primary sample tank which is divided into two equal halves, each with two pre-anesthetizing chambers. Corp of Engineer staff set the slide gates to open and close six times per hour. The length of time the gates are closed depends upon the sample rate. For example, if the sample rate is 10%, the gate closes for sixty seconds, six times per hour for a total of six minutes, or one tenth of an hour. The sample rate is determined by the number of fish entering the system with the attempt to sample between 495 and 750 fish (Table 3). The primary slide gates can be set to override the sample if a PIT-tagged fish crosses one of these gates.

From March 25 at 0700 hours through July 29 at 0736 hours the system was set to override the PIT-tag diversion system, sending PIT-tagged fish to the sample and from July 29 at 0736 hours until October 31 at 0700 hours, the system was set to divert PIT-tagged fish back to the river during the sample. In 2001 and 202 the system was set to divert PIT-tagged fish back to the river during the sample on October 17 and August 17 respectively.

Table 3. Lower Granite Dam Juvenile Fish Facility sample rate guidelines.

Estimated Daily Collection	Sample Rate (%)	Equivalent Multiplier 1/sample rate	Estimated Number of Fish in Sample
Emergency	0.50%	200	
> 75,000	0.70%	143	>525
50,000 - 75,000	1.00%	100	500 - 750
35,000 - 50,000	1.50%	66.6	525 - 750
25,000 - 35,000	2.00%	50	500 - 750
16,500 - 25,000	3.00%	33.3	495 - 750
12,500 - 16,500	4.00%	25	500 - 660
10,000 - 12,500	5.00%	20	500 - 625
7,500 - 10,000	7.00%	14.3	525 - 700
5,000 - 7,500	10.00%	10	500 - 750
4,000 - 5,000	12.50%	8	500 - 625
3,000 - 4,000	15.00%	6.66	450 - 600
2,500 - 3,000	20.00%	5	500 - 600
1,500 - 2,500	25.00%	4	375 - 625
500 - 1,500	50.00%	2	250 - 750
< 500	100.00%	1	< 500

Season sample summary

Sampling began at Lower Granite at 0700 hours March 26 and continued daily through September 2. Every-other-day (EOD) sampling began September 2, and continued to the end of the season, October 31, at 0700 hours. A total of 220 daily samples were processed this season. The sample rate was set at 10% March 26 and adjusted throughout the season until September 2, to achieve daily sample sizes of between 495 and 750 smolts based on guidelines provided by the Fish Passage Center (FPC) and daily fish collection numbers. From September 2 through October 31, the sample rate was set at 100%.

A total of 106,503 fish, 1.7% of the total collection, were sampled in 2003 compared to 2002 when 103,396 fish, 2.6% of the collection were sampled (Table 5). The total number of fish sampled by species included: 16,471 clipped yearling chinook, 8,905 unclipped yearling chinook, 2,455 clipped subyearling fall chinook, 55,982 unclipped subyearling fall chinook, 16,172 clipped steelhead, 5,179 unclipped steelhead, 73 clipped sockeye/kokanee, 40 unclipped sockeye/kokanee and 1,226 coho.

Sample size exceeded 1,000 fish on one day between March 26 and April 22 as daily collection counts increased and the sample rate was gradually reduced to the minimum rate of 0.67% on April 23. The sample rate stayed at .067% between April 23 and May 23 during which time sample sizes exceeded 1,000 seven times. After May 23 the sample increased from the minimum rate and samples exceeded 1,000 smolts eight times, twice in late May, four times in June and twice in July for a total of 16 samples that exceede 1,000 fish (Table 4).

Table 4. Weekly sample rates in percent and sample totals at LGR, 2003.

Week Ending	Sample rate (%)	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Total
		Clipped[2]	No Clip[1]	Clipped[2]	No Clip[1]	Clipped[2]	No Clip[1]	Clipped[2]	No Clip[1]	Clip/Uclp	
3/27	10.00%	95	165	0	9	5	48	1	1	0	324
4/3	8.26%	1,026	1,136	0	43	119	478	1	4	3	2,810
4/10	4.99%	804	1,265	0	21	539	278	0	1	3	2,911
4/17	3.11%	1,546	1,977	0	36	787	458	0	2	0	4,806
4/24	0.96%	1,682	1,010	0	4	1,079	495	0	1	1	4,272
5/1	0.67%	2,834	818	0	4	2,668	388	0	2	6	6,720
5/8	0.67%	3,371	824	0	0	1,235	282	0	2	9	5,723
5/15	0.67%	2,194	336	0	4	1,603	312	0	1	9	4,459
5/22	0.67%	2,018	480	0	2	2,223	691	2	0	133	5,549
5/29	0.80%	598	631	48	54	3,527	815	7	8	280	5,968
6/5	0.77%	70	91	260	775	638	258	44	4	131	2,271
6/12	2.00%	97	56	397	4,090	316	187	12	3	117	5,275
6/19	2.98%	53	31	445	3,603	247	131	2	3	67	4,582
6/26	2.52%	32	20	830	5,139	148	65	0	0	72	6,306
7/3	2.33%	4	10	187	3,481	75	12	0	1	44	3,814
7/10	2.81%	6	9	83	3,198	61	12	0	1	46	3,416
7/17	6.68%	5	4	40	3,850	84	20	1	0	43	4,047
7/24	10.00%	10	8	67	3,999	90	22	0	0	42	4,238
7/31	20.00%	0	2	23	1,414	172	55	0	0	33	1,699
8/7	20.28%	1	1	24	4,100	113	22	0	0	32	4,293
8/14	20.00%	0	1	7	2,544	54	16	0	0	56	2,678
8/21	20.28%	1	1	7	1,359	44	7	0	0	34	1,453
8/28	25.00%	0	0	3	920	20	11	0	1	5	960
9/4	59.78%	0	2	3	472	40	12	0	0	6	535
9/11	100.00%	0	0	7	1,987	142	56	0	0	22	2,214
9/18	100.00%	0	5	3	865	49	19	0	0	4	945
9/25	100.00%	5	6	0	1,030	27	4	0	0	3	1,075
10/2	100.00%	10	5	3	2,285	21	11	0	0	6	2,341
10/9	100.00%	1	1	4	2,207	14	0	0	2	2	2,231
10/16	100.00%	5	1	4	3,048	10	8	0	0	7	3,083
10/23	100.00%	2	7	8	3,786	16	1	0	1	2	3,823
10/31	100.00%	1	2	2	1,653	7	4	3	2	8	1,682
Totals		16,471	8,905	2,455	55,982	16,173	5,178	73	40	1,226	106,503

[1]Wild chinook, wild steelhead and wild sockeye/kokanee designated in text as unclipped beginning in 2000.
[2]Hatchery chinook, hatchery steelhead and hatchery sockeye/kokanee designated in text as clipped for 2000-2003.

Table 5. Annual percentage of total juvenile salmonids collected that were sampled at Lower Granite Dam, 1999-2003.

Year	Yearling Chinook Clipped[2]	Yearling Chinook No Clip[1]	Subyearling Chinook Clipped	Subyearling Chinook No Clip	Steelhead Clipped[2]	Steelhead No Clip[1]	Sockeye/Kokanee Clipped[2]	Sockeye/Kokanee No Clip[1]	Coho Clip/Uclp	Total
1999	0.9	2.0	54.2	19.8	1.2	1.4	4.2	6.1	2.1	2.0
2000	0.8	2.2	---	10.3	1.0	1.4	2.5	11.6	1.9	1.8
2001	1.1	1.5	4.3	8.0	11.4	12.8	2.1	17.1	3.7	1.8
2002	1.5	1.8	5.3	7.8	1.6	1.8	2.9	2.1	2.2	2.6
2003	0.9	1.3	2.1	5.3	0.9	1.1	1.0	1.5	1.4	1.7

[1]Wild chinook, wild steelhead and wild sockeye/kokanee designated in text as unclipped beginning in 2000.
[2]Hatchery chinook, hatchery steelhead and hatchery sockeye/kokanee designated in text as clipped for 2000-2003.

Two different agencies, the United States Geological Survey Biological Research Division (USGS-BRD) and the National Oceanic Atmospheric Administration (NOAA Fisheries) conducted five studies using fish from the daily samples at Lower Granite Dam Juvenile Fish Facility in 2003. Researchers utilized 6,780 smolts from the sample in 2003 compared to 6,774 smolts in 2002, 2,302 in 2001 and 8,452 smolts in 2000. Of the 6,780 smolts taken from the sample in 2003, 5,875 (86.7%) were tagged for research. Of the 5,875 tagged fish, 3,275 were transported and 2,600 were bypassed (Table 6).

Table 6. Total number of fish taken from the sample for research needs at LGR, 2003

Summary	Yearling Chinook Clip	Yearling Chinook No Clip	Subyearling Chinook Clip	Subyearling Chinook No Clip	Steelhead Clip	Steelhead No Clip	Sockeye/Kokanee Clip	Sockeye/Kokanee No Clip	Coho All	Total
Tag'd, byp	1,852	0	26	192	604	601	0	0	0	3,275
Tag'd, trans	0	0	0	2,600	0	0	0	0	0	2,600
Handled, trans	0	0	33	110	0	0	0	0	0	143
Handled, byp	448	0	1	0	119	91	0	0	0	659
Sacrificed	62	0	0	0	0	0	0	0	0	62
Mortalities	35	0	0	5	1	0	0	0	0	41
Totals	2,397	0	60	2,907	724	692	0	0	0	6,780

The National Oceanic Atmospheric Administration (NOAA Fisheries) collected a total of 2,600 unclipped subyearling fall chinook from daily samples at Lower Granite Dam Juvenile Fish Facility. These fish were PIT-tagged and transported to assess the survival and return rate of late season transported fish (Table 7).

Table 7. Number of fish taken from the sample by NOAA Fisheries for late-season transportation study at LGR, September 4- October 31, 2003.

	Yearling Chinook Clip	Yearling Chinook No Clip	Subyearling Chinook Clip	Subyearling Chinook No Clip	Steelhead Clip	Steelhead No Clip	Sockeye/Kokanee Clip	Sockeye/Kokanee No Clip	Coho All	Total
Tag'd, byp	0	0	0	0	0	0	0	0	0	0
Tag'd, trans	0	0	0	2,600	0	0	0	0	0	2,600
Handled, byp	0	0	0	0	0	0	0	0	0	0
Handled, trans	0	0	0	0	0	0	0	0	0	0
Mortality	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	2,600	0	0	0	0	0	2,600

The United States Geological Survey Biological Research Division (USGS-BRD) researchers received 4,183 smolts from daily samples for four studies. Of these, 3,418 were surgically implanted with radio tags for Removable Spillway Weir (RSW) tests. These fish were released upstream of Lower Granite and tracked with 3-D tracking equipment to monitor movement and passage through the LGR pool, RSW and in the LGR tailrace (Tables 8-11). See Research section for study details.

Table 8. Number of fish taken from the sample by USGS-BRD Radio Telemetry Tailrace research at LGR, April 17-May 30, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clip	No Clip	Clip	No Clip	Clip	No Clip	Clip	No Clip	All	Total
Tag'd, byp	397	0	0	0	0	0	0	0	0	397
Tag'd, trans	0	0	0	0	0	0	0	0	0	0
Handled, byp	147	0	1	0	0	0	0	0	0	148
Sacrificed	62	0	0	0	0	0	0	0	0	62
Mortalities	25	0	0	0	0	0	0	0	0	25
Totals	631	0	1	0	0	0	0	0	0	632

Table 9. Number of fish taken from the sample by USGS-BRD Radio Telemetry Forebay research at LGR, April 17-May 29, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clip	No Clip	Clip	No Clip	Clip	No Clip	Clip	No Clip	All	Total
Tagged, byp	1,255	0	0	0	401	399	0	0	0	2,055
Handled, trans	0	0	0	0	0	0	0	0	0	0
Handled,byp	301	0	0	0	114	91	0	0	0	506
Sacrificed	0	0	0	0	0	0	0	0	0	0
Mortalities	10	0	0	0	1	0	0	0	0	11
Totals	1,566	0	0	0	516	490	0	0	0	2,572

Table 10. Number of fish taken from the sample by USGS-BRD Radio Telemetry 3-D Sonic research at LGR, April 22-May 29, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clip	No Clip	Clip	No Clip	Clip	No Clip	Clip	No Clip	All	Total
Tag'd, byp	200	0	0	0	203	202	0	0	0	605
Handled, trans	0	0	0	0	0	0	0	0	0	0
Handled,byp	0	0	0	0	5	0	0	0	0	5
Sacrificed	0	0	0	0	0	0	0	0	0	0
Mortalities	0	0	0	0	0	0	0	0	0	0
Totals	200	0	0	0	208	202	0	0	0	610

Table 11. Number of fish taken from the sample by USGS-BRD Radio Telemetry of Subyearling Fall Chinook at LGR, June 25-August 21, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clip	No Clip	Clip	No Clip	Clip	No Clip	Clip	No Clip	All	Total
Tag'd, byp	0	0	26	192	0	0	0	0	0	218
Handled, trans	0	0	33	110	0	0	0	0	0	143
Handled,byp	0	0	0	0	0	0	0	0	0	0
Sacrificed	0	0	0	0	0	0	0	0	0	0
Mortalities	0	0	0	5	0	0	0	0	0	5
Totals	0	0	59	307	0	0	0	0	0	366

Mark Recapture

Staff recorded hatchery marks and tags from all smolts examined for the Smolt Monitoring Program (SMP) and Gas Bubble Trauma sampling program (GBT). These marks included freeze brands, fin clips, visual implanted elastomer tags (VIE) and coded-wire tags (CWT). Information recorded for each mark type included type of mark, location, orientation, color, fin clips and lengths on branded fish. This information was reported daily to the Fish Passage Center throughout the season. We also recorded passive integrated transponder (PIT) tag codes from tagged fish collected in GBT samples and PIT-tagged fish mortalities recovered from the sample, raceways and recovery tank. PIT-tag records were flagged with conditional codes "RE" for recaptured fish and "M" for mortalities where appropriate and were submitted to the Columbia River Basin PIT-Tag Information System (PTAGIS). Additionally, we recorded all PIT-tagged fish that were detected at the Juvenile Fish Facility.

Because many groups of hatchery juveniles are not fin clipped we are unable to distinguish untagged hatchery fish from wild migrants. Therefore, we did not record juveniles as hatchery or wild but as clipped or unclipped. All unclipped yearling and subyearling chinook were scanned for coded-wire tags (CWT). We also recorded the number of steelhead with fin erosion/deformities, typical of hatchery rearing on unclipped steelhead. Collection numbers were derived by expanding the daily sample numbers by the daily sample rate. In 2003 we collected 17.2% of the hatchery marked fish released above LGR (4,607,471 of 26,793,442) (Table 12). The number and percent of each marked group collected and passage date for these marked groups is summarized in Tables 13 and 14.

Table 12. Number of hatchery fish released above LGR, number of hatchery fish collected at LGR and the percent of release collected at LGR, 2000-2003.

Year	Total Hatchery Fish Released Above LGR	Total Hatchery Marked Fish Collected	Percent Collected
2000	17,635,542	6,733,035	38.2%
2001	16,489,551	6,697,823	40.6%
2002	25,466,576	2,921,032	11.5%
2003	26,793,442	4,607,471	17.2%

Table 13. Number of hatchery marked fish released above LGR and the numbers and percent of each marked group collected at LGR fish facility, 2003.

[1]Mark Code	Rearing Type & Species	Race	Hatchery	Release Site	RKm To LGR	Total Released	Total Recapture	Percent Recovered
CWT, nc	H. Chinook	SP, SU	Multiple Sites	Multiple Sites		887,896	115,913	13.1%
CWT, nc	H. Chinook	FA	L. F./Cherry Ln	Multiple Sites		1,271,953	367,097	28.9%
CWT, nc	H. Coho		Multiple Sites	Multiple Sites	63, 75, 175	114,044	10,870	9.5%
Fin Eroded, nc	H. Steelhead	SU	Multiple Sites	Multiple Sites		1,186,853	215,944	18.2%
EL-LE-GR	H. Chinook	FA	Lyons Ferry	Big Canyon Accl. Pd.	108	132,251	39,632	30.0%
EL-RE-GR	H. Chinook	FA	Lyons Ferry	Pittsburg Landing	173	118,343	30,087	25.4%
EL-LE-BL	H. Chinook	FA	Lyons Ferry	Cpt. John Accl. Pd.	90	135,056	29,239	21.6%
EL-LE-RD	H. Chinook	SP	Looking Glass	Lostine Acc. Pd	292	101,979	15,023	14.9%
EL-RE-OR	H. Chinook	SU	McCall	Johnson Creek	429	72,146	1,643	2.3%
EL-LE-OR	H. Chinook	SP	Lookingglass	Gande Ronde Acc. Pond	418	26,606	2,976	11.2%
EL-LE-GR	H. Chinook	SP	Lookingglass	Catherine Cr. Acc. Pond	378	24,092	1,145	4.8%
FB-RD R-1	H. Steelhead	SU	Dworshak	Dworshak Hatchery	116	10,115	0	0.0%
FB-RA R-2	H. Steelhead	SU	Dworshak	Dworshak Hatchery	116	10,309	1,096	10.6%
FB-LD R-3	H. Steelhead	SU	Dworshak	Dworshak Hatchery	116	10,217	0	0.0%
FB-LA R-4	H. Steelhead	SU	Dworshak	Dworshak Hatchery	116	10,050	448	4.5%
FB LA IC-1	H. Steelhead	SU	Lyons Ferry	Cottonwood Accl. Pd.	144	41,255	5,772	14.0%
Totals						4,153,165	836,885	20.2%

[1]Mark Codes: FB = freeze brands (location, brand-orientation), EL = elastomer tags (side-color); FE = fin erosion; CWT = coded wire tag; nc = no fin clip. Table does not include marked fish collected during GBT examinations.

Table 14. Passage dates of unclipped and marked hatchery fish collected at LGR, 2003.

[1]Mark Code	Species, run & rear type	Release Date	First Observed	25%	50%	75%	Last Observed
CWT, nc	HCH1, SPSU	Aug. 4, 02 - April 18, 03	March 26	April 25	May 3	May 12	Oct 28
CWT, nc	HCH0, FA	May 27 – June 21, 03	May 31	June 10	July 20	July 29	Oct. 31
CWT, nc	HCoho	March 11 - May 1, 03	April 27	May 24	May 27	June 2	Oct 29
Fin Eroded, nc	H ST, SU	March 24 – May 7, 03	April 1	May 4	May 17	May 25	Oct 9
EL-LE-GR	HCH1, FA	April 15 - 16, 03	April 18	April 23	April 26	May 1	May 31
EL-RE-GR	HCH1, FA	April 13 - 14, 03	April 18	April 23	April 25	April 29	May 26
EL-LE-BL	HCH1, FA	April 11 – May 10, 03	April 11	April 19	April 23	April 26	May 10
EL-LE-RD	HCH1, SP	May 17 – May 23, 03	April 8	Sptil 25	May 1	May 9	May 21
EL-RE-OR	HCH1, SU	April 25 – June 2, 03	April 25	May 1	May 20	May 21	June 3
EL-LE-OR	HCH1, SP	April 10 – May 21, 03	April 10	May 2	May 7	May 12	May 21
EL-LE-GR	HCH1, SP	March 28 - April 14, 03	April 26	May 8	May 12	May 16	May 25
FB-RD R-1	H.ST, SU	April 22, 03					
FB-RA R-2	H.ST, SU	April 22, 03	April 27	April 27	April 28	April 30	May 14
FB-LD R-3	H.ST, SU	April 21,03					
FB-LA R-4	H.ST, SU	April 23 - April 24, 03	April 30	April 30	May 6	May 10	May 10
FB LA IC-1	H.ST, SU	April 15 – May 17, 03	April 16	April 24	April 25	April 28	June 17

[1]Mark Codes: FB = freeze brands (location, brand, orientation); EL = elastomer tags (side, color). No fin clip, nc.

Unclipped Mark Recoveries

Unclipped Hatchery Coded-Wire Tagged Yearling Chinook

We recorded 115,913 unclipped hatchery yearling chinook collected at LGR that were marked with coded-wire tags (CWT). The Idaho Department of Fish and Game (IDFG), Umatilla tribe and the Nez Perce tribe released an estimated 887,896 unclipped coded-wire tagged hatchery yearling chinook above Lower Granite Dam (LGR). IDFG releases included 13,948 CWT marked fish from Pete King Creek, 14,067 from the Squaw Creek and 295,992 from the Pahsimeroi Hatchery and 144,976 from the Sawtooth Hatchery. The Nez Perce Tribe releases included 52,225 from Papoose Creek, 43,621from Mill Creek Bridge and 74,066 from Newsome Creek. The 115,913 collected unclipped hatchery coded-wire tagged yearling chinook represents 13.1% of the 887,896 tagged fish released. Pete King Creek, Squaw Creek, Pahsimeroi Hatchery, Sawtooth Hatchery, Papoose Creek, Mill Creek and Newsome Creek, and are located 211, 725, 621, 747, 313, 886, 255 river kilometers above LGR respectively. These fish were released between August 4, 2002 and April 18, 2003 with the peak daily collection at LGR of 6,866 on April 27, slightly earlier than previous years (Figure 8, Tables 13 - 15).

Table 15. Number of unclipped CWT marked yearling spring/summer chinook released, collected, and peak collection day, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2000	123,425	27,530	22.3%	5/5
2001	627,431	176,823	28.2%	5/1
2002	1,058,334	91,820	8.7%	5/6
2003	887,896	115,913	13.1%	4/27

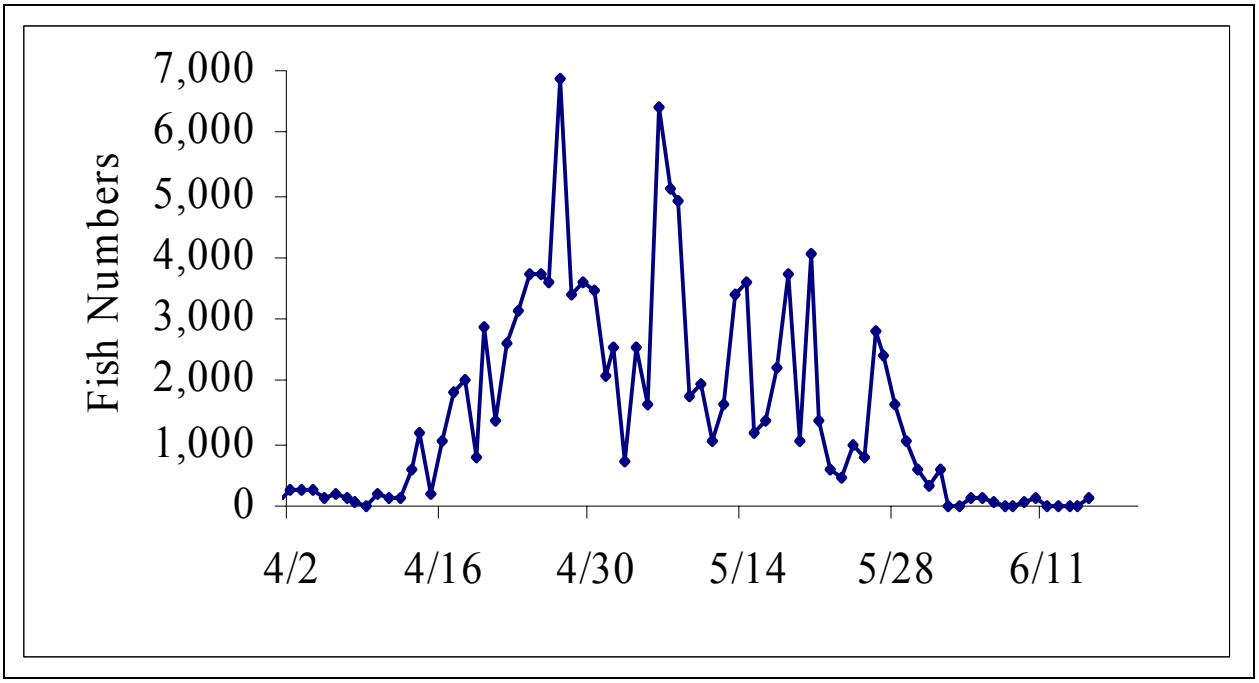

Figure 8. Daily collection of unclipped hatchery yearling chinook with coded-wire tags, 2003.

Unclipped Hatchery Coded-wire Tagged Subyearling Fall Chinook

SMP staff detected 13,840 CWT marked unclipped hatchery subyearling fall chinook in daily samples. This represents an expanded total of 367,097 CWT marked unclipped hatchery subyearling fall chinook collected at LGR. A total of 2,206,629 unclipped hatchery subyearling fall chinook was released by the Nez Perce tribe above LGR of which 1,271,953 (52.8%) were marked with CWTs. This represents a 52.4% increase over last years 765,167 CWT marked unclipped subyearling chinook releases. Between May 27 and June 21, the Nez Perce tribe released 189,782 CWT marked unclipped hatchery subyearling fall chinook from Pittsburg Landing Acclimation Facility, 193,255 from Big Canyon Acclimation Facility, 383,005 from Captain John Acclimation Facility, 314,529 from Cherry Lane Hatchery and 191,382 from Lapwai Creek. The 367,097 collected CWT marked unclipped hatchery subyearling fall chinook represents 28.9% of the 1,271,953 released. The peak collection of 23,150 was on June 22, slightly earlier than previous years. Pittsburg Landing Acclimation Pond, Big Canyon Acclimation Facility, Captain John Acclimation Pond and Lapwai Creek are 173, 106, 90 and 63 river kilometers above LGR, respectively. (Figure 9, Tables 13, 14 and 16).

Table 16. Number of unclipped CWT marked subyearling fall chinook released, collected and peak collection day, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2000	397,503	87,450	22.0%	7/4
2001	393,689	111,158	28.2%	7/3
2002	765,167	141,214	18.5%	7/21
2003	1,271,953	367,097	28.9%	6/22

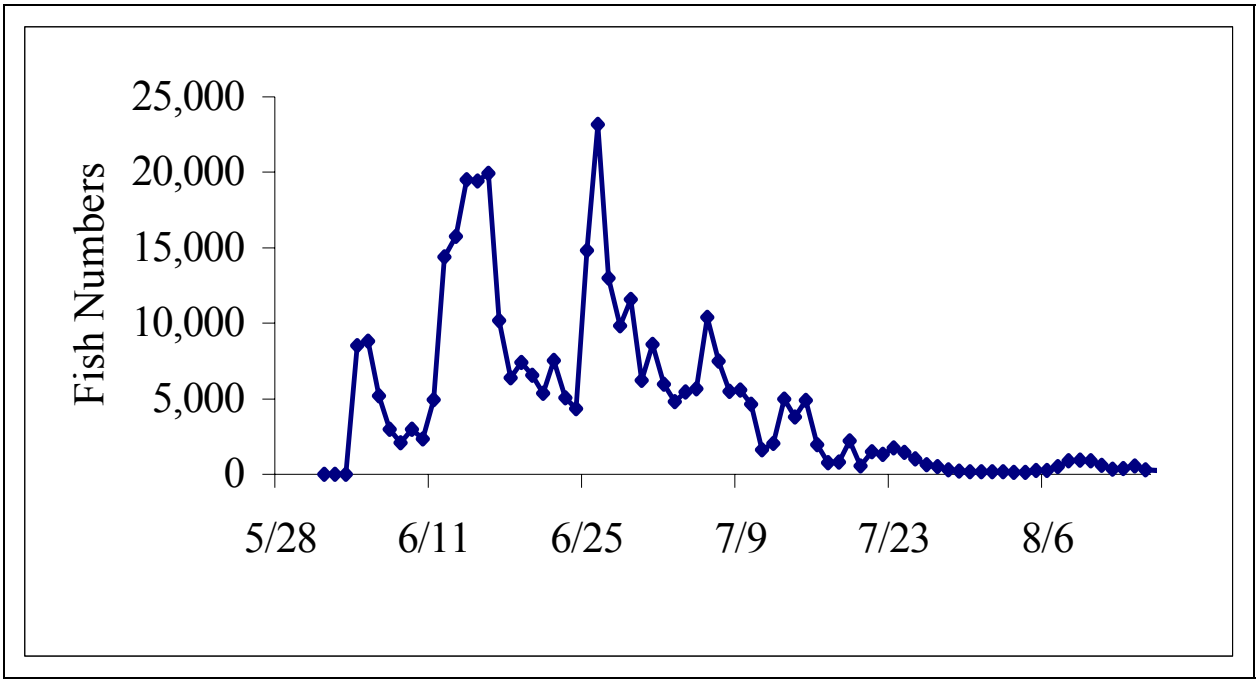

Figure 9. Daily collection of unclipped hatchery subyearling fall chinook with CWT at Lower Granite, 2003.

Unclipped Hatchery Coded-wire Tagged Coho

SMP staff sampled 158 unclipped coho with CWTs at LGR. When expanded, this represents a collection of 10,870 unclipped coho with CWTs. The Nez Pierce Tribe released a total of 1,076,712 unclipped coho of which 114,044 (1.3%) were marked with CWTs. Of the 114,044 CWT marked coho, 59,419 were Dworshak Hatchery coho released into Clear Creek on May 1, 27,163 were Eagle Creek National Fish Hatchery coho released into Lapwai Creek on March 11 and 27,462 were Eagle Creek National Fish Hatchery coho released into Potlatch River on March 13. The 10,870 collected CWT marked unclipped coho represents 9.5% of the 114,000 released. Lapwai Creek, Potlatch River and Clear Creek are 63, 75 and 175, river kilometers above LGR respectively. The peak collection day of 1,642 coded wire-tagged coho occurred on May 27 (Figure 10, Tables 13, 14 and17).

Table 17. Number of unclipped CWT marked coho released, collected, and peak collection day, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2000	120,000	14,280	11.9%	5/26
2001	60,000	7,095	11.8%	5/20
2002	108,718	4,494	4.1%	5/22
2003	114,044	10,870	9.5%	5/27

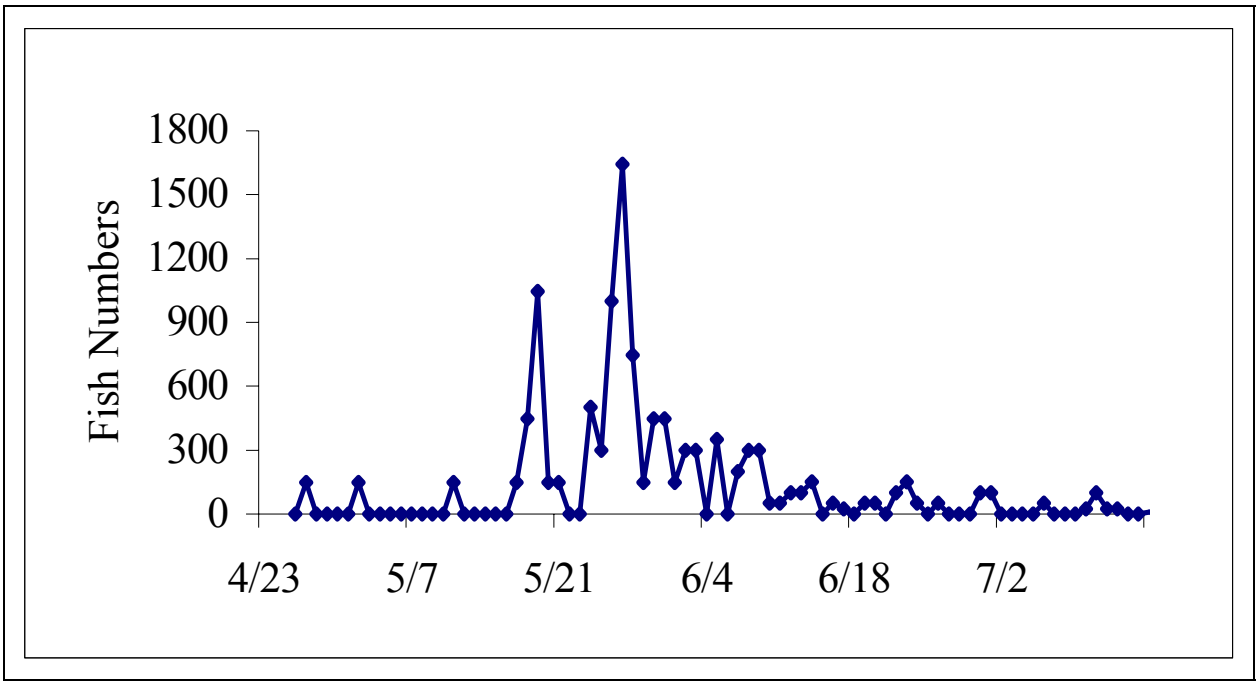

Figure 10. Daily collection of unclipped coded-wire tagged coho at Lower Granite, 2003.

Unclipped Steelhead of Hatchery Origin

A total of 2,113 unclipped steelhead of hatchery origin were examined in daily samples. These fish represent a collection of 215,944 unclipped steelhead of hatchery origin (based on fin erosion). The Nez Pierce Tribe, United States Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife and the Shoshone-Bannock Tribes released 1,186,853 unmarked steelhead from sixteen locations above Lower Granite Dam. The collection of 215,944 unclipped hatchery steelhead with fin erosion represents 18.2% of the

1,204,088 released. These releases were made between March 24 and May 7, 2003 from sites up to 739 river kilometers above LGR. Peak collection of 9,900 unclipped steelhead of hatchery origin was on May 26. Of the 5,179 unclipped steelhead sampled at Lower Granite, 2,113 (40.8%) showed fin erosion typical of hatchery rearing (Figure 11, Tables 13, 14 and 18).

Table 18. Number of unclipped steelhead with fin erosion released, collected, and peak collection day, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2000	596,700	307,284	51.5%	5/6
2001	852,195	430,694	50.5%	5/16
2002	1,420,838	182,870	12.9%	5/16
2003	1,186,853	215,944	18.2%	5/26

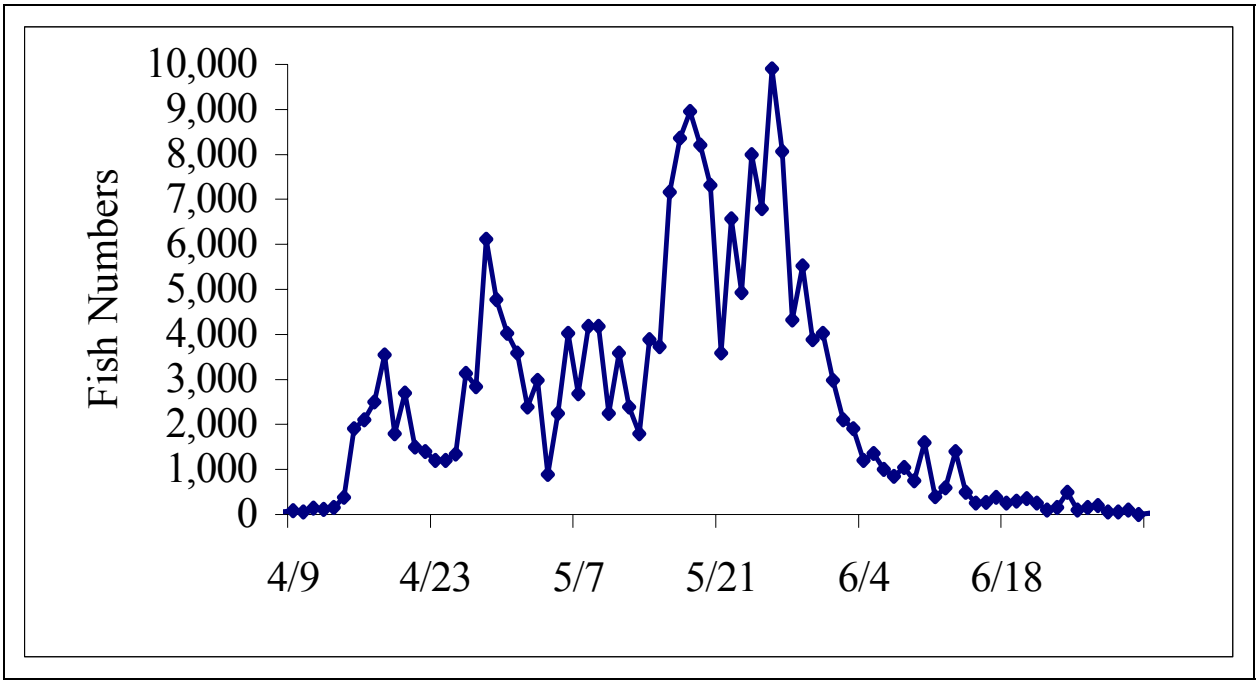

Figure 11. Daily collection of unclipped fin eroded steelhead at Lower Granite, 2003.

Elastomer Mark Recoveries

Visual elastomer marks (VIE) were reported for seven different groups of fish released above LGR this season (Tables 13 and 14). With the exception of the Left Eye Green elastomer tags (LE-GR), all the VIE marks were unique for each group. The LE-GR VIE was used to mark one group of yearling spring chinook and one group of fall yearling chinook. Based on the typical body morphology common to yearling fall chinook versus spring chinook, staff biologists assigned each LE-GR VIE as either a yearling fall or yearling spring chinook. We recognize that there is some risk of error with this approach, however we believe that the summary derived from this approach presents a valid assessment of the arrival timing and collection at LGR for each group.

Left Eye Green Elastomer Tagged Hatchery Yearling Fall Chinook

The Nez Pierce Tribe released three groups of Lyons Ferry Hatchery yearling fall chinook marked with colored elastomer (VIE) tags above Lower Granite.

The first group of 132,251 fish received left eye/green elastomer tags (EL-LGR) and was released at Big Canyon Acclimation Facility on the Clearwater River, 108 river kilometers above LGR, between April 15 and 16. Staff sampled 288 left eye green elastomer tagged hatchery yearling fall chinook in daily samples. This represents a total of 39,632 EL-LGR marked fish collected at Lower Granite between April 18 and May 31. The peak day of collection of 4,332 EL-LGR marked fish occurred on April 23. The 39,632 collected represents 30.0% of the total release (Figure 12, Tables 13, 14 and 19).

Table 19. Number of left eye green elastomer tagged hatchery yearling fall chinook released, collected, and peak collection day, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
1998	61,472	17,417	28.3%	5/3
1999	228,451	51,490	22.5%	4/22
2000	131,306	30,644	23.3%	4/16
2001	113,215	43,104	38.1%	4/27
2002	137,465	23,252	16.9%	4/16
2003	132,251	39,632	30.0%	4/23

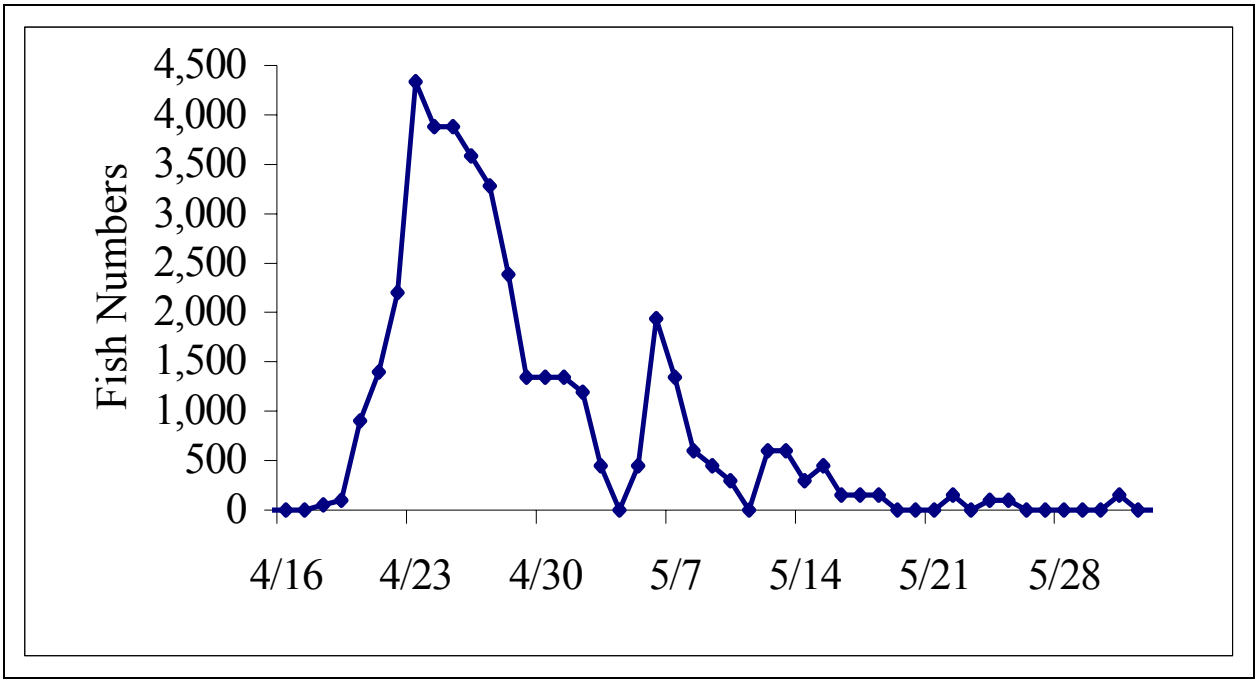

Figure 12. Daily collection of yearling fall chinook with left eye green elastomer tags at LGR, 2003.

Right Eye Green Elastomer Tagged Hatchery Yearling Fall Chinook

Another group of 118,343 Lyons Ferry Hatchery yearling fall chinook smolts received right eye/green elastomer tags (EL-RGR) and was released from Pittsburg Landing Acclimation Facility 173 river kilometers above LGR between April 13 and 14. The SMP staff sampled 229 of these fish in daily samples. This represents a collection of 30,087 EL-RGR marked fish at Lower Granite between April 18 and May 26, 25.4% of those released. The peak collection of 5,373 occurred on April 25. (Figure 13, Tables 13, 14 and 20).

Table 20. Number of right eye green elastomer tagged hatchery yearling fall chinook released, collected and peak collection day, 1998-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
1998	114,814	46,360	40.4%	4/25
1999	142,882	42,835	30.0%	4/22
2000	134,709	28,723	21.3%	4/17
2001	103,741	33,747	32.5%	4/27
2002	132,577	26,595	20.1%	4/27
2003	118,343	30,087	25.4%	4/25

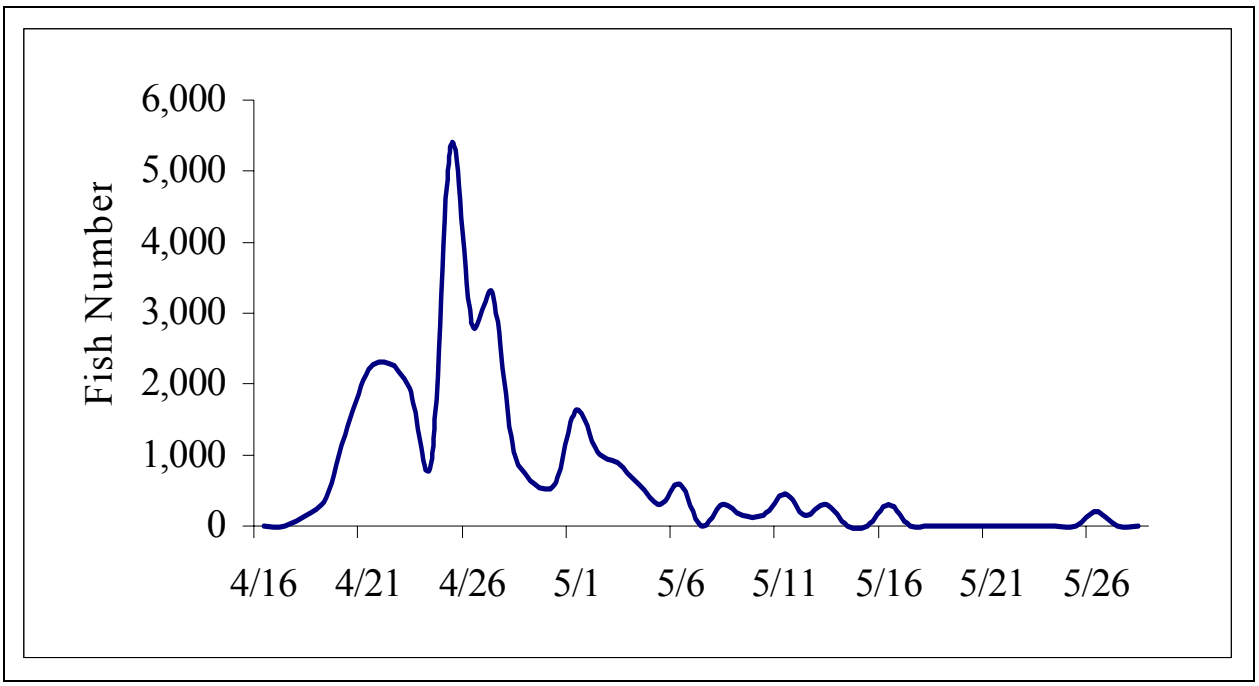

Figure 13. Daily collected yearling fall chinook with right eye green elastomer tags at LGR in 2003.

Left Eye Blue Elastomer Tagged Hatchery Yearling Fall Chinook

The third group of 135,056 Lyons Ferry Hatchery yearling fall chinook received left eye/blue tags (EL-LBL) and was released from Captain John Rapids Acclimation Pond, 90 river kilometers above LGR, on April 16. A total of 359 left eye blue elastomer tagged hatchery yearling fall chinook were seen in daily samples. These fish represent a collection of 29,239 EL-LBL marked fish between April 11 and May10 with a peak collection of 3,731 on April 25. The 29,239 collected represent 21.6% of the 135,056 released. (Figure 14, Tables 13, 14 and 21).

Table 21. Number of left eye blue elastomer tagged hatchery yearling fall chinook released, collected and peak collection day, 1998-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
1998	133,205	37,415	28.1%	4/25
1999	157,310	46,447	29.5%	4/22
2000	131,324	36,283	27.6%	4/17
2001	101,976	33,747	33.1%	4/21
2002	128,604	25,402	19.8%	4/21
2003	135,056	29,239	21.6%	4/25

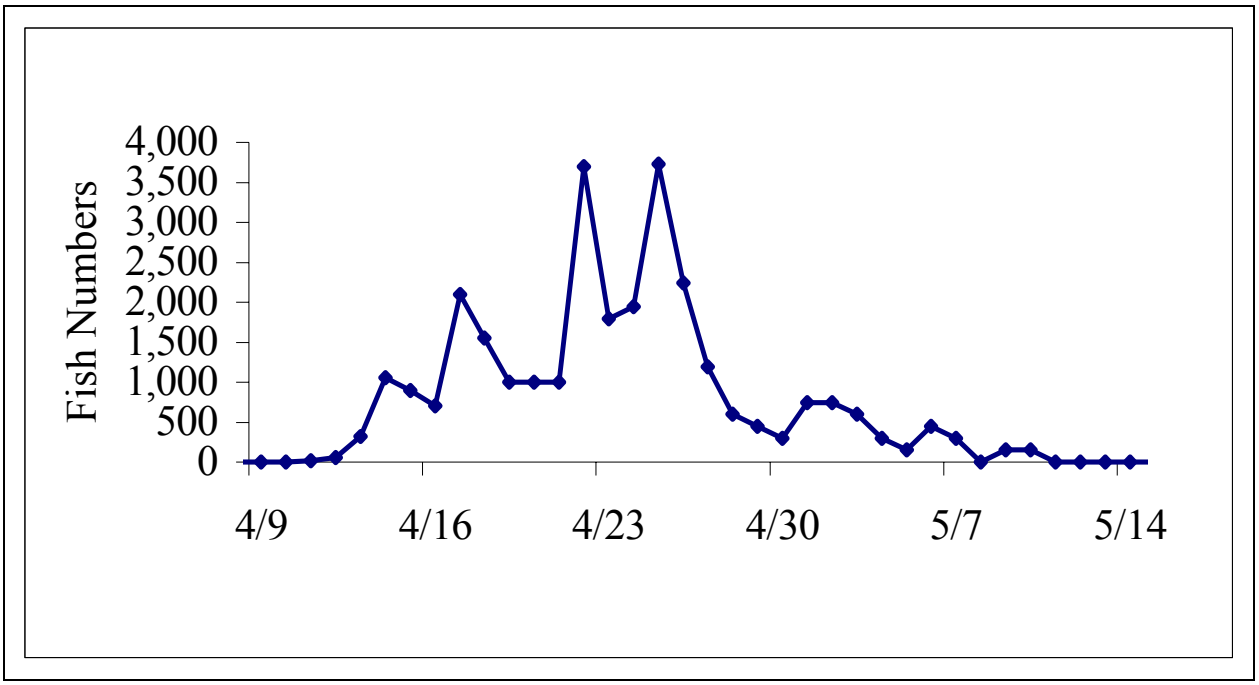

Figure 14. Daily collection of yearling fall chinook with left eye blue elastomer tags at LGR, 2003.

Left Eye Red Elastomer Tagged Hatchery Yearling Spring Chinook

A total of 118 yearling chinook with a left eye red (LE-RD) VIE tag were observed in daily samples. The Nez Perce Tribe (NEZP) released two groups of Lookingglass Hatchery reared yearling spring chinook with LE-RD elastomer tags into Lostine Acclimation Pond, 292 river kilometers above LGR. The first group of 51,873 was released between May 17 and May 23. The second group of 49,106 was released between April 1 and April 14 for a combined release total of 101,979 fish. The 118 fish in daily samples represents a collection of 15,023 fish, 14.9% of the total released. Peak collection day was 1,194 smolts on May 1 (Figure 15, Tables 13, 14 and 22).

Table 22. Number released, collected and peak collection day of NEZP LE-RD elastomer tagged yearling spring chinook released at Lostine Acclimation Facility, 2002-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2002	31,464	2,367	7.5%	5/5 and 5/8
2003	101,979	15,023	14.9%	5/1

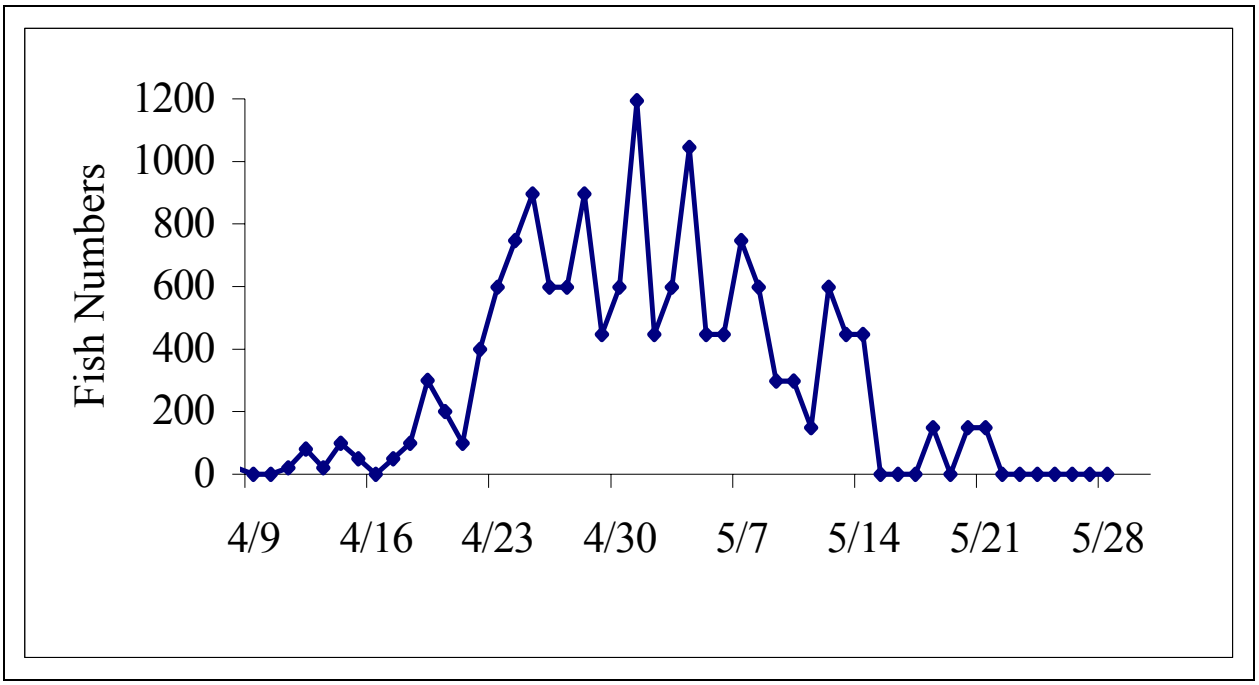

Figure 15. Daily collection of yearling chinook with right eye red elastomers at LGR, 2003.

Right Eye Orange Elastomer Tagged Hatchery Yearling Summer Chinook

Between April 25 and June 2, twelve McCall Hatchery yearling chinook with right eye orange elastomer tags (RE-OR) were recorded in daily samples. The Nez Perce Tribe released a total of 72,146 yearling chinook with RE-OR tags into Johnson Creek between March 17 and March 20 429 river kilometers above LGR. These twelve fish represent a collection of 1,643 fish, 2.2% of the total released with a peak collection of 448 on May 21(Figure 16, Tables 13, 14 and 23).

Table 23. Number released, collected and peak collection day of NEZP RE-OR elastomer tagged yearling summer chinook released at Johnson Creek, 2002-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2002	56,296	300	0.5%	6/2
2003	72,146	1,643	2.3%	5/21

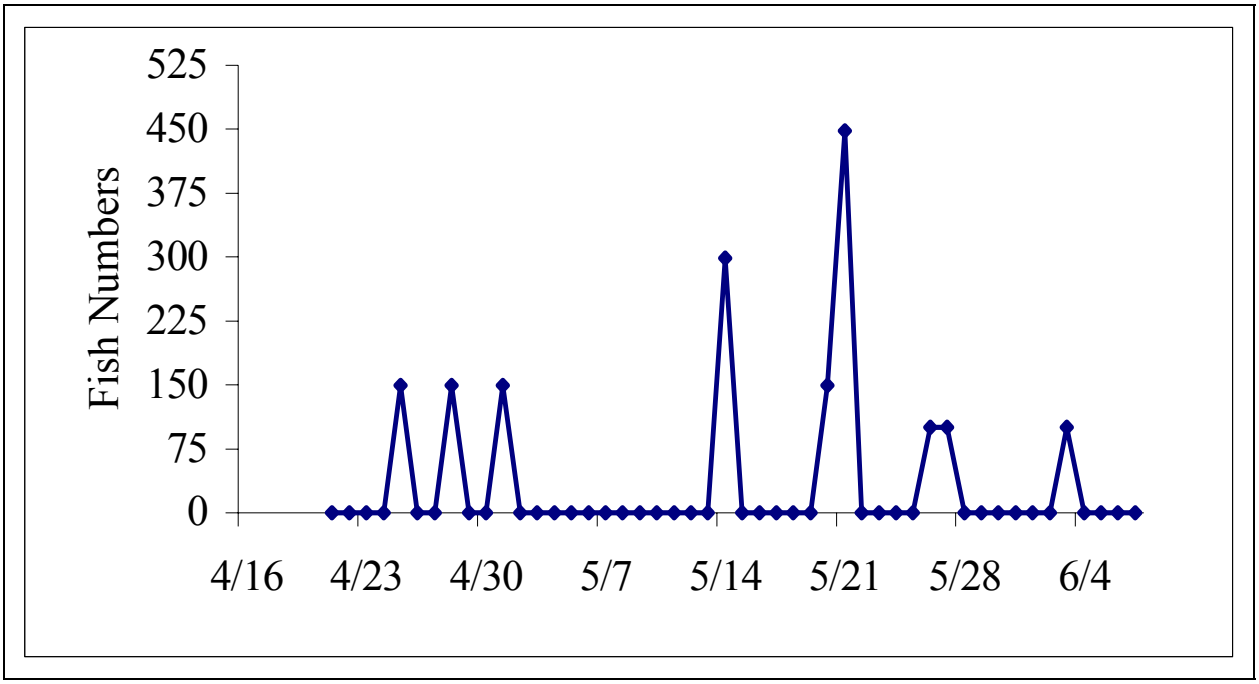

Figure 16. Daily collection of yearling chinook with right eye orange elastomers, at LGR, 2003.

Left Eye Orange Elastomer Tagged Hatchery Yearling Spring Chinook

Between April 10 and May 21, 22 hatchery yearling spring chinook with left eye orange elastomer tags (LE-OR) were recorded in daily samples. The Umatilla Tribe released 26,606 Lookingglass Hatchery yearling spring chinook with left eye/orange elastomer tags into the Grande Ronde Acclimation Pond between March 28 and April 14, 418 river kilometers above LGR. The 22 recorded fish represents a collection of 2,976 fish, 11.2% of the release group. Peak collection of 299 fish occurred on May 11 and May 12 (Figure 17, Tables 13 and 14). There were no releases of hatchery yearling spring chinook with left eye orange elastomer tags in previous years.

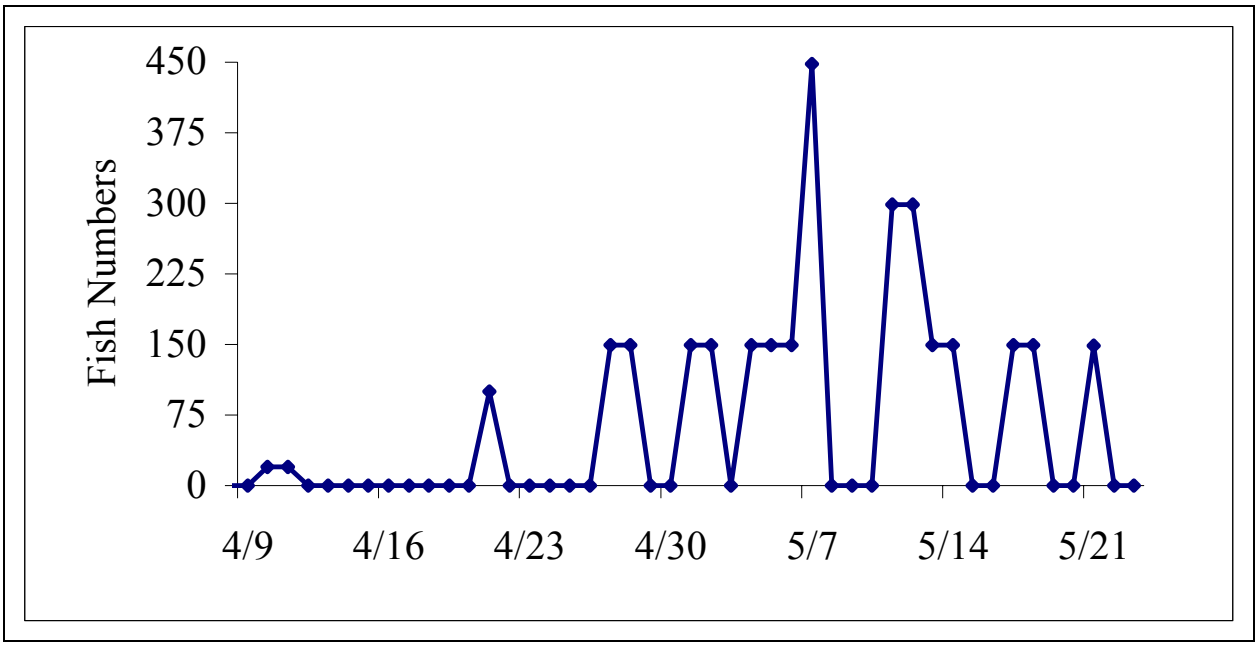

Figure 17. Daily collection of yearling chinook with left eye orange elastomers at LGR, 2003.

Left Eye Green Elastomer Tagged Hatchery Yearling Spring Chinook

Between April 26 and May 24, eight hatchery yearling spring chinook with left eye green elastomer tags (LE-GR) were recorded in daily samples. These fish were differentiated from the left eye green hatchery yearling fall chinook by morphological characteristics. The Umatilla Tribe released 24,092 Lookingglass Hatchery yearling spring chinook with left eye green elastomer tags into Catherine Creek Acclimation Pond between March 28 and April 14, 378 river kilometers above LGR. The eight recorded fish represents a collection of 1,145 fish, 4.8% of the release group. Peak collection of 488 fish occurred on May 7 (Figure 18, Tables 13 and 14). There were no releases of hatchery yearling spring chinook with left eye green elastomer tags by the Umatilla Tribe in previous years.

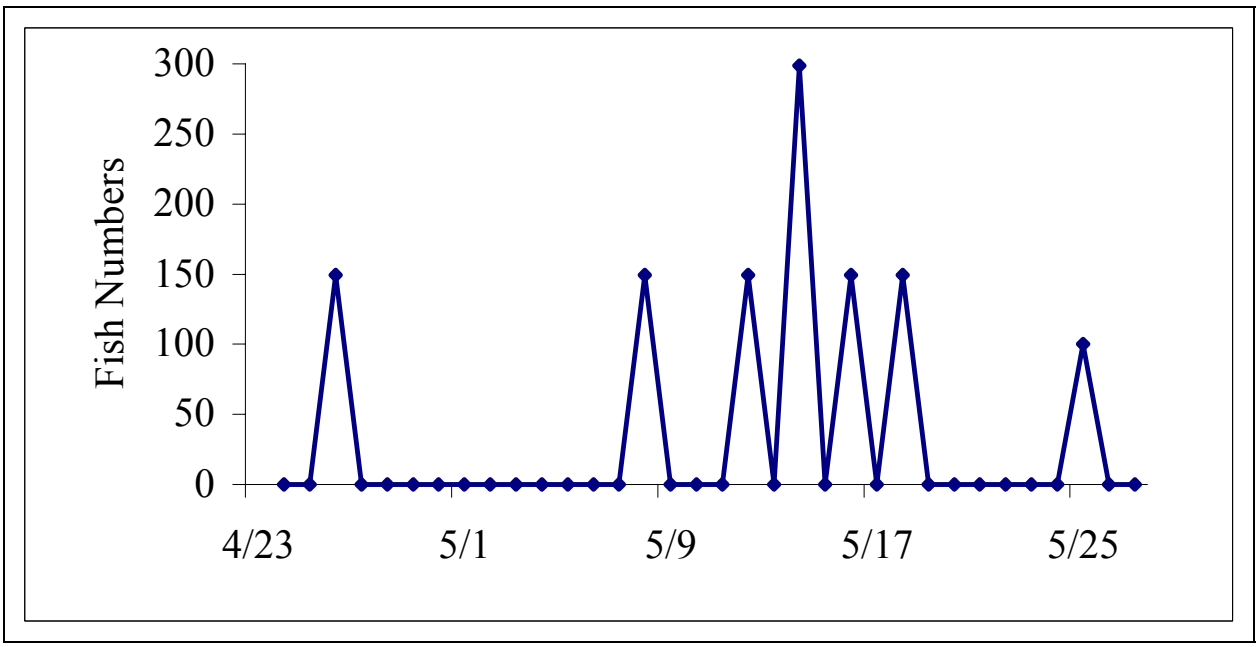

Figure 18. Daily collection of yearling spring chinook with left eye green elastomers at LGR, 2003.

Freeze Branded Mark Recoveries

Dworshak Hatchery released 40,691 freeze-branded steelhead smolts, divided into four treatment groups of approximately 10,150 smolts each. Each group received a unique brand, RD R-1, RA R-2, LA R-4 or LD R-3. Direct releases of these branded fish were made from Dworshak Hatchery between April 22 and April 24. Only steelhead with the brands LA R-4 and RA R-2 were observed in daily samples.

LA R-4 Freeze Branded Hatchery Steelhead

A total of three hatchery steelhead with the freeze brand LA R-4 (left anterior, with a "R" brand in the fourth position) were observed in daily samples between April 30 and May 10. An estimated 10,050 LA R-4 freeze branded steelhead were released at Dworshak hatchery between April 23 and April 24. The three observed fish represents 448 collected fish, 4.5% of the total released. These fish were recorded on April 30, May 6 and May 9 (Figure 19, Tables 13 and 14).

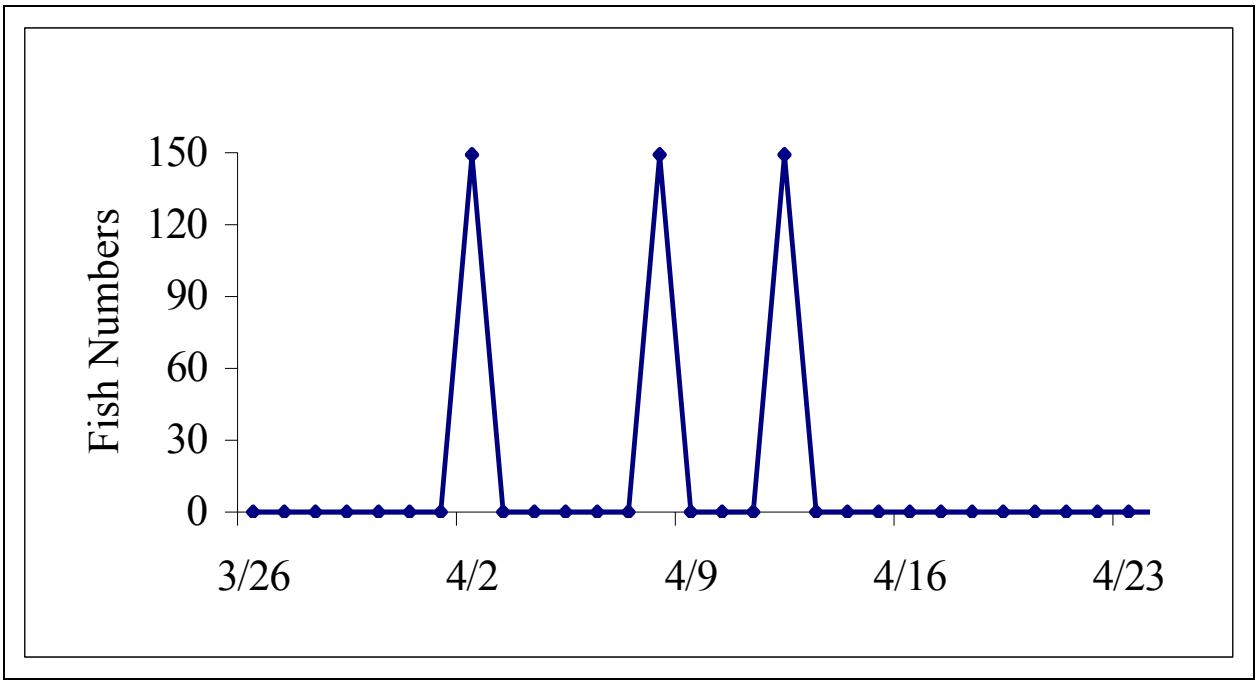

Figure 19. Daily collection of Dworshak Hatchery steelhead with the freeze brand LA R-4 at LGR, 2003.

RA R-4 Freeze Branded Hatchery Steelhead

Of the 10,050 steelhead with the LA R-4 brand that were released from Dworshak hatchery, an unknown number from this release group were incorrectly branded with the RA R-4 brand (personal conversation with Ralph Roseberg, Fish Biologist at Dworshak National Fish Hatchery). We recorded eight Dworshak Hatchery steelhead with the RA R-4 freeze brand in daily samples between April 27 and June 14. This represents a collection of 1,096 RA R-4 branded fish, 10.9% of the total released. These eight fish were observed on April 27, 28, 30, May 6 and June 14 (Figure 20, Tables 13 and 14).

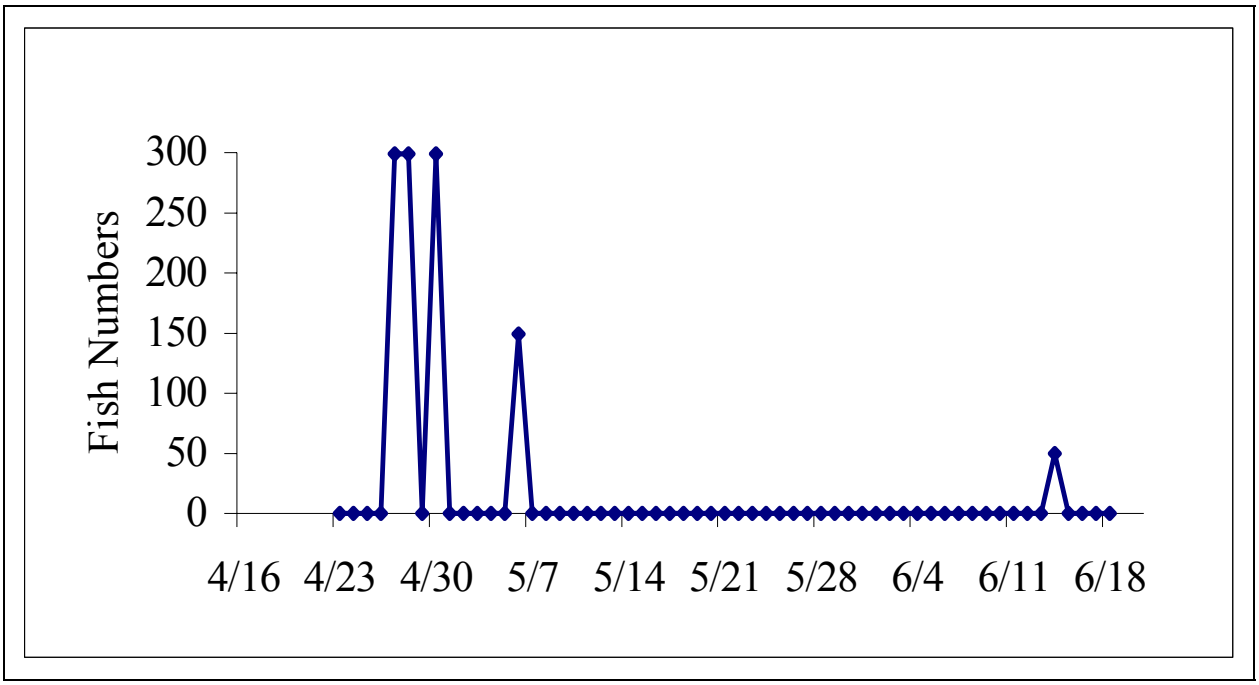

Figure 20. Daily collection of Dworshak Hatchery steelhead with the freeze brand RA R-4 at LGR, 2003.

LA-IC-1 Freeze Branded Steelhead

A total of 5,772 steelhead with the freeze brand LA IT-1 was collected between April 16 and May 17. Between April 15 and April 30, Washington Dept of Fish and Wildlife released 41,255 Lyons Ferry Hatchery reared steelhead from at the Cottonwood Acclimation Pond on the Grand Ronde River, 144 river kilometers above LGR. Staff examined 40 steelhead with this brand which represents a collection of 5,772 branded fish, 14.0% of those released. The peak collection of 1,493 occurred on April 25 (Figure 21, Tables 13 and14).

Table 24. Number released, collected, and peak collection day of WDFW freeze branded steelhead released at Cottonwood Acclimation Facility, 2000-2003.

Year	Number released	Number collected	Percent of Release Collected	Peak Collection Day
2000	80,201	17,376	21.6%	5/1
2001	40,545	12,240	30.2%	5/1
2002	41,545	1,960	4.9%	5/4
2003	41,255	5,772	14.0%	4/25

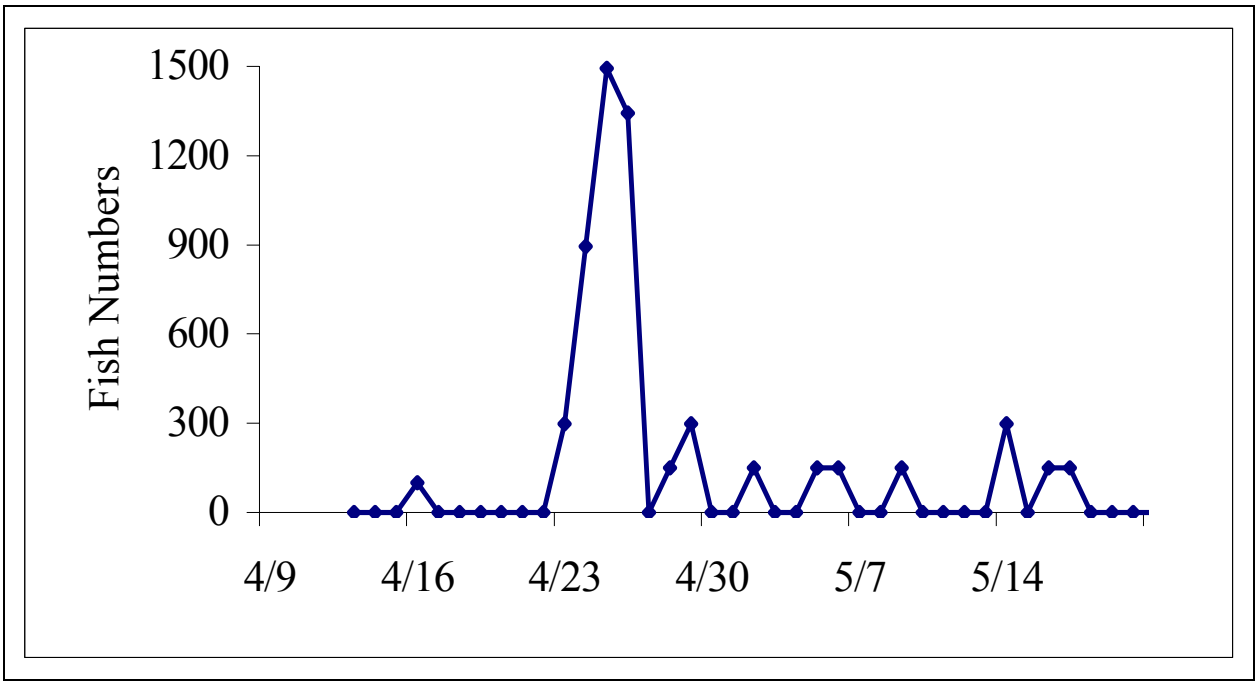

Figure 21. Daily collection of steelhead with the freeze brand LA IC-1 at LGR, 2003.

Mark records for fish captured off the separator for Gas Bubble Trauma (GBT) examinations were reported to FPC. GBT sample fish were removed from the separator and put into raceways after examination. A total of 20 colored elastomer (VIE) tagged hatchery yearling chinook was examined for symptoms of GBT, including seven with left green tags, four with right green tags, eight with left blue tags and one with left red tag. Additionally, 27 unclipped yearling chinook marked with CWT were recorded in GBT samples.

All fish removed from the separator during the GBT monitoring program were scanned for PIT-tags. PIT-tagged fish were not examined for GBT but placed in fresh water and allowed to recover from the anesthesia before being returned to the separator. All PIT-tag codes were stored in a scanner and recorded on a form with species, rearing type and hatchery mark information. Daily PIT-tag records were combined into one tagging file and sent to PTAGIS (GBT Sample Summary). A total of 17 PIT-tagged fish were netted during GBT sampling. They included eleven clipped yearling chinook, two clipped steelhead and four unclipped steelhead.

A total of 94 smolts was detected by the PIT-tag detection system between 0600 hours October 1 and 0600 hours October 31 when the sample rate was set at 100%. Of these, 71 (76%) were released by the Nez Perce Tribe at the Nez Perce Tribal Hatchery (42), into the Clearwater River (20), at Big Canyon Acclimation Facility (5), Meadow Creek (2) and the North Lapwai Valley Acclimation Pone (2) (Table 25).

Table 25. Records of PIT-tagged fish detected in daily samples at LGR between 0600 hours October 1 and 0600 hours October 31, 2003 with 100% sample rate.

Organization	Tage Site	Begin Release Date	Release Site	Run	Species and Rearing	Number
NPT	NPTH	06/18/03	NPTH	Fall	H.Chinook	42
NPT	CLWR	07/07/03	CLWR	Unknown	Unk. Chinook	20
NMFS	LYFE	05/30/03	SNAKE3	Fall	H.Chinook	10
NPT	BCCAP	06/03/03	BCCAP	Fall	H.Chinook	5
USFWS	SNAKER	06/18/03	SNAKER	Fall	H.Chinook	5
USFWS	SNAKE3	05/20/03	SNAKE3	Unknown	W. Chinook	4
NPT	NLVP	05/29/03	NLVP	Fall	H.Chinook	2
NPT	NPTH	06/30/03	MEADOC	Spring	H.Chinook	2
IDFG	CFCTRP	10/04/02	CFCTRP	Unknown	W. Chinook	1
ODFW	IRRI	05/02/03	BCANF	Summer	H. Steelhead	1
NMFS	LMN	07/06/02	IHRSPF	Fall	H.Chinook	1
IDFG	PAHTRP	06/12/03	PAHTRP	Summer	W. Chinook	1
Total						94

Abbreviations: NPTH = Nex Perce Tribal Hatchery, CLWR = Clearwater River, LTFE = Lyons Ferry Hatcchery, BCCAP = Big Canyon Creek Acclimation Facility, SNAKER = Snake River, SNAKE3 = Clearwater River to Salmon River (km 224-303), NLVP = North Lapwai Valley Acclimation Pond, CFCTRP = Crooked Fork Creek Trap, IRR = Irrigon Hatchery, LMN = Lower Monumental Dam, PAHTRP = Pahsimeroi River Trap, MEADOC = Meadow Creek, BCANF = Big Canyon Facility.

During the collection season, we scanned all sample and raceway smolt mortalities for PIT-tags. A total of 346 tagged mortalities were recovered and recorded in files submitted to PTAGIS in 2003 compared to 186 in 2002, 168 in 2001, seven in 2000 and 173 in 1999.

A total of 205 fallbacks were examined in daily samples between October 1 and October 31, when the sample rate was 100%. The 205 fallbacks accounted for 93.6% of the 219 total fallbacks recorded in daily samples during the season. Of the 205, there were seven adult clipped steelhead (3.4%), 173 clipped jack chinook (84.4%), 24 unclipped jack chinook (11.7%), and one clipped chinook mini-jacks (0.5%).

GBT Sample Program and Summary

GBT Sampling Procedures

Sampling methods to identify levels of dissolved gas in juvenile salmonids have undergone continuous review since the program began in 1994. Current sampling methods and protocol are based on research conducted by fish physiologists and health specialists/pathologists with the United States Geological Survey, Biological Research Division (USGS-BRD) at the Columbia River Lab at Cook, WA. Fish Passage Center staff have actively guided and participated in this process. USGS-BRD staff has conducted training sessions at the beginning of each season for the past four years. Staff from Lower Granite Dam attended this season's GBT training seminar at the Cook lab on April 3 where fish handling methods, examination techniques, and data handling protocols were reviewed and demonstrated. Site specific sample protocols at Lower Granite called for us to examine 100 yearling chinook and/or steelhead, clipped or unclipped, on Tuesdays, between April 9 and June 18.

Smolts collected for GBT samples were netted from the open flume in front of the separator bars. We netted fish individually and placed them in a dark five-gallon bucket with 10 liters of water. The time required to net seven fish varied with fish availability but generally took about five minutes. After collecting seven fish, the fish were taken to the GBT lab located next to the separator. Three cc of MS-222® was added to the buckets with the fish as an anesthetic, making a concentration of 30 mg/l. As the fish responded to the MS-222®, one fish a would be removed from the capture bucket and scanned for the presence of a PIT-tag. If a PIT-tag was detected, the code was recorded and the fish was allowed to recover and released back into the separator. Later, all PIT-tag codes were entered into a PTAGIS tagging file. If no PIT-tag was detected the fish was placed in a bucket with water and MS-222® at 80mg/l to fully sedate the fish for the detailed examination. Once fully sedated the fish was placed in an examination tray equipped with hoses that provide flowing water with 30mg/l of MS-222® directly to the mouth and over the gills throughout the examination. Another fish was then scanned for a PIT-tag and if not tagged, placed in the bucket of water with 80mg/l MS-222®. In addition staff also scanned all unclipped chinook for CWTs to identify these unclipped hatchery origin smolts.

Staff then used a stereomicroscope to examine the unpaired fins and both eyes on the fish in the examination tray for bubbles associated with GBT. The unpaired fins (anal and caudal fins) and both eyes were inspected for bubbles at a minimum of 10X magnification in order to allow for comparability among sites and years. Fish with bubbles were given a rating from 0-4 based on the percentage of the area covered by bubbles. A rank of 0 was assigned if no bubbles were observed; rank 1 was assigned if 1 to 5 percent of the fin or eye was covered with bubbles; rank 2 was assigned if 6 to 25 percent area was covered; rank 3 for 26 to 50 percent area covered; and rank 4 for greater than 50 percent area covered. The rank reported for the eyes was the highest rank for either eye. The lateral line, unlike previous years, was not examined in 2002 or 2003. The examiner recorded species, fin clips, fork length, presence or absence of bubbles, and the time at the start of the exam. The sample fish was then placed in a bucket of freshwater with aeration and allowed to recover before it was released into a raceway to prevent being diverted to the sample tank and anesthetized again. It took about two minutes to complete each examination. At the end of the day, sample data was transcribed to a spreadsheet database and transmitted to FPC. GBT fish were treated and recorded as a separate sample with a sample rate of 100% and their numbers added to the following day's collection totals.

GBT Sample Summary

We examined a total of 1,100 smolts for symptoms of Gas Bubble Trauma (GBT) including, 316 clipped yearling chinook, 108 unclipped yearling chinook, 507 clipped steelhead and 169 unclipped steelhead. These fish were anesthetized, examined, allowed to recover from anesthesia and then placed in raceways for transportation. Symptoms of GBT were observed on one unclipped steelhead in the unpaired fins, 0.08% of the total fish examined for GBT. No fish were observed with GBT symptoms greater than five percent (a GBT rank 1).

Incidental to fish netted from the separator for GBT examination, staff released 17 fish back into the separator because they were PIT-tagged. These 17 PIT-tagged fish included; two clipped steelhead, four unclipped steelhead and eleven clipped yearling chinook. After each GBT sampling day the codes stored in the scanner were downloaded to a temporary computer file and later assembled in a tagging file and submitted to PTAGIS.

Sample Anesthesia

The use of MS-222® to safely sedate juvenile salmonids is an important component of the smolt monitoring programs. Reviews of methods employed at different sites by FPC, USGS-BRD and SMP program staff in 1992 provided specific guidelines for standard stock solutions, minimal induction times and total exposure times for SMP sampling programs. At Lower Granite Dam Juvenile Fish Facility concentrations of approximately 60 mg/L of MS-222® from stock solutions of 100 g/L enable us to follow the general guidelines and handle the juvenile salmonids safely and efficiently. Over the course of each season, adjustments are made to account for changes in water temperature and the number of fish in the sample. Induction and recovery times for a given concentration tend to decrease as water temperatures increase.

Anesthesia Procedures

Anesthetic solutions are used in the pre-anesthetic chambers, the re-circulating sample system and for GBT sampling. The pre-anesthetic chambers are drained to about 95 liters before we add between 70 and 90 ml of MS-222® to achieve an initial concentration of about 63 mg/L. This typically sedates nearly all the fish within three minutes. However, the pre-anesthetic chambers are not watertight. Fresh water seepage reduces the effective concentration. Depending upon the amount of fresh water seepage, fish response, water temperature, the size and number of smolts in the chamber, we may add more MS-222®. Once sedated these fish are flushed down to the sorting trough.

The re-circulation system holds 670 liters of water and includes the sorting trough, sump, chilling reservoir, a rotary chiller, a filter and two pumps. We add anesthetic to the sump and chilling reservoir to achieve an initial concentration of about 50 mg/L. This level maintains sedation in most fish and allows some fish to gradually recover. The effective concentration of anesthetic in this system diminishes over time because sampled fish that absorb the anesthetic are removed from the system. Some leakage and infusion of fresh water also occurs throughout the sample. The longer we use the re-circulation system the more likely we are to add additional MS-222® in 50 to 100 ml increments to maintain effective concentrations. As a result, careful monitoring of fish response is a constant component of our sample procedures. To monitor

anesthetic effectiveness and ensure the safety of the fish in the sample, we continuously watch and observe fish behavior and gilling rates.

Anesthetic Induction

Safe and effective induction times should be greater than one minute but not longer than three minutes. For each batch of fish sedated in the pre-anesthetic chambers, we recorded induction times as well as the estimated number and relative size of smolts, water temperature and initial concentration of MS-222® used (Table 26). The induction time was that point when approximately 95% of the fish were belly-up or on their side and gilling evenly.

Table 26. Weekly average induction times of sample fish exposed to MS-222® at LGR, 2003.

Week Ending Date	Average Temp. (C.)	Number of Batches	Average No. Fish per Batch	Average Proportion Small Fish/Batch	Average Number of Small Fish/Batch	Initial Concentration (mg/L) MS-222®	Average Induction Time (seconds)
3/28	7.3	15	22	16	0.73	84	182
4/4	7.5	62	41	32	0.77	88	175
4/11	6.5	8	50	36	0.73	88	167
4/18	7.6	9	62	49	0.78	88	164
4/25	9.1	73	57	41	0.73	86	165
5/2	9.4	93	66	48	0.73	83	165
5/9	9.9	101	58	47	0.81	90	161
5/16	10.5	64	62	50	0.81	92	153
5/23	10.8	97	60	41	0.68	92	156
5/30	11.8	100	59	34	0.58	85	153
6/6	12.3	53	53	41	0.77	85	163
6/13	14.1	65	69	61	0.88	90	165
6/20	15.8	45	83	76	0.91	88	159
6/27	16.8	60	72	67	0.93	94	156
7/4	18.1	47	69	64	0.94	94	156
7/11	20.0	44	64	61	0.95	88	140
7/18	20.2	46	66	63	0.95	80	136
7/25	20.3	52	69	65	0.94	79	141
8/1	21.6	41	40	33	0.84	78	129
8/8	21.4	56	68	62	0.92	69	124
8/15	20.4	40	57	54	0.95	73	145
8/22	21.0	30	50	46	0.92	73	135
8/29	20.7	22	29	27	0.93	73	164
9/5	20.9	16	32	28	0.87	73	141
9/12	20.4	43	52	46	0.89	74	157
9/19	18.6	23	52	46	0.89	78	144
9/26	18.1	23	52	44	0.85	79	134
10/3	18.3	41	59	53	0.91	78	139
10/10	18.7	60	53	50	0.94	73	150
10/17	17.5	40	53	50	0.94	76	161
10/24	16.0	71	55	52	0.94	84	154
10/31	14.4	27	54	50	0.94	85	140

Beginning in 1999, daily records were kept by the pre-anesthetization technician. These records include temperature, number of fish per batch, number of small fish per batch, the volume of MS-222® concentration used per batch and the induction time per batch. For each degree Celsius recorded between 1999 and 2003, the daily volume of MS-222® concentration used per batch and the daily induction time per batch were averaged (Table 27). The five year averages were graphed against the corresponding temperature. As water temperature increases, induction time decreases. The pre-anesthetization technician responds to the decline in induction time by reducing the volume of MS-222® used in each batch (Figure 22).

Table 27. Volume of MS-222® concentrate used per batch and average length of induction time per batch based on temperature, 1999-2003.

Average Temperature Celsius	Volume of MS-222® concentrate used per batch	Length of induction time (seconds)
5.1 – 5.9	87	167
6.1 – 6.9	87	161
7.1 – 7.9	80	166
8.1 – 8.9	82	161
9.1 – 9.9	81	158
10.1 – 10.9	79	152
11.1 – 11.9	81	151
12.1 – 12.9	81	151
13.1 – 13.9	79	153
14.1 – 14.9	81	151
15.1 – 15.9	80	149
16.1 – 16.9	81	155
17.1 – 17.9	75	152
18.1 – 18.9	76	145
19.1 – 19.9	80	144
20.1 – 20.9	76	142
21.1 – 21.9	72	133
22.1 – 22.9	74	116

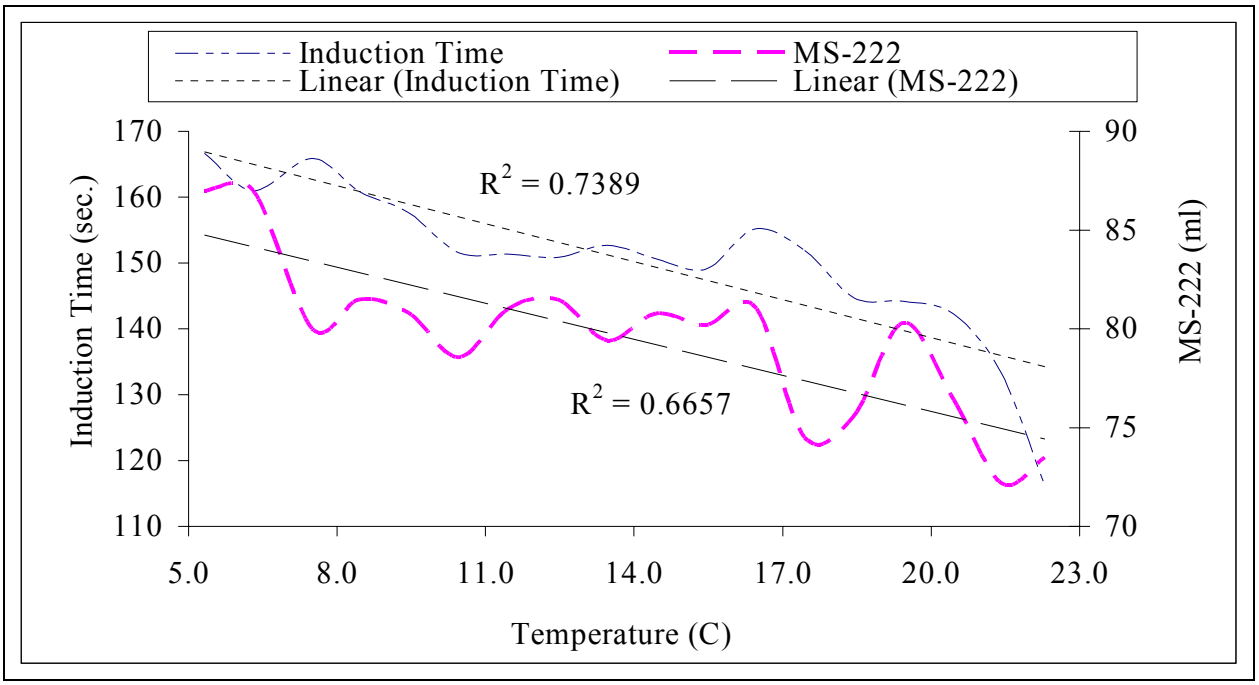

Figure 22. Average weekly induction times for fish exposed to MS-222® (~60 mg/L) and Average Induction Time (sec.) with trendlines compared to temperature at LGR, 1999- 2003.

Audit of data entry

This season, a total of 220 daily sample batches were generated and sent to FPC. Eleven batches (5.0%) were sent again because they were revised after the original posting. We categorized the errors that led to the revisions, as we have done in previous years, into six categories; setup errors, recording errors, omitted data, fish identification errors, facility errors and miscellaneous changes (Table 28). We had no setup errors from problems with templates or formulas within spreadsheets used to summarize daily data or software. Recording errors resulted in revisions to eight batches. These errors are "typos" and inaccurate transcription of hand log data into the FPC32 data entry program. These errors included incorrect entries of research mortalities (three batches), incorrect entries of transported fish (two batches), incorrect fin clip entry for freeze branded steelhead (one batch) and incorrect flow data (two batches). Omitted or missing data resulted in the revision of one batch this season, due to omitted research mortality data. Two batches were categorized as fish identification errors this season. These batches were reposted due to incorrectly entering the fish ID code in the FPC data entry program. No facility errors were recorded from events or changes in the data because of unusual operations, mistakes in fish facility data reporting or technical problems related to the fish facility. There were no batches categorized as miscellaneous errors this season.

Table 28. Number and percentages of sample batches revised and resent to FPC, 2003.

Error Type	Number of re-posted batches	Percent of total re-posted batches	Percent of total number of batches
Setup	0	0.0%	0.0%
Recording	8	72.7%	3.6%
Omitted data	1	9.1%	0.5%
Fish I.D.	2	18.2%	0.9%
Facility	0	0%	0%
Miscellaneous	0	0%	0%
Total	11		5.0%

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Fish Collection

Migration and Collection

The juvenile fish bypass gallery was watered up at 1030 hours March 19. Fish were bypassed through the 42-inch pipe (primary bypass) until 0700 hours March 25 when the separator was watered-up and collection of fish for transportation began. Collection ended at 0700 hours October 31. An estimated 6,183,825 juvenile salmonids were collected at Lower Granite Dam during the 2003 operating season. The species groups collected included: 1,909,312 clipped yearling chinook, 667,719 unclipped yearling chinook, 114,614 clipped subyearling fall chinook, 1,055,198 unclipped subyearling fall chinook, 1,870,652 clipped steelhead, 466,498 unclipped steelhead, 7,014 clipped sockeye/kokanee, 2,746 unclipped sockeye/kokanee and 90,072 coho (Table 29). Daily collection for each species group, project flow and spill are presented in Appendix 1, Tables 1 and 5.

Total fish collection and transportation increased, 54.6% and 55.9%, respectively, over the totals in 2002 and 2001. Species that showed increases in collection compared to 2002 included: clipped yearling chinook (59.6%), unclipped yearling chinook (98.8%), clipped subyearling fall chinook (344%), unclipped subyearling fall chinook (74.0%), clipped steelhead (47.4%), unclipped steelhead (8.5%), clipped sockeye/kokanee (82.9%) and coho (11.5%). Unclipped sockeye/kokanee decreased 94.3% (Table 29).

Subyearling chinook smolts collected this season included both hatchery and naturally produced fish. In early March and late May and June, five releases of 1,271,953 externally unmarked subyearling chinook with CWT of Lyons Ferry Hatchery and Cherry Lane stock were made at sites above Lower Granite Dam by the Nez Perce Tribe. We detected 13,840 unclipped subyearling fall chinook with coded-wire tags in the sample, 13% of all sample fish. When expanded, this represents 367,097 unclipped subyearling fall chinook collected and 28.9% of the total coded-wire tagged subyearling chinook released. These unclipped CWT subyearlings were included in the unclipped totals.

A total of 385,650 yearling fall chinook reared at Lyons Ferry Hatchery and released above LGR were 100% adipose clipped, CWT tagged and elastomer tagged (left-blue, left-green and right-green). Of these, approximately 25.6% (98,958) were collected and transported. The 98,958 elastomer tagged smolts collected represents 5.2% of the total clipped yearling chinook collection at Lower Granite Dam this season.

Table 29. Annual collection, bypass and transport at LGR, 1999-2003.

Year	Yearling Chinook		Subyearling[1] Chinook		Steelhead		Sockeye/Kokanee[2]		Coho	Total
	Clipped	No Clip	Clipped	No Clip	Clipped[2]	No Clip	Clipped	No Clip	Hatchery	
Collection										
1999	1,762,655	410,842	107	257,400	3,032,104	323,083	10,085	7,975	78,621	5,882,872
2000	2,007,545	442,635	---	681,803	4,281,834	757,786	2,688	4,152	122,103	8,300,546
2001	1,370,898	587,375	40,175	699,676	4,555,036	1,025,435	3,182	1,669	58,255	8,341,701
2002	1,196,249	341,050	25,813	606,471	1,268,841	430,092	3,835	47,897	80,777	4,001,025
2003	1,909,312	667,719	114,614	1,055,198	1,870,652	466,498	7,014	2,746	90,072	6,183,825
Bypass										
1999	88,628	27,289	---	861	235,513	30,851	1,338	309	14,609	399,398
2000	53,561	61,883	----	46	143,732	82,869	0	16	400	342,507
2001	60,319	18,879	1	0	231,830	38,994	37	184	976	351,220
2002	2,908	35,244	36	174	21,490	44,410	0	7	5	104,274
2003	2,428	43,461	111	2,783	21,034	32,516	0	0	7	102,340
Truck										
1999	9,235	23,261	106	162,540	26,133	9,158	315	1,640	1,564	233,952
2000	4,072	3,151	----	145,460	10,875	6,596	28	1,002	611	171,795
2001	3,035	3,860	268	84,719	28,611	8,522	12	451	1,845	131,323
2002	7,733	3,754	5	56,748	2,353	1,217	20	644	39	72,513
2003	22,629	31,638	72	25,936	7,016	8,711	21	68	191	96,282
Barge										
1999	1,653,625	357,962	---	91,851	2,769,501	282,912	8,348	5,652	62,254	5,232,105
2000	1,947,270	376,939	----	533,095	4,126,649	668,158	2,658	3,039	121,045	7,778,853
2001	1,304,304	563,474	39,739	611,306	4,292,959	977,250	3,133	982	55,289	7,848,436
2002	1,182,415	301,383	25,405	542,145	1,244,007	384,201	3,753	45,748	80,608	3,809,665
2003	1,879,956	590,937	111,140	1,011,242	1,840,995	424,802	6,907	2,642	89,264	5,957,885
Total Transport										
1999	1,662,860	381,223	106	254,391	2,795,634	292,070	8,663	7,292	63,818	5,466,057
2000	1,951,342	380,090	----	678,555	4,137,524	674,754	2,686	4,041	121,656	7,950,648
2001	1,307,339	567,334	40,007	696,025	4,321,570	985,772	3,145	1,433	57,134	7,979,759
2002	1,190,148	305,137	25,410	598,893	1,246,360	385,418	3,773	46,392	80,647	3,882,178
2003	1,902,585	622,575	111,212	1,037,178	1,848,011	433,513	6,928	2,710	89,455	6,054,167

Peak Collection Days

Peak collection day for all species combined this season followed the pattern of the previous four years. The peak daily collection total (221,941) occurred May 6, just as it did in 2002 and it was also the peak collection day for yearling chinook. In 1999, 2000 and 2001 the peak day of collection has also been the peak collection day of clipped steelhead. With the exception of unclipped subyearling fall chinook peak collection day of June 22, the remaining species peak collection days occurred the last week in May. Generally, the peak collection days in 2003 were later and less variable than in the previous four years. There were 21 days in which the total daily collection exceeded 100,000 fish this season compared to 26 days in 2002 (Table 30 and Figures 23 – 35).

Table 30. Peak collection days at LGR, 1999-2003.

	Yearling Chinook		Subyearling[1] Chinook		Steelhead		Sockeye/Kokanee[2]		Coho	
Year	Clipped	No Clip	Clipped	No Clip[2]	Clipped	No Clip	Clipped	No Clip	All	Total
1996	May 14	April 21	---	July 13	April 27	April 27	May 17	April 2	May 19	April 27
	(31,350)	(9,000)	---	(1,004)	(366,900)	(22,350)	(750)	(910)	(1,650)	(407,550)
1997	April 22	April 22	July 18	July 2	May 2	April 22	July 25	April 22	May 27	May 2
	(13,070)	(5,730)	(2,876)	(480)	(250,146)	(27,821)	(28)	(400)	(150)	(261,350)
1998	May 4	May 3	June 1	July 9	May 4	April 28	May 15	May 15	May 15	May 4
	(70,950)	(19,050)	(60)	(6,210)	(375,900)	(40,220)	(5,550)	(450)	(15,000)	(489,450)
1999	May 9	April 27	July 31	June 9	May 5	May 26	May 29	May 2	May 26	May 5
	(82,650)	(20,877)	(10)	(12,700)	(291,750)	(19,050)	(1,800)	(300)	(8,400)	(353,250)
2000	May 5	April 15	---	July 3	May 7	May 7	May 23	May 28	May 25	May 7
	(171,300)	(18,100)	---	(71,900)	(343,350)	(49,350)	(600)	(300)	(15,600)	(491,250)
2001	May 1	April 30	June 13	July 4	May 16	May 2	May 22	May 17	July 4	May 16
	(122,100)	(34,350)	(4,840)	(80,300)	(338,017)	(72,020)	(450)	(300)	(3,960)	(500,650)
2002	May 6	May 6	June 30	July 21	May 23	May 23	May 19	May 21	May 21	May 6
	(94,333)	(20,166)	(1,833)	(59,457)	(85,900)	(27,000)	(700)	(4,000)	(13,700)	(193,833)
2003	May 6	May 6	May 31	June 22	May 27	May 26	May 30	May 29	May 27	May 6
	(138,657)	(37,761)	(10,149)	(50,500)	(122,687)	(21,200)	(1,493)	(448)	(11,642)	(221,941)

[1]Wild chinook, wild steelhead and wild sockeye/kokanee designated in text as unclipped beginning in 2000.
[2]Hatchery chinook, hatchery steelhead and hatchery sockeye/kokanee designated in text as clipped for 2000-2003.

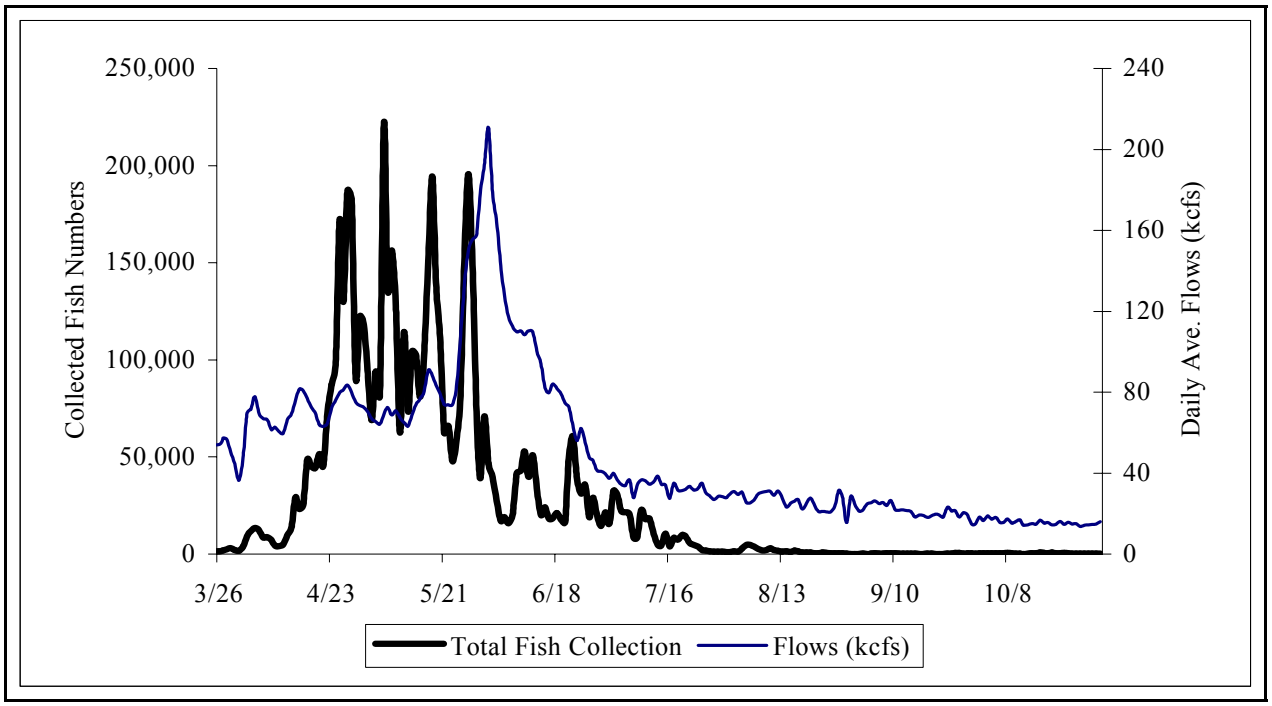

Figure 23. Daily juvenile salmonid collection and river flow at LGR from March 26 through October 31, 2003.

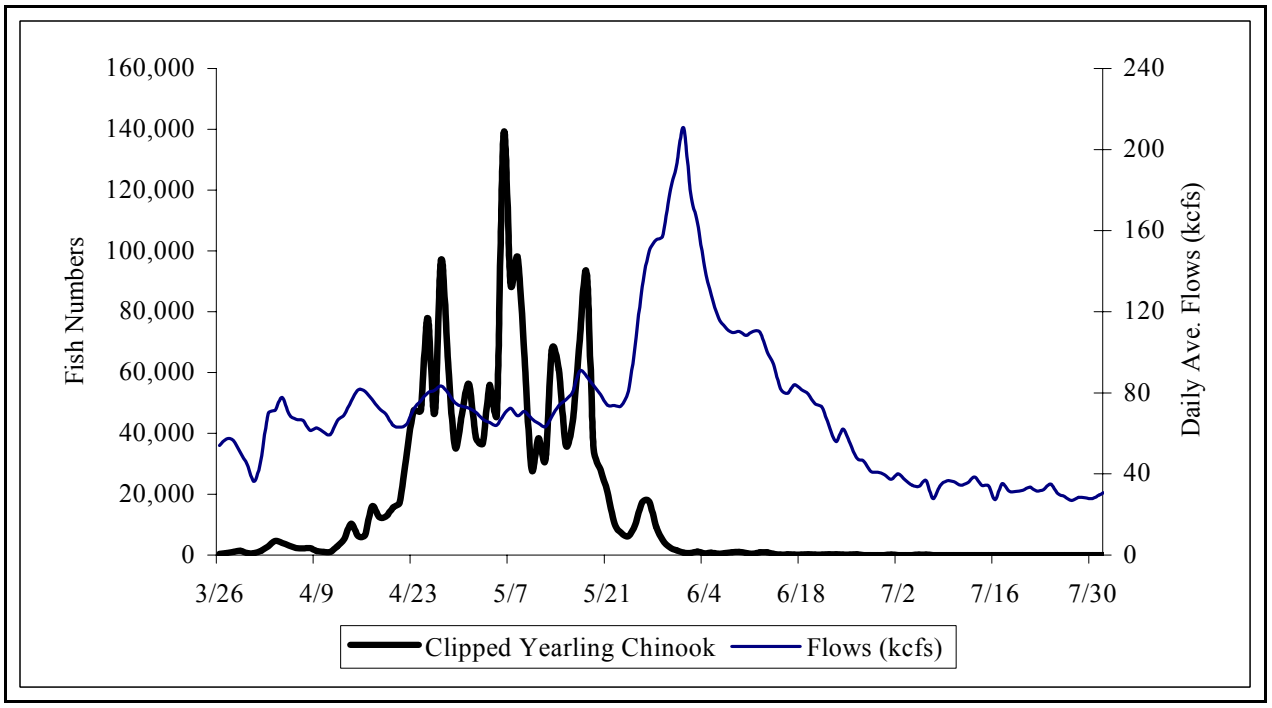

Figure 24. Daily collection of clipped yearling chinook and river flow at LGR from March 26 through June 29, 2003.

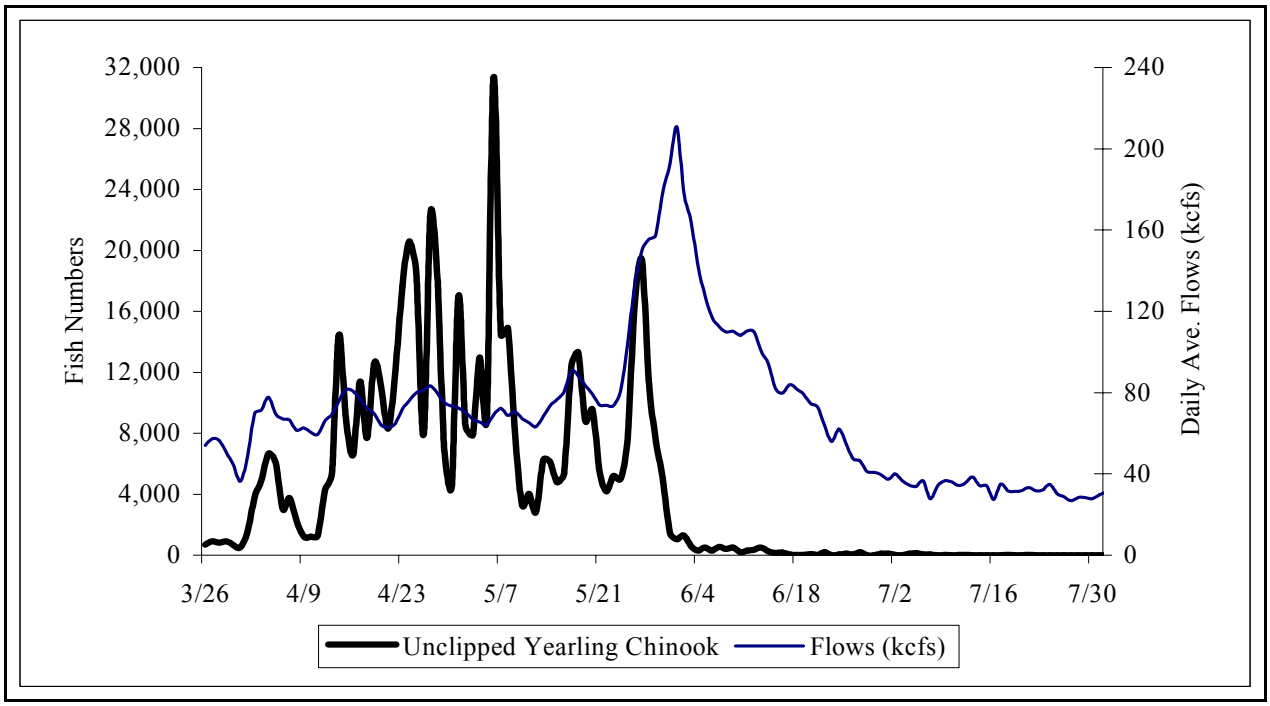

Figure 25. Daily collection of unclipped yearling chinook and river flow at LGR from March 26 through June 29, 2003.

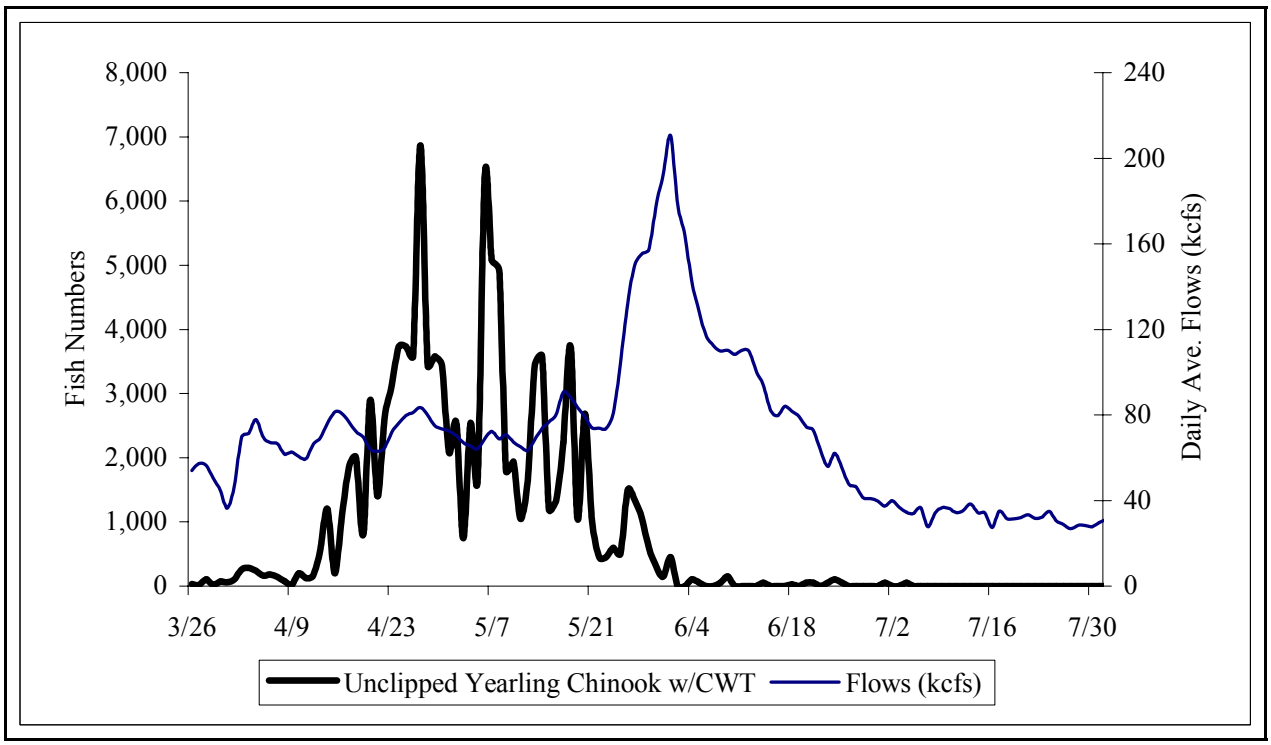

Figure 26. Daily collection of unclipped yearling chinook with CWT and river flow at LGR from March 26 through June 29, 2003.

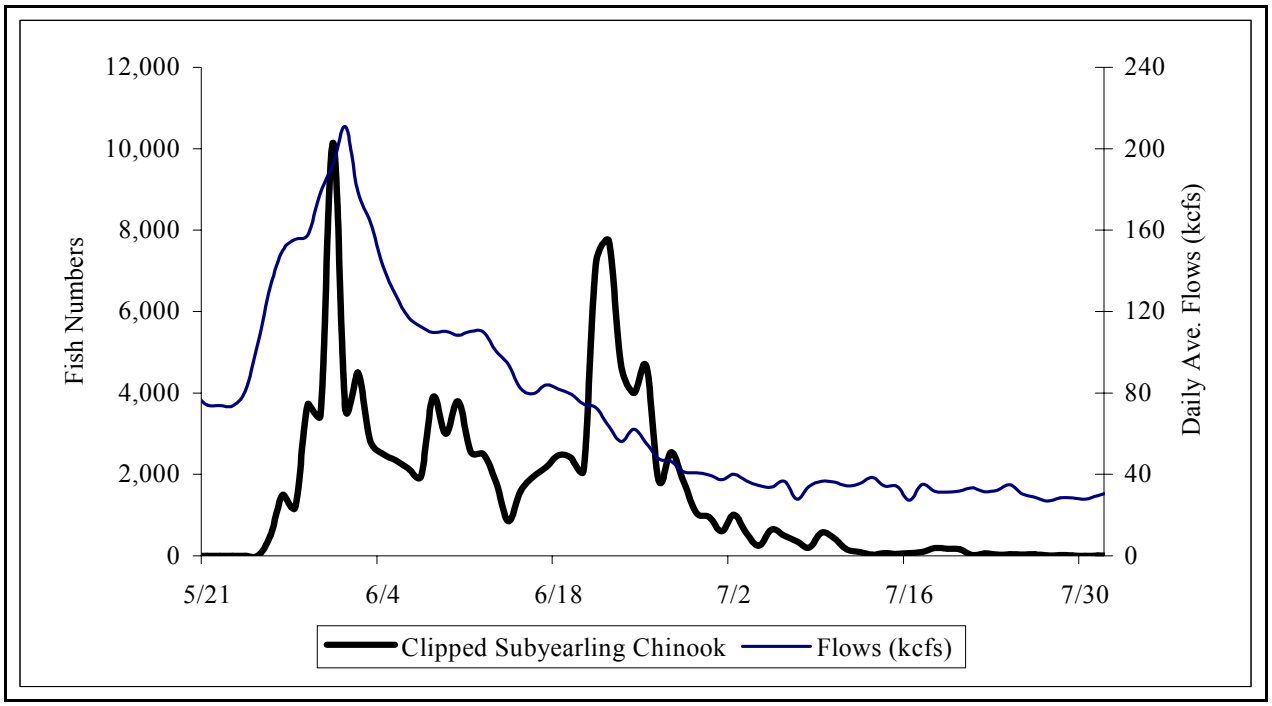

Figure 27. Daily collection of clipped subyearling chinook and river flow at LGR from May 15 through July 30, 2003.

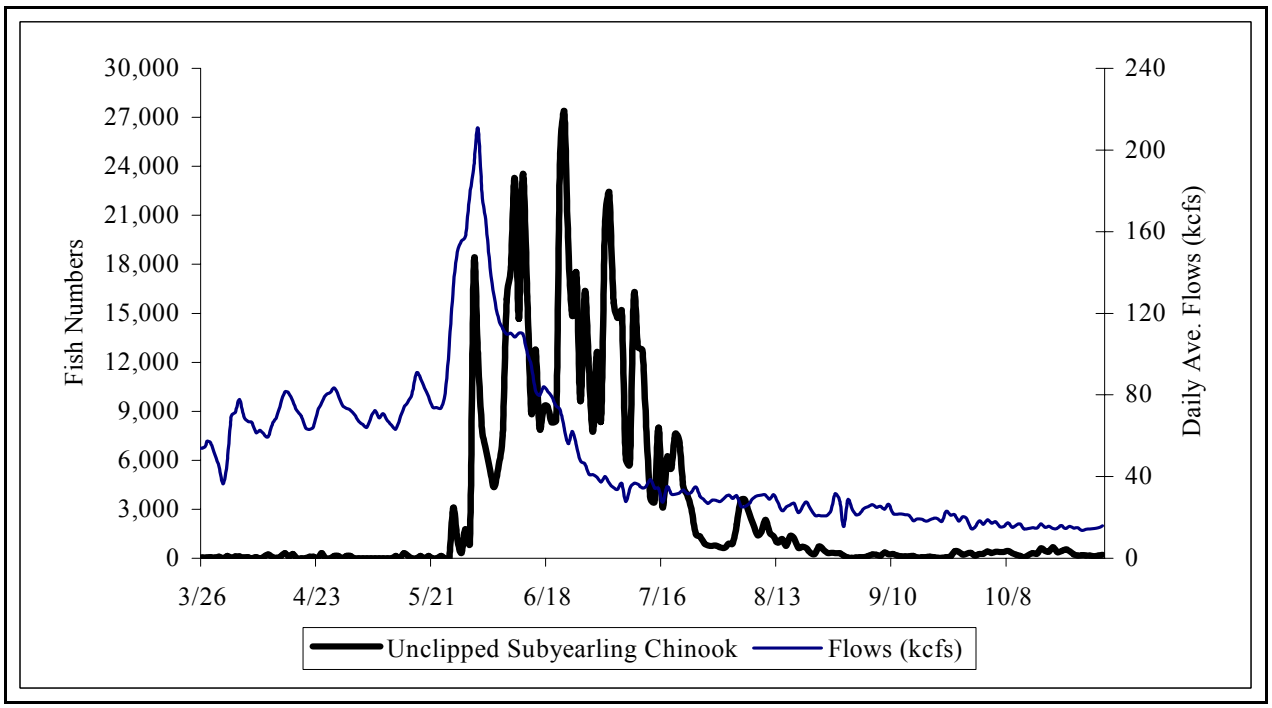

Figure 28. Daily collection of unclipped subyearling chinook and river flow at LGR from March 26 through October 31, 2003.

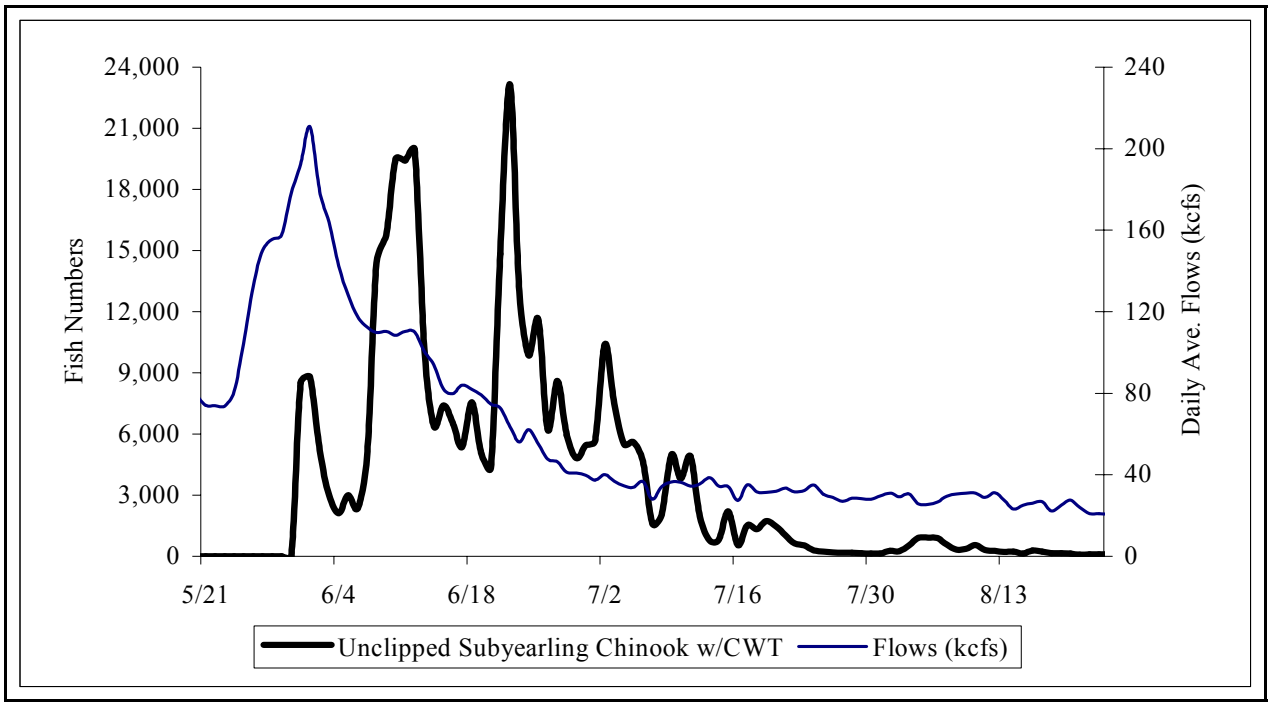

Figure 29. Daily collection of unclipped subyearling chinook with CWT and river flow at LGR from May 27 through Auguts 31, 2003.

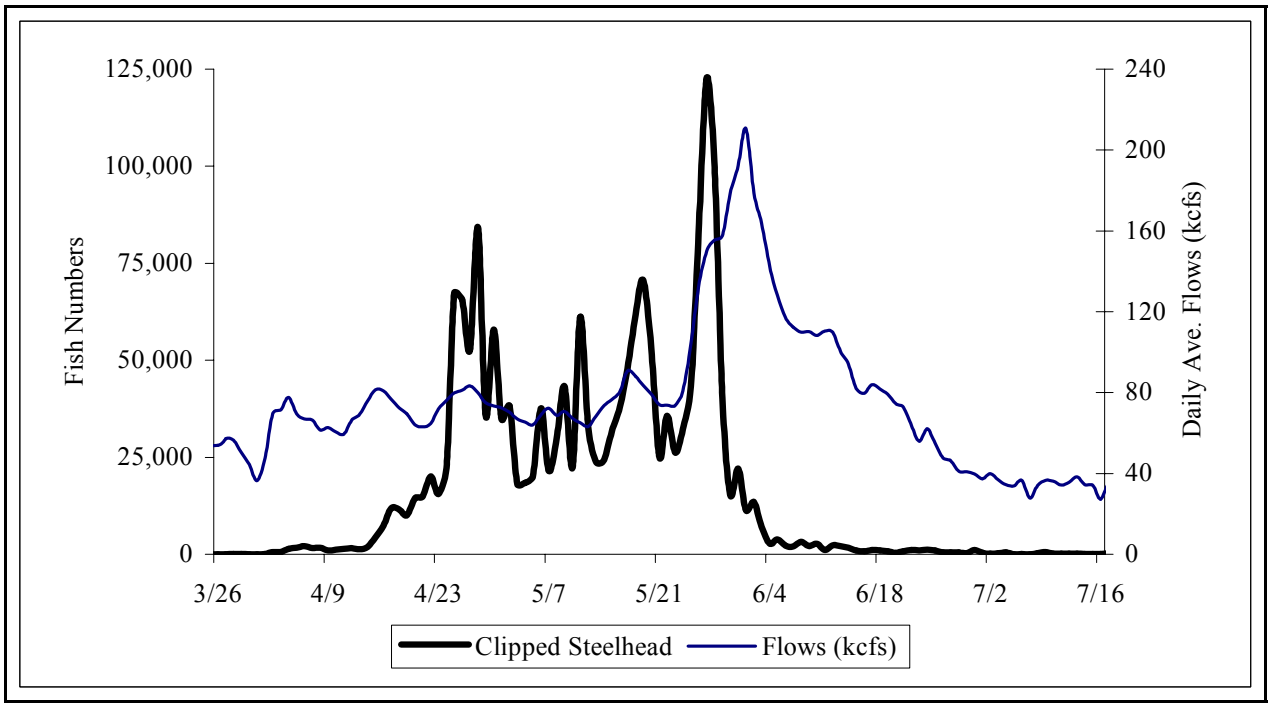

Figure 30. Daily collection of clipped steelhead and river flow at LGR from March 26 through June 29, 2003.

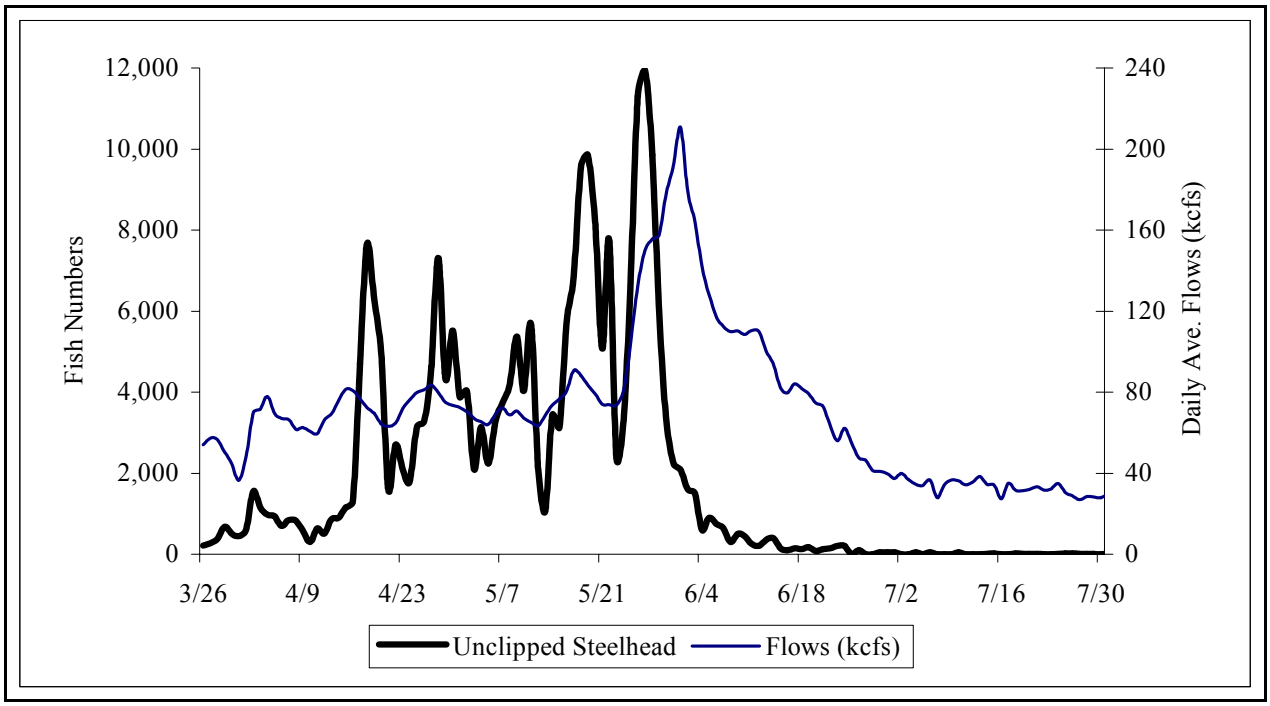

Figure 31. Daily collection of unclipped steelhead and river flow at LGR from March 26 through July 29, 2003.

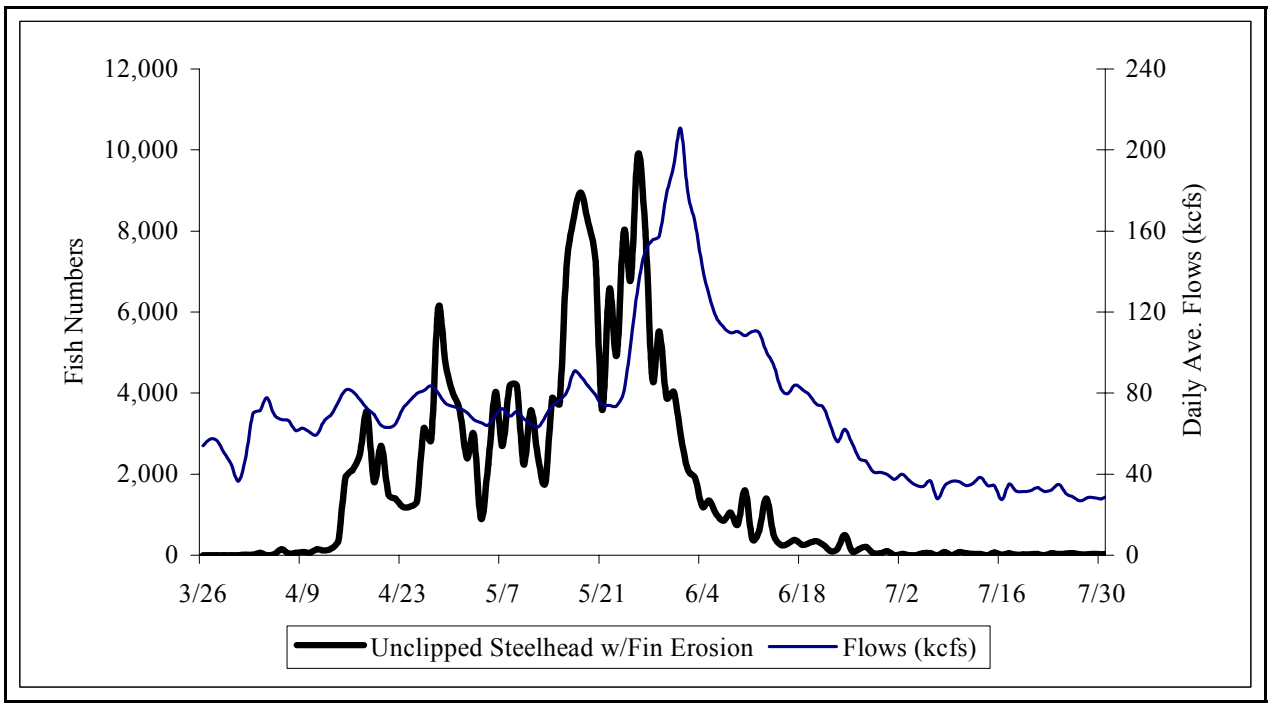

Figure 32. Daily collection of unclipped steelhead with fin erosion and river flow at LGR from March 26 through July 29, 2003.

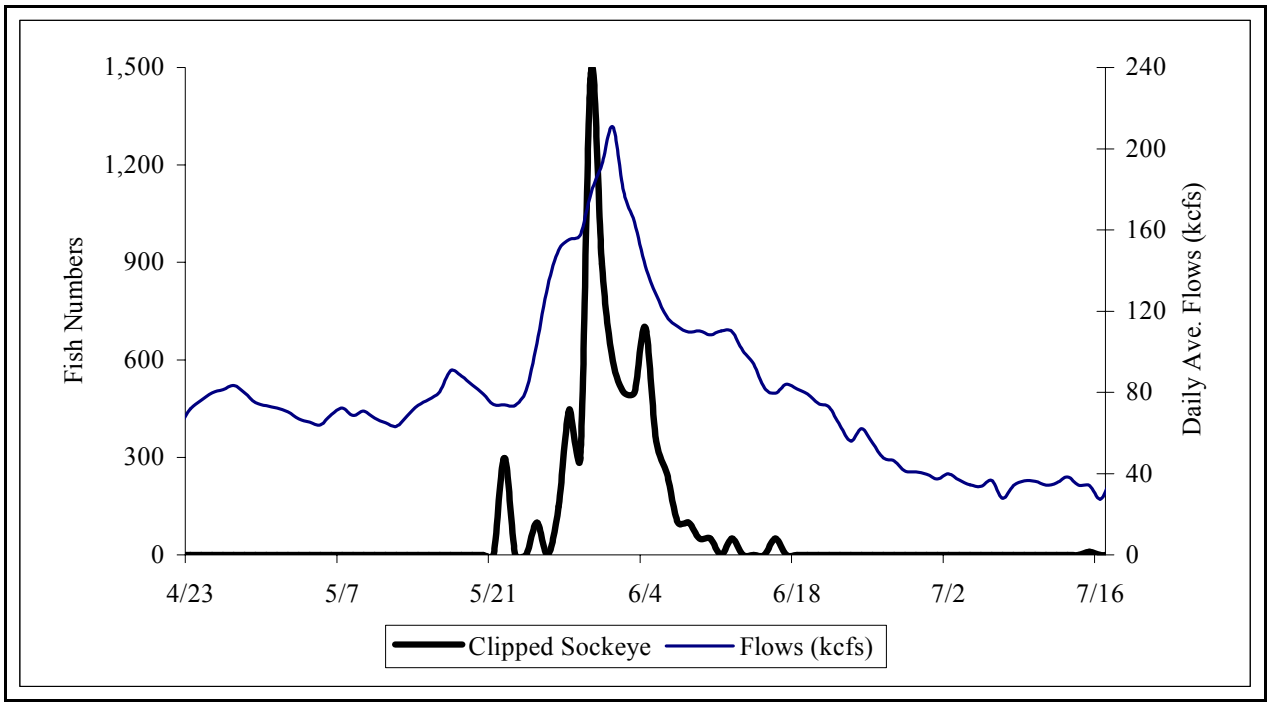

Figure 33. Daily collection of clipped sockeye and river flow at LGR from April 28 through June 29, 2003.

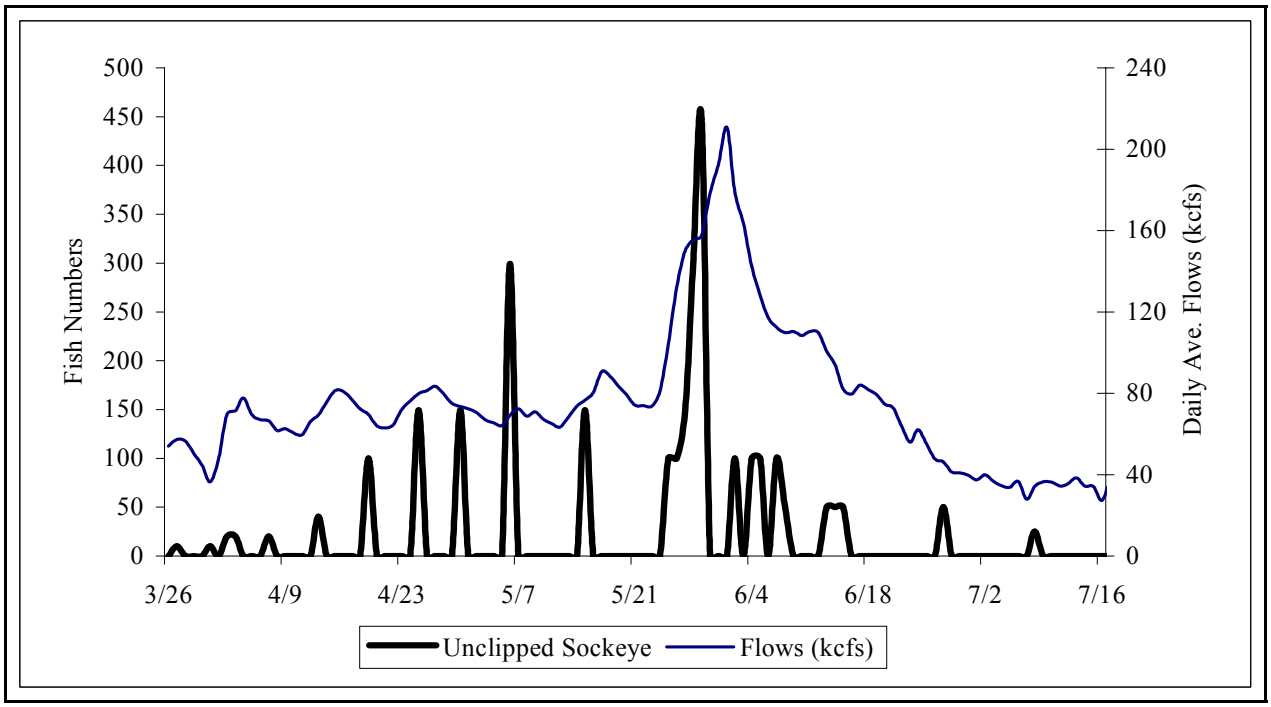

Figure 34. Daily collection of unclipped sockeye and river flow at LGR from March 26 through August 31, 2003.

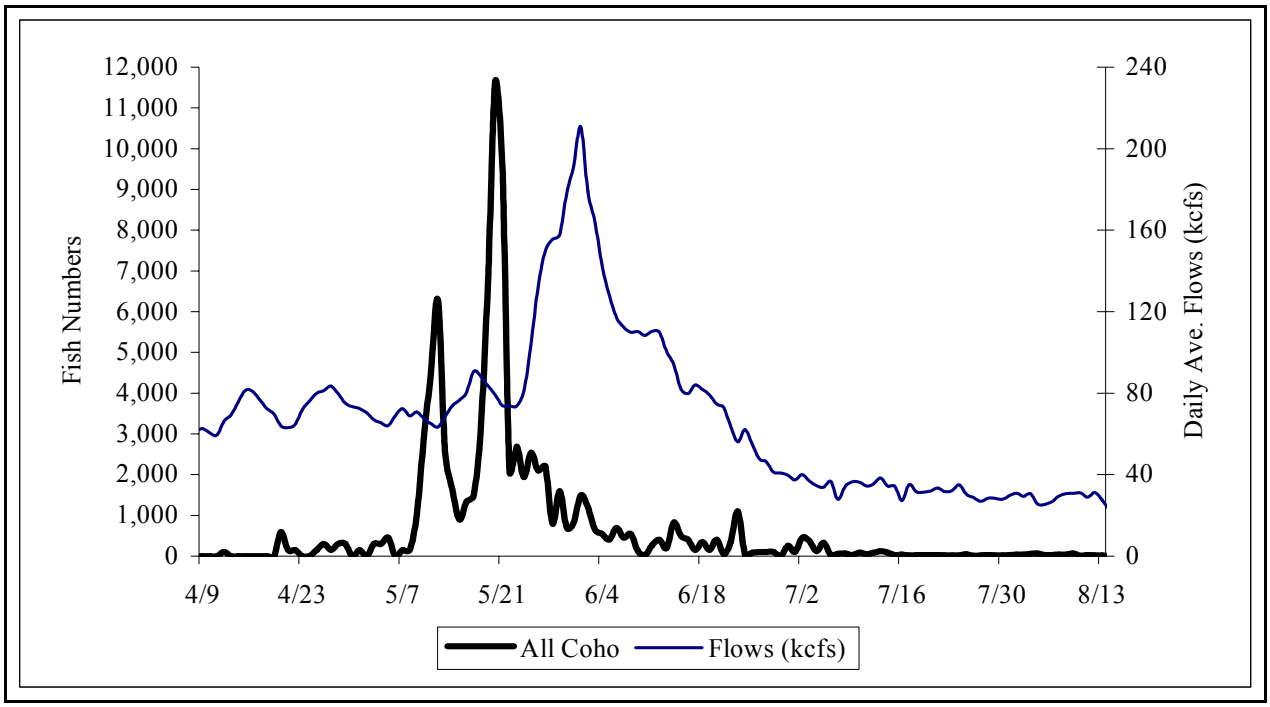

Figure 35. Daily collection of coho and river flow at LGR from April 15 through August 15, 2003.

Migration Run Timing

The distribution of daily collection counts for a particular species provides a measure of migration timing for smolts passing Lower Granite Dam (Table 31). Collection efficiency, spill and spill volume influence daily and seasonal collection at the facility. Thus, the 10% and 90% dates are approximations of the middle 80% passage timing for smolts passing Lower Granite Dam. These dates of 10% and 90% passage are based on the cumulative daily collection.

Table 31. Estimated 10%, 50% and 90% passage dates based on cumulative numbers of fish at LGR, 1996 through 2003.

	Yearling Chinook		Subyearling[1, 2] Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clipped	No Clip[3]	Clipped	No Clip[3]	Clipped	No Clip	Clipped	No Clip	All	Total
10%										
1996	4/24	4/17	----	6/27	4/24	4/17	5/17	3/30	5/18	4/23
1997	4/22	4/13	6/30	6/22	4/23	4/17	7/18	4/23	5/22	4/22
1998	4/20	4/12	6/1	6/24	4/27	4/25	5/8	5/11	5/6	4/24
1999	4/23	4/17	8/3	6/10	4/22	4/14	5/15	5/20	4/23	4/23
2000	4/22	4/15	----	6/18	4/22	4/18	5/11	4/12	5/12	4/23
2001	4/13	4/6	6/7	6/7	4/23	4/13	5/14	3/27	5/6	4/16
2002	4/18	4/15	6/3	6/25	4/21	4/17	5/16	4/23	5/18	4/19
2003	4/22	4/14	5/31	6/7	4/25	4/19	5/28	4/25	5/18	4/24
50%										
1996	5/15	4/25	----	8/9	5/15	4/27	6/9	4/4	6/7	5/17
1997	5/3	4/23	7/19	7/18	5/3	4/29	7/29	5/14	6/2	5/3
1998	4/30	5/2	6/7	7/14	5/4	5/5	5/12	5/14	5/15	5/4
1999	5/6	5/1	8/29	7/18	5/7	5/10	5/29	5/2	5/26	5/8
2000	5/4	5/2	----	7/5	5/6	5/7	5/23	5/25	5/24	5/6
2001	5/3	5/5	6/14	7/4	5/9	5/7	5/27	5/18	6/5	5/10
2002	5/6	5/5	6/19	7/16	5/10	5/18	5/21	5/18	5/23	5/14
2003	5/6	5/2	6/13	6/23	5/14	5/17	6/1	5/28	5/27	5/14
90%										
1996	5/19	5/19	----	8/29	6/26	5/20	6/15	5/16	6/17	5/19
1997	5/20	5/16	8/19	9/18	5/23	5/19	9/17	7/5	6/27	5/25
1998	5/10	5/17	6/17	8/30	5/20	5/23	5/26	5/26	5/29	5/20
1999	5/22	6/2	11/8	8/22	5/30	6/7	6/7	6/9	5/30	5/30
2000	5/13	6/3	----	8/26	5/23	5/24	5/28	9/15	6/3	6/2
2001	5/17	5/25	7/5	8/10	5/26	5/27	6/13	6/12	7/13	6/15
2002	5/20	5/24	6/30	8/11	5/28	5/31	6/10	5/28	6/7	7/6
2003	5/18	5/26	6/27	7/18	5/28	5/30	6/5	6/8	6/15	6/22

[1]Hatchery subyearling chinook were not present until 1997.
[2]Hatchery and wild subyearling chinook were indistinguishable in 1999 - 2003.
[3]Includes unclipped hatchery chinook with CWT in 1999 - 2003.

Passage dates for hatchery origin species typically reflect release dates. Passage dates for naturally produced smolts reflect many variables including photoperiod, flow and water temperatures. Passage dates for subyearling fall chinook this season were influenced by the early June release of approximately 2,206,629 million unclipped and 382,650 clipped subyearling fall chinook above Lower Granite Dam in the Clearwater and Snake Rivers.

Clipped and unclipped yearling chinook 10% passage dates in 2003 followed the general trend for 1996-2002, with clipped yearling chinook averaging thirteen days earlier than their unclipped counterpart (Table 31). In 2001 clipped and unclipped yearling chinook 10% passage dates were more than one week earlier than in the previous five years, 1996-2000. Clipped subyearling fall chinook typically have their 10% passage dates in early June except for 1999 (August 3). Unclipped subyearling fall chinook 10% passage date usually occurs in the later part of June. However, in 2001 and 2003 the unclipped subyearling fall chinook 10% passage date of June 7 was nearly two weeks earlier than in previous years. Clipped steelhead 10% passage run-timing since 1996 has occurred within a six day period from April 21-27. The unclipped steelhead 10% run-timing is more variable than observed in the clipped steelhead. Clipped sockeye/kokanee and coho (clipped and unclipped are combined in the tables) 10% run-timing usually occurs near the middle of May while the unclipped sockeye/kokanee has nearly a two month variation of their respective 10% run-timing passage from 1996 through 2003. For all species combined the 10% run passage dates has occurred from April 16-24 since 1996 (Table 31 and Figure 36).

The 50% run-timing in 2003 for yearling chinook and steelhead followed the general 1996-2002 trend, usually within the first two weeks of May. Clipped subyearling fall chinook 50% passage usually occurs in mid-June, with exceptions in 1997 (July 19)) and also in 1999 (August 29). Unclipped subyearling fall chinook 50% passage typically occurs in mid-July, but in 2003 was the earliest in the last eight years (June 23) and in 1996 the latest (August 9). Variations in the 50% migration run-timing are even greater for clipped sockeye/kokanee, from May 12 to July 29, while unclipped sockeye/kokanee 50% run timing is less variable. The coho 50% passage typically occurs in late May to early June.

The 90% passage dates for yearling chinook and steelhead in 2003 also followed the 1996-2002 trends, occurring in late May to early June. The clipped subyearling fall chinook 90% passage dates are the most variable of any species, occurring from June 17 to November 11 spanning 1997-2003. The unclipped subyearling fall chinook 90% passage date of July 18 was the earliest in the last eight years by nearly three weeks. The 90% run-timing for sockeye/kokanee and coho is less predictable and varies widely from year-to-year. For all species combined, June 22 was the 90% passage date in 2003 and the 90% passage date has been later each succeeding year since 1996 with exceptions in the 90% date in 1997. 2003 was the second latest recorded since 1996.

The number of days for the middle 80% passage run-timing (60 days) for all species combined in 2003 was 19 days less than in 2002 and 16 days more than 1996-2002 average of 44 days (Table 32). Seven species 80% passage dates were less than the 1996-2002 average while two were greater. Unclipped yearling chinook (two days) and unclipped steelhead (two days) were the only two species which had increases in the number of days for their respective 80% run-timing passage in 2003 compared to the 1996-2002 average.

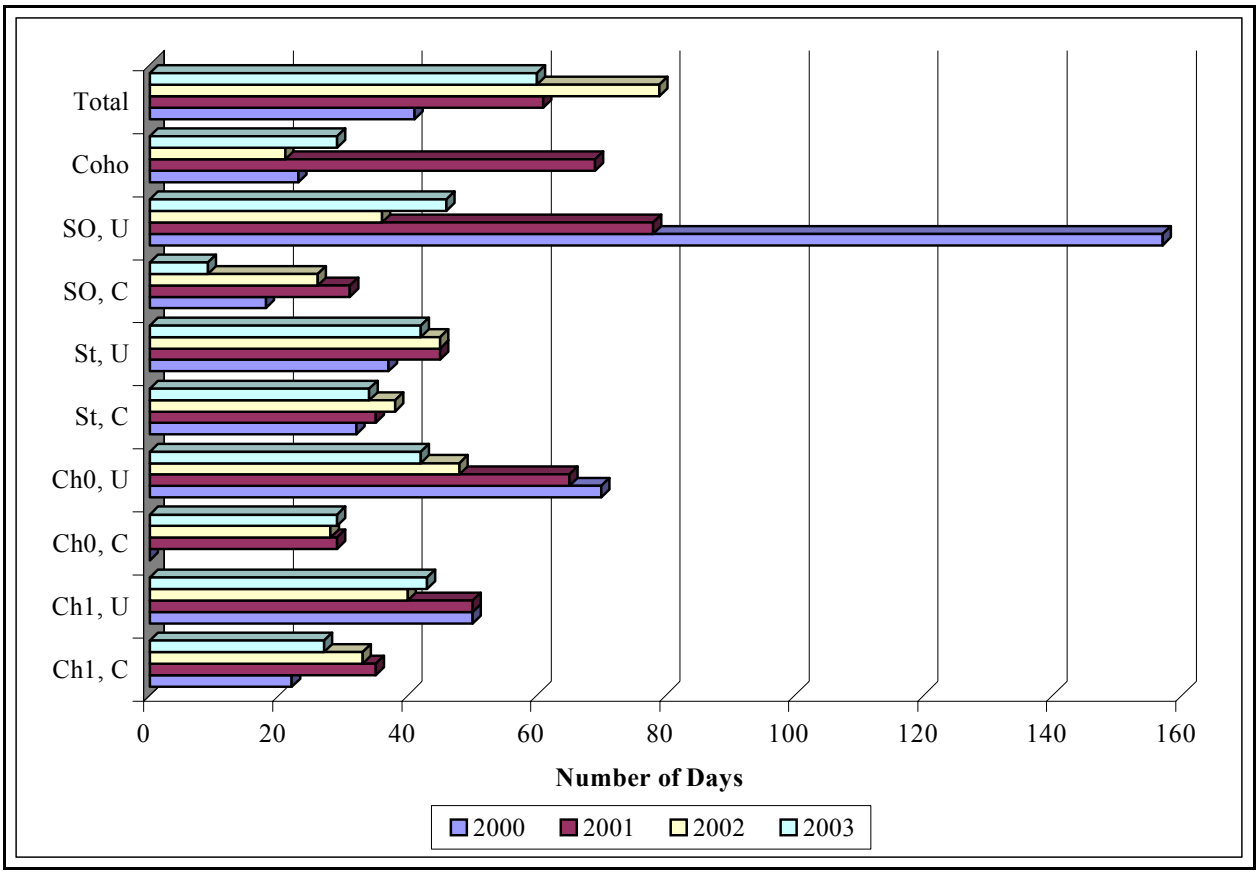

Figure 36. Estimated number of days for the middle 80% passage run-timing based on the 10% and 90% cumulative numbers of fish at LGR, 1996 through 2003.

Species abbreviations are unclipped sockeye, SO,U; clipped sockeye, SO,C; unclipped steelhead, St,U; clipped steelhead, St,C; unclipped subyearling chinook, Ch0,U; clipped subyearling chinook, Ch0,C; unclipped yearling chinook, Ch1,U; clipped yearling chinook, Ch1,C.

Table 32. The estimated number of days for the middle 80% passage run-timing at LGR, 1996-2003.

	Yearling Chinook		Subyearling[1, 2] Chinook		Steelhead		Sockeye/Kokanee		Coho	
Year	Clipped	No Clip[3]	Clipped	No Clip[3]	Clipped	No Clip	Clipped	No Clip	All	Total
1996	26	33	----	64	64	34	30	48	31	27
1997	29	34	51	89	30	33	62	74	37	34
1998	21	36	17	68	24	29	19	16	24	27
1999	30	47	98	74	39	55	24	21	38	38
2000	22	50	----	70	32	37	18	157	23	41
2001	35	50	29	65	35	45	31	78	69	61
2002	33	40	28	48	38	45	26	36	21	79
2003	27	43	29	42	34	42	9	46	29	60
96-02 avg	28	41	45	68	37	40	30	61	35	44

[1]Hatchery subyearling chinook were not present until 1997.
[2]Hatchery and wild subyearling chinook were indistinguishable in 1999 -2002.
[3]Includes unclipped hatchery chinook with CWT in 1999 - 2002.

Bypass

Primary bypass at Lower Granite (fish diverted directly back to the river) was initiated March 19 at 1030 hours and continued until 0700 hours on March 25 when collection began. At 0700 hours October 31, the system returned to primary bypass when collection for the transportation program ended. The facility remained in primary bypass until December when the entire bypass system was de-watered for the season. When the facility is in primary bypass mode, no estimates of the number of fish bypassed are made because fish do not pass through the counting system.

During the 2003 collection season 102,340 juvenile salmonids, 1.7% of the collection, were bypassed back to the river below Lower Granite Dam, primarily from research activities. This is a decrease of 1.9% compared to 2002 when 104,274 juveniles were bypassed (Table 29). The numbers and percentages of fish bypassed during 2003 by species group were: 2,428 clipped yearling chinook (0.1%), 43,461 unclipped yearling chinook (6.5%), 111 clipped subyearling fall chinook (0.1%), 2,783 unclipped subyearling fall chinook (0.3%), 21,034 clipped steelhead (1.1%), 32,515 unclipped steelhead (7.0%), no clipped or unclipped sockeye/kokanee and seven coho (<0.1%). According to the PTAGIS database, 152,268 PIT-tagged fish were detected at Lower Granite Dam in 2003. Of these, 62,122 (41%) were bypassed through the PIT-tag diversion system. A complete description of fish bypassed to the river through the PIT-tag diversion system is in the PIT-tag Diversion section.

No juvenile salmonids were released back to the river directly from the separator or from the raceways due to high collection numbers this season. No bypass events occurred in 2002 and only two events occurred in 2001.

On September 2 at 0700 the sample rate was increased to 100% and the midi-tanker was used for transportation. To reduce loading of the midi-tanker and stress on the subyearlings, steelhead were bypassed to the river during 100% sampling. From September 2 until the end of the season, October 31, 302 clipped and 106 unclipped steelhead were bypassed. In 2002 from October 17 (beginning of 100% sample rate) through October 31, three clipped and two unclipped steelhead were bypassed from the sample to the river.

The PIT tag diversion system was operated in the standard diversion mode (PIT-tagged fish are not diverted to the river during a sample), between March 25 at 0700 hours and July 29 at 0736 hours. During this time the sample diversion gate overrode the PIT-tag diversion gate and fish present during a sample diversion gate operation went to the sample holding tank. From July 29 at 0736 hours until the end of the season the PIT-tag diversion system was set to divert (bypass) all PIT-tagged fish, overriding the sample diversion gate.

Some fish were also bypassed as a part of on-going research projects at Lower Granite Dam. The National Oceanic Atmospheric Administration (NOAA) Fisheries PIT-tagged and bypassed 43,415 unclipped yearling chinook, 19,950 clipped steelhead and 31,708 unclipped steelhead. The United States Geological Survey Biological Research Division (USGS-BRD) radio-tagged and bypassed 1,852 clipped yearling chinook, 192 unclipped subyearling fall chinook, 604 clipped steelhead and 601 unclipped steelhead for their migration route study. The USGS-BRD also handled and bypassed 448 clipped yearling chinook, 119 clipped steelhead and 91 unclipped steelhead. University of Idaho handled and bypassed 117 clipped yearling chinook, 36 unclipped yearling chinook, five unclipped subyearling fall chinook, 43 clipped steelhead,

eight unclipped steelhead and one coho. A description of the research conducted by NOAA and USGS-BRD is in the Research section.

Transportation

An estimated 6,054,167 juvenile salmonids (97.9%) of all fish collected were transported from Lower Granite Dam in 2003, compared to 3,882,178 in 2002 (Table 29). The numbers of fish and the percentages transported of each species group in 2003 were: 1,902,585 clipped yearling chinook (99.6%), 622,575 unclipped yearling chinook (93.2%), 111,212 clipped subyearling fall chinook (97.0%), 1,037,178 unclipped subyearling fall chinook (98.3%), 1,848,011 clipped steelhead (98.8%), 433,513 unclipped steelhead 92.9%), 6,928 clipped sockeye/kokanee (98.8%), 2,710 unclipped sockeye/kokanee (98.7%) and 89,455 coho (98.8%).

The COE began the transport season using trucks to transport smolts. As the number of collected smolts increased, the COE switched to barges and later as the numbers declined, resumed using trucks. The first truck left Lower Granite Dam March 27 and every-other-day truck transport continued through April 6. The first barge departed Lower Granite Dam April 8 and every-other-day barge transport continued through April 20. From April 22 through June 3 the Corps barged fish everyday and then every-other-day June 5 through August 16. Every-other-day trucking resumed August 18 and continued until October 31. The 3,500-gallon trailers were used during the early and late-season trucking phase through September 1. The 300-gallon pickup-mounted midi-tanker was brought into use for transport September 3.

Approximately 96,282 juvenile salmonids, 1.6% of the fish transported in 2003, were transported by truck compared to 72,513 (1.9%) in 2002 (Table 29). The numbers of fish trucked and the percentages of the total transported for each species group in 2003 were: 22,629 clipped yearling chinook (1.2%), 31,638 unclipped yearling chinook (5.1%), 72 clipped subyearling fall chinook (<0.1%), 25,936 unclipped subyearling fall chinook (2.5%), 7,016 clipped steelhead (0.4%), 8,711 unclipped steelhead (2.0%), 21 clipped sockeye/kokanee (0.3%), 68 unclipped sockeye/kokanee (2.5%) and 191 coho (0.2%).

An estimated 5,957,885 (98.4%) of transported juvenile salmonids were barged from Lower Granite Dam in 2003 (Table 29). The number of fish barged and the percentages of the total transported by species group were: 1,879,956 clipped yearling chinook (98.8%), 590,937 unclipped yearling chinook (94.9%), 111,140 clipped subyearling fall chinook (99.9%), 1,011,242 unclipped subyearling fall chinook (97.5%), 1,840,995 clipped steelhead (99.6%), 424,802 unclipped steelhead (98.0%), 6,907 clipped sockeye/kokanee (99.7%), 2,642 unclipped sockeye/kokanee (97.5%) and 89,264 coho (99.8%).

PIT-tag Diversion

This season marked the fourth year of operation for the new International Standards Organization (ISO) based 134.2 kHz PIT-tag detection system at Lower Granite. The PIT tag diversion system was operated in the standard diversion mode (Non-divert during the sample), between March 25 at 0700 hours and July 29 at 0736 hours. During this time, the sample diversion gate overrode the PIT-tag diversion gate and any fish present during a sample diversion gate operation went to the sample holding tank. From July 29 at 0736 hours until the end of the season, the PIT-tag diversion system was set to divert all PIT-tagged fish, overriding the sample diversion gate. Most of the PIT-tagged fish detected exiting the separator were sent to the raceways and transported. Some PIT-tagged fish were bypassed for research purposes. Others missed by the diversion system were sent to either the raceways or the sample tank and transported. An unknown number of non-tagged fish were bypassed by the PIT-tag diversion system along with the tagged fish. Fish bypassed through the PIT-tag diversion system are not included in the facility bypass numbers. Between 1997 and 2002, around 63% of the PIT-tagged fish detected at Lower Granite were bypassed and around 36% were transported in each year. In 2003 this ratio was reversed, 41% were bypassed to the river and 58% were transported.

According to the PTAGIS database, 152,268 PIT-tagged fish were detected at Lower Granite Dam in 2003 compared to 95,022 in 2002 and 211,914 in 2001. Of these, 62,122 (41%) were bypassed through the PIT-tag diversion system, 87,119 (57%) were diverted to the raceways and transported, 2,225 (1%) were diverted to the sample tank (sampled and then transported), 802 (1%) were not detected at any of the exit monitors (fish disposition unknown) and there were 357 orphans. The total number of fish detected by species at Lower Granite included: 80,408 hatchery yearling chinook, 10,688 wild yearling chinook, 39,818 hatchery subyearling chinook, two wild subyearling chinook, 1,665 hatchery chinook of unknown race, 5,116 wild chinook of unknown race, 59 chinook of unknown rearing type or age, 43 unknown rearing type yearling chinook, 7,189 hatchery steelhead, 5,820 wild steelhead, one steelhead of unknown rearing type, 403 hatchery coho, 586 hatchery sockeye, 113 wild sockeye and 357 orphans (Table 33 and 34).

The 62,122 PIT-tagged fish bypassed to the river included: 21,347 hatchery yearling chinook, 1,611 hatchery chinook of unknown race, 6,647 wild yearling chinook, 3,056 wild chinook of unknown race, 45 unknown rearing/race type chinook, 18,665 hatchery subyearling chinook, one wild subyearling chinook, 40 yearling chinook of unknown race, 5,027 hatchery steelhead 4,358 wild steelhead, one steelhead of unknown rearing type 560 hatchery sockeye/kokanee, 108 wild sockeye/kokanee, 392 hatchery coho and 264 orphans (Table 33 and 34). Another 87,119 PIT-tagged fish were diverted to raceways and transported. This group included: 58,030 hatchery yearling chinook, 3,689 wild yearling chinook, 19,887 hatchery subyearling chinook, 35 hatchery chinook of unknown race, 1,931 wild chinook of unknown race, 2 yearling chinook of unknown race, 1 wild fall chinook, 2,072 hatchery steelhead, 1,381 wild steelhead, 9 hatchery sockeye/kokanee, two wild sockeye/kokanee, four hatchery coho and 76 orphans.

The 2,225 PIT-tagged fish diverted to the sample tank and transported included: 603 hatchery yearling chinook, 1,064 hatchery subyearling chinook, 18 hatchery chinook of unknown race, 116 wild chinook of unknown rearing, 14 chinook of unknown run or rear type, 224 wild yearling chinook, seven hatchery coho, 80 hatchery steelhead, 77 wild steelhead, 15 hatchery sockeye, three wild sockeye and 4 orphans.

Only 802 PIT-tagged fish were not detected at an exit monitor this season: 428 hatchery yearling chinook, 202 hatchery subyearling chinook, 1 hatchery chinook of unknown race, 128 wild yearling chinook, 13 wild chinook of unknown race, 1 yearling chinook of unknown rearing type, 10 hatchery steelhead, four wild steelhead, 2 hatchery sockeye and 13 orphans. The total of 802 PIT-tagged fish not detected at an exit monitor is much lower than the 4,519 in 2002 and 2,242 in 2001.

Table 33. The final disposition of PIT-tagged juvenile salmonids detected at LGR in 2003.

	Yearling Chinook		Subyearling Chinook		Unknown Chinook			Steelhead			Sockeye		Coho		
	Hatch	Wild	Hatch	Wild	Hatch	Wild	Unk.	Hatch.	Wild	Unk.	Hatch.	Wild	All	Orphan	Total
Raceway	58,030	3,689	19,887	1	35	1,931	2	2,072	1,381		9	2	4	76	87,119
Bypass	21,347	6,647	18,665	1	1,611	3,056	85	5,027	4,358	1	560	108	392	264	62,122
Sample	603	224	1,064		18	116	14	80	77		15	3	7	4	2,225
Unk Exit	428	128	202		1	13	1	10	4		2			13	802
Total	80,408	10,688	39,818	2	1,665	5,116	102	7,189	5,820	1	586	113	403	357	152,268

Note: PIT-tagged fish were denoted as hatchery or wild rather than clipped and unclipped.

Table 34. Disposition of PIT-tagged fish (number and percent) detected at LGR, 1996-2003.

Year	Bypass to River		Raceways/Transport		Sample Tank/Transport		Not Detected at an Exit		Total
1996	48,934	89.41%	3,719	6.80%	1,392	2.54%	686	1.25%	54,731
1997	46,691	59.29%	28,564	36.28%	1,803	2.29%	1,686	2.14%	78,744
1998	81,000	59.76%	50,126	36.98%	1,683	1.24%	2,729	2.01%	135,538
1999	47,574	59.98%	29,251	36.88%	1,359	1.71%	1134	1.43%	79,318
2000	62,409	61.90%	34,437	34.15%	1,287	1.28%	2,696	2.67%	100,829
2001	130,825	61.40%	75,684	35.52%	4,294	2.02%	2,272	1.07%	213,075
2002	57,920	60.95%	29,933	31.50%	2,650	2.79%	4,519	4.76%	95,022
96-02 ave.	67,908	62.77%	35,959	33.24%	2,067	1.91%	2,246	2.08%	108,180
2003	62,122	40.80%	87,119	57.21%	2,225	1.46%	802	0.53%	152,268

PIT-tag Detections

We have scanned all sample and raceway mortalities for the presence of PIT-tags and reported these to PTAGIS since 1998. In 2003, 346 of 89,344 (0.39%) were found to have PIT-tags compared to 186 of 32,583 (0.31%) in 2002. The PIT-tagged fish mortality rate of 0.39% in 2003 is higher than the previous five-year average of 0.28% (Table 35). PIT-tagged fish mortality rates at Lower Granite Dam showed similar trends when compared to the overall facility mortality rates. PIT-tagged fish mortality rates were higher than the total facility mortality rate in all years examined except for 2000 and 2003.

Table 35. Sample and raceway PIT-tag mortality (number and percent) at LGR, 1998-2003.

Year	Number of PIT-tag Mortalities	Number of tagged detected in Sample and Raceways	% of PIT-tag Mortality in Sample and Raceways	Facility Mortality (%) (Comparison)
1998	117	51,809	0.23%	0.15%
1999	173	30,610	0.57%	0.28%
2000	7	35,724	0.02%	0.09%
2001	168	79,978	0.21%	0.13%
2002	186	32,583	0.57%	0.34%
98-02 ave.	130	46,141	0.28%	0.20%
2003	346	89,344	0.39%	0.43%

In the weekly Lower Granite Dam task order reports prepared for the Corps of Engineers we reported the number of PIT-tagged smolts detected at Lower Granite (LGR) by species, race type, rear type, release dates, release site, tag site and tagging organization. Here we summarize these observed detections at LGR by species, rear type (hatchery or wild), run type (spring, summer or fall), tag site and release site groups by week, Friday-Thursday. We combined detections for common tagging sites with different release sites, typically hatchery tagging sites with several release sites and some wild groups tagged and released in different reaches of the same river or creek. PIT-tagged smolts detected at LGR identified as unknown race, rear type, or as orphans in the data download from PITAGIS were not included in the summaries.

This year 152,268 PIT-tagged fish were detected at Lower Granite Dam compared to 95,022 in 2002 and 213,075 in 2001. The number of fish collected in 2003 was greater than in 2002. In 2001, very low flows and no spill occurred at LGR. In 2002, flows were higher and the project spilled water for fish passage throughout the spring migration to test and evaluate the removable spillway weir. Flows were similar to the water conditions observed in 2003. All Pit-tag release groups are summarized in Appendix 2, Tables 1-11.

Hatchery Yearling Chinook-Spring

The largest numbers of PIT-tagged hatchery spring chinook detected at LGR during the 2003 sampling season originated from fish tagged at five hatcheries, Rapid River, Lookingglass, Dworshak, Clearwater and Kooskia. Rapid River PIT-tagged smolts accounted for the most PIT-tagged hatchery yearling spring chinook detected at LGR (42,511) followed by 10,782 from Dworshak Hatchery, 10,360 from Lookinglass Hatchery, 713 from Clearwater Hatchery and 277 from Kooskia Hatchery.

More than 99 % of the PIT-tagged fish from these five hatcheries were detected by week 11 in 2003. In 2002, more than 99 % of the PIT-tagged fish from four of these five hatcheries were detected by week 10. In both years the weekly average peak flows occurred during week 10. All five hatchery groups of PIT-tagged smolts had fewer fish detected in 2003 during their peak week of detections than those observed in 2001 and 2002. For example, in 2003, 28.6% of the Rapid River PIT-tagged smolts were detected during their peak week of detections, 50.1% in 2002 and 59.8% in 2001.

Rapid River and Dworshak hatcheries PIT-tagged yearling spring chinook detections peaked during week 6, the same week as in 2002 and one week later than in 2001(Table 36). Lookingglass hatchery PIT-tagged yearling spring chinook detections peaked during week 6 in 2003, week 8 in 2002 and week 7 in 2001. Clearwater and Kooskia hatchery PIT-tagged yearling spring chinook detections peaked during week 5 in 2003 and 2001. In 2002 Clearwater Hatchery PIT-tagged smolts peaked during week 6 and Kooskia Hatchery PIT-tagged smolts peaked during week 8.

In 2003, 2002 and 2001 Rapid River and Dworshak Hatchery released their PIT-tagged smolts the end of March. The PIT-tagged smolts from these hatcheries showed a large single peak week of detection in 2001 and 2002. The other three hatcheries released their smolts in April and these release groups showed fewer detections during the peak weeks of detection and had two or more weeks of similar peak detections. In 2003 this pattern was not observed as all release groups showed lower peak weeks of detections with two or more peaks. PIT-tag detection rates for each release group was greater than those observed in 2002 but still much lower than the detection rates observed during 2001's no spill year (Table 36).

Table 36. PIT-tagged hatchery spring chinook release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Rapid River	5	April 27-May 3	59.8	55,091	29,399	53.4
Dworshak	5	April 27-May 3	52.3	55,142	28,989	52.6
Lookingglass	7	May 11-17	37.3	42,000	21,732	51.7
Clearwater	5	April 27-May 3	63.8	1,657	962	58.1
Kooskia	5	April 27-May 3	33.7	749	306	41.0
2002						
Rapid River	6	May 3-9	50.1	183,924	27,811	15.1
Dworshak	6	May 3-9	40.6	54,725	6,526	11.9
Lookingglass	8	May 17-23	33.7	42,000	7,445	17.7
Clearwater	6	May 3-9	30.0	3,671	260	7.1
Kooskia	8	May 17-23	35.9	1,500	167	11.1
2003						
Rapid River	6	May 2-8	28.6	184,475	42,511	23.0
Dworshak	6	May 2-8	19.3	54,705	10,782	19.7
Lookingglass	6	May 2-8	26.7	42,000	10,360	24.7
Clearwater	5	April 25-31	28.9	4,820	713	14.8
Kooskia	5	April 25-31	26.4	1,501	277	18.5

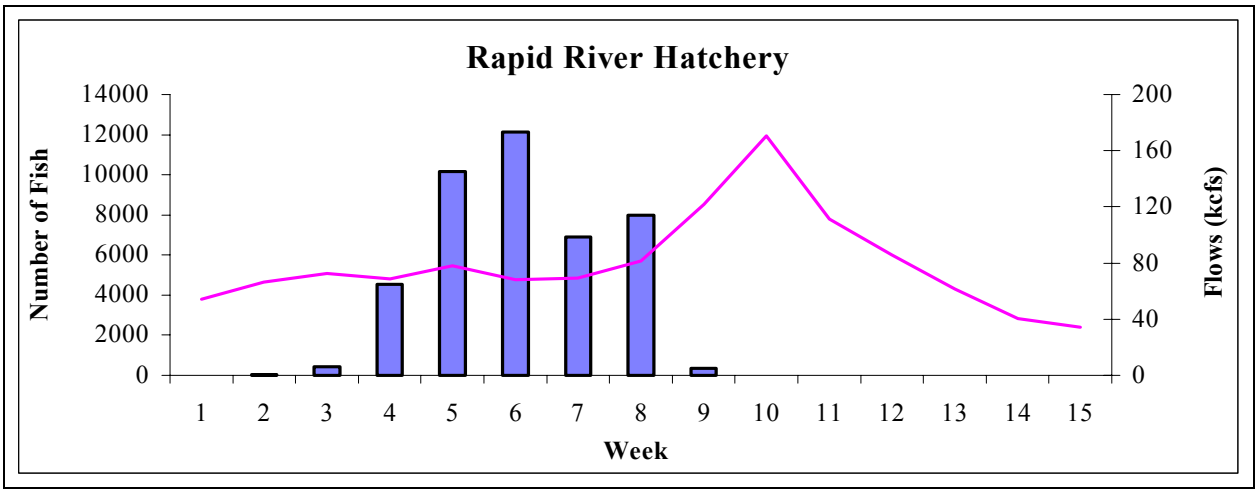

Figure 37. Number of PIT-tagged Rapid River Hatchery spring chinook detected by week and flows at LGR, 2003.

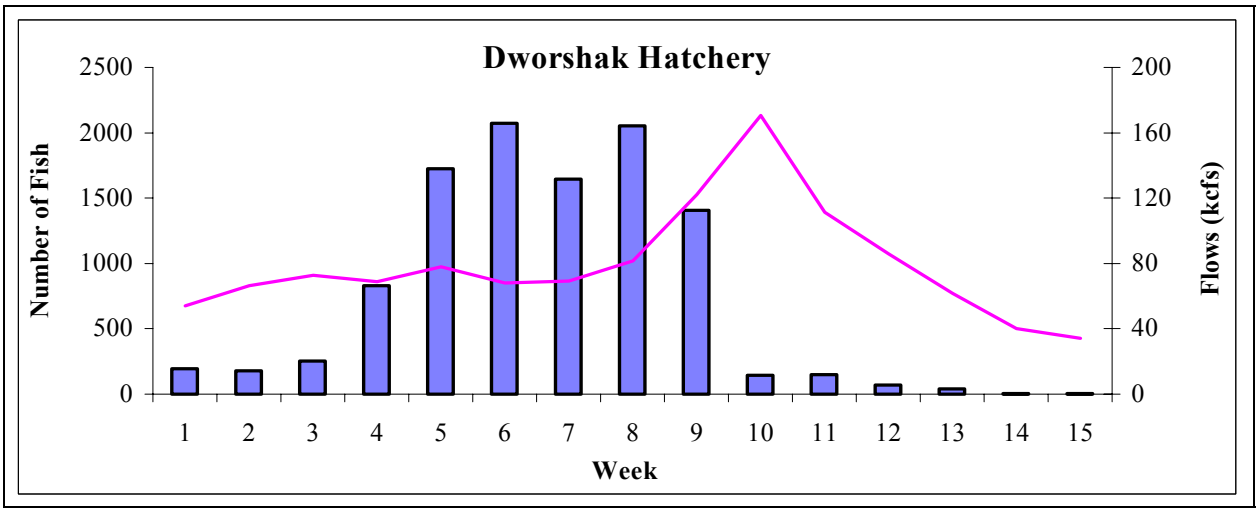

Figure 38. Number of PIT-tagged Dworshak Hatchery spring chinook detected by week and flows at LGR, 2003.

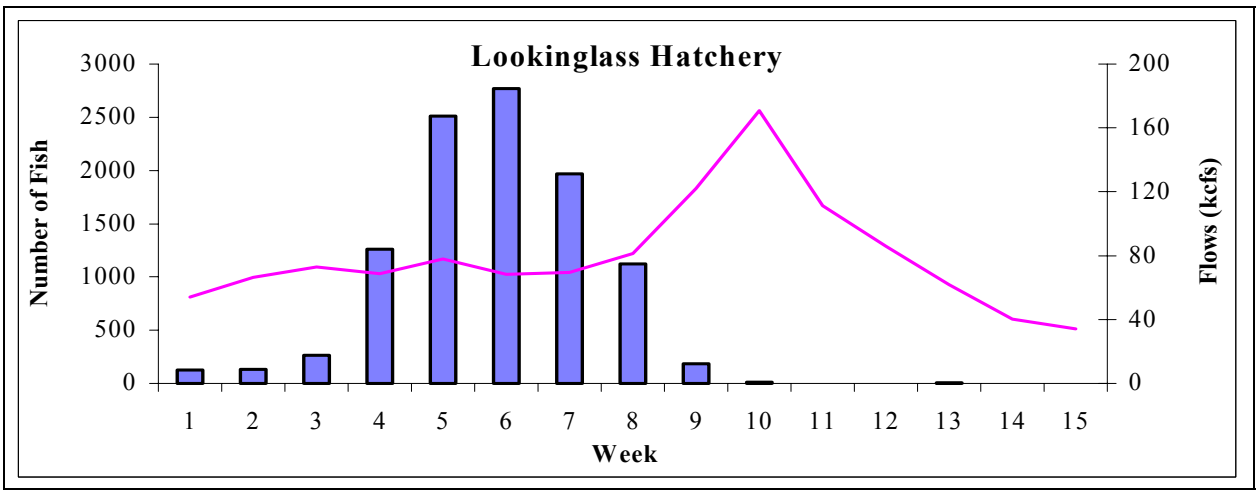

Figure 39. Number of PIT-tagged Lookinglass Hatchery spring chinook detected by week and flows at LGR, 2003.

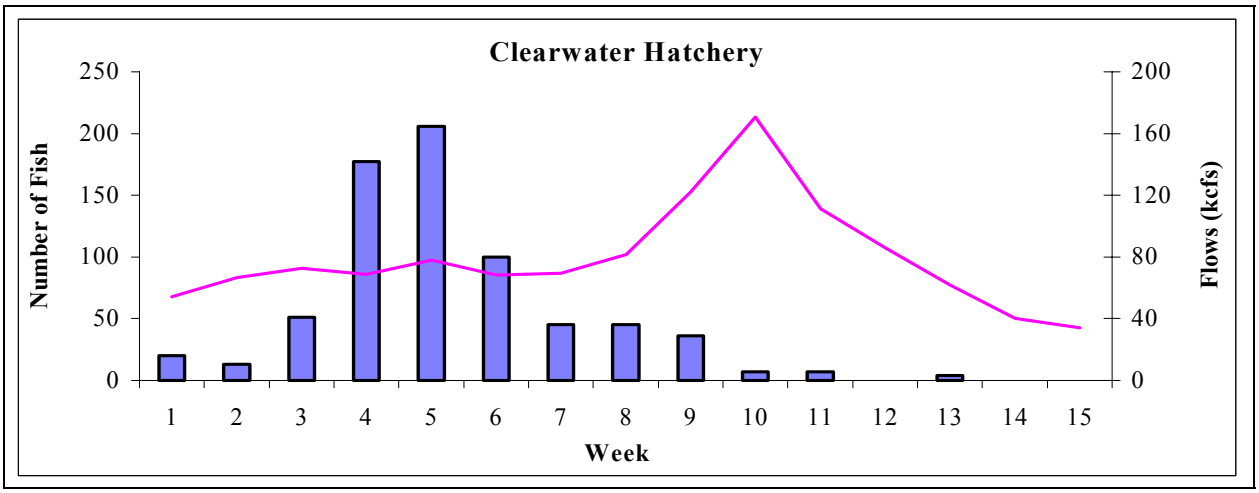

Figure 40. Number of PIT-tagged Clearwater Hatchery spring chinook detected by week and flows at LGR, 2003.

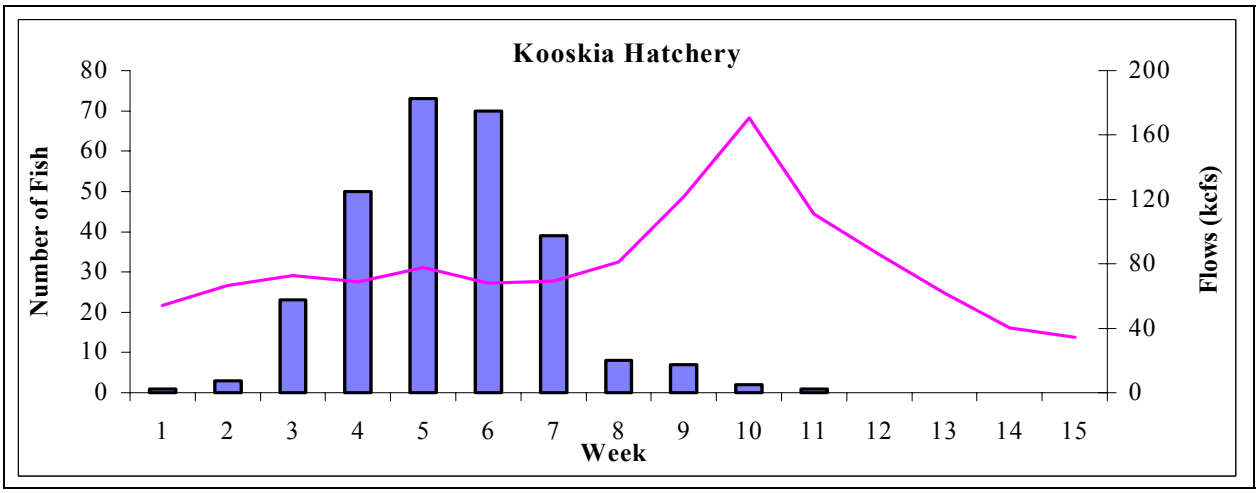

Figure 41. Number of PIT-tagged Kooskia Hatchery spring chinook detected by week and flows at LGR, 2003.

Wild Yearling Spring Chinook

Wild yearling Spring Chinook collected and PIT-tagged at traps and in streams typically have the same tag site and release site and we grouped these by tagging site. Depending upon the trap location or stream site where the fish were tagged, the tagged chinook may represent stock components from one or more tributaries upstream of the tagging site.

More than 5,540 PIT-tagged wild yearling spring chinook were detected at Lower Granite Dam this season originating from 47 tagging sites compared to 2,972 PIT-tagged wild yearling spring chinook detected from 32 tagging sites in 2002. Most of the detections this year originated from juveniles tagged at the Grande Ronde Trap (861), Sawtooth Trap (754), Lolo Creek (449), American River (416) and Marsh Cr. Trap (356). Detections of PIT-tagged wild spring chinook from the Grande Ronde Trap peaked week 4, Sawtooth Trap peaked week 9, Lolo Creek peaked week 11, American River peaked week 13 and Marsh Cr. Trap peaked week 9 (Figures 42-46, Table 37). Detection dates and patterns for these groups were similar to those observed in 2001 and 2002 and did not appear to coincide with peak flows. More than 99 % of all detections for these groups were recorded by the end of week 17, similar to 2002.

The different groups of tagged wild spring chinook peaked as early as week 4 (Grande Ronde Trap) and as late as week 13 (American River) while PIT-tagged hatchery spring chinook detections peaked during weeks 5 and 6. This same trend was observed in 2002 (Table 37). Tagged smolts from American River and Lolo creek showed more protracted detection periods at LGR than most other groups. More PIT-tagged fish were detected from these groups in 2003 than in 2002; however there was no spill at Lower Granite in 2003.

Table 37. PIT-tagged wild spring chinook release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Grande Ronde Trap	5	April 27-May 3	36.7			
Sawtooth Trap	7	May 11-17	34.2	1,589	389	24.5
Lolo Cr.	10	June 1-7	17.0	1,396	311	22.3
American River	12	June 14-20	14.8	120	27	22.5
Marsh Cr. Trap	6	May 3-9	100.0	60	1	1.7
2002						
Grande Ronde Trap	3	April 12-18	30.1	1,336	286	21.4
Sawtooth Trap	8	May 17-23	34.1	3,357	214	6.4
Lolo Cr.	12	June 14-20	16.2	2,986	247	8.3
American River	13	June 21-27	34.9	615	83	13.5
Marsh Cr. Trap	8	May 17-23	26.8	1,854	142	7.7
2003						
Grande Ronde Trap	4	April 18-24	21.7	2669	861	32.3
Sawtooth Trap	9	May 23-29	33.7	6418	754	11.8
Lolo Cr.	11	June 6-12	31.0	3335	449	13.5
American River	13	June 20-26	25.5	1858	416	22.4
Marsh Cr. Trap	9	May 23-29	17.7	4122	356	8.6

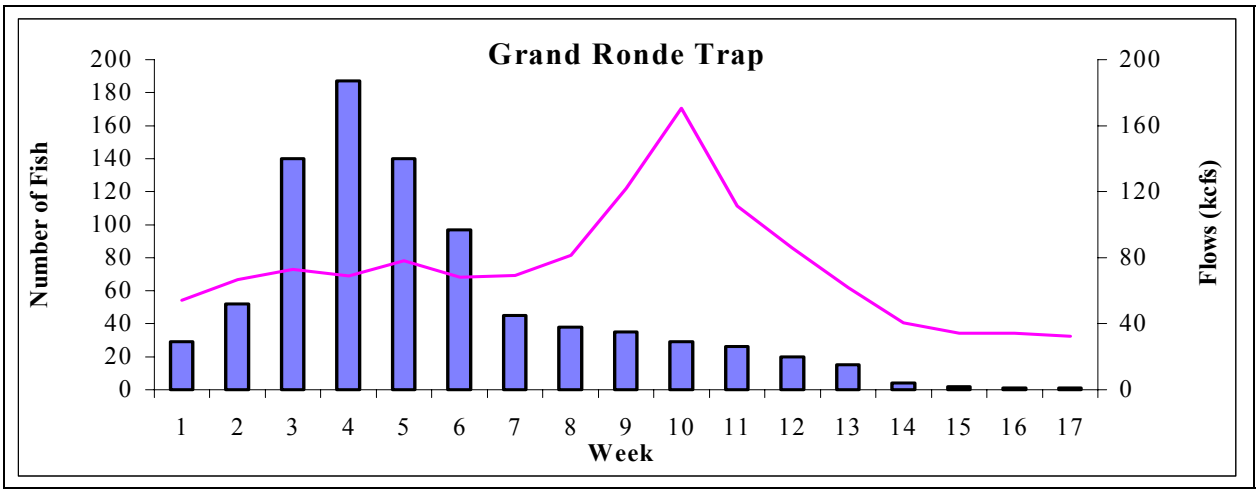

Figure 42. Number of PIT-tagged Grande Ronde Trap wild spring chinook detected by week and flows at LGR, 2003.

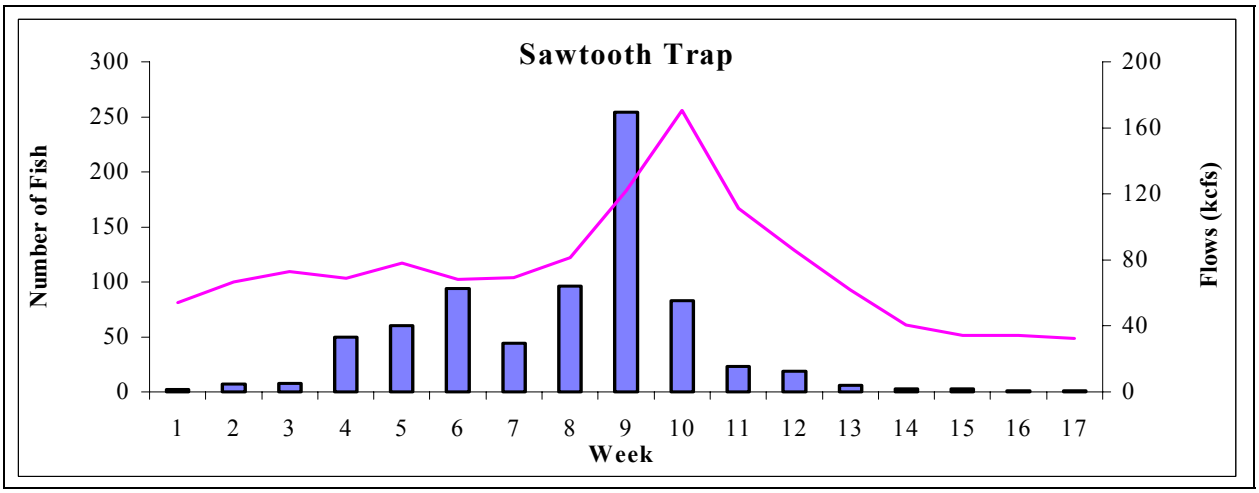

Figure 43. Number of PIT-tagged Sawtooth Trap wild spring chinook detected by week and flows at LGR, 2003.

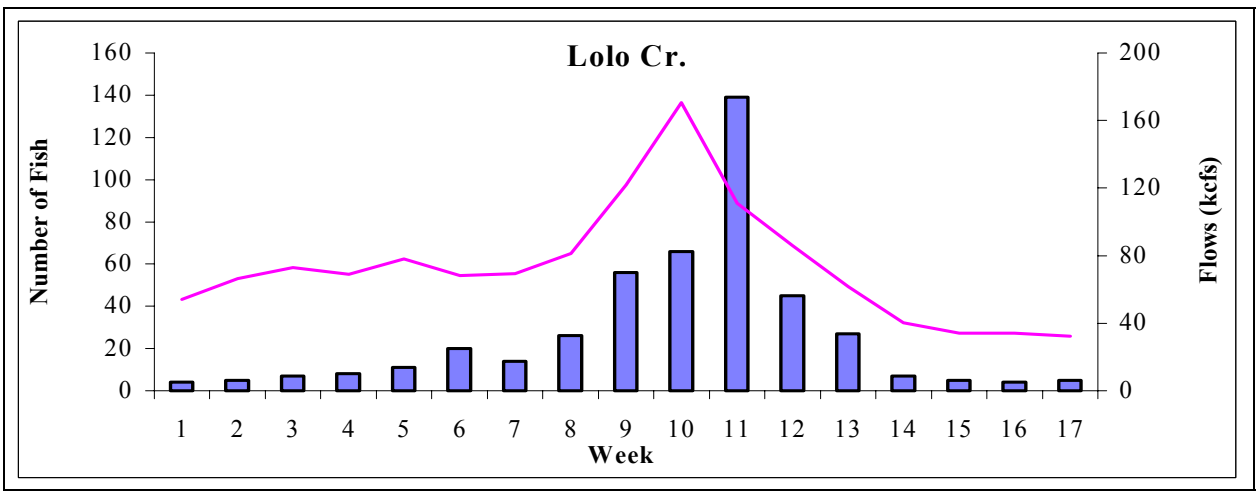

Figure 44. Number of PIT-tagged Lolo Cr. wild spring chinook detected by week and flows at LGR, 2003.

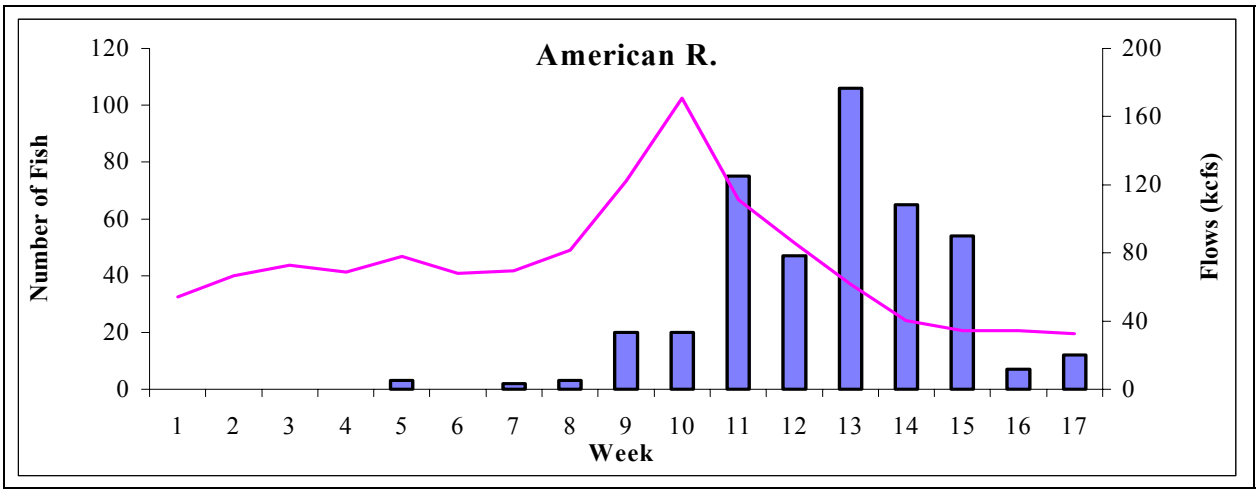

Figure 45. Number of PIT-tagged American River wild spring chinook detected by week and flows at LGR, 2003.

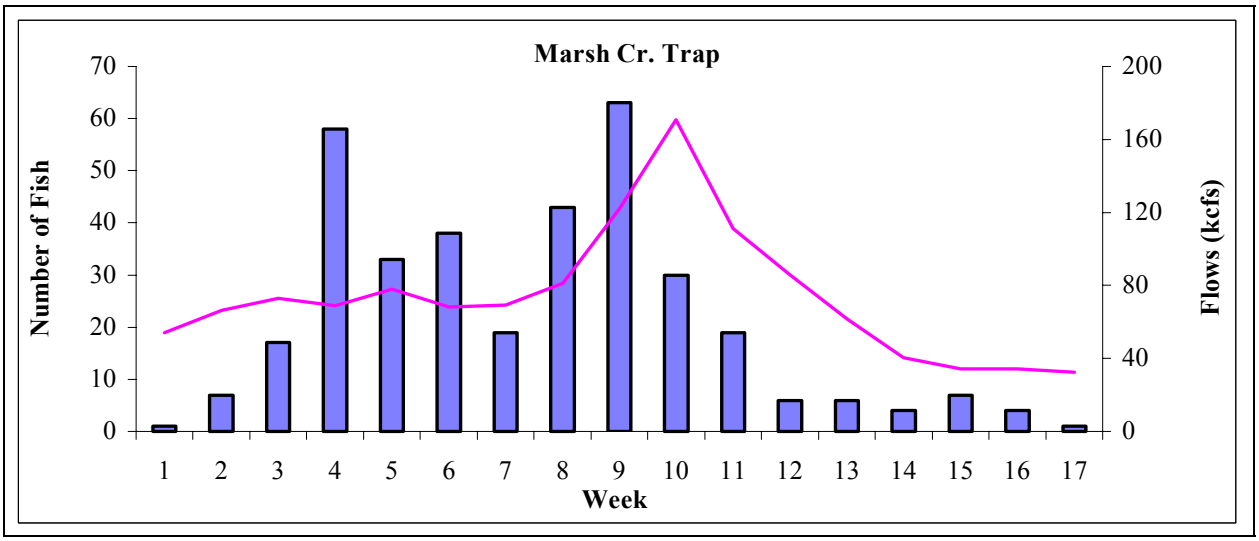

Figure 46. Number of PIT-tagged Marsh Cr. Trap wild spring chinook detected by week and flows at LGR, 2003.

Hatchery Yearling Summer Chinook

Hatchery yearling summer chinook were PIT-tagged at McCall Hatchery, Imnaha Trap, Pahsimeroi Pond, South Fork Salmon River Trap and the Salmon River Trap. In previous years the Salmon River sites did not classify any PIT-tagged fish as summer chinook like in 2003. McCall Hatchery PIT-tagged smolts accounted for 14,755 PIT-tagged hatchery yearling summer chinook detected at Lower Granite Dam, nearly twice as many as the 7,564 in 2002. Pahsimeroi Pond had 193 PIT-tagged smolts detected followed by 46 from the South Fork Salmon River Trap, 13 from Salmon River Trap and 13 from Imnaha Trap.

Peak weeks of detection for PIT-tagged summer chinook yearlings from McCall Hatchery (week 8), Pahsimeroi Pond (week 5) and Imnaha Trap (week 6) this season were comparable to 2002 (Table 38). Detections for four of the five groups exceeded 99 % by the end of week 9. However, detections for South Fork Salmon River Trap PIT-tagged fish did not reach 99 % until the end of week 15. More PIT-tagged fish were detected from these groups this year than in 2002 (Table 38). Seventeen percent of the McCall Hatchery PIT-tagged fish were detected at Lower Granite in 2003 versus 11.6 % in 2002. Nearly twenty percent of the PIT-tagged smolts from Pahsimeroi Pond were detected in 2003 compared to 13.6 % in 2002. For PIT-tagged fish from the Imnaha trap 27.7 % were detected in 2003 versus 15.5 % in 2002.

The lower spill level observed in 2003 likely contributes to the higher detection rates and numbers detected in 2003 compared to 2002. Overall detection rates and numbers of PIT-tagged fish were much higher in 2001's drought year than in either 2002 or 2003. Hatchery summer chinook detections did not seem to correspond to increasing flows (Figures 47-51).

Table 38. PIT-tagged hatchery summer chinook release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
McCall Hatchery	7	May 11-17	49.3	56,327	29,494	52.4
Pahsimeroi Pond	7	May 11-17	45.3	1,002	488	48.7
Imnaha Trap	5	April 27-May 3	56.2	3,008	1,706	56.7
2002						
McCall Hatchery	8	May 17-23	41.6	65,416	7,564	11.6
Pahsimeroi Pond	6	May 3-9	48.2	992	135	13.6
Imnaha Trap	6	May 3-9	32.8	3,022	467	15.5
2003						
McCall Hatchery	8	May 16-22	35.6	87,046	14,755	17.0
Pahsimeroi Pond	5	April 25-May 1	36.8	982	193	19.7
Imnaha Trap	6	May 2-8	46.2	47	13	27.7
S. Fk. Salmon R. Trap	10	May 30-June 5	27.7	608	46	7.6
Salmon Trap	6	May 2-8	23.1	50	13	26.0

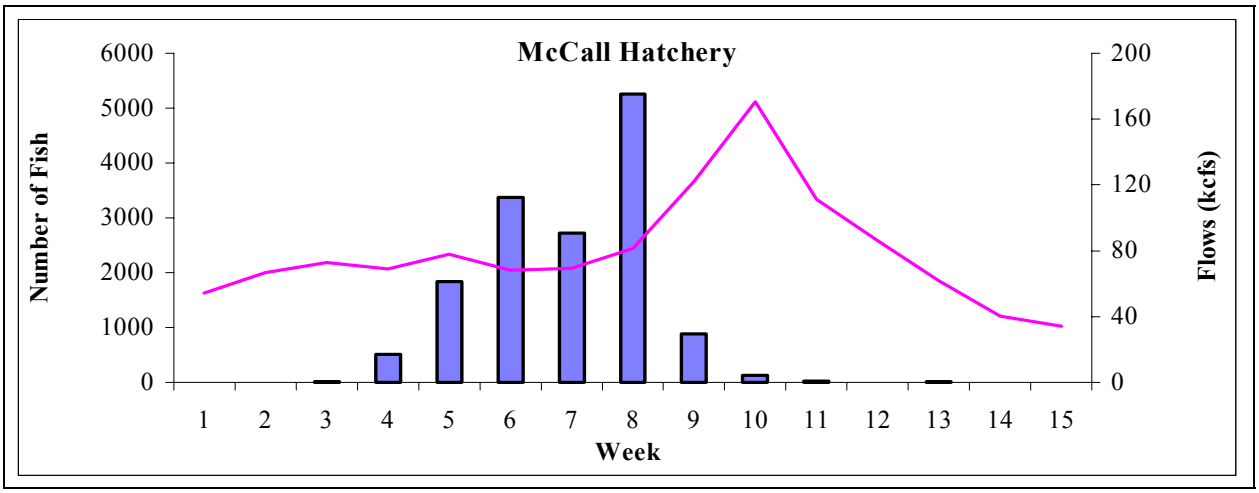

Figure 47. Number of PIT-tagged McCall Hatchery summer chinook detected by week and flows at LGR, 2003.

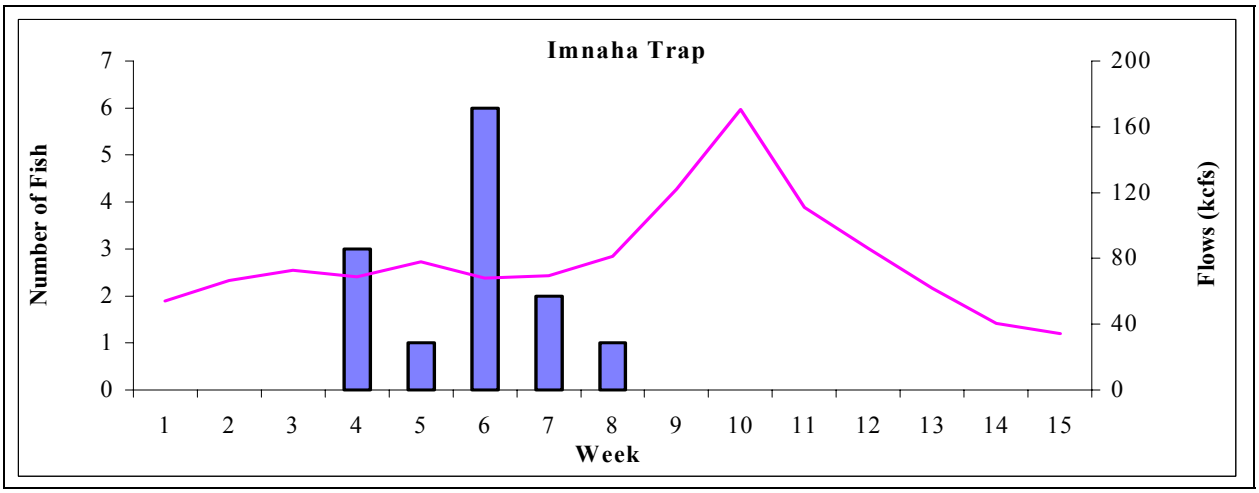

Figure 48. Number of PIT-tagged Imnaha Trap hatchery summer chinook detected by week and flows at LGR, 2003.

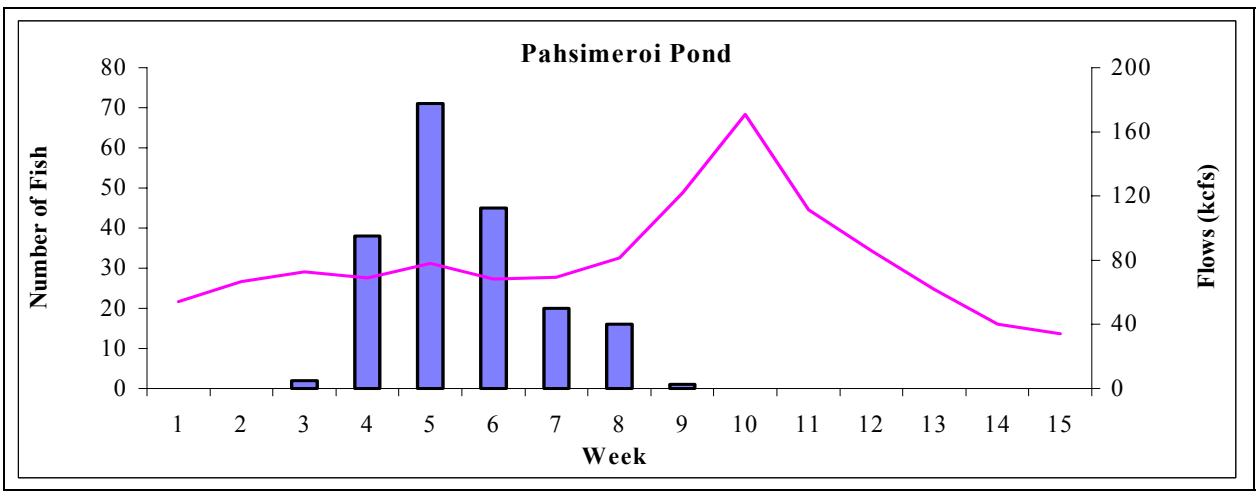

Figure 49. Number of PIT-tagged Pahsimeroi Pond hatchery summer chinook detected by week and flows at LGR, 2003.

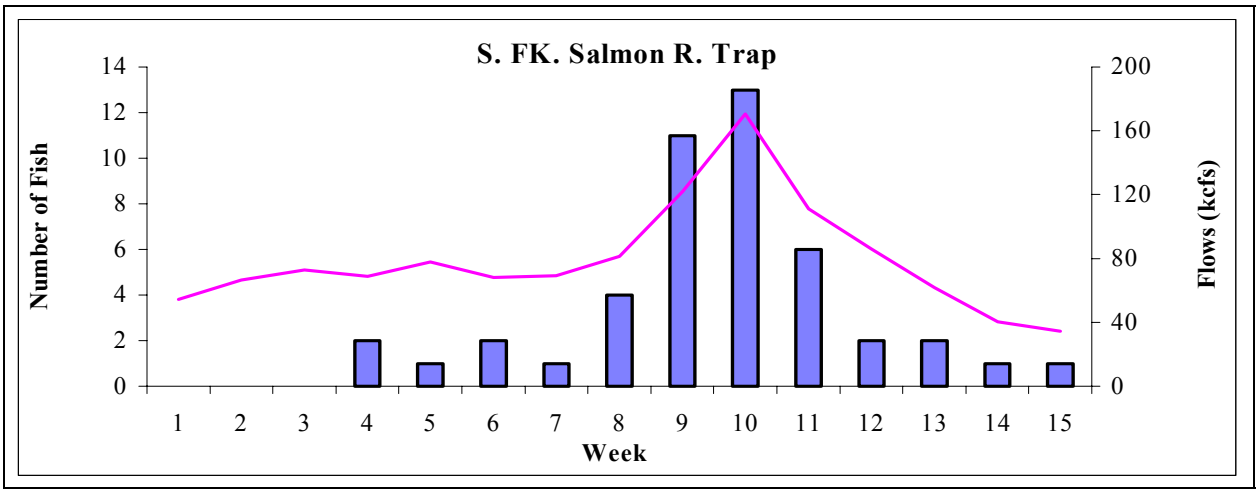

Figure 50. Number of PIT-tagged South Fork Salmon River Trap hatchery summer chinook detected by week and flows at LGR, 2003.

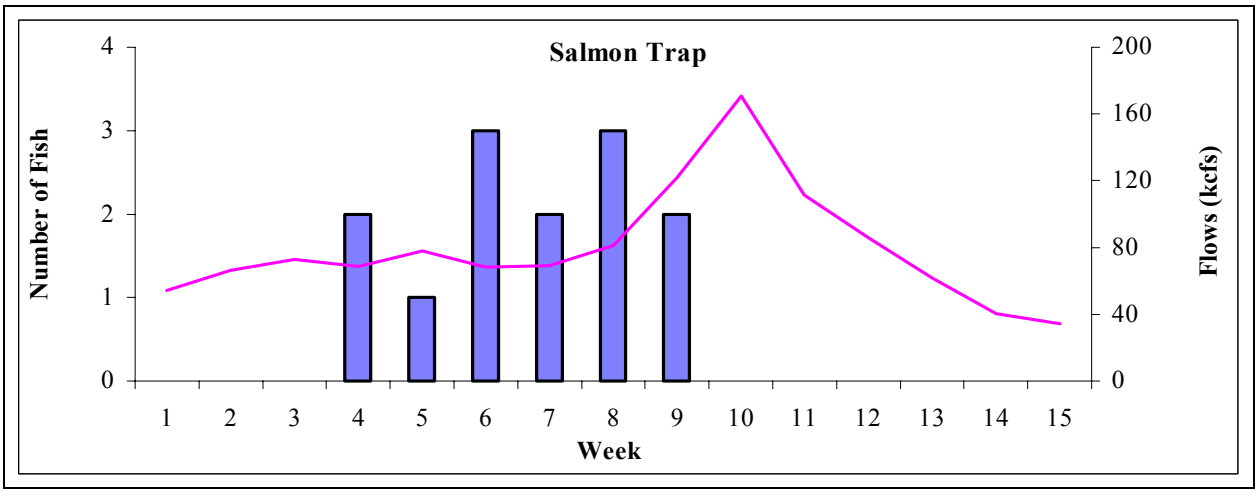

Figure 51. Number of PIT-tagged Salmon River Trap hatchery summer chinook detected by week and flows at LGR, 2003.

Wild Yearling Summer Chinook

Wild summer chinook collected and PIT-tagged at the traps and in stream typically have the same tag and release site and we grouped these by tagging site. Depending upon the trap location or stream site where the fish were tagged, the tagged chinook may represent stock components from one or more different tributaries upstream of the tagging site. There were 4,938 PIT-tagged wild yearling summer chinook detected at LGR this season originating from 12 tagging sites. Most of the detections originated from juveniles tagged at the Imnaha Trap (2,401), followed by Pahsimeroi Trap (890), Johnson Creek and Trap (878), South Fork Salmon River and Trap (323) and Secesh River (268).

Imnaha Trap, Secesh River and South Fork Salmon River and Trap PIT-tagged smolts showed similar peak weeks of detections during 2001-2003. Imnaha Trap detections peaked week 5, week 6 and week 4 from 2001-2003, Secesh River detections peaked week 5, week 3 and week 4 from 2001-2003 and South Fork Salmon River and Trap detections peaked week 7, week 10 and week 9 from 2001-2003. Johnson Cr. Trap PIT-tagged smolts detections peaked during week 9 in 2003, week 3 in 2002 and week 7 in 2001. Pahsimeroi River Trap PIT-tagged smolts detections peaked during week 4 in 2003, week 13 in 2002 and week 6 in 2001. Johnson Cr. Trap and Pahsimeroi River Trap peak detections have shown a great deal of variation from year to year.

The percentage of PIT-tagged smolts detected during the peak weeks for all five of these groups was less in 2003 than in 2002 and is similar to the differences between 2002 and 2001 (Table 39). The overall detection rates for each group in 2003 were similar to those observed in 2002 yet much lower than those observed in 2001 (No spill). Total detections for these groups did not reach 99% until week 17, similar to 2002 and 2001. In comparison, total detections for four of the five PIT-tagged hatchery summer chinook release groups exceeded 99% by week 9, about 8 weeks earlier than the wild yearling summer chinook groups. With the exception of the PIT-tagged smolts released from the Imnaha Trap, these tagged smolts exhibited a more protracted migration period to Lower Granite Dam than PIT-tagged hatchery yearling summer chinook. Detections do not appear to be related to peak flows at Lower Granite observed during week 10 (Figures 52-56).

Table 39. PIT-tagged wild summer chinook release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Imnaha Trap	5	April 27-May 3	47.2	12,062	7,277	60.3
Secesh R.	5	April 27-May 3	48.0	4,232	1,285	30.4
Johnson Cr. Trap	7	May 11-17	26.9	5,626	2,072	36.8
S. Fk. Salmon R. and Trap	7	May 11-17	21.8	1,950	432	22.2
Pahsimeroi R. Trap	6	May 4-10	33.6	2,288	468	20.5
2002						
Imnaha Trap	6	May 3-9	29.0	6,237	655	10.5
Secesh R.	3	April 12-18	24.6	4,554	191	4.2
Johnson Cr. Trap	3	April 12-18	26.0	7,009	477	6.8
S. Fk. Salmon R. and Trap	10	May 31-June 6	21.2	2,072	193	9.3
Pahsimeroi R. Trap	13	June 21-27	27.7	2,247	329	14.6
2003						
Imnaha Trap	4	April 18-24	20.2	12,560	2,401	19.1
Secesh R.	4	April 18-24	14.9	7,123	268	3.8
Johnson Cr. Trap	9	May 23-29	21.0	11,393	878	7.7
S. Fk. Salmon R. and Trap	9	May 23-29	15.5	6,021	323	5.4
Pahsimeroi R. Trap	4	April 18-24	17.6	8,523	890	10.4

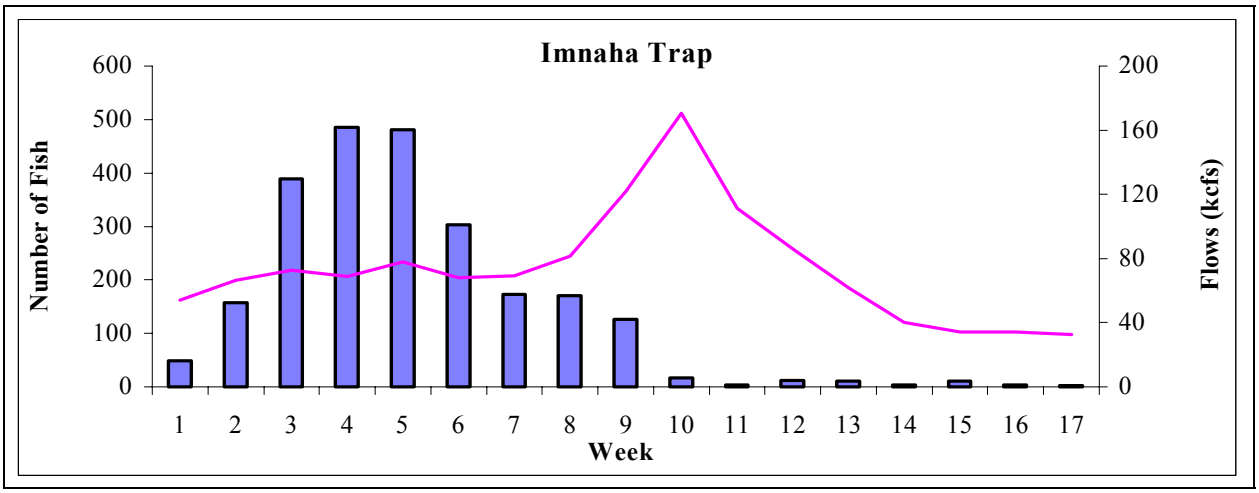

Figure 52. Number of PIT-tagged Imnaha Trap wild summer chinook detected by week and flows at LGR, 2003.

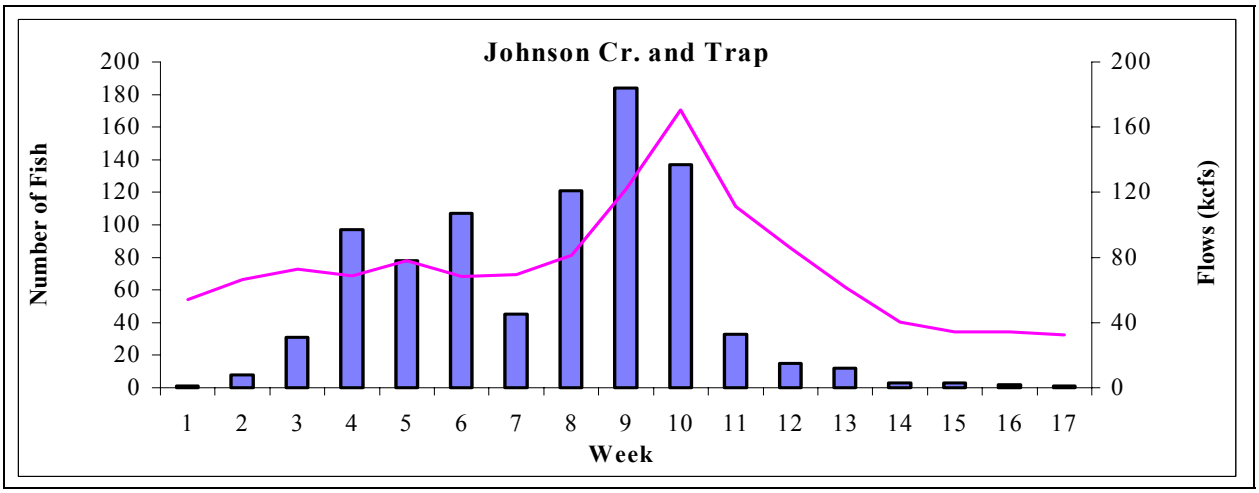

Figure 53. Number of PIT-tagged Johnson Cr. Trap wild summer chinook detected by week and flows at LGR, 2003.

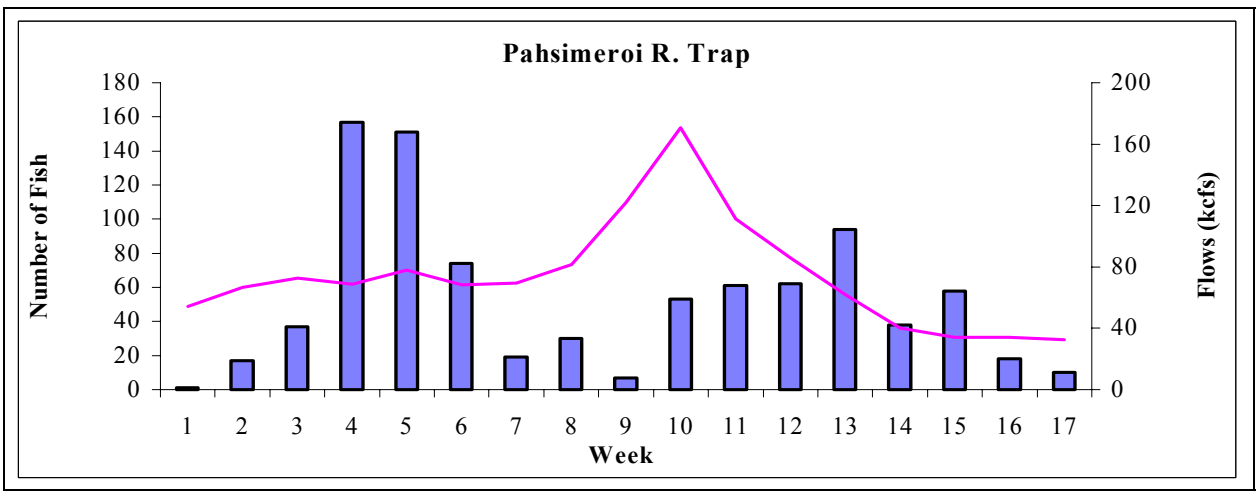

Figure 54. Number of PIT-tagged Pahsimeroi Trap wild summer chinook detected by week and flows at LGR, 2003.

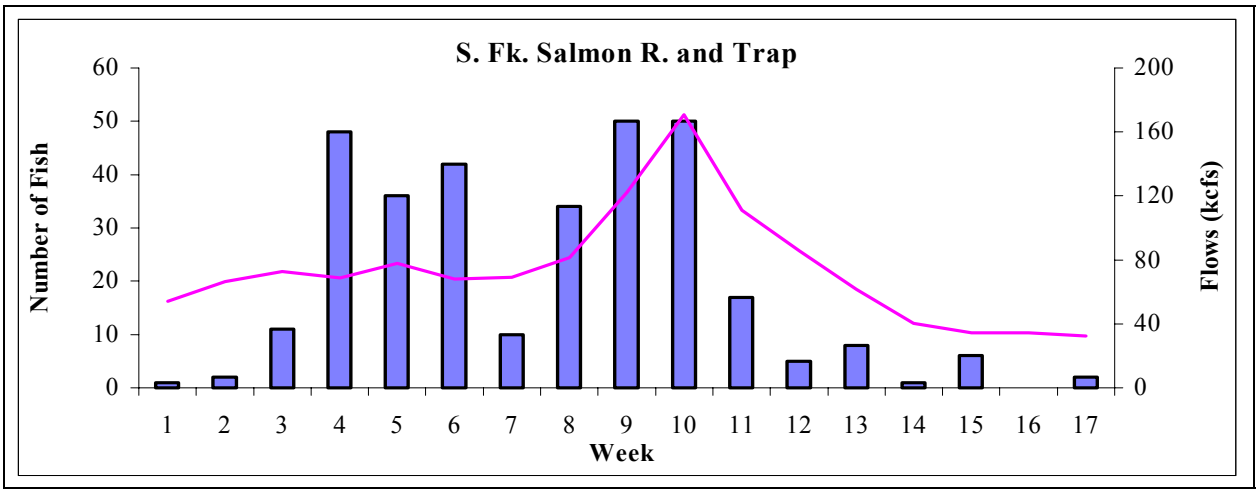

Figure 55. Number of PIT-tagged South Fork Salmon River Trap wild summer chinook detected by week and flows at LGR, 2003.

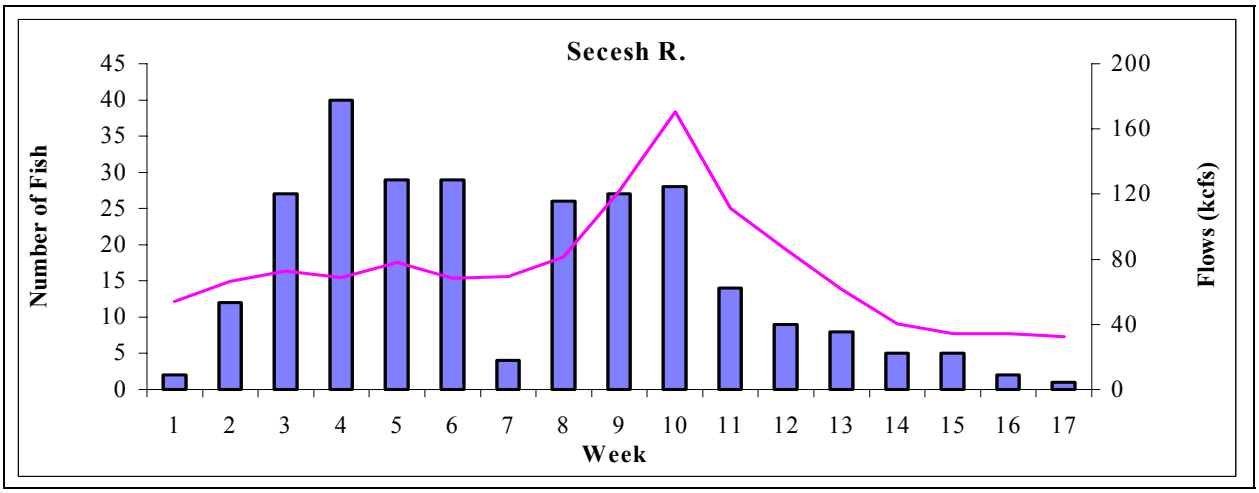

Figure 56. Number of PIT-tagged Secesh River wild summer chinook detected by week and flows at LGR, 2003.

Hatchery Yearling Fall Chinook with Elastomer Tags

Three groups of elastomer tagged Lyons Ferry Hatchery yearling fall chinook were PIT-tagged and transported to one of three sites above LGR for acclimation and release. These sites are Big Canyon Cr. Acclimation Pond (BCCAP), Pittsburg Landing Acclimation Pond (PLAP) and Captain John Rapids Acclimation Pond (CJRAP).

PIT-tagged elastomer tagged yearling fall chinook from Pittsburg Landing accounted for 2,734 detections at Lower Granite Dam followed by Big Canyon Cr. (2,566) and Captain John Rapids (947) (Table 40). BCCAP and PLAP detections peaked during week 5 while CJRAP detections peaked during week 4, similar to the run timings observed for each group in 2001 and 2002 (Figures 57-59). As in previous years, more than 99% of the total detections for each group were recorded by the end of week 9. Overall detection rates in 2003 were much higher than in 2001; however, detection rates in both 2003 and 2002 were much lower than in 2001, a year with no spill. Detection rates for PIT-tagged fish from CJRAP have consistently been slightly higher than those for PLAP and BCCAP

Table 40. PIT-tagged hatchery yearling fall chinook (elastomer tagged) release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Big Canyon Cr. Acc. Fac.	5	April 27-May 3	54.0	7,499	3,593	47.9
Capt. John Rapids Acc. Pond	5	April 27-May 3	58.2	2,518	1,326	52.7
Pittsburg Landing Acc. Fac.	5	April 27-May 3	52.7	7,503	3,629	48.4
2002						
Big Canyon Cr. Acc. Fac.	3	April 12-18	41.0	7,482	1,851	24.7
Capt. John Rapids Acc. Pond	5	April 26-May 2	36.7	2,487	686	27.6
Pittsburg Landing Acc. Fac.	5	April 26-May 2	43.2	7,545	1,634	21.7
2003						
Big Canyon Cr. Acc. Fac.	5	April 25-May 1	40.7	7,494	2,566	34.2
Capt. John Rapids Acc. Pond	4	April 18-24	47.6	2,497	947	37.9
Pittsburg Landing Acc. Fac.	5	April 25-May 1	46.5	7,492	2,734	36.5

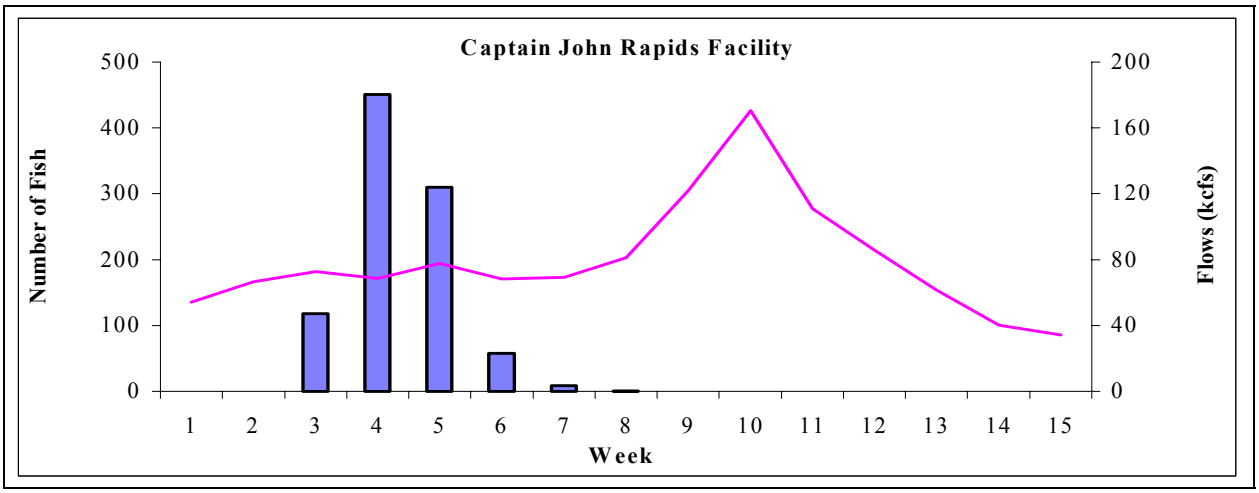

Figure 57. Number of PIT-tagged Captain John Rapids hatchery yearling fall chinook detected by week and flows at LGR, 2003.

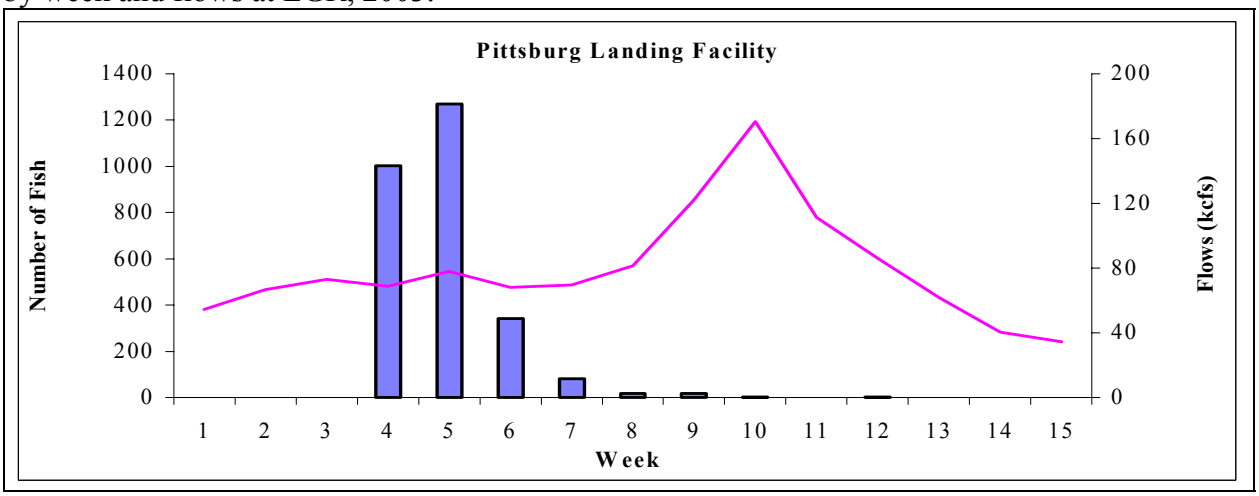

Figure 58. Number of PIT-tagged Pittsburg Landing hatchery yearling fall chinook detected by week and flows at LGR, 2003.

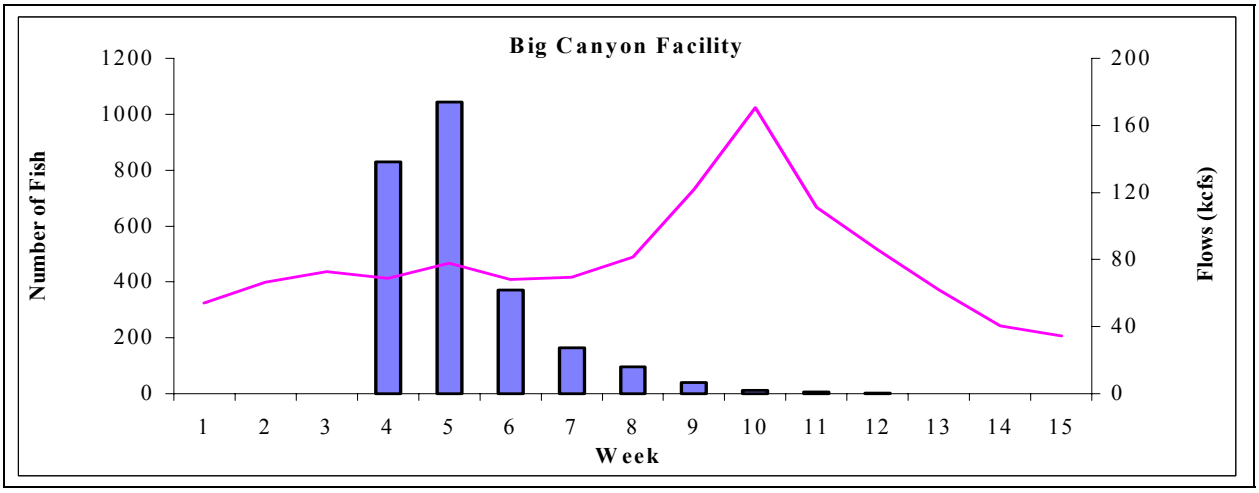

Figure 59. Number of PIT-tagged Big Canyon hatchery yearling fall chinook detected by week and flows at LGR, 2003.

Hatchery Subyearling Chinook

PIT-tagged hatchery subyearling chinook were grouped together by release site. There were ten groups of PIT-tagged hatchery subyearling chinook detected at Lower Granite Dam in 2003, up from the five sites that had PIT-tagged fish detected in 2002. Snake River Trap fish were excluded from this analysis because we do not know the release site of those smolts. Snake River fish include all fish who had a designated release site of anywhere on the main stem Snake River.

Snake River (22,160) had the most PIT-tagged fish detected at Lower Granite Dam in 2003 followed respectively by Pittsburg Landing Acclimation Pond (6,120), Nez Perce Tribal Hatchery (1,543), Hells Canyon Dam (1,395), Big Canyon Cr. Acclimation Pond (893), N. Lapwai Valley Acclimation Pond (597), Captain John Rapids Acclimation Pond (497), and Umatilla Hatchery (352). Nearly all the PIT-tagged smolts detected this season were released in 2003, however some PIT-tagged smolts released in 2002 from the Snake River, PLAP, BCCAP and CJRAP were detected during the first nine weeks of the 2003 season at Lower Granite. Because release date information was not included with the tagging files for the PIT-tagged fish from the Umatilla Hatchery, we can not determine if these fish are from 2002 or 2003 releases.

The peak weeks of detection, weeks 10-13, occurred as much as seven weeks earlier for some groups this year compared to 2002 and 2001 (Table 41). The difference in peak weeks between 2003 and 2002 was greater than that between 2003 and 2001. Peak week detections closely followed peak flows at Lower Granite this year (Figures 60-66). However, in the previous two years peak detection and run timing did not exhibit any relationship with flows.

With the exception of the CJRAP release group, detection rates were typically greater in 2003 than in 2002 and 2001(Table 41). PIT-tag detection rates for CJRAP PIT-tagged fish were the only rate that was less than the detection rates reported in 2002 and 2001.

Table 41. PIT-tagged hatchery subyearling chinook release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Snake R.	14	June 29-July 5	24.9	81,784	21,817	26.7
Big Canyon Cr. Fac.	14	June 29-July 5	26.2	27,339	5,894	21.6
Pittsburg Landing Fac.	14	June 29-July 5	27.0	1,974	441	22.3
Captain John Rapids Fac.	14	June 29-July 5	24.7	4,516	932	20.6
2002						
Snake R.	17	July 19-25	28.5	105,863	16,608	15.7
Big Canyon Cr. Fac.	17	July 19-25	25.3	5,016	1,149	22.9
Pittsburg Landing Fac.	15	July 5-11	22.7	2,539	587	23.1
Captain John Rapids Fac.	17	July 19-25	26.4	5,024	1,298	25.8
2003						
Snake R.	13	June 20-26	43.1	57,366	22,160	38.6
Pittsburg Landing Fac.	13	June 20-26	41.0	17,483	6,120	35.0
Nez Perce Tribal Hatchery	11	June 6-12	34.4	5,449	1,543	28.3
Hells Canyon Dam	11	June 6-12	39.0	9,971	1,395	14.0
Big Canyon Cr. Fac.	11	June 6-12	32.0	2,495	893	35.8
N. Lapwai Valley Acc. Pond	11	June 6-12	40.9	2,755	597	21.7
Captain John Rapids Fac.	10	May 30-June 5	51.5	2,498	497	19.9

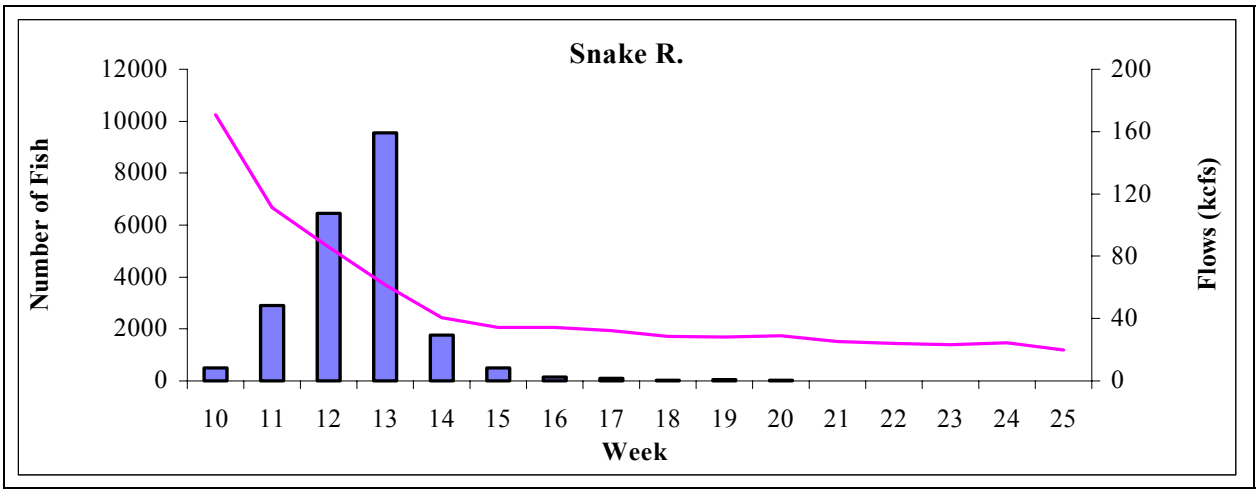

Figure 60. Number of PIT-tagged Snake River hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

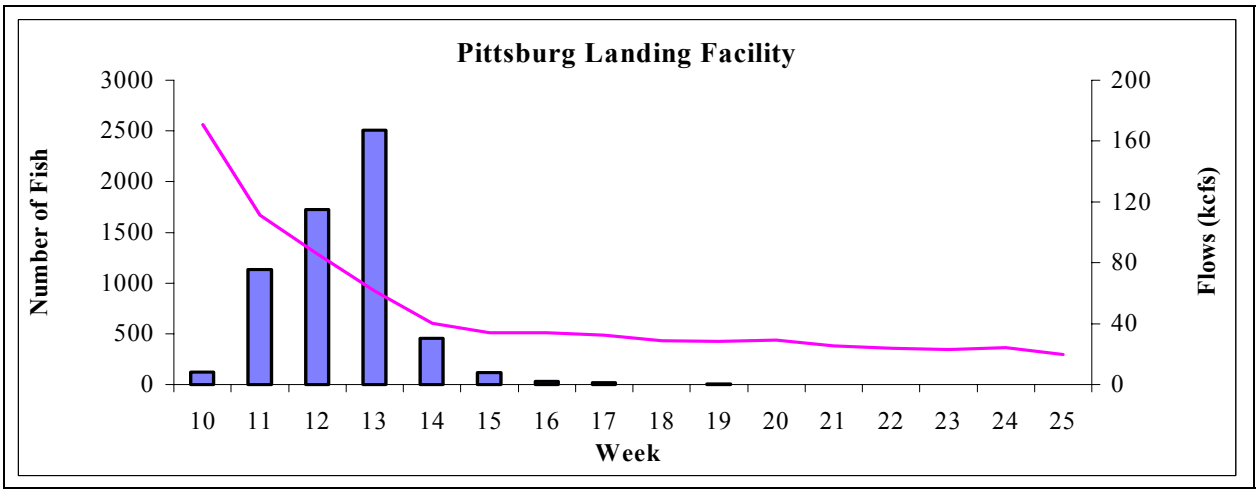

Figure 61. Number of PIT-tagged Pittsburg Landing hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

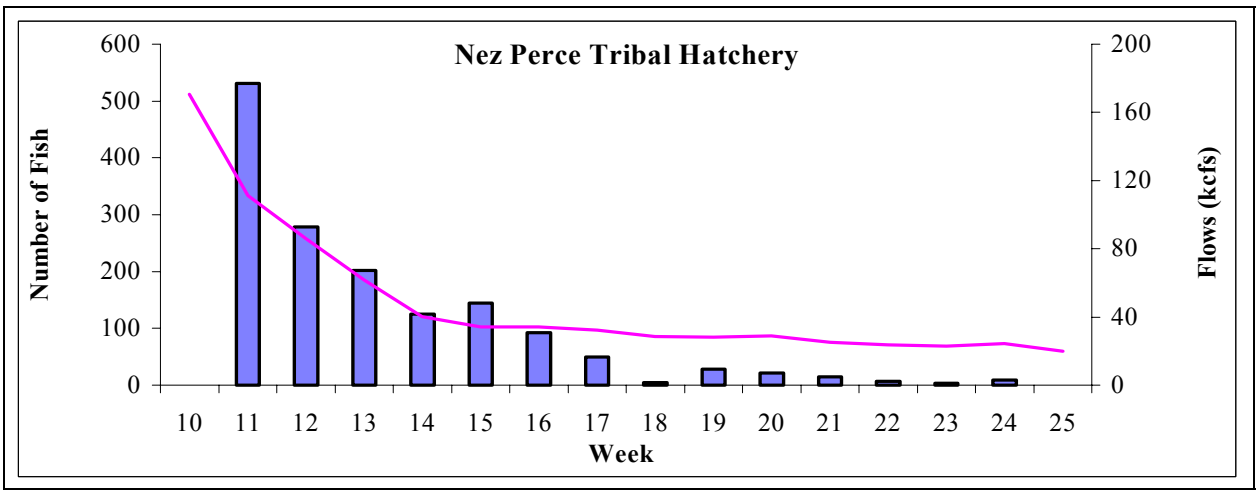

Figure 62. Number of PIT-tagged Nez Perce Tribal Hatchery, hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

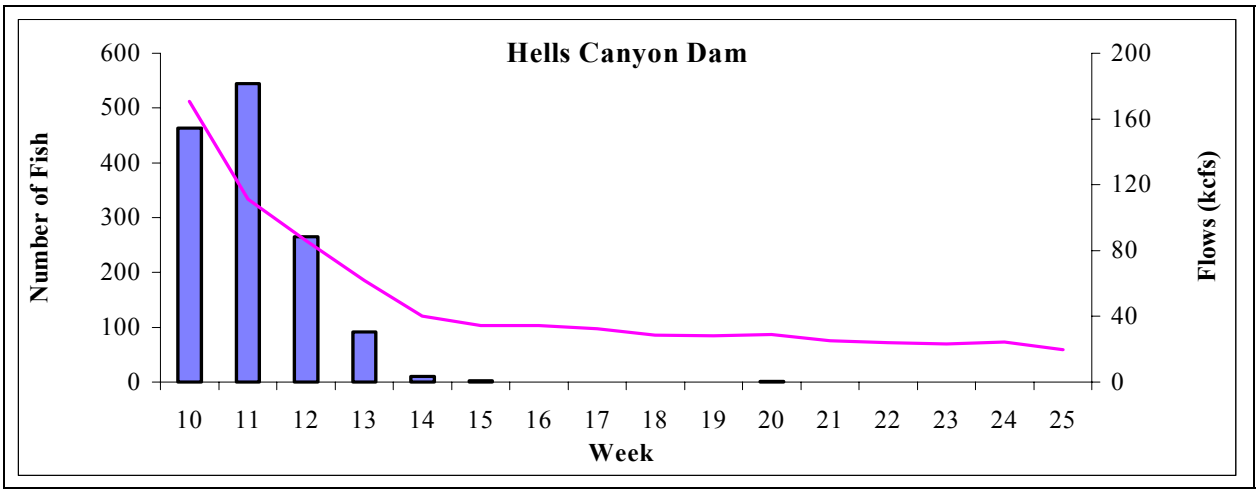

Figure 63. Number of PIT-tagged Hells Canyon Dam hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

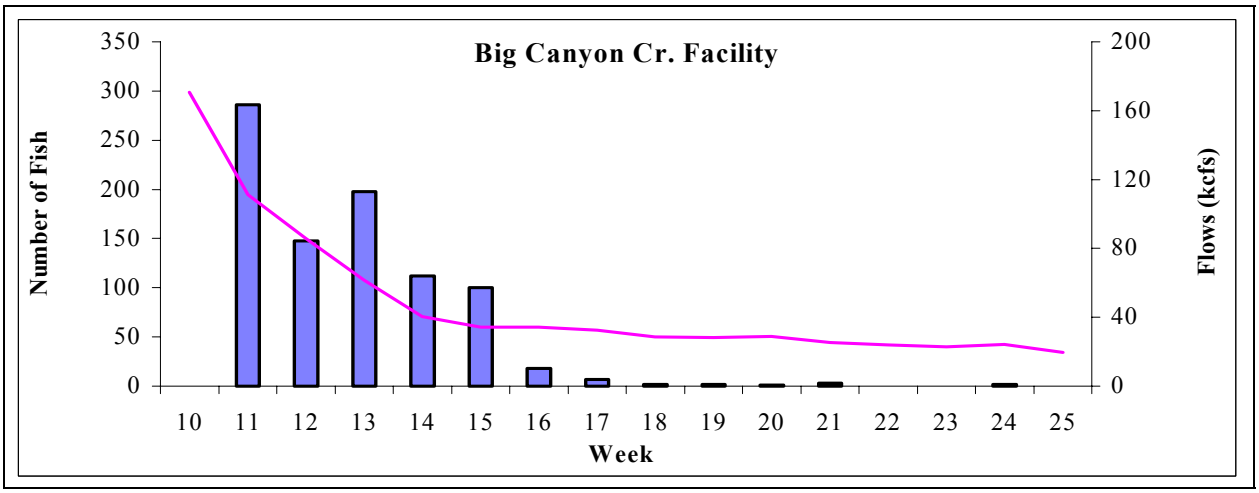

Figure 64. Number of PIT-tagged Big Canyon hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

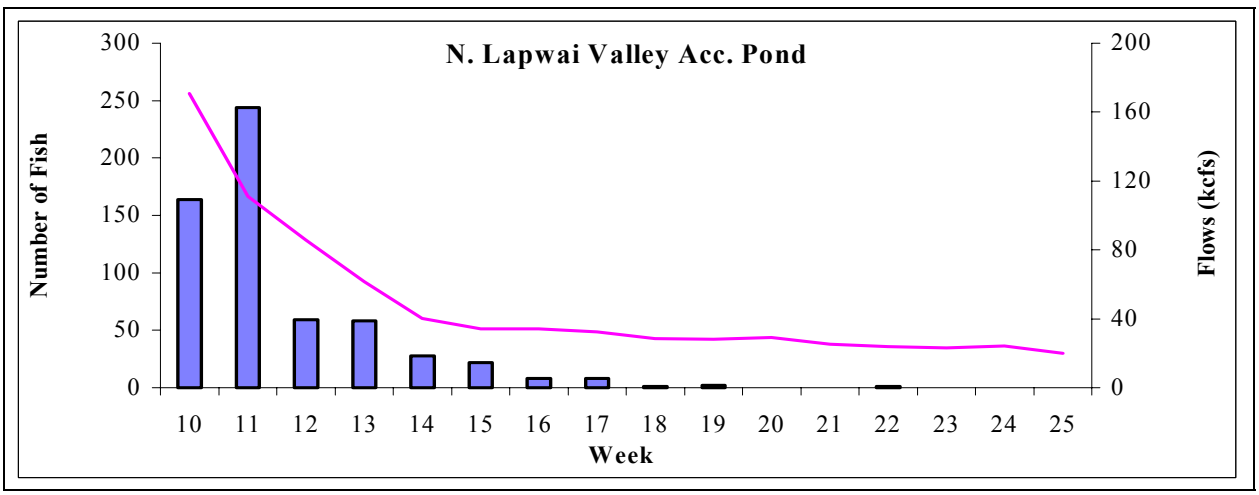

Figure 65. Number of PIT-tagged North Lapwai Valley Acclimation Pond hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

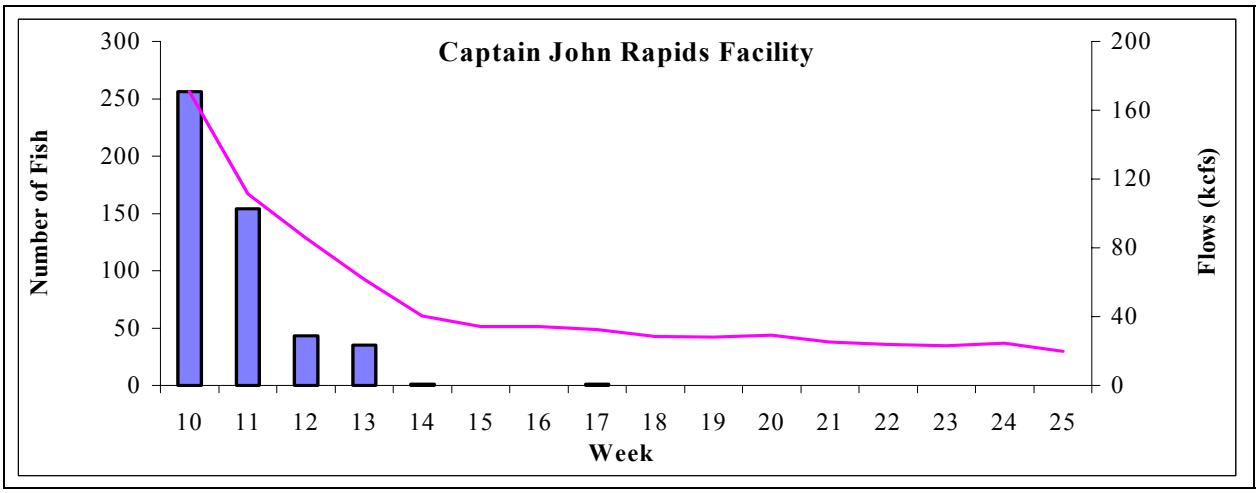

Figure 66. Number of PIT-tagged North Lapwai Valley Acclimation Pond hatchery subyearling fall chinook detected by week and flows at LGR, 2003.

Hatchery Steelhead

PIT-tagged hatchery steelhead were released at multiple release sites, therefore we grouped PIT-tagged hatchery steelhead by the hatchery where they were PIT-tagged. Hatchery steelhead that were tagged at traps and subsequently detected at Lower Granite Dam were not included in this analysis due to unknown hatchery origin and to delays that may occur after trapping and tagging.

Irrigon Hatchery had the most PIT-tagged hatchery steelhead smolts detected at Lower Granite Dam during the 2003 collection season followed respectively by Clearwater Hatchery, Magic Valley Hatchery, Hagerman Hatchery, Dworshak Hatchery and Niagra Springs (Table 42). Peak weeks of detection for PIT-tagged steelhead from Irrigon, Hagerman and Niagara Springs were similar to those observed in 2002. Peak weeks of detection for PIT-tagged steelhead from the Clearwater, Dworshak and Magic Valley were earlier than in 2002. Overall detection rates in 2003 for all but Magic Valley PIT-tagged steelhead were higher than in 2002 and with the exception of Irrigon and Niagara Springs, much lower than the detection rates reported in 2001 with no spill. Irrigon Hatchery PIT-tagged steelhead have consistently been the latest group to arrive at Lower Granite with more than 40 % of the detections reported from week 10 on.

Table 42. PIT-tagged hatchery steelhead release groups at LGR, 2001-2003.

Hatchery	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Irrigon	8	May 18-24	36.4	3,607	1,266	35.1
Magic Valley	7	May 11-17	30.7	2,701	1,513	56.0
Hagerman	7	May 11-17	32.1	1,787	971	54.3
Clearwater	5	April 27-May 3	34.0	1,496	782	52.3
Niagra Springs	7	May 11-17	41.3	901	172	19.1
Dworshak	5	April 27-May 3	63.1	6016	4162	69.2
2002						
Irrigon	8	May 17-23	29.0	5,597	555	9.9
Magic Valley	9	May 24-30	33.0	2,994	737	24.6
Hagerman	8	May 17-23	23.4	1,198	167	13.9
Clearwater	9	May 24-30	36.0	1,201	161	13.4
Niagra Springs	9	May 24-30	34.4	897	157	17.5
Dworshak	9	May 24-30	27.5	1500	40	2.7
2003						
Irrigon	9	May 23-29	30.4	2,012	759	37.7
Magic Valley	5	April 25-May 1	23.4	3,268	594	18.2
Hagerman	8	May 16-22	33.5	1,939	520	26.8
Clearwater	5	April 25-May 1	27.9	3,967	729	18.4
Niagra Springs	9	May 23-29	31.1	1,194	277	23.2
Dworshak	5	April 25-May 1	58.4	1500	363	24.2

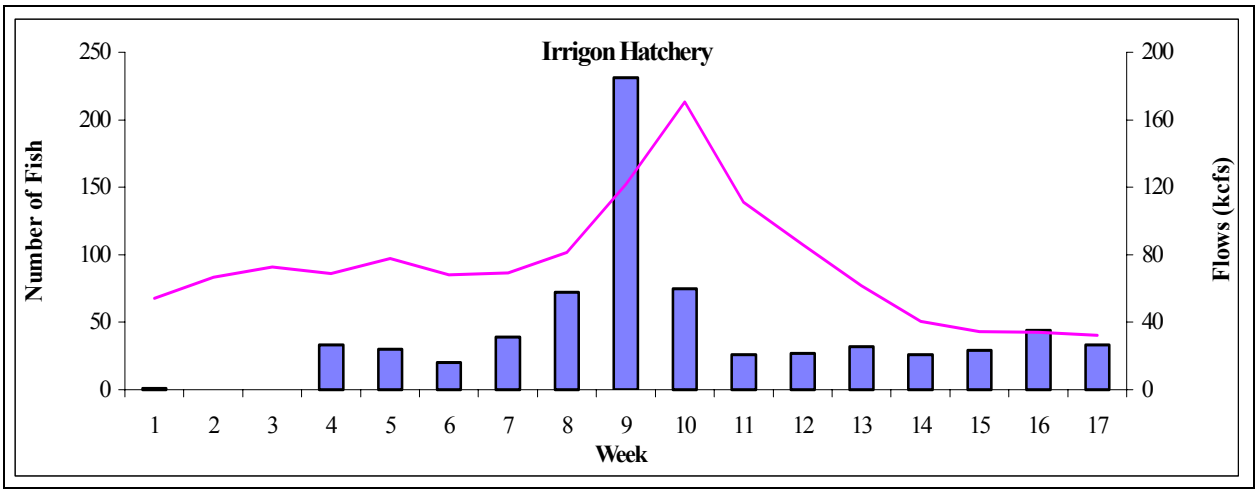

Figure 67. Number of PIT-tagged Irrigon hatchery steelhead detected by week and flows at LGR, 2003.

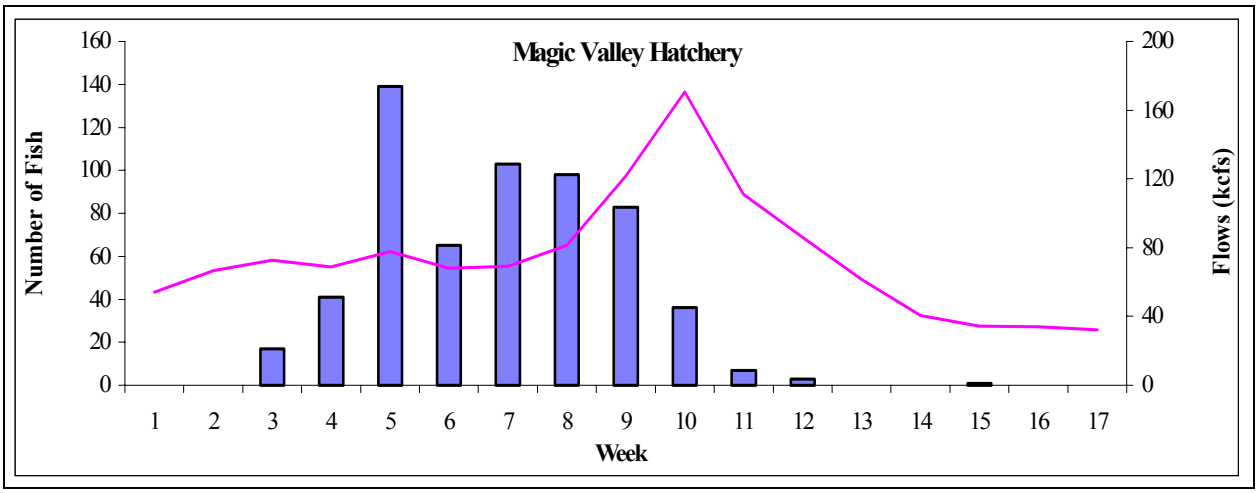

Figure 68. Number of PIT-tagged Magic Valley hatchery steelhead detected by week and flows at LGR, 2003.

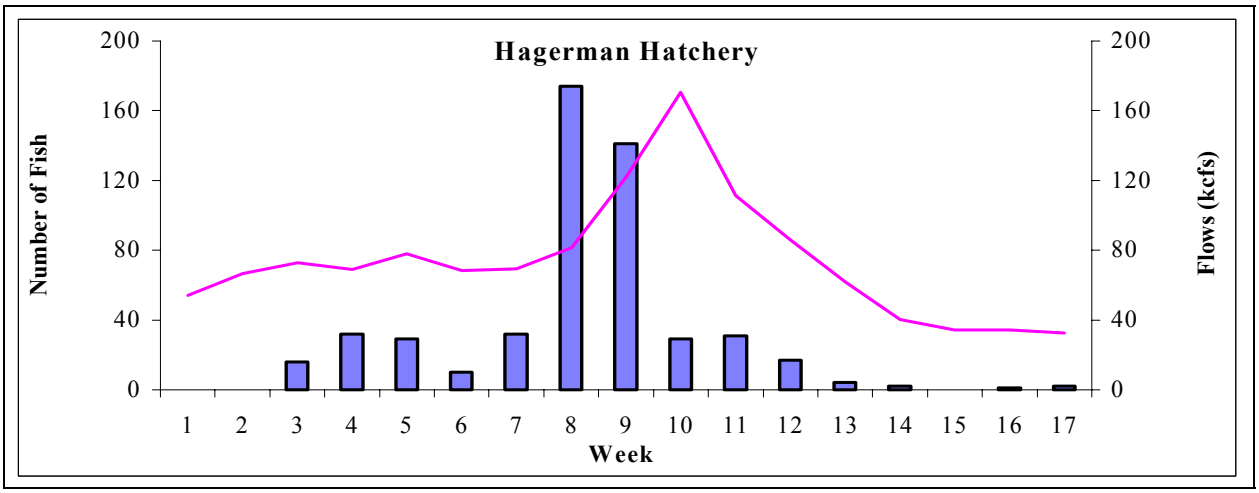

Figure 69. Number of PIT-tagged Hagerman hatchery steelhead detected by week and flows at LGR, 2003.

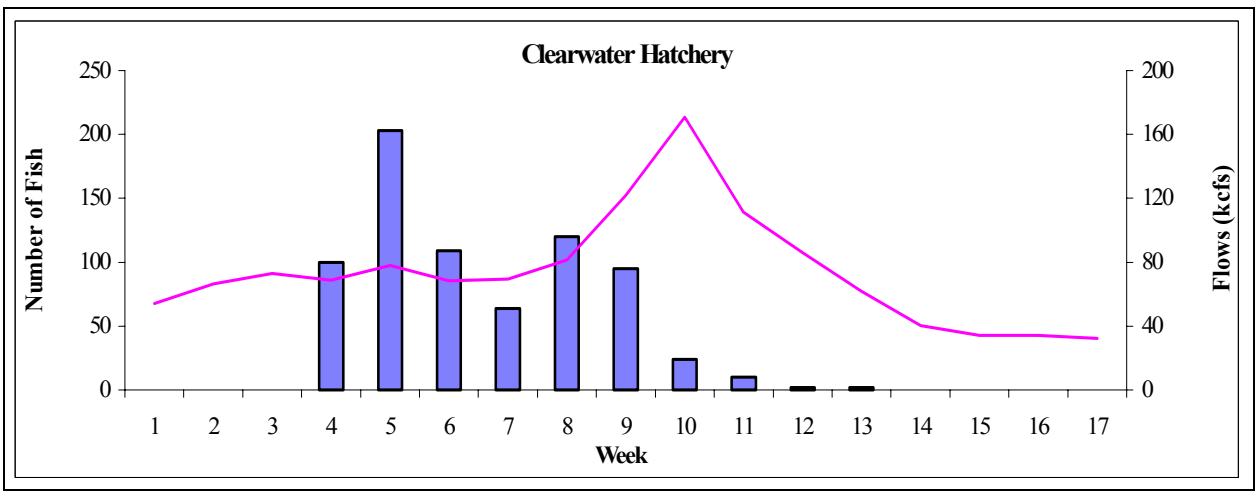

Figure 70. Number of PIT-tagged Clearwater hatchery steelhead detected by week and flows at LGR, 2003.

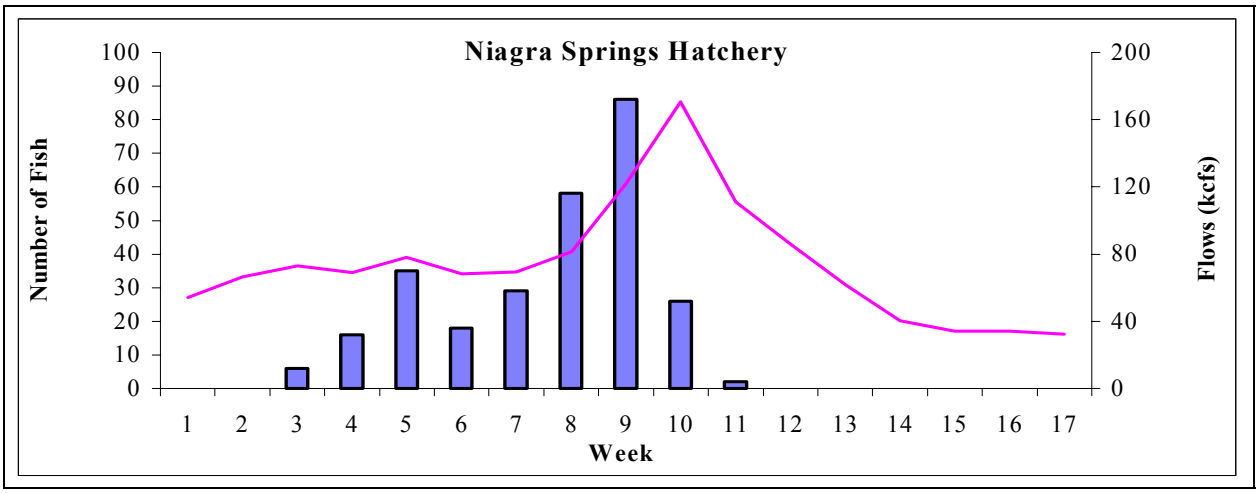

Figure 71. Number of PIT-tagged Niagra Springs hatchery steelhead detected by week and flows at LGR, 2003.

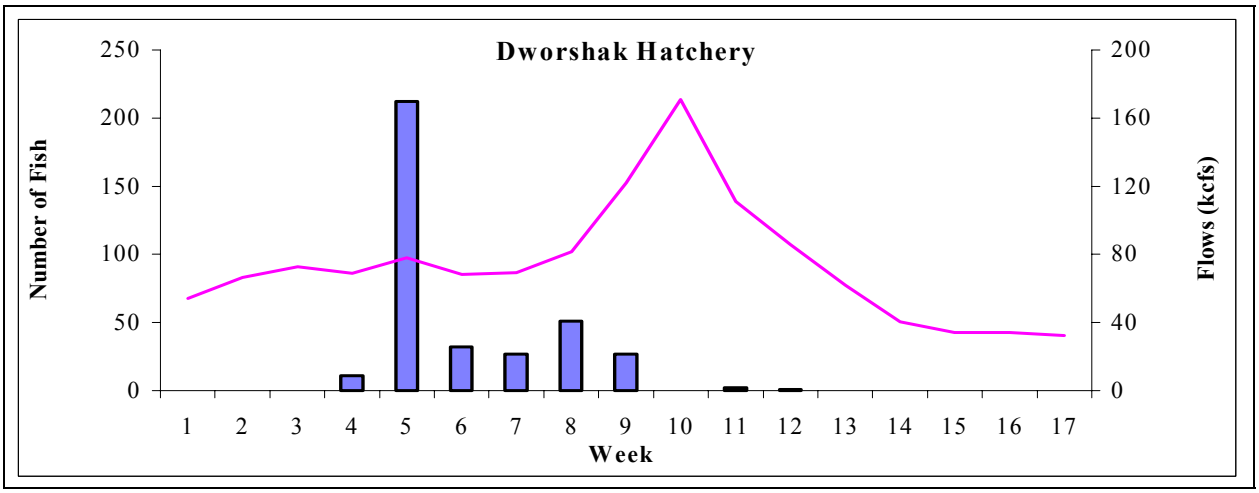

Figure 72. Number of PIT-tagged Dworshak hatchery steelhead detected by week and flows at LGR, 2003.

Wild Steelhead

Wild steelhead captured and PIT-tagged at traps and stream locations were grouped by trap or stream name. Fish tagged at these sites include different groups of wild steelhead so the specific origin of a wild steelhead smolt is unknown. This data includes all wild steelhead detected at Lower Granite in 2003 including those tagged in prior years

The five trap sites with the greatest number of PIT-tagged fish detected at Lower Granite Dam in 2003 are Imnaha trap, Fish Cr. trap, Snake trap, Clear Cr. and Grande Ronde trap (Table 43). PIT-tag detections of fish tagged at Fish Cr. trap and Clear Cr peaked during week 5, at the Imnaha trap, week 8, and at the Snake and Grand Ronde traps, week 9. This pattern is similar to that observed in 2002. Peak weekly detections for all groups occurred prior to peak flows (Figures 73-77). With the exception of steelhead PIT-tagged and released from Fish Cr., detection rates at Lower Granite Dam for all groups were higher in 2003 than those observed in 2002 (Table 42). However, the 2003 detection rates were in most cases less than half the reported detection rates in 2001 when there was no spill at Lower Granite.

Table 43. PIT-tagged wild steelhead release groups at LGR, 2001-2003.

Trap Site	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Fish Cr. Trap	5	April 27-May 3	70.1	5,893	3,366	57.1
Imnaha Trap	7	May 11-17	46.7	3,681	2,654	72.1
Snake Trap	6	May 4-10	57.5	876	717	81.9
Clear Cr.	5	April 27-May 3	78.7	110	75	68.2
Grand Ronde Trap	6	May 4-10		602	276	45.9
2002						
Fish Cr. Trap	3	April 12-18	50.1	7,031	1,413	20.1
Imnaha Trap	8	May 17-23	23.1	4,809	1,029	21.4
Snake Trap	8	May 17-23	23.2	2,518	612	24.3
Clear Cr.	6	May 3-9	40.0	661	55	8.3
Grand Ronde Trap	9	May 24-30	28.5	609	151	24.8
2003						
Fish Cr. Trap	5	April 25-May 1	23.7	5,286	819	15.5
Imnaha Trap	8	May 16-22	35.2	6,303	1,891	30.0
Snake Trap	9	May 23-29	31.2	1,208	397	32.9
Clear Cr.	5	April 25-May 1	21.1	625	228	36.5
Grand Ronde Trap	9	May 23-29	37.2	612	218	35.6

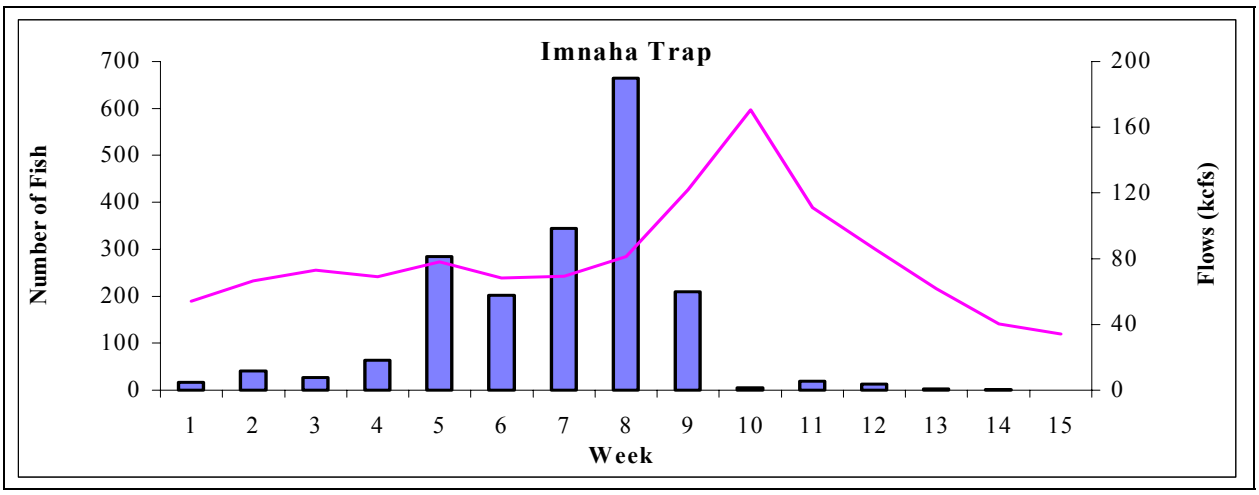

Figure 73. Number of PIT-tagged Imnaha trap wild steelhead detected by week and flows at LGR, 2003.

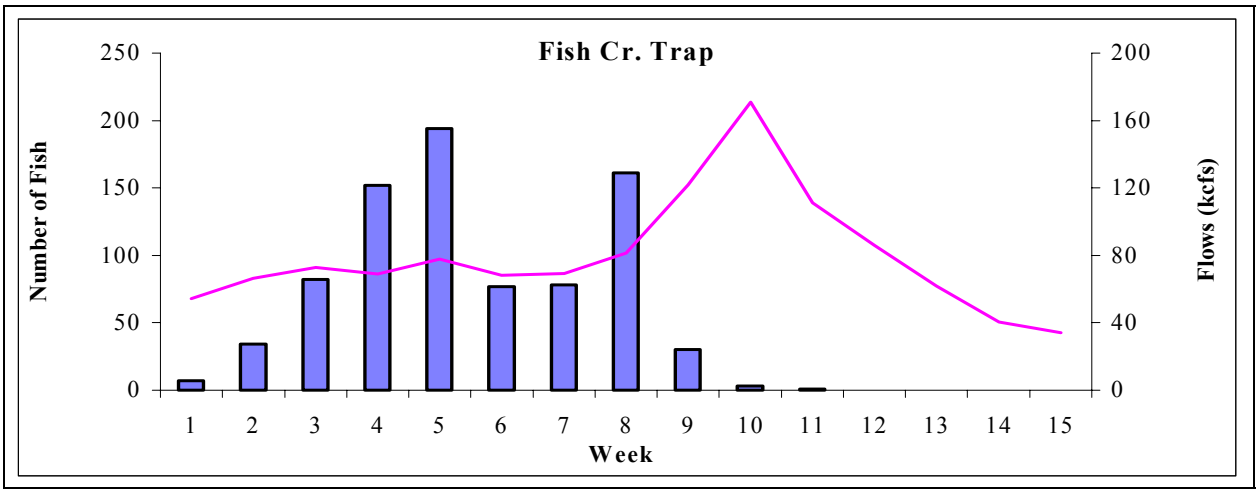

Figure 74. Number of PIT-tagged Fish Cr. trap wild steelhead detected by week and flows at LGR, 2003.

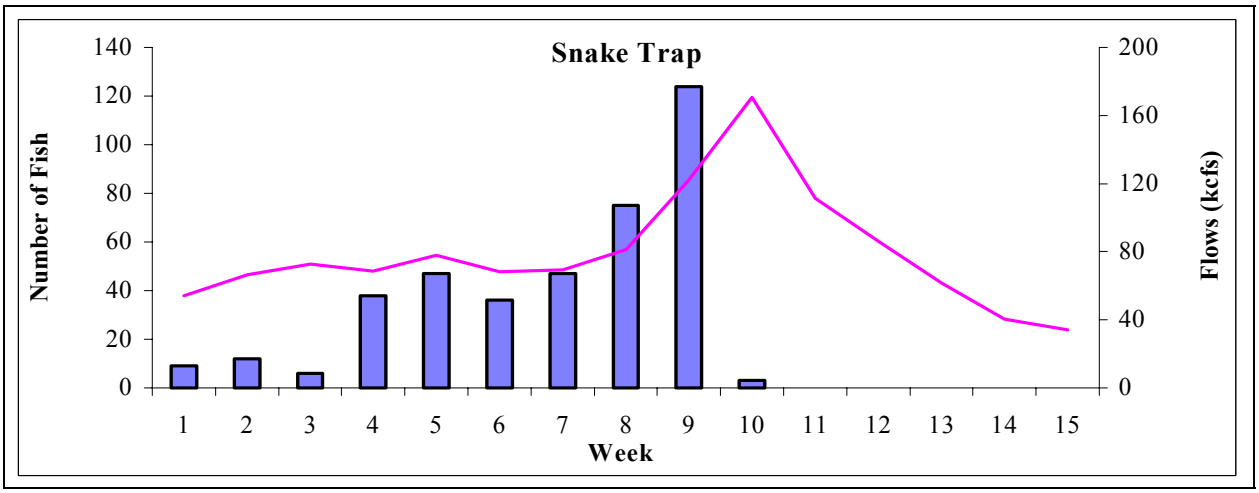

Figure 75. Number of PIT-tagged Snake trap wild steelhead detected by week and flows at LGR, 2003.

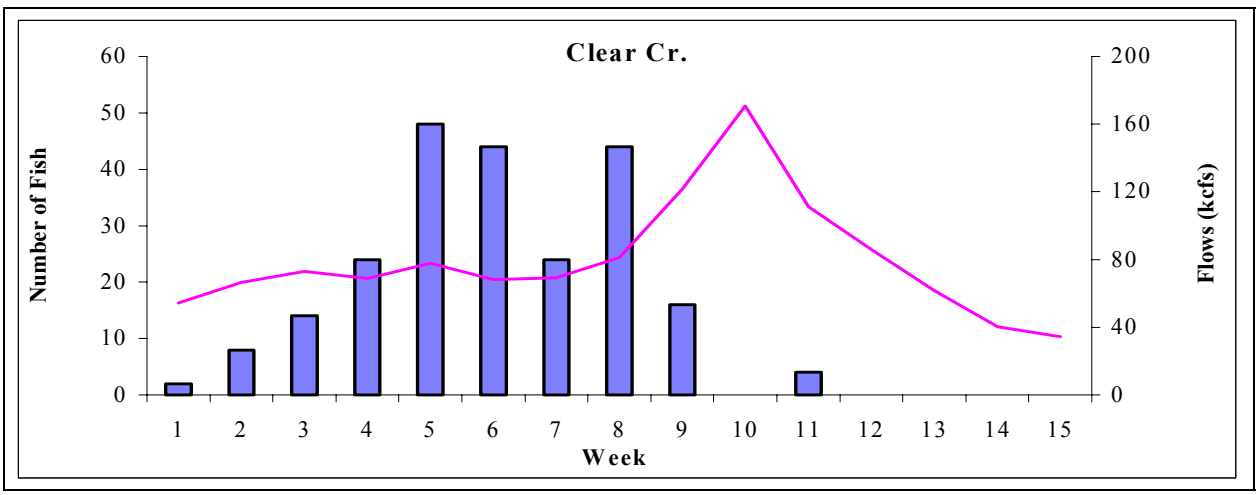

Figure 76. Number of PIT-tagged Clear Cr. wild steelhead detected by week and flows at LGR, 2003.

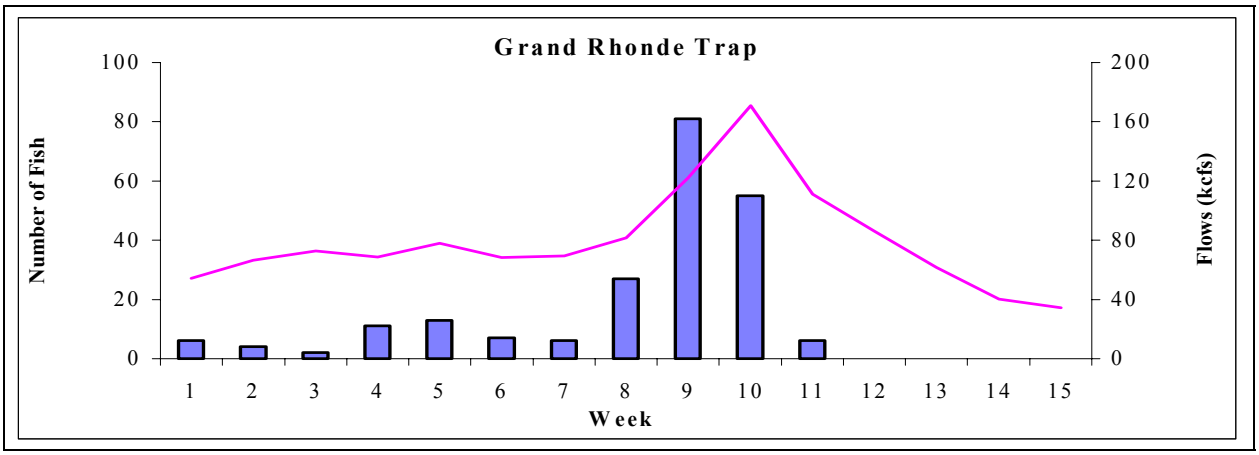

Figure 77. Number of PIT-tagged Grande Rhonde trap wild steelhead detected by week and flows at LGR, 2003.

Hatchery Sockeye

PIT-tagged hatchery sockeye were tagged at multiple sites, therefore we grouped PIT-tagged hatchery sockeye groups by their release site. PIT-tagged hatchery sockeye were detected at Lower Granite Dam from only three release sites this season (Table 44).

Pettit Lake had the most PIT-tagged smolts detected at Lower Granite Dam in 2003 followed respectively by Redfish Lake and Alturas Lake (Table 44, Figures 78-80). In 2002, all of the PIT-tagged hatchery sockeye detected at Lower Granite Dam were from 2002 releases while in 2003, all release groups had fish detected at Lower Granite from both the 2002 and 2003 releases, except for Alturas Lake which only had four detections and all were from the 2002 release. Pettit Lake and Redfish Lake detections peaked during week 10, the same week that flows peaked. In 2002, Redfish Lake detections peaked week 8 and Pettit Lake detections peaked week 9, before week 10's peak in flows. Compared to other PIT-tagged species groups, detection rates for PIT-tagged sockeye are typically lower. Detection rates for Redfish Lake PIT-tagged fish have been very consistent, the last three years. Very few Alturas Lake sockeye were detected in 2003 and 2002. In 2001, more than 18% of the PIT-tagged sockeye were detected at Lower Granite.

Table 44. PIT-tagged hatchery sockeye release groups at LGR, 2001-2003.

Tag Site	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Pettit Lake	8	May 18-24	54.8	273	31	11.4
Redfish Lake	7	May 11-17	54.2	2,390	118	4.9
Alturas Lake	8	May 18-24	80.3	387	71	18.3
2002						
Pettit Lake	9	May 24-30	75.0	390	16	4.1
Redfish Lake	8	May 17-23	45.9	2,807	146	5.2
Alturas Lake	9	May 24-30	75.0	249	4	1.6
2003						
Pettit Lake	10	May 30-June 5	65.5	3,653	409	11.2
Redfish Lake	10	May 30-June 5	52.6	3,353	173	5.2
Alturas Lake	11	June 6-12	50.0	1,486	4	0.3

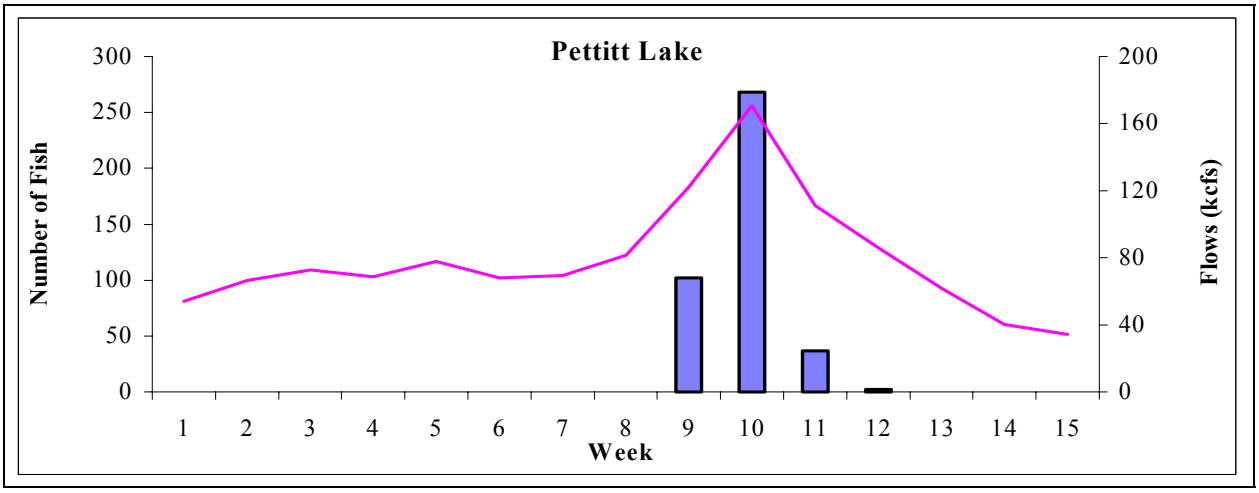

Figure 78. Number of PIT-tagged Pettit Lake Cr. hatchery sockeye detected by week and flows at LGR, 2003.

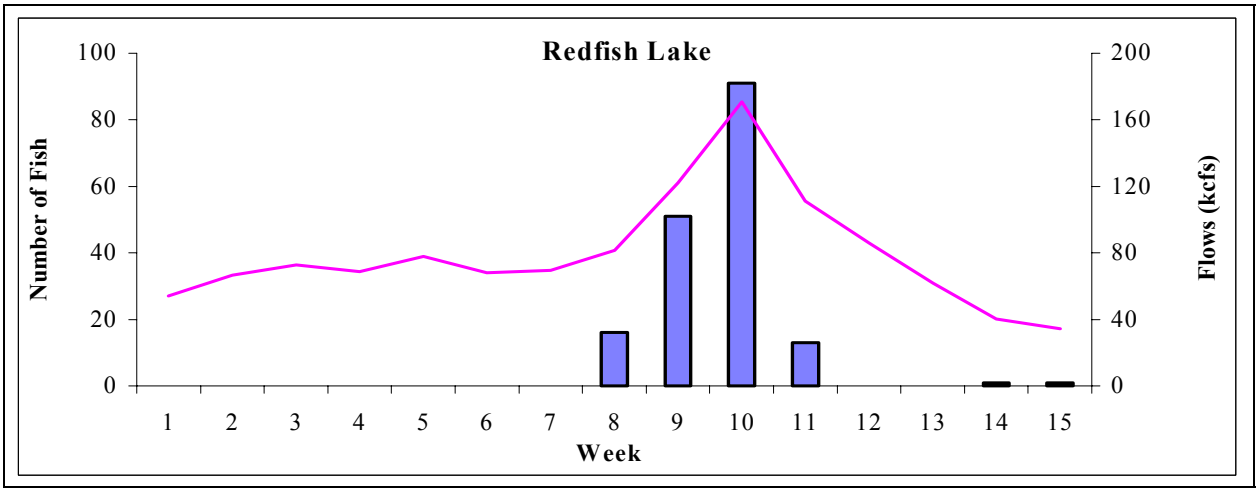

Figure 79. Number of PIT-tagged Redfish Lake Cr. trap hatchery sockeye detected by week and flows at LGR, 2003.

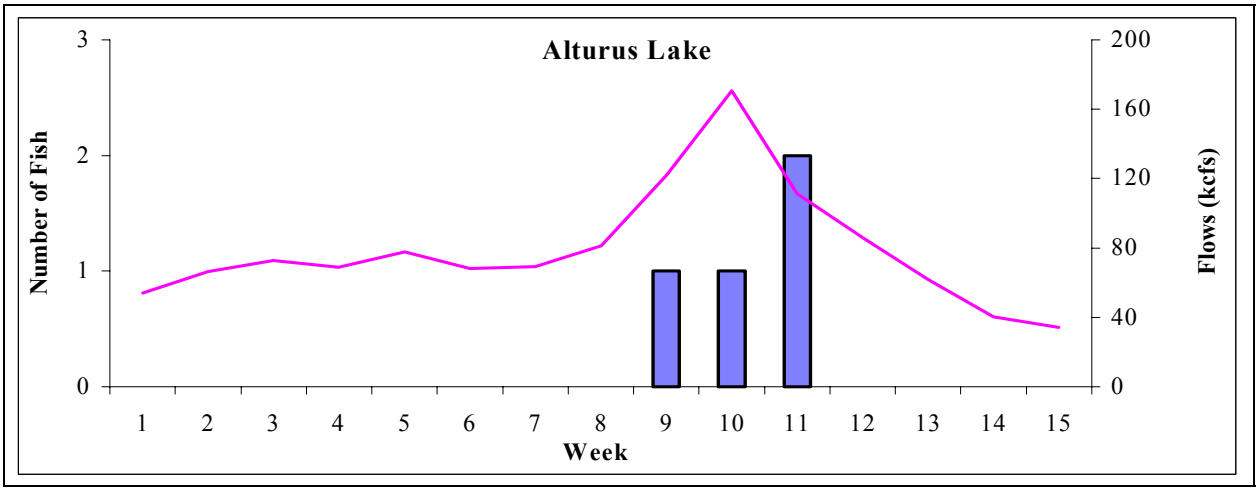

Figure 80. Number of PIT-tagged Alturas Lake Cr. hatchery sockeye detected by week and flows at LGR, 2003.

Wild Sockeye

There was only one release group or site for sockeye that was classified as wild in the PTAGIS database in 2003 and 113 of these Redfish Lake Creek PIT-tagged sockeye were detected at Lower Granite. Detections peaked during week 9, the same week as in 2002. Peak detections occurred week 9 (Figure 81), just ahead of the peak weeks for the three groups of PIT-tagged hatchery sockeye (Figures 78-80).

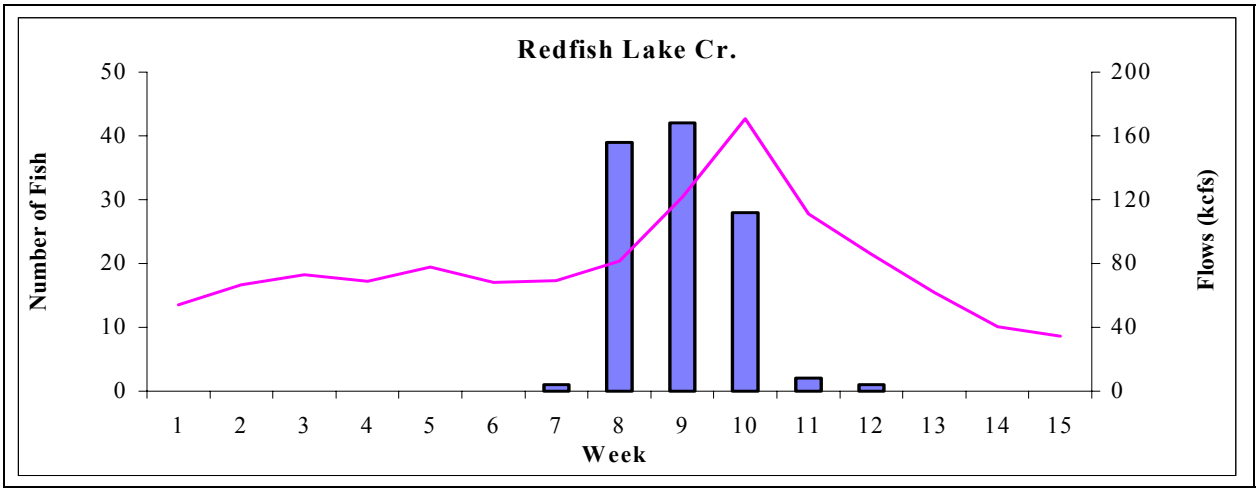

Figure 81. Number of PIT-tagged Redfish Lake Cr.trap wild sockeye detected by week and flows at LGR, 2003.

Coho

PIT-tagged coho detected at Lower Granite this season were released from six sites, one more site than reported in 2002 and 2001. Kooskia hatchery had the most PIT-tagged coho detected at Lower Granite Dam followed by Lapwai Cr., S. Fk. Clearwater R., Potlatch R., Eldorado Cr. and Meadow Cr. (Table 45). As in previous years, peak detections for coho occurred in weeks during or just after peak flows (Figures 82-87).

Detection rates over the last three years ranged from a low of 0.3% to a high of 16.8% (Table 45). Most of the coho in these groups were tagged and released as parr and detection rates for these coho have been very low. These groups included S. Fk. Clearwater R., Potlatch R., Eldorado Cr. and Meadow Cr. releases in 2003. The highest detection rates recorded at Lower Granite each year have been those observed for those groups of coho PIT-tagged prior to smolting and released as smolts, and these groups included the Kooskia hatchery and Lapwai Cr. release groups in 2003.

Table 45. PIT-tagged coho release groups at LGR, 2001-2003.

Release site	Peak Week	Peak Date	% Detected During the Peak Week	Total Released	Total Detected	Percent Detected
2001						
Lapwai Cr. (WNFH)	9	May 25-31	28.9	1,035	111	10.7
Eldorado Cr. (CLWH)	14	June 29-July 5	44.6	1,553	74	4.8
Potlatch R. (WNFH)	8	May 18-24	24.1	1,042	58	5.6
Lolo Cr.	14	June 29-July 5	18.2	708	22	3.1
Meadow Cr. (CLWH)	16	July 13-19	25.0	1,443	16	1.1
2002						
Kooskia Hatchery	10	May 31-June 6	77.3	994	44	4.4
Lapwai Cr. (WNFH)	10	May 31-June 6	43.8	1,050	16	1.5
Potlatch R. (WNFH)	11	June 7-13	66.7	1,049	3	0.3
Meadow Cr. (CLWH)	13	June 21-27	33.0	1,024	21	2.1
Eldorado Cr. (CLWH)	13	June 21-27	26.3	1,000	19	1.9
2003						
Kooskia Hatchery	9	May 23-29	56.0	1,000	168	16.8
Lapwai Cr. (Eagle Cr.)	10	May 30-June 5	34.3	1,000	140	14.0
S. Fk. Clearwater (CLWH)	13	June 20-26	26.7	1,990	30	1.5
Potlatch R. (Eagle Cr.)	9	May 23-29	50.0	1,000	28	2.8
Eldorado Cr. (CLWH)	13	June 20-26	21.7	1,006	23	2.3
Meadow Cr. (CLWH)	11	June 6-12	57.1	999	14	1.4

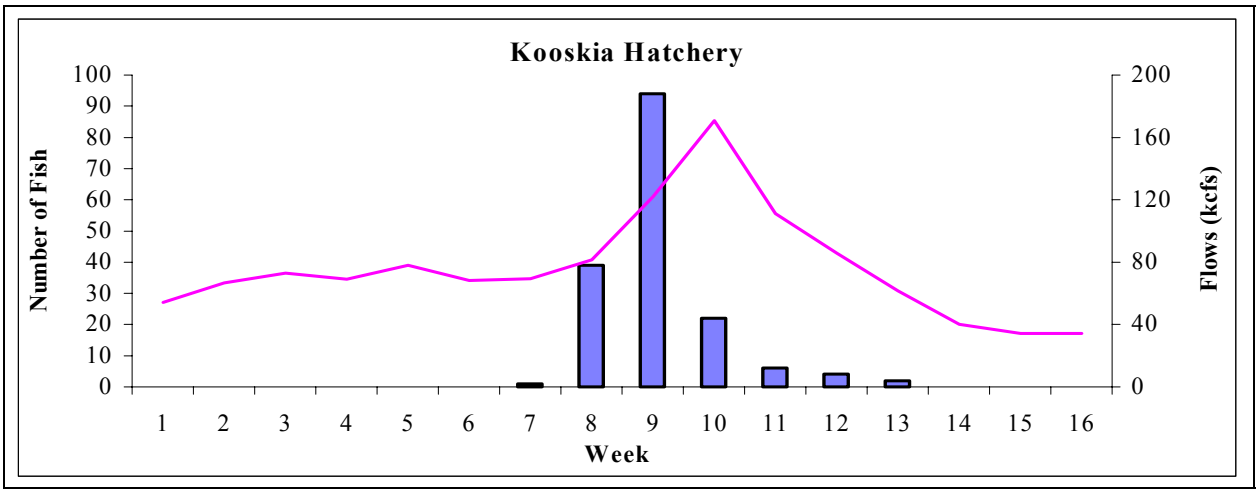

Figure 82. Number of PIT-tagged Kooskia hatchery coho detected by week and flows at LGR, 2003.

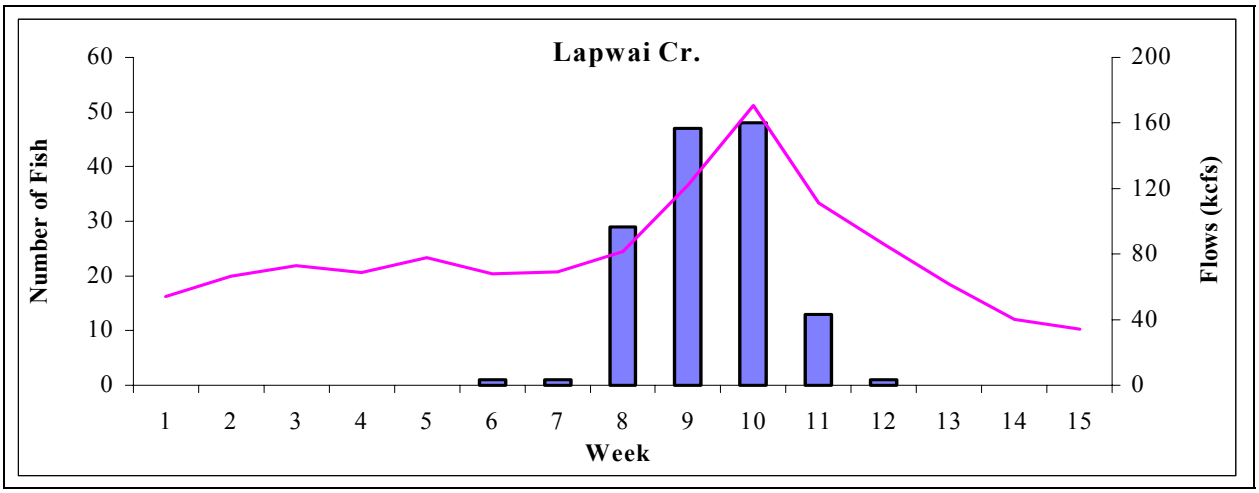

Figure 83. Number of PIT-tagged hatchery coho released into Lapwai Cr. detected by week and flows at LGR, 2003.

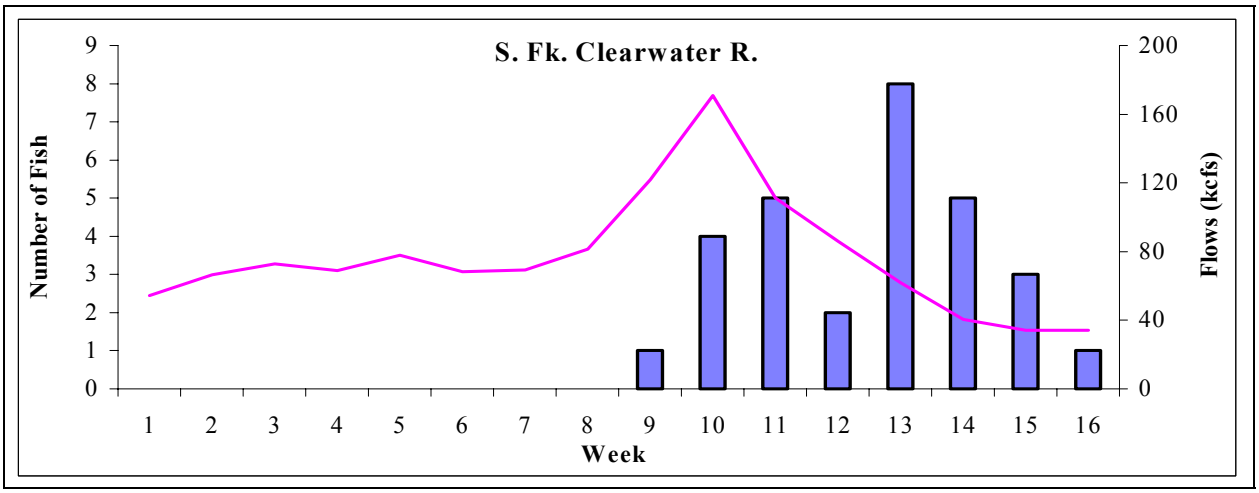

Figure 84. Number of PIT-tagged hatchery coho released into S. Fk. Clearwater R. detected by week and flows at LGR, 2003.

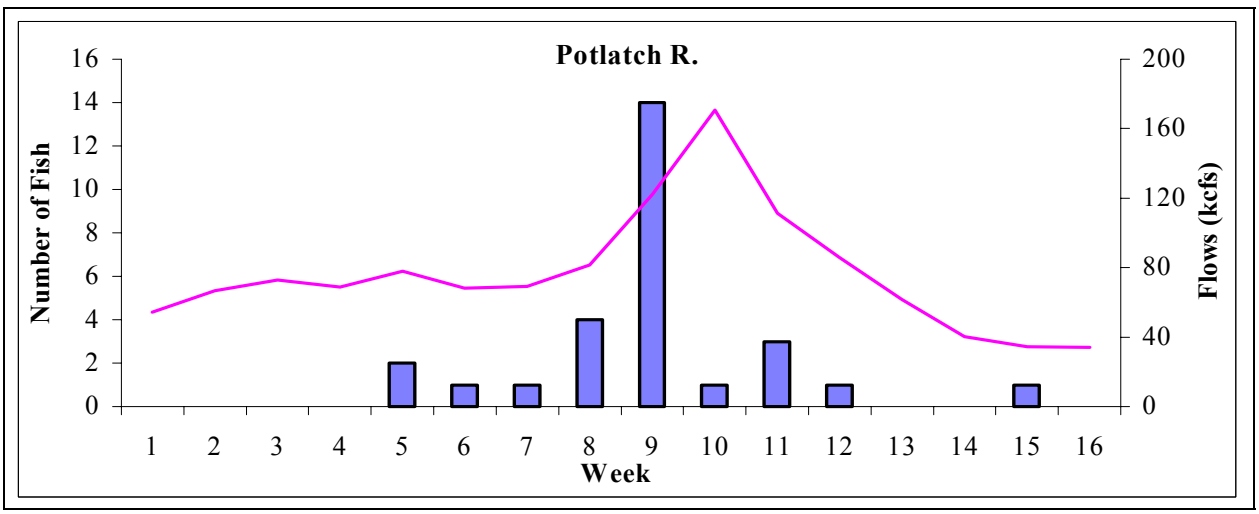

Figure 85. Number of PIT-tagged hatchery coho released into Potlatch River detected by week and flows at LGR, 2003.

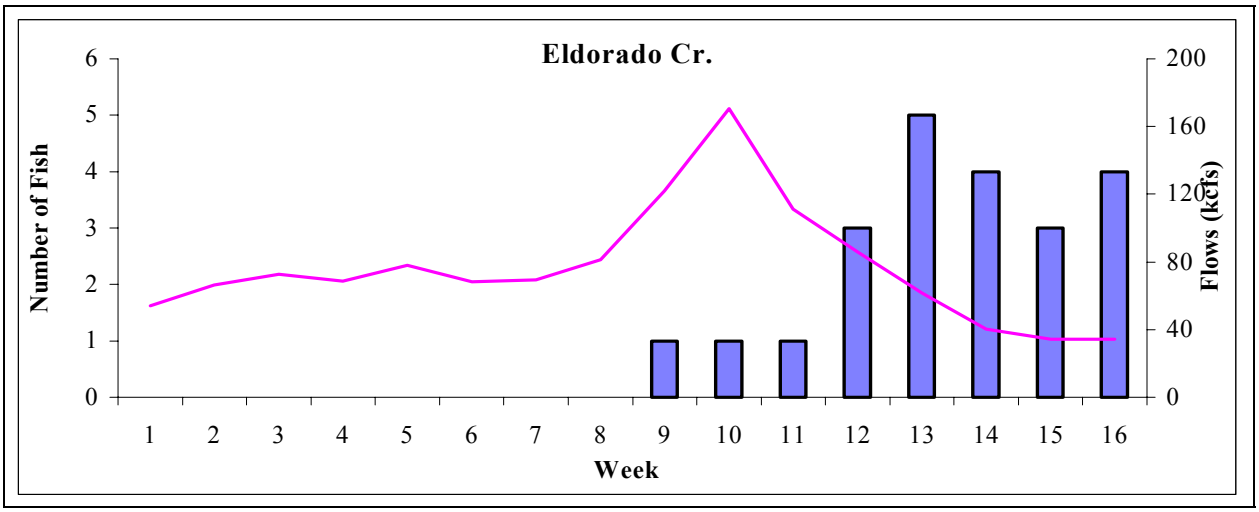

Figure 86. Number of PIT-tagged hatchery coho released into Eldorado Cr. detected by week and flows at LGR, 2003.

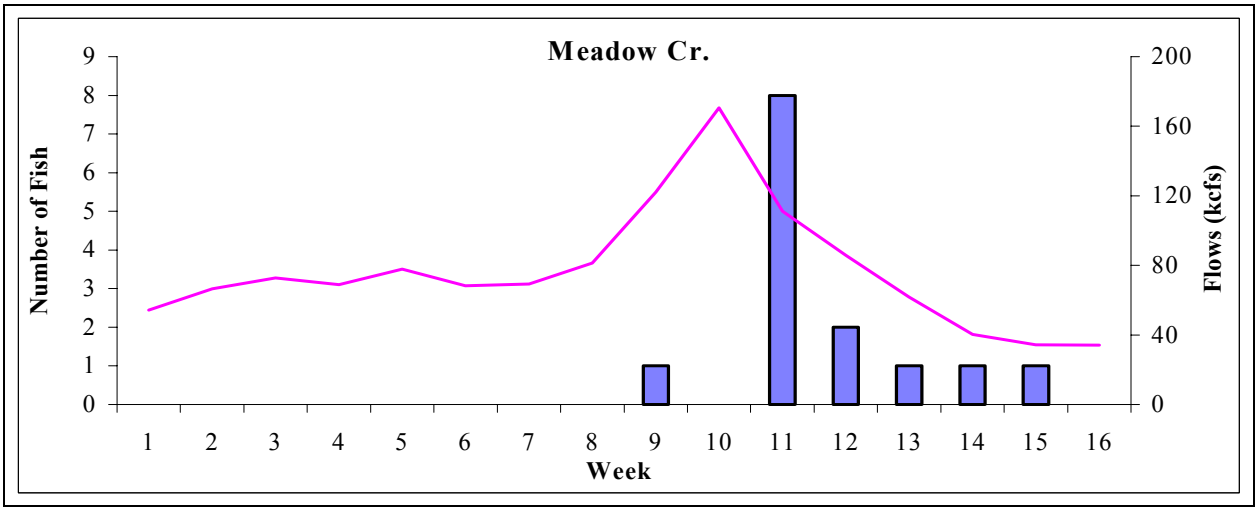

Figure 87. Number of PIT-tagged hatchery coho released into Meadow Cr. detected by week and flows at LGR, 2003.

Fish Condition

Condition Factor

Condition factor, a coefficient that relates weight to length, provides a relative measure of the general health and robustness of an individual fish. It also defines a relationship that can be used to predict expected weight or length for a given species and life stage. As juvenile salmonids begin the smoltification process and oceanward migration, condition factors typically decrease as the fish undergoes the physical and physiological changes for life in salt water. Higher condition factors at the onset of this process indicate greater body mass and energy reserves to sustain the fish through this process.

We record weights and fork lengths of individual fish from the detailed daily subsamle for each species group, clipped and unclipped, yearling and subyearling chinook and steelhead. Unclipped chinook with coded-wire tags and or elastomer marks and unclipped steelhead with eroded dorsal fins were not included in the calculations for the unclipped species groups. For each fish we calculated Condition Factor (K) as:

$K = (\text{weight in grams} * 100{,}000) / (\text{Forklength})^3$.

Condition factors for the individuals in each species group were averaged to obtain a daily and weekly average. These condition factors are not specific to any stock but are a composite average for each species group as they reach Lower Granite Dam. They provide a single metric with which to quantify relative differences between clipped and unclipped species groups and changes in average condition throughout the migration season at Lower Granite Dam. Condition factors also provide a tool to look at differences and similarities among years for the different species groups. Average condition factors at Lower Granite Dam calculated for the different species groups typically range between 0.95 and 1.25. Condition factors for clipped steelhead based on four years data from 1997 through 2001 typically fall between 0.95 and 1.00. Condition factors for unclipped steelhead are only slightly higher. Condition factors for yearling clipped and unclipped chinook are very similar and typically fall between 1.00 and1.15. Condition factors for sub-yearling chinook are consistently higher, from 1.10 to 1.35, reflecting the rapid growth of these juveniles above Lower Granite prior to their emigration.

Clipped Yearling Chinook Condition Factors

Average weekly condition factors for clipped yearling chinook throughout the spring migration period, April 1 to June 20, were lower than those in 2002 (Figure 88). Weekly K values in 2003 varied between 1.00 to 1.08, compared to K values in 2002 between 1.10 and 1.25. The difference in K values between the years reflects an average of 1.9 grams difference in weight for the same length. K values in 2003 were highest at the beginning of the season, declined through mid-May and then increased through mid-June. The 2003 K values were, with the exception of the first week of the season, comparable with the composite average for the years 1997-2001.

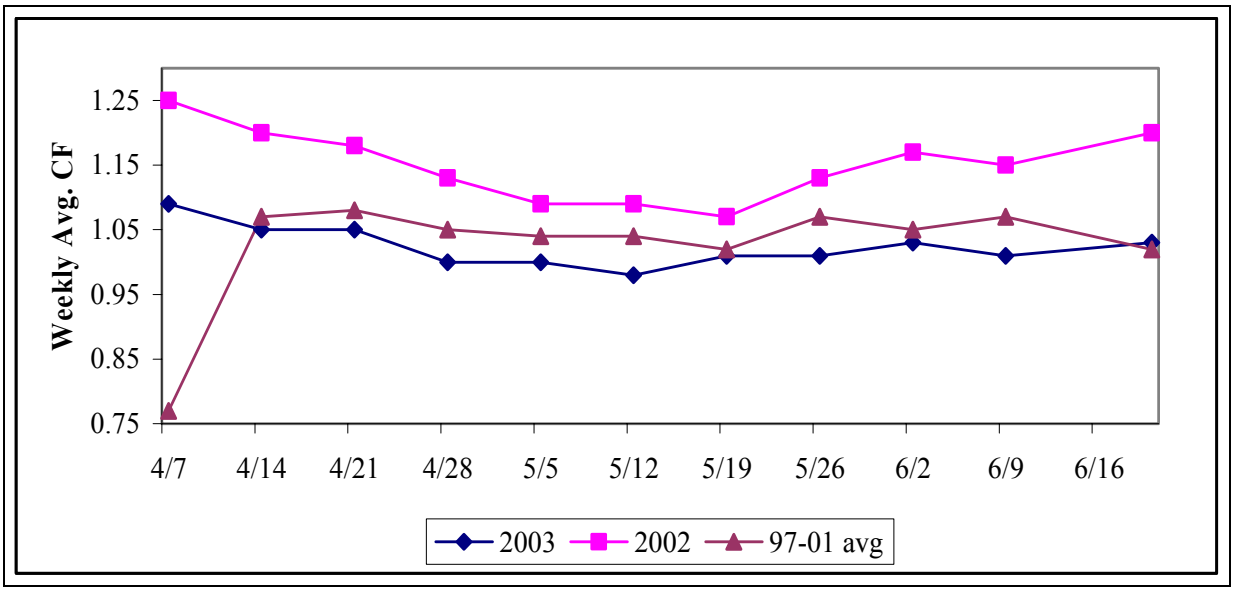

Figure 88. Weekly average condition factors for clipped yearling chinook at LGR, 1997-2003.

Unclipped Yearling Chinook Condition Factors

The weekly average condition factors for unclipped yearling chinook in 2003 were lower than those in 200 (Figure 89). Average K values followed a similar pattern in 2003 and 2002. Average K values were highest at the beginning of the season, declined slightly the first six weeks and then increased slightly through the end of the spring migration period, more so in 2002 than in 2003. Weekly K values in 2003 varied between 0.99 and 1.25, compared to K values in 2002 between 1.10 and 1.25. The difference in K values between the years reflects an average of 1.0 grams difference in weight for juveniles of the same length. The K values in both 2003 and 2002 are comparable to the composite average recorded from 1997-2001 with 2002 K values greater than and 2003 K values less than the composite five-year average.

Condition factors for both clipped and unclipped yearling chinook appear similar and exhibit similar patterns in 2003 with the higher K values at the beginning and end of the spring migration period with a gradual decrease over the first five to six weeks of the season and then a gradual increase to the end. In 2003 average K values were slightly greater most of the season for unclipped yearling chinook. On average the unclipped yearling chinook were 6.8 grams less for a given length than clipped yearling chinook. In 2002 unclipped yearling chinook were, on average, 7.8 grams lighter than the clipped yearling chinook in 2003.

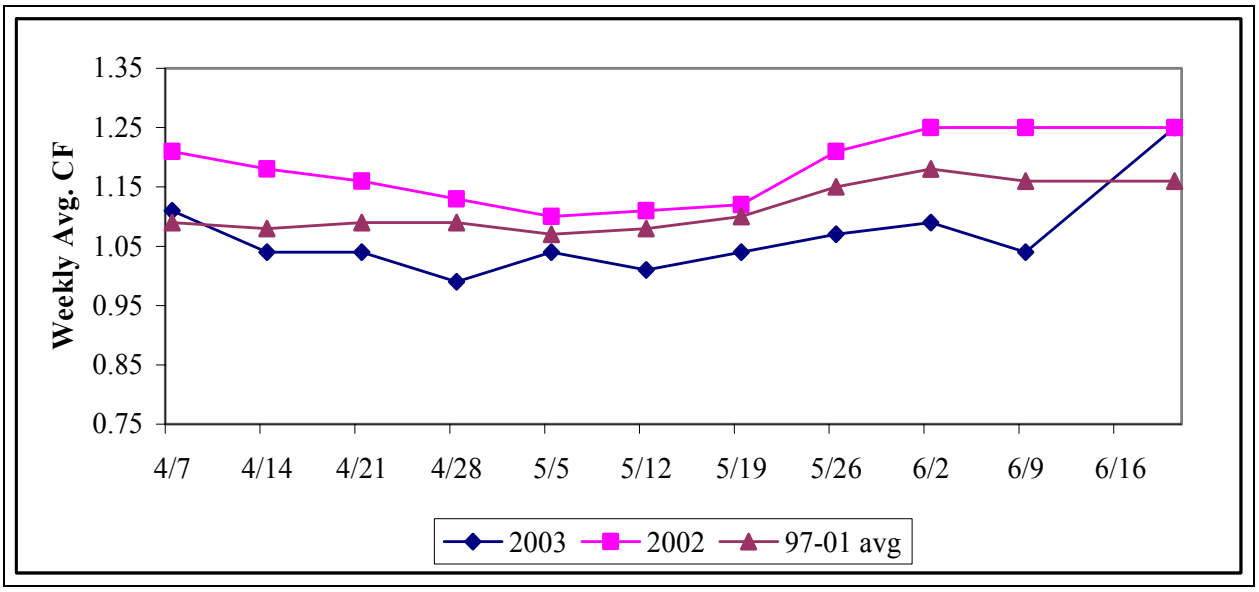

Figure 89. Weekly average condition factors for unclipped yearling chinook at LGR, 1997-2003.

Unclipped Subyearling Fall Chinook Condition Factors

Unclipped subyearling fall chinook began arriving at Lower Granite in significant numbers this year in early June. The first week's average K values for these fish started at1.11, peaked at 1.31 the end of September, and declined to 1.25 by the end of October (Figure 90). This season's peak of 1.31 is the lowest recorded since 1997. This compares to peak K values in 1998 and 2001 of 1.50, years with the highest recorded flows and cumulative temperature units through the summer/fall migration at Lower Granite since 1992.

Overall K values for 2003 were similar to but slightly less than those in 2002 and less than the composite 1997-2001 average. On average, subyearling chinook of similar lengths were 1.4 grams lighter than fish in 2002. Both the five-year composite average and 2002 averages have early and late peak weeks but this did not occur in 2003.

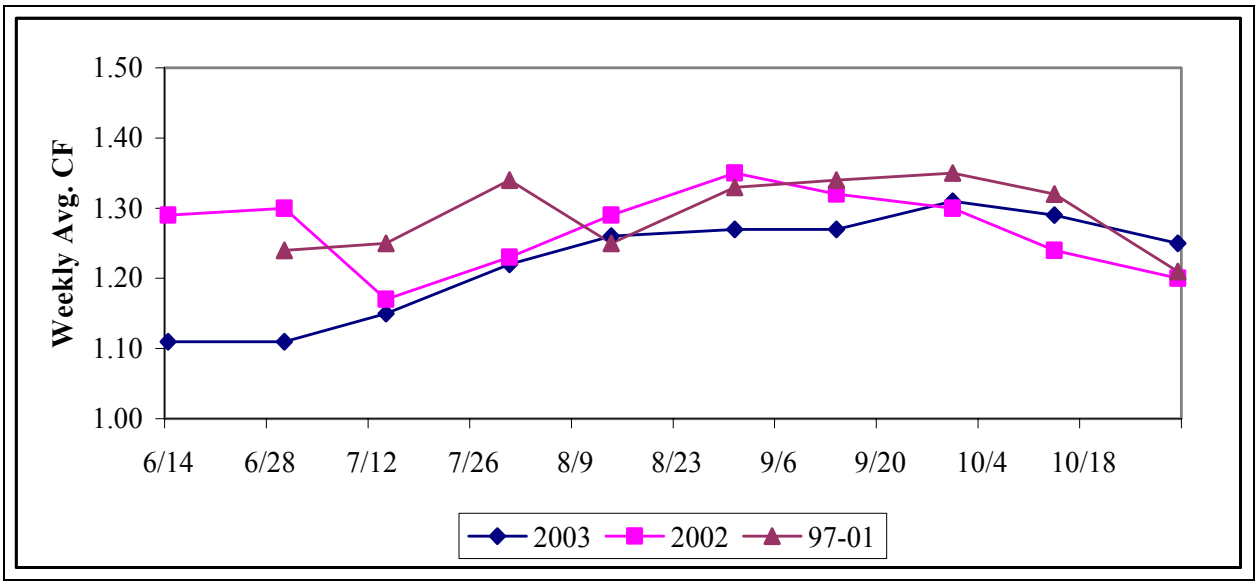

Figure 90. Weekly average condition factors for unclipped subyearling fall chinook at LGR,

1997-2003.

Clipped Steelhead Condition Factors

Weekly average condition factors in 2003 were nearly identical to the five-year composite average for 1997 to 2001, but were noticeably less than in 2002 (Figure 91). Clipped steelhead weekly average K's decreased steadily from the beginning of April until the end of the spring migration period June 20. Only in 2002 did the average weekly K value exceed 1.00 throughout this time period. On average, clipped steelhead in 2002 were 21 grams heavier than fish of the same length in 2003.

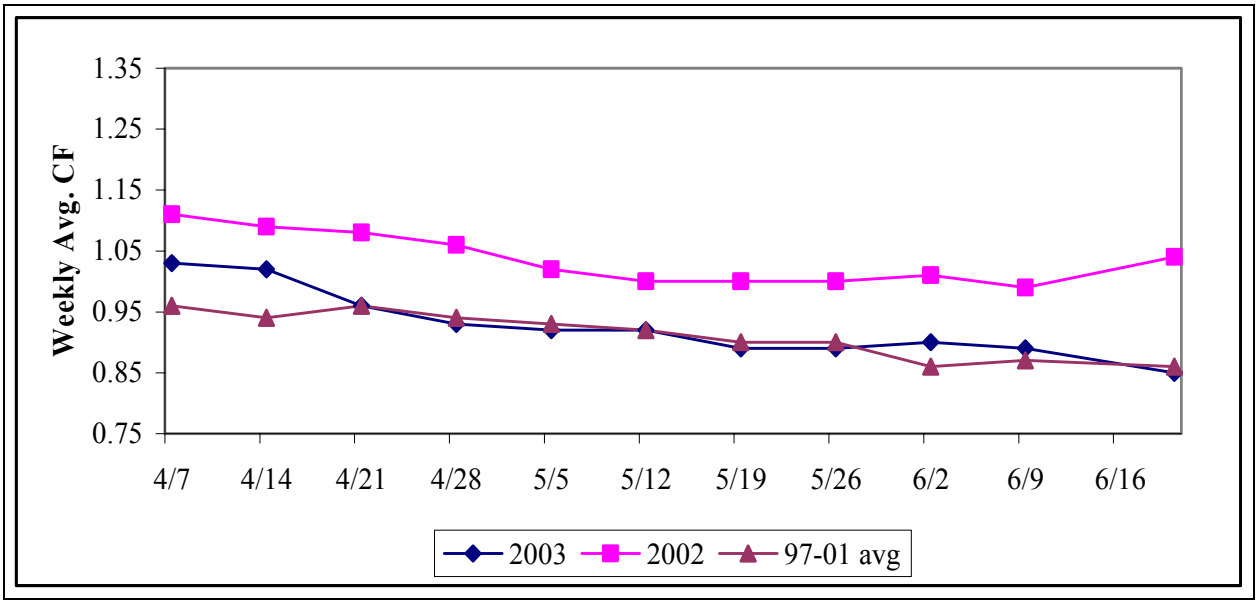

Figure 91. Weekly average condition factors for clipped steelhead at LGR, 1997-2003.

Unclipped Steelhead Condition Factors

Average weekly condition factors for unclipped steelhead in 2003 were noticeably less than those in 2002 and nearly identical to those based on the five-year composite average (Figure 92). Condition factors in 2003 ranged from 0.90 to 0.99 and averaged 0.95. On average, unclipped steelhead in 2003 were 11 grams lighter than fish of the same length in 2002. Condition factors for the unclipped steelhead typically are slightly lower than that of the fin-clipped hatchery origin steelhead.

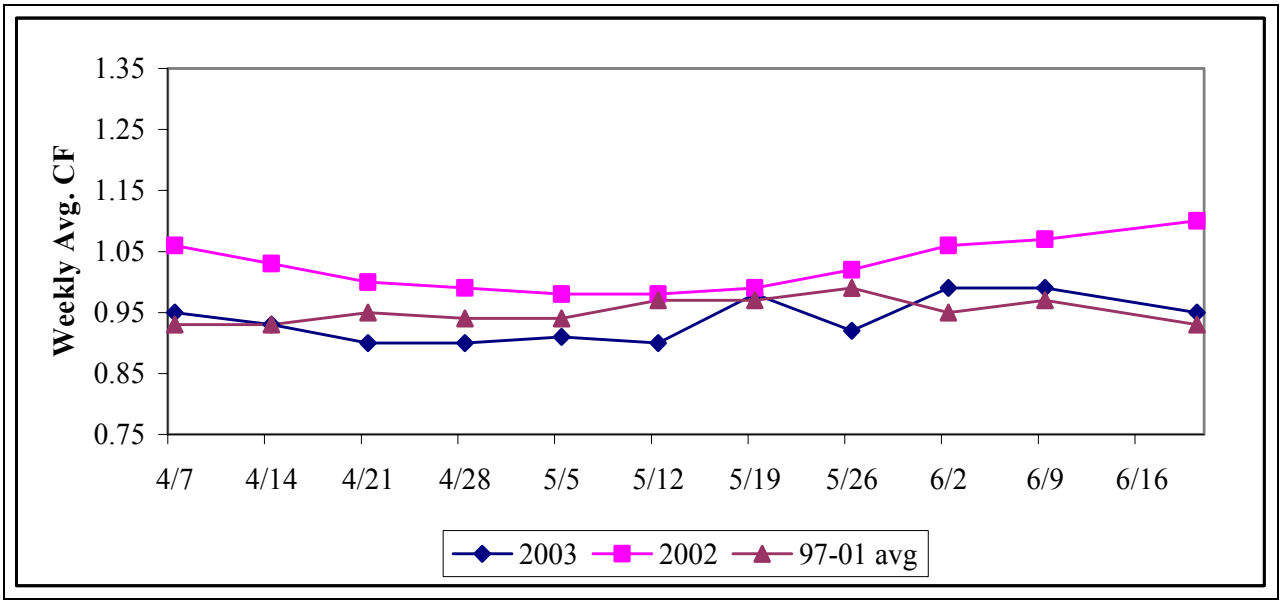

Figure 92. Weekly average condition factors for unclipped steelhead at LGR, 1997-2003.

Descaling

The 2003 descaling rate for all groups combined is 2.0% compared to 2.3% in 2002 (Table 46). Annual descaling rates for unclipped subyearling fall chinook, clipped and unclipped sockeye/kokanee and coho increased while descaling rates for clipped yearling chinook, unclipped yearling chinook, clipped subyearling fall chinook and clipped and unclipped steelhead decreased compared to the 2002 rates.

Weekly average descaling rates for steelhead and yearling chinook were highest during the peak of the spring migration May 15 through June 12. There were no weeks during the 2003 migration season in which either clipped or unclipped sockeye/kokanee sample numbers exceeded 100 fish. Unclipped subyearling fall chinook descaling rates were highest for the week ending September 25 (Table 47).

Table 46. Annual descaling rates in percent for fish sampled at LGR, 1999-2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
Year	Clipped	No Clip[1]	Clipped	No Clip[2]	Clipped	No Clip[1]	Clipped	No Clip[1]	All	Total
1999	3.1	1.1	3.4	1.7	7.2	1.7	3.4	10.0	4.2	3.6
2000	3.1	1.0	---	0.6	1.8	0.9	0.0	12.0	1.3	1.3
2001	1.9	1.4	1.0	1.2	2.2	1.3	5.9	9.3	3.1	1.7
2002	2.3	1.5	0.9	1.5	4.2	2.5	1.8	6.9	2.0	2.3
2003	2.0	1.2	0.6	1.7	3.8	2.1	4.1	10.0	2.9	2.0

[1]Wild chinook, wild steelhead and wild sockeye/kokanee designated in text as unclipped beginning in 2000.
[2]Hatchery chinook, hatchery steelhead and hatchery sockeye/kokanee designated in text as clipped for 2000-2003.

We began looking at gradations of scale loss in smolts during 1998 to augment the standard descaling data taken from sample fish. Standard descaling criteria identifies a fish with 20% or greater scale loss on one side of its body as descaled, according to the Fish Passage Center guidelines. If scale loss is less, the fish is not considered descaled at all. We observed that fish have levels of scale loss that do not fit the standard descaling criteria. As a result, we began noting, in addition to standard descaling, if a smolt was more than 5% but less than 20% descaled, and if a smolt was descaled 50% or more. Furthermore, each gradation of scale loss was characterized as patchy or scattered. In 2003, patchy low level scale loss, scale loss greater than 5% but less than 20%, was observed on 1.8% of all fish examined, in 2002 it was 2.0%, 2001 it was 1.9%, 1.8% in 2000 and 3.5% for 1999. Descaling criteria was represented by the following abbreviations;

>P: Patchy descaling greater than 20% on one side of the body.
>S: Scattered descaling greater than 20% on one side of the body.
<P: Patchy descaling less than 20% on one side of the body.
<S: Scattered descaling less than 20% on one side of the body.
5P: Patchy descaling greater than 50% on one side of the body.

Unclipped subyearling fall chinook in 2003 suffered more patchy (>20%) scale loss (3.3%) when sample counts exceeded 100 smolts, than other species. The next highest was clipped yearling chinook were next at 2.4%. The greater than 20% patchy descaling rate for all species combined was 2.0% in 2003, 0.9% in 2002 and 0.8% in 2001. The greater-than 50% descaling rate for all species combined in 2003 was 0.5%, in 2002 it was 0.4%, 0.3% in 2001, 0.5% in 2000 and 0.1% in 1999. In 2003 the greater-than 50% descaling rate was highest in yearling spring chinook (0.94%).

Table 47. Weekly descaling rates in percent for fish sampled at LGR, 2003.

Week Ending	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Total
	Clipped	No Clip	Clipped	No Clip[2]	Clipped	No Clip	Clipped	No Clip	All	
3/27	5.3	1.8	----	*0.0	*0.0	*0.2	*<0.1	*<0.1	----	2.5
4/3	3.1	0.9	----	*0.0	*0.0	0.0	*<0.1	*<0.1	*<0.1	1.7
4/10	2.7	0.7	----	*0.0	0.9	0.7	----	*0.0	*0.0	1.3
4/17	1.4	0.3	----	*0.0	0.6	0.7	----	*0.0	----	0.7
4/24	1.3	1.5	----	*0.0	0.9	2.2	----	*0.0	*0.0	1.4
5/1	2.7	1.7	----	*0.0	2.0	1.0	----	*0.0	*0.0	2.2
5/8	1.6	1.2	----	----	4.0	2.5	----	*0.0	----	2.1
5/15	2.1	2.7	----	*0.0	4.9	4.2	----	*0.0	*0.0	3.3
5/22	1.2	0.4	----	*0.0	5.6	2.9	*0.0	----	5.3	3.2
5/29	3.2	1.9	*4.2	*0.0	4.7	2.8	*0.0	*12.5	3.6	3.9
6/5	*0.0	*2.2	0.0	0.0	7.8	1.6	*2.3	*0.0	4.6	2.8
6/12	*2.1	*1.8	0.8	0.1	5.7	3.2	*16.7	*0.0	2.6	0.7
6/19	*3.8	*12.9	0.0	0.4	3.6	2.3	*0.0	*0.0	*0.0	0.7
6/26	*0.0	*0.0	0.4	0.1	2.0	*3.1	----	----	*2.8	0.2
7/3	*0.0	*0.0	0.5	0.2	*1.3	*0.0	----	*0.0	*0.0	0.2
7/10	*0.0	*11.1	*1.2	0.2	*1.6	*0.0	----	*100	*2.2	0.3
7/17	*0.0	*0.0	*0.0	0.4	*3.6	*10.0	*0.0	----	*0.0	0.5
7/24	*0.0	*0.0	*3.0	0.1	*3.3	*9.1	----	----	*2.4	0.3
7/31	----	*0.0	*0.0	0.4	1.7	*3.6	----	----	*9.1	0.8
8/7	*0.0	*0.0	*0.0	0.1	0.0	*0.0	----	----	*0.0	0.1
8/14	----	*0.0	*0.0	0.6	*9.3	*6.3	----	----	*1.8	0.8
8/21	*0.0	*0.0	*0.0	0.8	*4.5	*0.0	----	----	*0.0	0.9
8/28	----	----	*0.0	1.7	*0.0	*0.0	----	*0.0	*0.0	1.7
9/4	----	*50	*0.0	0.4	*10.0	*0.0	----	----	*0.0	1.3
9/11	----	----	*0.0	4.4	2.8	*0.0	----	----	*4.5	4.2
9/18	----	*40.0	*0.0	2.9	*10.2	*0.0	----	----	*0.0	3.4
9/25	*20.0	*0.0	----	11.7	*7.4	*0.0	----	----	*0.0	11.4
10/2	*10.0	*0.0	*33.3	5.6	*4.8	*0.0	----	----	*0.0	5.6
10/9	*0.0	*0.0	*0.0	4.9	*0.0	*0.0	*0.0	----	*14.3	4.9
10/16	*0.0	*0.0	*0.0	4.1	*0.0	----	----	*50.0	*0.0	4.1
10/23	*0.0	*0.0	*0.0	4.2	*0.0	*0.0	----	*0.0	*0.0	4.2
10/31	----	*0.0	*0.0	4.6	*0.0	*0.0	----	50.0	*0.0	4.7
Totals										
# Desc.	329	103	15	941	607	110	3	4	36	2,148
#Samp'd	16,471	8,905	2,455	55,982	16,173	5,178	73	40	1,226	106,503
% Desc'd	2.0%	1.2%	0.6%	1.7%	3.8%	2.1%	4.1%	10.0%	2.9%	2.0%

* Less than 100 fish sampled during the week.
--- No fish sampled during the week.

In addition to standard length, weight and descaling data recorded for individual smolts in the daily sub-sample, smolts were also examined for visible injuries and symptoms of disease. This season a total of 2,958 (15.7%) smolts were recorded as having some level of descaling, head, body or predator-caused injury or symptom of disease. In contrast, rates of visible injury and disease in 1999, 2000, 2001 and 2002 were, 22.2%, 28.1%, 19.0% and 17.3%, respectively. A total of 18,859 smolts were examined in the detailed sub-sample during the 2003 season, compared to 22,372 in 2002 and 26,699 in 2001 (Tables 49 and 50).

Head Injuries

Head injuries that were noted this season included abrasions and injury to the eye, "pop"-eye, opercula, mandible, maxillary and head deformity. Head injuries were recorded in 1.0% of the smolts examined in the detailed sub-sample in 2003, 1.2% in 2002, 1.7% in 2001 and 3.9% in 2000. Injuries to opercula and eyes comprised 73.1% of the total head injuries. Unclipped subyearling fall chinook and clipped steelhead were the species most affected by head injuries (Tables 49 and 50).

Body Injuries

The most prevalent body injuries recorded this season included fin damage, lesions, scale regeneration, lacerations and deformity. Approximately 3.5% of the smolts examined this year in the detailed sub-sample exhibited some visible body injury compared to 2.9% in 2002 and 5.0% recorded in 2001. Fin injuries (split rays and fraying) were present in all species and represented 78.0% of all the body injuries. The groups most afflicted were unclipped steelhead (3.7%), unclipped subyearling chinook (3.2%) and clipped steelhead (2.8%) (Tables 49 and 50).

Disease

Diseases with common external symptoms noted during the season include fungus, cysts, columnaris, digenia, gill hyperplasia, hemorrhaged fin, bacterial kidney disease, parasites and scoliosis. Fin hemorrhaging, characterized by redness in the ventral fin tissues, was observed in 1.5% of fish examined in the detailed sub-sample. It was most prevalent in unclipped subyearling fall chinook, 27% (265 of 980 diseases). Fin hemorrhaging was recorded in 28% of the subyearling fall chinook in 2002, 22% in 2001 and 19% in 2000 (Tables 49 and 50).

The percentage of smolts observed with symptoms consistent with columnaris, yellowish blemishes, lesions, and loss of skin from the snout, decreased this year to 2.6%, compared to 7.3% in 2002 and 13.1% in 2001. This disease caused by the bacterium *Flavobacterium columnare*, infects mainly summer and fall migrants because it becomes more virulent when water temperatures exceed 60 F. Columnaris rates in unclipped subyearling fall chinook for previous years were: 13.9% in 2001, 14.5% in 2000 and 11.1% in 1999. Warren Groberg, Fish Pathologist for Oregon Department of Fish and Wildlife, visited the Lower Granite Juvenile Fish Facility September 30, 1998 and provided additional information on external symptoms characteristic of columnaris. Warren Groberg explained that the snout injuries (loss of protective skin tissue) and yellowish blemishes without broken skin were also symptoms of F. columnare infection. Based on this information subyearling fall chinook were identified as being infected with columnaris (Tables 49 and 50).

The 2003 season columnaris infection rates were the lowest since 1998, when examinations for columnaris at Lower Granite Dam began. Unclipped subyearling fall chinook with snout injuries characteristic of columnaris were not observed in significant numbers as in previous years. Daily rates of columnaris in September generally ranged from 3% to 8% in the sample fish, exceeding 10% only four times, while weekly rates ranged from 4% to 8% and gradually declined to 2.1% the week sampling ended, October 31. Between September 1 and October 31, 7.6% of the unclipped subyearling fall chinook were observed to have symptoms of columnaris compared to 20.0% in 2002, 20.2% in 2001 and 25.3% in 2000. During this same time period in 2003 we sampled 17,247 subyearling fall chinook compared to 13,056 in 2002, an increase of 32.1%. Weekly columnaris symptoms for 2003 peaked at 9.3% for the week ending October 16. The highest weekly rate in 2002 was 26.2% September 1 through September 7. This is the sixth year we have calculated columnaris rates based on the entire sample (Tables 49 and 50).

Gill hyperplasia, characterized by swollen or "club-shaped" gill filaments, primarily affects clipped steelhead and occurs throughout the main portion of the migration in April and May. Gill hyperplasia was recorded in 0.2% of the clipped steelhead in 2003, compared to 0.9% in 2002, 0.2% in 2001, 1.5% in 2000 and 2.0% in 1999. Injuries associated with predator marks included wounds inflicted by anglers, birds, and lampreys. This year, as in the previous four years, birds were the primary predator causing most of the injuries. Bird predation marks in 2003, characterized by V-shaped scratches on both sides of a fish, were most prevalent on clipped and unclipped steelhead and when combined they represented 58% of the predator category injuries. For the 2003 season, only 19 predator marks were identified. The bird predation rates for clipped and unclipped steelhead combined for previous years were: 29.8% of the total predator wounds in 2002, 74.2% in 2001 and 70.1% in 2000. Lamprey marks, characterized by the presence of small disc-shaped patches of scale loss sometimes with central petechial hemorrhaging, were not evident on any of the fish examined in the sub-sample in 2003, compared to 120 recorded in 2002 (Tables 49 and 50).

Table 48. Key to injury data.

Head		**Body**	
AB	Abrasion	BL	Bloated
EI	Eye Injury	SR	Scale Regeneration
EP	Pop" Eye	EM	Emaciated
OP	Opercula	FI	Fin Injury
JW	Mandable (Jaw)	LA	Laceration
MX	Maxillary	LE	Lesion
HD	Head Deformity	BD	Deformity

Disease		**Predator**	
FU	Fungus	PA	Angler
CY	Cyst	PB	Bird
CO	Columnaris	PL	Lamprey
DI	Digenia	MD	Moribund
GH	Gill Hyperplasia	PP	Fish Bite
HE	Hemorrhage		
KD	BKD		
PA	Parasite		
SC	Scoliosis		

Table 49. Injury tallies at LGR, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Samp'd	2,656	2,308	1,015	7,125	2,707	2,075	68	37	874	18,865
Descaled										
>P	63	34	10	233	65	35	2	4	20	466
>S	11	5	0	23	56	14	0	0	2	111
<P	38	28	10	205	46	16	1	0	24	368
<S	24	4	2	44	43	12	0	1	5	135
5P	25	12	3	34	12	7	1	0	2	96
Total	161	83	25	539	222	84	4	5	53	1,176
%	6.06	3.60	2.46	7.56	8.20	4.05	5.88	13.51	6.06	6.23
Head Injury										
AB	2	0	0	4	0	2	0	0	1	9
EL	9	4	1	11	10	6	0	0	3	44
EP	3	0	0	3	0	1	0	0	0	7
OP	27	3	3	22	30	7	0	0	3	95
JW	1	2	1	1	2	0	1	0	1	9
MX	1	0	0	2	0	0	0	0	1	4
HD	3	5	0	2	3	10	0	0	0	23
Total	46	14	5	45	45	26	1	0	9	191
%	1.73	0.61	0.49	0.63	1.66	1.25	1.47	0.00	1.03	1.01
Body inj										
BL	4	4	1	9	0	0	0	0	0	18
SR	3	1	2	8	4	2	0	0	1	21
EM	2	0	0	2	13	13	0	0	1	31
FI	65	40	19	231	76	76	0	1	34	542
LA	9	1	0	7	6	3	0	0	0	26
LE	9	1	0	6	10	7	1	0	5	39
BD	6	2	0	6	2	2	0	0	0	18
Total	98	49	22	269	111	103	1	1	41	695
%	3.69	2.12	2.17	3.78	4.10	4.96	1.47	2.70	4.69	3.68
Disease										
FU	51	12	0	2	18	9	0	0	0	92
CY	0	0	0	5	3	0	0	0	0	8
CO	1	0	2	479	1	0	0	0	0	483
DI	1	2	0	0	1	28	0	0	0	32
GH	1	0	1	1	5	3	0	0	0	11
HE	2	6	3	265	9	2	0	0	0	287
KD	2	3	1	2	1	1	0	0	0	10
PA	2	3	1	18	13	8	0	0	0	45
SC	3	0	0	3	6	0	0	0	0	12
Total	63	26	8	775	57	51	0	0	0	980
%	2.37	1.13	0.79	10.88	2.11	2.46	0.00	0.00	1.37	5.26
Predator Injury										
PA	0	0	0	0	0	0	0	0	0	0
PB	4	0	0	0	2	9	0	0	2	17
PL	0	0	0	0	0	0	0	0	2	2
MD	1	0	0	0	0	0	0	0	0	1
PP	3	0	0	0	0	0	0	0	1	4
Total	8	0	0	0	2	9	0	0	5	24
%	0.30	0.00	0.00	0.00	0.07	0.43	0.00	0.00	0.57	0.13

Table 50. Injury percent at LGR, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Samp'd	2,656	2,308	1,015	7,125	2,707	2,075	68	37	874	18,865
Descaled										
>P	2.37	1.47	0.99	3.27	2.40	1.69	2.94	10.81	2.29	2.47
>S	0.41	0.22	0.00	0.32	2.07	0.67	0.00	0.00	0.23	0.59
<P	1.43	1.21	0.99	2.88	1.70	0.77	1.47	0.00	2.75	1.95
<S	0.90	0.17	0.20	0.62	1.59	0.58	0.00	2.70	0.57	0.72
5P	0.94	0.52	0.30	0.48	0.44	0.34	1.47	0.00	0.23	0.51
Total	161	83	25	539	222	84	4	5	53	1176
%	6.06	3.60	2.46	7.56	8.20	4.05	5.88	13.51	6.06	6.23
Head Injury										
AB	0.08	0.00	0.00	0.06	0.00	0.10	0.00	0.00	0.11	0.05
EL	0.34	0.17	0.10	0.15	0.37	0.29	0.00	0.00	0.34	0.23
EP	0.11	0.00	0.00	0.04	0.00	0.05	0.00	0.00	0.00	0.04
OP	1.02	0.13	0.30	0.31	1.11	0.34	0.00	0.00	0.34	0.50
JW	0.04	0.09	0.10	0.01	0.07	0.00	1.47	0.00	0.11	0.05
MX	0.04	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.11	0.02
HD	0.11	0.22	0.00	0.03	0.11	0.48	0.00	0.00	0.00	0.12
Total	46	14	5	45	45	26	1	0	9	191
%	1.73	0.61	0.49	0.63	1.66	1.25	1.47	0.00	1.03	1.01
Body Injury										
BL	0.15	0.17	0.10	0.13	0.00	0.00	0.00	0.00	0.00	0.10
SR	0.11	0.04	0.20	0.11	0.15	0.10	0.00	0.00	0.11	0.11
EM	0.08	0.00	0.00	0.03	0.48	0.63	0.00	0.00	0.11	0.16
FI	2.45	1.73	1.87	3.24	2.81	3.66	0.00	2.70	3.89	2.87
LA	0.34	0.04	0.00	0.10	0.22	0.14	0.00	0.00	0.00	0.14
LE	0.34	0.04	0.00	0.08	0.37	0.34	1.47	0.00	0.57	0.21
BD	0.23	0.09	0.00	0.08	0.07	0.10	0.00	0.00	0.00	0.10
Total	98	49	22	269	111	103	1	1	41	695
%	3.69	2.12	2.17	3.78	4.10	4.96	1.47	2.70	4.69	3.68
Disease										
FU	1.92	0.52	0.00	0.03	0.66	0.43	0.00	0.00	0.46	0.51
CY	0.00	0.00	0.00	0.07	0.11	0.00	0.00	0.00	0.00	0.04
CO	0.04	0.00	0.20	6.72	0.04	0.00	0.00	0.00	0.46	2.58
DI	0.04	0.09	0.00	0.00	0.04	1.35	0.00	0.00	0.00	0.17
GH	0.04	0.00	0.10	0.01	0.18	0.14	0.00	0.00	0.00	0.06
HE	0.08	0.26	0.30	3.72	0.33	0.10	0.00	0.00	0.34	1.54
KD	0.08	0.13	0.10	0.03	0.04	0.05	0.00	0.00	0.00	0.05
PA	0.08	0.13	0.10	0.25	0.48	0.39	0.00	0.00	0.11	0.24
SC	0.11	0.00	0.00	0.04	0.22	0.00	0.00	0.00	0.00	0.06
Total	63	26	8	775	57	51	0	0	12	992
%	2.37	1.13	0.79	10.88	2.11	2.46	0.00	0.00	1.37	5.26
Predator Injury										
PA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PB	0.15	0.00	0.00	0.00	0.07	0.43	0.00	0.00	0.23	0.09
PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.01
MD	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
PP	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.02
Total	8	0	0	0	2	9	0	0	5	24
%	0.30	0.00	0.00	0.00	0.07	0.43	0.00	0.00	0.57	0.13

Fish Mortality

The overall facility mortality rate for juvenile salmonids collected at Lower Granite Dam in 2003 was 0.43% compared to 0.34% in 2002 (Table 51). A total of 26,786 facility mortalities were recorded from a collection of 6,183,825 smolts. The numbers of facility mortalities and the mortality percentages by species group were: 3,980 clipped yearling chinook (0.21%), 1,582 unclipped yearling chinook (0.24%), 3,288 clipped subyearling fall chinook (2.87%), 15,138 unclipped subyearling fall chinook (1.43%), 1,599 clipped steelhead (0.09%), 467 unclipped steelhead (0.10%), 86 clipped sockeye/kokanee (1.23%), 36 unclipped sockeye/kokanee (1.31%) and 610 coho (0.68%).

Facility Mortality

Facility mortality included fish removed from the raceways, barges or trucks before departure, sample mortalities, recovery tank mortalities and NMFS mortalities attributed to handling. Facility mortalities for all species combined was the second highest in the last five years. Mortality rates for yearling chinook and steelhead were the same as in 2002 (Table 51). The clipped subyearling fall chinook mortality rate of 4.00% rate is the highest in the last five years. The unclipped subyearling fall chinook mortality rate for 2003 was 1.43% compared to 1.19% in 2002 and 0.52% for 2001. Weekly subyearling fall chinook facility mortality rates were highest in the week ending September 4 (Table 56. The unclipped sockeye/kokanee mortality rate of 1.31% was the lowest in the last five years.

Table 51. Annual facility mortality in percent at LGR, 1999-2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
Year	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
1999	0.6	0.6	0.9	0.8	0.0	0.0	0.8	4.7	0.2	0.3
2000	0.1	0.1	----	0.5	0.0	0.0	0.1	2.3	0.0	0.1
2001	0.2	0.2	0.4	0.5	0.0	0.1	0.0	3.1	0.2	0.1
2002	0.2	0.2	1.4	1.2	0.1	0.1	1.6	3.1	0.2	0.3
2003	0.2	0.2	2.9	1.4	0.1	0.1	1.2	1.3	0.7	0.4

Sample Mortality

Sample mortalities include dead fish removed from the sample tank prior to sampling and those from the sorting trough in the sample lab. In 2003 a total of 1,505 sample mortalities were recorded, 1.4% (1,505 of 106,503 fish sampled) compared to 1.0% (1,104 sample mortalities of 103,396 fish sampled) in 2002 (Table 52). The sample mortalities and percent mortality by species group included: 177 clipped yearling chinook (1.1%), 90 unclipped yearling chinook (1.0%), 98 clipped subyearling fall chinook (4.0%), 1,022 unclipped subyearling fall chinook (1.8%), 70 clipped steelhead (0.4%), 32 unclipped steelhead (0.6%), two clipped sockeye/kokanee (2.7%), one unclipped sockeye/kokanee (2.5%), and 13 coho (1.1%).

Table 52. Annual sample mortality in percent at LGR, 1999-2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
Year	Clipped	No Clip	Clipped	No Clip[2]	Clipped	No Clip	Clipped	No Clip	All	Total
1999	1.6	1.5	---	1.3	0.3	0.5	1.7	9.6	0.6	1.1
2000	1.1	0.8	---	1.3	0.1	0.2	0.0	10.0	0.3	0.8
2001	0.7	0.6	1.2	1.7	0.4	0.5	0.0	14.0	1.1	1.0
2002	0.8	0.8	2.6	1.4	0.3	0.3	2.7	12.3	0.7	1.1
2003	1.1	1.0	4.0	2.0	0.4	0.6	2.9	2.9	1.1	1.4

Barge Mortality

Barge mortalities included fish removed from barge holds after the barges departed Lower Granite Dam. Mortalities also include fish loaded at Little Goose, Lower Monumental and McNary Dams into barges originating at Lower Granite Dam. The total barge mortality rate in 2003 for all facilities combined was 0.08%, a total of 13,320 mortalities of 16,835,117 barged fish (Table 53) compared to 0.09% in 2002 (Table 54). The total number barged included 5,957,885 fish from Lower Granite, 4,377,458 from Little Goose Dam, 1,867,207 fish from Lower Monumental Dam and 4,632,567 from McNary Dam. Barge mortalities by species include: 3,255 clipped yearling chinook, 1,132 unclipped yearling chinook, 763 clipped subyearling fall chinook, 4,736 unclipped subyearling fall chinook, 2,275 clipped steelhead, 878 unclipped steelhead, five clipped sockeye/kokanee, four unclipped sockeye/kokanee and 272 coho (Table 53).

Table 53. Total barge mortalities from LGR, LGS, LMN and MCN dams, 1996-2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	
Year	Clip	No Clip	Clip	No Clip	Clip	No Clip	Clip	No Clip	All	Total
1996	2,514	849	---	8	2,327	133	17	275	3	6,126
1997	1,169	354	---	3	1,389	44	2	37	0	2,998
1998	4,289	822	3	433	1,312	201	7	4	154	7,225
1999	3,808	889	---	148	773	146	118	61	236	6,179
2000	2,651	464	---	895	567	138	4	5	5	4,729
2001	1,037	470	46	280	1,566	562	3	0	5	3,969
2002	3,358	888	24	2,374	3,656	913	120	314	62	11,709
2003	3,255	1,132	763	4,736	2,275	878	5	4	272	13,320
96-02 avg	2,689	677	24	592	1,656	305	39	99	66	6,134

Table 54. Barge mortality percent 1996-2003.

Year	Number of Mortalities	Number Barged	% Mortality
1996	6,126	4,990,798	0.12%
1997	2,998	4,327,398	0.07%
1998	7,225	6,542,402	0.11%
1999	6,179	5,232,105	0.12%
2000	4,729	19,140,329	0.02%
2001	3,969	21,090,654	0.02%
2002	11,709	13,678,513	0.09%
96-02 average	6,134	10,714,600	0.06%
2003	13,320	16,835,117	0.08%

Note: Mortality percent for 1996-1999 calculated without including the number of fish barged from LGS, LMN, MCN. Mortality percent for 2000-2003 calculated using number of fish barged from all Sites (LGR, LGS,LMN and MCN).

Truck Mortality

The mortality rate for fish trucked from Lower Granite Dam in 2003 was 0.23% (223) mortalities of 96,282 fish trucked) compared to 0.20% in 2002 (147 mortalities of 72,513 fish trucked) and in 2001 it was 0.47% (618 mortalities of 131,323 fish trucked) compared to 0.23% in 2000 (390 mortalities of 171,795 fish trucked) (Table 55). This includes fish trucked prior to barging and fish trucked during the late season ending October 31. Total 2003 trucking mortality numbers by species were as follows: 66 clipped yearling chinook, 41 unclipped yearling chinook, one clipped subyearling fall chinook, 91 unclipped subyearling fall chinook, 18 clipped steelhead, four unclipped steelhead, one clipped sockeye/kokanee and one coho.

Table 55. Annual truck mortality in percent at LGR, 1999-2003.

	Yearling Chinook		Subyearling[1] Chinook		Steelhead		Sock/Kokanee		Coho	
Year	Clipped	No Clip	Clipped	No Clip[2]	Clipped	No Clip	Clipped	No Clip	All	Total
1999	0.39	0.18	0.00	0.22	0.45	0.09	0.00	0.30	0.22	0.24
2000	0.54	0.89	----	0.17	0.50	0.53	0.00	0.40	0.00	0.23
2001	0.10	0.10	0.75	0.44	0.67	0.54	0.00	0.00	0.00	0.47
2002	0.19	0.05	0.00	0.22	0.13	0.00	0.00	0.16	0.00	0.20
2003	0.29	0.13	1.39	0.35	0.26	0.05	4.76	0.00	0.52	0.23

[1]Wild chinook, wild steelhead and wild sockeye/kokanee designated in text as unclipped beginning in 2000.
[2]Hatchery chinook, hatchery steelhead and hatchery sockeye/kokanee designated in text as clipped for 2000-2003.

Table 56. Weekly facility mortality in percent at LGR, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
Year	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
3/27	0.53	0.73	----	1.11	0.00	0.00	0.00	0.00	0.00	0.56
4/3	1.36	1.18	----	0.41	0.07	0.32	20.00	0.00	0.00	1.05
4/10	1.25	0.87	----	0.71	0.05	0.11	0.00	0.05	0.00	0.75
4/17	0.30	0.10	----	0.09	0.01	0.01	0.00	2.50	0.00	0.14
4/24	0.19	<0.01	----	0.00	0.09	<0.01	0.00	3.00	0.00	0.13
5/1	0.18	0.14	----	0.00	0.01	0.02	0.00	1.68	0.00	0.10
5/8	0.09	0.08	----	0.00	0.02	0.01	0.00	0.00	0.07	0.07
5/15	0.01	0.10	----	0.34	0.03	0.02	0.00	1.34	0.15	0.07
5/22	0.18	0.16	----	0.00	0.04	0.04	0.00	----	0.04	0.10
5/29	0.82	0.45	0.91	0.46	0.08	0.08	0.50	1.12	0.50	0.22
6/5	3.97	1.30	6.69	1.58	0.72	0.46	1.39	0.02	2.00	1.85
6/12	0.83	0.89	2.41	0.90	0.21	0.17	1.12	0.00	1.04	0.95
6/19	0.54	0.48	1.3	1.13	0.25	0.25	0.00	0.00	0.51	1.04
6/26	1.09	0.75	1.08	1.17	1.02	0.61	0.00	0.00	0.66	1.14
7/3	2.50	5.24	1.16	1.55	1.92	2.78	----	0.00	0.56	1.54
7/10	8.36	2.82	2.34	2.15	1.76	5.75	----	16.00	0.51	2.16
7/17	16.25	7.14	9.91	3.29	2.97	7.31	20.00	----	2.24	3.37
7/24	6.00	2.50	2.56	1.22	0.89	3.63	----	----	0.24	1.25
7/31	----	0.00	11.3	4.55	1.05	5.45	----	----	0.61	4.24
8/7	20.00	0.00	5.08	0.96	0.89	2.73	----	----	1.90	1.01
8/14	----	0.00	2.86	1.06	0.37	1.25	----	----	2.50	1.08
8/21	20.00	0.00	14.29	1.19	0.94	3.03	----	----	1.18	1.27
8/28	----	----	0.00	1.20	1.25	2.27	----	25.00	0.00	1.22
9/4	----	0.00	0.00	4.52	0.00	0.00	----	----	0.00	4.02
9/11	----	----	28.57	1.81	0.70	0.00	----	----	13.64	1.90
9/18	----	20.00	0.00	2.66	0.00	0.00	----	----	0.00	2.54
9/25	0.00	0.00	----	1.75	11.11	0.00	----	----	0.00	1.95
10/2	0.00	0.00	0.00	2.19	0.00	0.00	----	----	0.00	2.14
10/9	0.00	0.00	0.00	1.51	0.00	37.50	----	----	----	1.59
10/16	0.00	0.00	0.00	0.68	7.14	0.00	----	0.00	0.00	0.72
10/23	0.00	0.00	0.00	0.95	0.00	0.00	----	0.00	0.00	0.94
10/31	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.54
# morts	3,980	1,582	3,288	15,138	1,599	467	86	36	610	26,786
collected	1,909,312	667,719	114,614	1,055,198	1,870,653	466,497	7,014	2,746	90,072	6,183,825
% Morts	0.21%	0.24%	2.87%	1.43%	0.09%	0.10%	1.23%	1.31%	0.68%	0.43%

Incidental Fishes

Incidental species

An estimated total of 54,857 non-salmonid incidental fish entered the fish facility at Lower Granite Dam in 2003 (Table 57). This represents a decrease of 36.8% in total incidentals from the 2002 total of 86,871. Approximately 51,381 (94%) of this season's incidental fish were counted prior to September 2 when the sample rate was set at 100% compared to 97% in 2002 (October 18), 92.7% in 2001 (September 6) and 92.0% in 2000 (October 2). An estimated total of 36,184 lamprey comprised 68% of the total incidentals in the collection in 2003. This represents a 43% decrease from the number collected (63,492) in 2002. In 2001 and 2000, 20,572 and 6,304 were collected, respectively. The majority of lamprey juveniles in 2003 were collected by May 29.

The second most abundant incidental species collected in 2003 was peamouth with 4,740, an increase of 10% over the 4,304 peamouth collected in 2002. Mountain whitefish was the third most abundant incidental species, with 2,951 collected, a 32% decrease from the 4,352 collected in 2002. Crappie was the fourth most abundant species with a collection of 2,768, a 2% decrease from the 2002 crappie collection (2,829). Other incidentals in significant numbers in the collection included suckers (1,106), smallmouth bass (958), rainbow trout (777) and sunfish (627). All sampled incidental fish counts were expanded based on daily sample rates to estimate the total transported collection (Table 57).

Incidental species are ranked by most abundant by year are identified in Table 58.

Table 57. Estimated collection of incidental fish species at LGR, 2003.

Common Name	Scientific Name	Separator	Expanded Sample	Total Collection[1]
American Shad (Adult)	Alosa sapidissima	275	519	794
American Shad (Juvenile)	A. sapidissima		387	387
Bull Trout	Salvelinus Malma	4	11	15
Bullhead (misc.)	Amierus sp.		241	241
Channel catfish	Ictalurus punctatus	156	512	668
Chiselmouth	Acrocheilus alutaceus		250	250
Common carp	Cyprinus carpio	215	70	285
Crappie	Pomoxis sp.	14	2,768	2,782
Crayfish	Cambarus sp		21	21
Cutthroat Trout	Oncorhynchus clarkii		20	20
Flathead Catfish	Pylodictus olivaris		1	1
Kokanee[2]	Oncorhynchus nerka		299	299
Longnose dace	Rhinichthys cataractae		1	1
Northern Pikeminnow	Ptychocheilus oregonensis	34	83	117
Pacific Lamprey (Adult)	Entosphenus tridentatus	46	125	171
Pacific Lamprey (Ammocete)	E. tridentatus		4,141	4,141
Pacific Lamprey (Juvenile)	E. tridentatus		31,918	31,918
Peamouth	Mylocheilus caurinus	32	4,740	4,772
Rainbow Trout[3]	Oncorhynchus mykiss		777	777
Redside shiner	Richardsonius balteatus		100	100
Sand Roller	Percopsis transmontana		70	70
Sculpin	Cottus sp.		229	229
Smallmouth Bass	M. dolomieui	12	958	970
Sucker (misc.)	Catostomus sp.	1,076	1,106	2,182
Sunfish (misc.)	Lepomis sp.		627	627
White sturgeon	Acipenser transmontanus	46	0	46
Whitefish	Prosopium sp.	2	2,951	2,953
Yellow perch	Perca flavescens	2	20	22
Total		1,914	52,943	54,857

[1]Incidental species collection estimated based on numbers sampled, sample rates, and separator counts.
[2]Kokanee in the sample are classified as any sockeye juvenile over 200 mm in length.
[3]Rainbow trout are classified by morphological characteristics.

Table 58. Incidental Ranking.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
*Lamprey, Pacific (eyed)	-----	8	7	7	8	5	1	1	1	1
*Peamouth	3	3	2	1	3	1	2	2	5	2
*Lamprey, Pacific (non-eyed)	-----	5	3	2	6	3	5	5	2	3
*Whitefish, Mountain	2	2	4	6	4	4	3	4	4	4
Crappie	4	1	1	4	1	7	4	8	6	5
*Sucker, (spp)	1	4	6	3	2	2	8	3	3	6
Bass, Smallmouth	7	6	9	12	12	9	12	12	9	7
Shad (adult)	13	16	*17	22	19	17	10	7	10	8
Catfish, Channel	6	11	10	9	5	8	9	*9	15	10
Bluegill	10	15	12	15	10	14	11	17	14	11
Pumpkinseed	8	9	14	13	14	16	-----	-----	14	11
Shad (juvenile)	-----	-----	-----	23	15	*18	6	10	7	12
Carp, Common	*14	18	16	17	*11	*18	18	14	16	14
*Chiselmouth	9	7	5	5	7	6	7	*9	12	15
Bullhead, (spp)	15	13	15	16	*11	12	15	13	11	16
*Sculpin, (spp)	12	14	13	11	13	15	16	16	19	17
*Lamprey, Pacific (adult)**	5	-----	*17	18	16	19	20	21	21	18
Northern Pikeminnow	11	12	8	8	9	10	17	11	17	19
*Redside Shiner	-----	17	19	10	*21	20	19	-----	24	20
*Sturgeon, White	-----	-----	-----	24	17	-----	-----	18	20	22
Perch, (spp)	*14	10	18	14	20	11	14	19	22	23
*Crayfish	16	19	20	20	18	13	13	15	18	24
*Dace spp.	-----	-----	11	21	*21	21	21	-----	23	28
Total	6,565	173,113	48,225	52,637	31,766	53,257	22,183	48,930	86,871	54,857

*species native to the Columbia-Snake River Basin

**Eyed and non-eyed lamprey not distinguished prior to 1995.

Adult Fallbacks

A total of 8,730 adult salmonids were removed from the Lower Granite separator in 2003 (Table 59) compared to 12,602 in 2002, a decrease of 30.7%. This included: 205 adult clipped chinook, 179 adult unclipped chinook, 207 clipped (hatchery origin) jack chinook, 56 unclipped jack chinook, 4,205 clipped steelhead, 3,878 unclipped steelhead and one coho. Clipped steelhead were the most abundant adult salmonids removed from the separator and made up 48.2% of the total salmonid fallbacks in2003. Unclipped steelhead were second in abundance and made up 44.4% of the fallbacks. As is typical at Lower Granite Dam, the highest number of adult fallbacks in April and May were clipped and unclipped steelhead and in October, adult and jack chinook (Table 60).

Adult fallbacks that passed through the separator bars were not counted on daily separator fallback forms. Some of these passed into raceways and were transported but not counted while others entered the sample system and were counted as incidental fish. A total of 219 salmonid fallbacks were counted in daily samples (numbers are not included in the above tables), including: 178 clipped jack chinook, 26 unclipped jack chinook, three mini jacks (1 clipped and 2 unclipped), eight clipped steelhead and four unclipped steelhead.

Table 59. Annual adult salmonid totals released into the river from the LGR separator, 1996-2003.

Year	Adult Chinook	Jack Chinook	Clipped Steelhead	Unclipped Steelhead	Total
1996	150	70	5,385	1,167	6,772
1997	470	19	6,609	1,944	9,042
1998	226	163	4,340	2,043	6,772
1999	187	95	4,091	1,951	6,324
2000	268	202	3,349	2,693	[1]6,513
2001	620	329	9,881	6,197	[1]17,028
2002	428	183	7,437	4,553	[1]12,602
1996-2002 Avg.	336	152	5,870	2,935	9,293
2003	384	263	4,205	3,878	8,730

[1] Includes one sockeye/kokanee.

The number of adult chinook removed from the separator in 2003 of 384 was 4.4% of the 2003 total of 8,730, 11 % greater than the 1998-2002 average (Table 59). The total jack chinook fallback count of 263 is 43.7% greater than the 2002 total of 183. The number of adult clipped steelhead of 4,205 is 43.5% of the 2002 total of 7,437 and 28.3% less than the 1996-2002 average. The unclipped steelhead total in 2003 (3,878) is 24.3% more than the previous seven-year average.

Table 60. Monthly adult salmonid totals released from the LGR separator, 2003.

	Adult Chinook	Jack Chinook	Clipped Steelhead	Unclipped Steelhead	Total
[1]April	34	1	2,220	1,999	4,254
May	53	7	750	947	1,757
June	70	23	125	401	619
July	57	24	120	104	305
August	13	5	317	152	487
September	63	55	299	142	559
October	95	147	376	133	751
Totals	384	263	4,205	3,878	8,730[2]

[1] Includes March 26-March 31

[2] Includes one coho

All fallback salmonids were superficially examined for condition while being released off the separator. Eighty-six percent of all adult salmonids were in good or fair condition (Table 61 and 62).

Table 61. Condition of adult salmonids released from the LGR separator, 2000-2003.

Condition	Adult Chinook	Jack Chinook	Clipped Steelhead	Unclipped Steelhead	Total
Good					
1999	153	89	3,148	1,631	5,021
2000	228	197	2,548	2,161	5,134
2001	497	305	7,508	5,149	13,459
2002	310	171	4,845	3,386	8,712
2003	289	252	2,573	2,771	5,885[1]
Fair					
1999	20	6	767	271	1,064
2000	35	3	610	449	1,097
2001	72	15	1,639	792	2,518
2002	71	7	1,632	787	2,497
2003	45	8	882	700	1,635
Poor					
1999	8	0	154	42	204
2000	4	2	171	78	255
2001	32	9	600	230	871
2002	34	3	777	326	1,140
2003	28	3	476	275	782
Dead					
1999	6	0	22	7	35
2000	1	0	20	5	26
2001	19	0	134	26	179
2002	13	2	183	54	252
2003	22	0	274	132	428

1 Includes one sockeye/kokanee in good condition.

Adult chinook, clipped and unclipped steelhead in the "Good" category has decreased steadily since 1999, with clipped steelhead having the largest drop at 15% since 1999, followed by unclipped steelhead at 12% (Table 62). Approximately 95% of the Jack Chinook in the last five years are in the "Good" category. Adults observed in "Fair" condition are less variable than other categories over the last five years. Since 1999, clipped steelhead in "Poor" condition have increased from 3.8% to 11.3%, the largest increase of any adult salmonids. The trend for unclipped steelhead is similar, though not as great. Another notable trend is the increase in percentage of dead adults observed at the juvenile separator. Clipped steelhead again had the largest increase in this category, increasing from 0.5% in 1999 to 6.5% in 2003. Unclipped steelhead increased from 0.4% to 3.4%, adult chinook from 3.2% to 5.7% and jack chinook mortalities were constant from 0.0% to 1.1%. One explanation for the decrease in adults in "Good" condition and increases in "Fair" condition may be that the biological technicians are becoming better at recognizing fish conditions with increased experience.

Table 62. Condition of adult salmonids by percent prior to release from the LGR separator, 1999-2003.

Condition	Adult Chinook	Jack Chinook	Clipped Steelhead	Unclipped Steelhead	Total
Good					
1999	81.8%	93.7%	76.9%	83.6%	79.4%
2000	85.1%	97.5%	76.1%	80.2%	78.8%
2001	80.2%	92.7%	76.0%	83.1%	79.0%
2002	72.4%	93.4%	65.1%	74.4%	69.1%
2003	75.3%	95.8%	61.2%	71.5%	67.4%
Fair					
1999	10.7%	6.3%	18.7%	13.9%	16.8%
2000	13.1%	1.5%	18.2%	16.7%	16.8%
2001	11.6%	4.6%	16.6%	12.8%	14.8%
2002	16.6%	3.8%	21.9%	17.3%	19.8%
2003	11.7%	3.0%	21.0%	18.1%	18.7%
Poor					
1999	4.3%	0.0%	3.8%	2.2%	3.2%
2000	1.5%	1.0%	5.1%	2.9%	3.9%
2001	5.2%	2.7%	6.1%	3.7%	5.1%
2002	7.9%	1.6%	10.4%	7.2%	9.0%
2003	7.3%	1.1%	11.3%	7.1%	9.0%
Dead					
1999	3.2%	0.0%	0.5%	0.4%	0.6%
2000	0.4%	0.0%	0.6%	0.2%	0.4%
2001	3.1%	0.0%	1.4%	0.4%	1.1%
2002	3.0%	1.1%	2.5%	1.2%	2.0%
2003	5.7%	0.0%	6.5%	3.4%	4.9%

Research

Five agencies conducted 13 research projects that impacted a total of 778,261 smolts. Of the smolts taken from the collection, 664,082 (85%) were anesthetized and handled but not utilized for research purposes. Of these, 721 smolts were handled and bypassed and 663,361 were handled and transported. Researchers PIT-tagged 108,637 smolts, radio-tagged or acoustic-tagged 4,653, examined 1,100 for Gas Bubble Trauma, sacrificed 492 from the general collection, handled and returned to the separator 848 and reported 492 incidental smolt mortalities (Table 63).

Table 63. Combined research smolt tallies at LGR, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tagged, bypassed	1,917	43,480	65	65	20,619	32,374	65	65	65	98,715
Tag'd, transported	0	7,185	139	2,842	744	3,665	0	0	0	14,575
Handled, bypassed	418	36	0	5	162	99	0	0	1	721
Handled,transported	282,733	6,585	13,692	46,193	290,942	5,003	2,104	518	15,591	663,361
Sacrificed	216	101	0	63	0	0	0	0	0	380
Handled (GBT)	10	1	0	0	3	3	0	0	0	17
Mortality	153	11	42	137	100	11	7	0	31	492

WDFW Gas Bubble Trauma Monitoring

The Washington Department of Fish and Wildlife (WDFW) conducted weekly Gas Bubble Trauma (GBT) examinations on fish collected from the wet separator on Tuesdays from April 9 through June 18. The examinations required inspections with a stereo dissecting microscope of the unpaired fins both eyes of sample fish for the presence of gas bubbles. We examined up to 100 fish, chinook (clipped and unclipped) or steelhead (clipped and unclipped), depending upon the numbers of fish available. A total of 1,100 salmonids were examined, including 296 clipped yearling chinook, 108 unclipped yearling chinook, 507 clipped steelhead and 169 unclipped steelhead (Table 64). Fish handled during sampling for GBT but not examined include 17 PIT-tagged fish that were netted, anesthetized and released back into the separator. Smolts examined for symptoms of GBT were released into raceways to prevent them from being diverted to the sample tank and re-anesthetized. These fish were added to daily collection counts because they were not available to the sample system. GBT staff observed only one unclipped steelhead observed with symptoms of GBT.

Table 64. Number of juveniles examined by WDFW for Gas Bubble Trauma, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Examined	296	108	20	0	507	169	0	0	0	1,100
Handled	10	1	0	0	3	3	0	0	0	17
Mortality	0	0	0	0	0	0	0	0	0	0

National Oceanic Atmospheric Administration (NOAA Fisheries): Subyearling Fall Chinook Transportation Evaluation Study

The objective for this study is to assess the survival and returns of late season transported fish. A total of 2,600 unclipped subyearling fall chinook were taken from the daily sample, PIT-tagged and transported (Table 65).

Table 65. NOAA Fisheries subyearling fall chinook transportation evaluation study, 2003.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag'd, transport	0	0	0	2,600	0	0	0	0	0	2,600
Mortality	0	0	0	0	0	0	0	0	0	0

National Oceanic Atmospheric Administration (NOAA Fisheries) : A Study to Compare the Adult Returns of In-river Migrating versus Barged Juvenile Anadromous Salmonids

The National Oceanic Atmospheric Administration (NOAA) Fisheries tagged a total of 85,720 smolts with PIT-tags for the transportation evaluation study during the spring migration from April 10 to June 7. These fish recovered from anesthesia in a raceway prior to their release. This study included 43,415 unclipped yearling chinook and 31,708 unclipped steelhead that were tagged and bypassed to the river, and 7,185 unclipped yearling chinook and 3,412 unclipped steelhead that were tagged and transported (Table 66). A total of 662,370 smolts were handled and transported but not tagged, including: 282,683 clipped yearling chinook, 20,200 unclipped yearling chinook, 46,036 subyearling fall chinook (clipped and unclipped), 290,245 clipped steelhead, 4,996 unclipped steelhead, 2,101 unclipped sockeye/kokanee, 518 clipped sockeye/kokanee and 15,591 coho.

Mortalities removed from raceways in which smolts were collected and held for tagging and those removed from raceways holding tagged fish for transportation were included with facility raceway mortalities and not research mortalities. Recovered mortalities totaled 370 smolts, including: 114 clipped yearling chinook, 46 unclipped yearling chinook, 73 subyearling fall chinook (clipped and unclipped), 92 clipped steelhead, seven unclipped steelhead, seven clipped sockeye/kokanee and 31 coho. Most of the smolts handled and tagged for this study were collected in the east raceways and tagged in the NOAA Fisheries marking trailer.

Table 66. NOAA Fisheries spring migration transportation evaluation.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag'd, Bypassed	0	43,415	0	0	0	31,708	0	0	0	75,123
Tag'd, transported	0	7,185	0	0	0	3,412	0	0	0	10,597
Handle, transport	282,683	6,558	13,642	46,036	290,245	4,996	2,101	518	15,591	662,370
Mortality	114	11	35	73	92	7	7	0	31	370

National Oceanic Atmospheric Administration (NOAA Fisheries) : A Study to Estimate Juvenile Reach Survival

This study was done to evaluate survival of juvenile salmonids between dam reaches during the spring migration period. A total of 19,950 clipped steelhead were tagged and bypassed to the river after a 24-hour recovery period (Table 67). This study was done in conjunction with the NOAA Fisheries Transportation Evaluation study.

Table 67. NOAA Fisheries reach survival.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tagged, bypass	0	0	0	0	19,950	0	0	0	0	19,950
Mortality	0	0	0	0	0	0	0	0	0	0

University of Idaho Fisheries Research Cooperative Unit (U of I): Evaluation of Physiological Condition of Transported Hatchery Yearling Chinook and Effects on Survival

University of Idaho Fishery co-op researchers used the PIT-tag separation-by-code system (SBC) to collect and sample migrating hatchery yearling chinook to evaluate the physiological response of these fish to transportation. Between April 18 and June 4, research staff sacrificed 317 hatchery yearling chinook smolts collected at the SBC holding tanks to measure physiological indices. A relatively large number (204) of other fish, both untagged and PIT-tagged were also diverted to the SBC tanks during this study, including: 117 clipped yearling chinook, 36 unclipped yearling chinook, 42 clipped steelhead, eight unclipped steelhead and one coho (Table 68). One clipped yearling chinook died as a result of handling during the tagging process. All fish were scanned for PIT-tags and tagged fish recapture events were reported to PTAGIS. All of these incidental by-catch fish were bypassed to the river.

Table 68. U of I evaluation of physiological indices of transported yearling chinook.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Sacrificed	216	101	0	0	0	0	0	0	0	317
Handled, bypass	117	36	0	0	42	8	0	0	1	204
Mortality	1	0	0	0	0	0	0	0	0	1

University of Idaho Fisheries Research Cooperative Unit (U of I): Evaluation of Physiological Condition of Transported Hatchery Subyearling Fall Chinook and Effects on Survival

This study is identical to the one utilizing yearling hatchery spring chinook, but with subyearling fall chinook. This study impacted a total of 72 smolts between June 10 and July 10. Of these, 63 hatchery subyearling fall chinook were sacrificed, three were mortalities and six were non-target fish collected at the SBC holding tanks and bypassed to the river (Table 69).

Table 69. U of I physiological indices of transported subyearling fall chinook.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Sacrificed	0	0	0	63	0	0	0	0	0	63
Handled, bypass	0	0	0	5	1	0	0	0	0	6
Mortality	0	0	0	3	0	0	0	0	0	3

University of Idaho (U of I) Kelt Study: Evaluate Steelhead (Oncorhynchus mykiss) Kelt Outmigration from Lower Granite Dam to Bonneville Dam to Assess Downstream Conversion Rates, Routes of Passage and Travel Time

U of I staff used ultrasound to identify the spawning status of adult steelhead that arrive at Lower Granite Dam bypass separator. Those determined to be kelts (post-spawned) were tagged using PIT-tags to monitor their downstream passage. From April 17 to June 13, U of I staff examined 1,774 adult steelhead of which 901 were clipped and 873 were unclipped (Table 70). Of the 1,774 adults 1,255 were PIT-tagged (572 clipped and 683 unclipped), 379 were tagged and transported (183 clipped, 196 unclipped) and 212 were radio-tagged (76 clipped, 136 unclipped).

Table 70. University of Idaho steelhead kelt study.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Examined	0	0	0	0	901	873	0	0	0	1,774
PIT-tagged	0	0	0	0	572	683	0	0	0	1,255
Radio-Tagged	0	0	0	0	76	136	0	0	0	212
Transported	0	0	0	0	183	196	0	0	0	379

United States Geological Service, Biological Resources Division (BRD): Migrational characteristics of juvenile spring chinook in the forebay of Lower Granite Dam relative to the Removable Spillway Weir (RSW)

The United States Geological Survey Biological Research Division (USGS-BRD) researchers impacted a total of 2,572 smolts between April 17 and May 29. These fish were collected at the lab, held for 24 hours in 50 gallon containers before being transported to Blyton Landing (18-20km) above Lower Granite Dam. Of the 2,572 collected smolts from the sample, 2,055 were tagged with surgically implanted radio tags and held for 24 hours to allow them to recover before being released. The tagged fish included: 1,255 clipped yearling chinook, 401 clipped steelhead and 399 unclipped steelhead. Tagged fish migration patterns and dam passage

routes were tracked using radio telemetry equipment. A total of 301 clipped yearling chinook, 114 clipped steelhead and 91 unclipped steelhead were handled and bypassed without being tagged. A total of 11 mortalities were reported during this study; 10 clipped yearling chinook and one clipped steelhead (Table 71).

Table 71. BRD migration characteristics of spring chinook relative to the RSW and LGR forebay.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag, bypass	1,255	0	0	0	401	399	0	0	0	2,055
Handle, bypass	301	0	0	0	114	91	0	0	0	506
Mortality	10	0	0	0	1	0	0	0	0	11

United States Geological Service, Biological Resources Division (BRD): Effects of Flow Augmentation on the Migrational Behavior and Survival of Juvenile Fall Chinook Salmon

USGS-BRD collected a total of 366 smolts from June 25 to August 21 from daily samples. They surgically implanted radio-tags and bypassed 26 clipped subyearling fall chinook and 192 unclipped subyearling fall chinook. In addition 33 clipped and 110 unclipped subyearling fall chinook were handled and transported without being tagged and there were five mortalities (Table 72). These fish were held for 24 hours after tagging before their release at Heller Bar on the Snake River (98 km upstream of Lower Granite Dam) at Potlatch on the Clearwater River (2-3 miles above the confluence with the Snake River) and at Lenore on the Clearwater River (98 km above Lower Granite Dam).

Table 72. BRD migrational and survival of subyearling fall chinook in the Lower Granite Pool.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tagged, bypassed	0	0	26	192	0	0	0	0	0	218
Handle, transported	0	0	33	110	0	0	0	0	0	143
Handled, bypassed	0	0	0	0	0	0	0	0	0	0
Sacrificed	0	0	0	0	0	0	0	0	0	0
Mortalities	0	0	0	5	0	0	0	0	0	5

United States Geological Service, Biological Resources Division (BRD): Migrational Characteristics of Juvenile Spring Chinook in the Tailrace of Lower Granite Dam Relative to the Removable Spillway Weir (RSW)

USGS-BRD Research staff surgically implanted radio-tags in clipped yearling chinook obtained from the sample laboratory at Lower Granite Dam. These fish were held for 24 hours prior to and after tagging and were tagged and released at Boyer Park approximately three miles downstream of Lower Granite Dam, then tracked to Little Goose Dam. A total of 397 clipped yearling chinook were radio-tagged and released during this study. Another 147 clipped yearling chinook were handled and were bypassed to the river. A total of 62 chinook were sacrificed and there were 25 mortalities from handling (Table 73).

Table 73. BRD migrational characteristics of juvenile spring chinook in the LGR tailrace relative to the RSW.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag, bypass	397	0	0	0	0	0	0	0	0	397
Handle,transported	0	0	0	0	0	0	0	0	0	0
Mortality	25	0	0	0	0	0	0	0	0	25

United States Geological Service, Biological Resources Division (BRD): Migrational characteristics of juvenile spring chinook in the forebay of Lower Granite Dam relative to the Removable Spillway Weir (RSW) using 3-D Sonic acoustics

This study was done to evaluate fish behavior and travel time through the Lower Granite Dam forebay under low spill conditions in conjunction with the RSW. From April 22 through May 29, 614 smolts were taken from the sample by USGS-BRD. Of these 200 clipped yearling chinook, 203 clipped steelhead and 202 unclipped steelhead were radio-tagged and bypassed into the forebay just upstream from the RSW, five were handled and bypassed and there were four mortalities (Table 74). This test was done to determine if low levels of spill for the RSW entrained juvenile chinook in the tailrace of Lower Granite Dam and was done in conjunction with the main study of the Removable Spillway Weir.

Table 74. BRD 3-D Sonic Acoustics evaluations of characteristics of juvenile spring chinook relative to the RSW.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag, bypass.	200	0	0	0	203	202	0	0	0	605
Handle, bypass	0	0	0	0	5	0	0	0	0	5
Sacrificed	0	0	0	0	0	0	0	0	0	0
Mortality	3	0	0	0	0	1	0	0	0	4

Oregon State University (OSU): Effect of Transportation on Survival and Migration of Juvenile Steelhead and Subyearling Fall Chinook

This is a two-part study to evaluate the survival and migratory behavior of juvenile steelhead (part 1) and subyearling fall chinook (part 2) as they exit the Columbia River system. The two studies were conducted from May 1 to July 15.

Part 1: OSU staff collected a total of 2,072 smolts from the wet separator and from NOAA Fisheries. A total of 1,264 smolts (267 subyearling fall chinook and 997 steelhead) were radio-tagged and transported. Another 764 smolts were handled, not tagged, and transported. There were 44 mortalities as a result of handling. Incidental fish captured were released back to the separator.

Part 2: OSU staff collected a total of 232 smolts from the wet separator and from NOAA Fisheries. A total of 52 clipped and 62 unclipped subyearling fall chinook were radio-tagged and transported. Another 84 smolts were handled, not tagged, and transported. There were 34

mortalities as a result of handling (Table 75). Incidental fish captured were released back to the separator.

Table 75. Effect of transportation on survival and migration of juvenile steelhead and subyearling fall chinook.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sock/Kokanee		Coho	
	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip	All	Total
Tag,transport	0	0	139	242	744	253	0	0	0	1,378
Handle,transport	50	27	17	47	697	7	3	0	0	848
Mortalities	0	0	7	61	7	3	0	0	0	78

References

NMFS. 1995. Endangered Species Act Section 7 Reinitiation of Consultation regarding 1994-1998 Operation of the Federal Columbia River System and Juvenile Transportation Program in 1994 and Future Years. Available from: NMFS, Northwest Region, 7600 Sand Pont Way N.E., BIN C15700 Bldg. 1, Seattle, Washington 98115.

Appendix 1

Table 1. Daily Smolt Collection Counts, 2003

Page 1.

Daily Number of Fish Collected

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
26-Mar	340	30	680	0	0	0	50	20	210	10	0	0	0	0	1,340
27-Mar	610	10	930	0	0	0	40	30	270	0	10	0	0	0	1,900
28-Mar	1,040	100	810	0	0	0	60	60	380	0	0	0	0	0	2,450
29-Mar	1,380	20	920	0	0	0	50	60	680	0	0	0	0	0	3,110
30-Mar	700	70	670	0	0	0	100	30	500	10	0	0	0	0	2,080
31-Mar	590	60	500	0	0	0	0	40	450	0	10	0	0	0	1,650
1-Apr	1,370	110	1,450	0	0	0	140	130	600	0	0	0	0	0	3,800
2-Apr	2,880	260	3,780	0	0	0	20	570	1,560	0	20	0	0	20	9,110
3-Apr	4,600	280	4,940	0	0	0	120	600	1,220	0	20	0	0	20	11,800
4-Apr	3,940	240	6,660	0	0	0	120	1,400	980	0	0	0	0	0	13,340
5-Apr	3,160	160	6,080	0	0	0	40	1,740	960	0	0	0	0	0	12,140
6-Apr	2,300	180	3,040	0	0	0	80	2,100	840	0	0	0	0	0	8,540
7-Apr	2,140	140	3,760	0	0	0	0	1,620	880	0	20	0	0	60	8,620
8-Apr	2,260	80	2,300	0	0	0	80	1,700	880	0	0	0	0	0	7,300
9-Apr	1,240	20	1,220	0	0	0	0	1,040	660	0	0	0	0	0	4,180
10-Apr	1,040	200	1,220	0	0	0	100	1,180	360	0	0	0	0	0	4,100
11-Apr	1,040	120	1,280	0	0	0	240	1,380	780	0	0	0	0	0	4,840
12-Apr	2,820	160	4,280	0	0	0	80	1,660	620	0	0	0	0	0	9,620
13-Apr	5,280	580	5,400	0	0	0	20	1,320	1,020	0	40	0	0	0	13,660
14-Apr	10,280	1,200	14,440	0	0	0	120	1,900	1,280	0	0	0	0	0	29,220
15-Apr	6,150	200	9,100	0	0	0	300	4,350	3,050	0	0	0	0	0	23,150
16-Apr	6,550	1,050	6,600	0	0	0	100	7,450	3,400	0	0	0	0	0	25,150
17-Apr	16,050	1,850	11,400	0	0	0	250	11,900	7,200	0	0	0	0	0	48,650
18-Apr	12,550	2,000	7,700	0	0	0	0	11,550	11,200	0	0	0	0	0	45,000
19-Apr	12,700	800	12,600	0	0	0	0	10,000	8,100	0	100	0	0	100	44,400
20-Apr	15,600	2,900	11,000	0	0	0	0	14,500	7,600	0	0	0	0	0	51,600
21-Apr	17,600	1,400	8,300	0	0	0	100	14,900	3,100	0	0	0	0	0	45,400
22-Apr	33,500	2,600	11,800	0	0	0	100	20,100	4,100	0	0	0	0	0	72,200
23-Apr	47,612	3,134	17,612	0	0	0	0	15,522	3,284	0	0	0	0	0	87,164
24-Apr	47,463	3,731	20,597	0	0	0	299	22,239	2,985	0	0	0	0	0	97,314
25-Apr	77,910	3,731	18,507	0	0	0	0	67,313	4,478	0	149	0	0	0	172,088
26-Apr	46,418	3,582	7,910	0	0	0	0	65,522	6,418	0	0	0	0	0	129,850
27-Apr	97,164	6,866	22,388	0	0	0	149	52,687	7,463	0	0	0	149	448	187,314
28-Apr	63,284	3,433	18,209	0	0	0	149	84,179	13,433	0	0	0	0	149	182,836
29-Apr	35,522	3,582	6,866	0	0	0	0	35,672	9,104	0	0	0	0	149	90,895
30-Apr	46,418	3,433	4,478	0	0	0	149	57,910	9,552	0	149	0	0	0	122,089
1-May	56,269	2,090	17,015	0	0	0	149	34,925	7,463	0	0	0	0	0	117,911
2-May	38,657	2,537	8,507	0	0	0	0	38,209	6,418	0	0	0	149	0	94,477
3-May	36,716	746	7,910	0	0	0	0	18,209	5,075	0	0	0	0	299	68,955
4-May	55,970	2,537	12,985	0	0	0	0	18,507	4,030	0	0	0	0	149	94,178
5-May	46,269	1,642	8,955	0	0	0	0	20,149	4,478	0	0	0	0	299	81,792
6-May	138,657	6,418	31,343	0	0	0	0	37,612	7,313	0	299	0	0	299	221,941
7-May	88,955	5,075	14,478	0	0	0	0	21,493	6,418	0	0	0	0	0	136,419
8-May	97,910	4,925	14,925	0	0	0	0	30,149	8,358	0	0	0	0	149	156,416
9-May	64,776	1,791	8,209	0	0	0	0	43,284	9,552	0	0	0	0	0	127,612
10-May	28,358	1,940	3,284	0	0	0	0	22,388	6,269	0	0	149	0	149	62,537

Table 1. Daily Smolt Collection Counts, 2003

Page 2.

Daily Number of Fish Collected

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
11-May	38,507	1,045	4,030	0	0	0	0	61,194	9,254	0	0	0	149	149	114,328
12-May	31,194	1,642	2,836	0	0	0	149	32,537	4,478	0	0	0	0	448	73,284
13-May	67,761	3,433	6,269	0	0	0	0	23,881	2,836	0	0	0	0	0	104,180
14-May	60,896	3,582	6,119	0	0	0	299	24,328	7,313	0	0	0	0	149	102,686
15-May	35,970	1,194	4,776	0	0	0	149	31,642	6,866	0	149	0	0	149	80,895
16-May	44,030	1,343	5,373	0	0	0	0	37,910	12,836	0	0	0	0	1,045	102,537
17-May	70,746	2,239	12,388	0	0	0	0	47,761	15,224	0	0	149	149	2,687	151,343
18-May	92,537	3,731	13,284	0	0	0	149	61,791	18,507	0	0	149	448	3,881	194,477
19-May	34,925	1,045	8,806	0	0	0	0	70,597	18,060	0	0	448	1,045	4,776	139,702
20-May	28,060	2,687	9,552	0	0	0	149	52,985	15,522	0	0	0	149	2,388	111,492
21-May	20,597	1,045	5,522	0	0	0	0	25,075	8,657	0	0	0	149	1,493	62,538
22-May	10,299	448	4,179	0	0	0	0	35,672	14,328	299	0	149	0	746	66,120
23-May	7,164	448	5,224	0	0	0	149	26,269	7,313	0	0	0	0	1,343	47,910
24-May	6,200	600	5,000	0	0	0	0	32,300	11,300	0	0	200	500	800	56,900
25-May	10,100	500	7,600	0	0	0	0	43,300	13,500	100	100	0	300	2,900	78,400
26-May	17,400	1,500	16,300	500	0	3,000	100	82,600	21,200	0	100	100	1,000	5,700	149,500
27-May	17,612	1,343	19,403	1,493	0	597	597	122,687	20,000	149	149	149	1,642	9,851	195,672
28-May	9,254	1,045	11,493	1,194	0	149	149	101,045	14,179	448	299	299	746	8,507	148,807
29-May	4,925	597	7,612	3,731	0	1,493	299	40,299	11,493	299	448	149	149	1,791	73,285
30-May	2,537	299	5,075	3,433	0	746	149	15,373	7,164	1,493	0	149	448	2,090	38,956
31-May	1,493	149	1,493	10,149	8,507	17,612	448	22,090	6,269	896	0	149	448	1,343	71,046
1-Jun	746	448	1,045	3,582	8,806	12,239	149	11,493	5,075	597	0	448	149	1,940	46,717
2-Jun	700	0	1,300	4,500	5,200	7,800	100	13,500	3,700	500	100	700	300	1,100	39,500
3-Jun	1,100	0	600	2,800	3,000	6,500	100	7,100	3,400	500	0	300	300	1,600	27,300
4-Jun	500	100	300	2,500	2,100	4,900	500	2,700	1,800	700	100	0	0	800	17,000
5-Jun	750	50	500	2,350	3,000	4,050	300	3,850	2,250	350	100	50	350	1,200	19,150
6-Jun	400	0	300	2,150	2,350	5,250	450	2,250	1,750	250	0	0	0	700	15,850
7-Jun	700	0	550	1,950	4,950	7,300	200	2,000	1,500	100	100	0	200	650	20,200
8-Jun	850	50	400	3,900	14,400	15,600	250	3,200	1,350	100	50	0	300	1,200	41,650
9-Jun	1,000	150	500	3,000	15,750	17,550	150	2,100	1,250	50	0	50	50	1,100	42,700
10-Jun	600	0	200	3,800	19,500	23,000	250	2,750	2,050	50	0	50	50	550	52,850
11-Jun	400	0	300	2,550	19,400	14,600	50	1,150	650	0	0	50	100	400	39,650
12-Jun	900	0	350	2,500	19,950	23,500	50	2,350	800	50	0	0	100	300	50,850
13-Jun	850	0	500	1,800	10,200	15,750	50	2,150	1,750	0	50	50	150	500	33,800
14-Jun	450	50	250	850	6,400	8,800	50	1,750	900	0	50	0	0	450	20,000
15-Jun	150	0	150	1,600	7,400	12,800	0	1,050	400	0	50	0	50	500	24,150
16-Jun	200	0	175	1,950	6,550	7,925	50	775	375	50	0	0	25	100	18,175
17-Jun	75	0	50	2,175	5,350	9,225	50	1,075	525	0	0	0	0	25	18,550
18-Jun	125	25	25	2,475	7,550	9,225	75	1,000	375	0	0	0	50	225	21,150
19-Jun	200	0	25	2,400	5,050	8,275	25	850	475	0	0	0	50	350	17,700
20-Jun	100	50	75	2,075	4,325	8,350	75	450	425	0	0	0	0	200	16,125
21-Jun	125	50	25	7,225	14,825	24,750	25	850	375	0	0	50	100	675	49,075
22-Jun	300	0	200	7,750	23,150	27,350	0	1,100	250	0	0	0	150	350	60,600
23-Jun	300	50	0	4,650	13,000	19,250	0	1,000	350	0	0	0	50	350	39,000
24-Jun	150	100	50	4,000	9,850	14,800	50	1,200	700	0	0	0	0	150	31,050
25-Jun	150	50	100	4,650	11,600	17,400	0	1,000	100	0	0	0	50	300	35,400
26-Jun	250	0	50	1,850	6,200	9,600	0	500	250	0	0	0	0	150	18,850
27-Jun	0	0	200	2,550	8,600	16,300	50	550	200	0	50	0	50	350	28,900
28-Jun	50	0	0	1,800	5,950	11,600	0	500	50	0	0	0	0	50	20,000
29-Jun	50	0	0	1,050	4,800	7,750	0	350	100	0	0	0	100	250	14,450

Table 1. Daily Smolt Collection Counts, 2003
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Daily Number of Fish Collected

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
30-Jun	0	0	100	950	5,450	12,650	0	1,150	150	0	0	0	100	1,000	21,550
1-Jul	100	50	100	600	5,650	8,550	0	450	50	0	0	0	0	50	15,600
2-Jul	0	0	27	1,011	10,410	20,628	0	246	27	0	0	0	0	82	32,431
3-Jul	0	0	0	550	7,500	22,400	0	300	0	0	0	0	0	100	30,850
4-Jul	0	50	100	250	5,500	15,650	0	500	50	0	0	0	0	100	22,200
5-Jul	150	0	150	650	5,600	14,700	0	50	50	0	0	0	50	50	21,450
6-Jul	100	0	50	500	4,650	15,150	0	100	100	0	0	0	0	0	20,650
7-Jul	0	0	50	350	1,600	6,050	0	50	0	0	0	0	0	250	8,350
8-Jul	25	0	0	200	2,025	5,725	0	300	75	0	25	0	0	100	8,475
9-Jul	0	0	25	575	4,975	16,075	0	625	0	0	0	0	25	425	22,725
10-Jul	0	0	0	425	3,800	12,900	0	250	125	0	0	0	100	275	17,875
11-Jul	0	0	25	150	4,900	12,750	0	200	50	0	0	0	25	100	18,200
12-Jul	0	0	25	100	1,950	7,750	0	250	25	0	0	0	25	300	10,425
13-Jul	50	0	0	25	775	3,625	0	225	25	0	0	0	0	25	4,750
14-Jul	10	0	0	70	810	3,440	0	80	10	0	0	0	0	60	4,480
15-Jul	20	0	10	50	2,200	8,000	0	80	90	10	0	0	10	60	10,530
16-Jul	0	0	0	70	540	3,110	0	90	10	0	0	0	10	20	3,850
17-Jul	0	0	10	100	1,510	6,190	0	320	50	0	0	0	0	80	8,260
18-Jul	20	0	20	190	1,330	5,470	0	170	30	0	0	0	0	50	7,280
19-Jul	40	0	10	170	1,730	7,620	0	90	30	0	0	20	10	50	9,770
20-Jul	10	0	10	160	1,460	7,180	0	110	30	0	0	10	0	110	9,080
21-Jul	20	0	30	20	1,020	4,380	0	60	40	0	0	0	10	70	5,650
22-Jul	0	0	0	60	620	3,880	0	120	0	0	0	0	10	20	4,710
23-Jul	10	0	10	30	530	3,030	0	170	50	0	0	0	0	40	3,870
24-Jul	0	0	0	40	280	1,460	0	180	40	0	0	0	10	10	2,020
25-Jul	0	0	0	30	225	1,340	0	105	55	0	0	0	0	30	1,785
26-Jul	0	0	5	40	190	935	0	85	70	0	0	0	15	15	1,355
27-Jul	0	0	0	10	175	775	0	130	25	0	0	0	5	20	1,140
28-Jul	0	0	0	15	165	755	0	145	25	0	0	0	5	20	1,130
29-Jul	0	0	5	10	150	785	0	125	35	0	0	0	0	20	1,130
30-Jul	0	0	0	0	135	665	0	160	15	0	0	0	0	15	990
31-Jul	0	0	0	10	140	635	0	110	50	0	0	0	5	15	965
1-Aug	0	0	0	10	260	890	0	90	30	0	0	0	0	45	1,325
2-Aug	0	0	0	0	245	900	0	105	25	0	0	0	0	5	1,280
3-Aug	5	0	0	10	530	2,075	0	100	15	0	0	0	5	15	2,755
4-Aug	0	0	5	5	905	3,565	0	135	20	0	0	0	0	30	4,665
5-Aug	0	0	0	60	920	3,595	0	55	10	0	0	0	0	15	4,655
6-Aug	0	0	0	23	895	2,800	0	42	5	0	0	0	9	9	3,783
7-Aug	0	0	0	10	575	2,055	0	35	5	0	0	0	5	20	2,705
8-Aug	0	0	0	10	320	1,405	5	50	20	0	0	0	0	35	1,845
9-Aug	0	0	5	5	370	1,625	0	40	5	0	0	0	5	35	2,090
10-Aug	0	0	0	5	560	2,365	0	70	15	0	0	0	10	45	3,070
11-Aug	0	0	0	0	300	1,580	0	50	10	0	0	0	15	50	2,005
12-Aug	0	0	0	5	270	1,350	0	30	15	0	0	0	5	20	1,695
13-Aug	0	0	0	0	210	940	0	15	5	0	0	0	5	20	1,195
14-Aug	0	0	0	10	230	1,190	0	15	10	0	0	0	15	20	1,490
15-Aug	0	0	0	0	125	750	0	45	0	0	0	0	10	25	955
16-Aug	0	0	5	5	285	1,375	0	40	5	0	0	0	10	55	1,780
17-Aug	0	0	0	0	230	1,175	0	30	10	0	0	0	0	10	1,455

Table 1. Daily Smolt Collection Counts, 2003
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Daily Number of Fish Collected

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
18-Aug	5	0	0	5	155	635	0	10	5	0	0	0	0	25	840
19-Aug	0	0	0	10	145	705	0	10	0	0	0	0	10	5	885
20-Aug	0	0	0	15	135	625	0	45	5	0	0	0	0	15	840
21-Aug	0	0	0	0	68	296	0	32	8	0	0	0	0	4	408
22-Aug	0	0	0	4	92	252	0	24	12	0	0	0	0	4	388
23-Aug	0	0	0	0	100	740	0	4	4	0	0	4	0	4	856
24-Aug	0	0	0	0	120	548	0	16	0	0	0	0	0	0	684
25-Aug	0	0	0	0	132	336	0	4	8	0	4	4	0	0	488
26-Aug	0	0	0	0	124	340	0	8	4	0	0	0	0	0	476
27-Aug	0	0	0	4	120	308	0	16	12	0	0	0	0	0	460
28-Aug	0	0	0	4	164	304	0	8	4	0	0	0	0	4	488
29-Aug	0	0	4	0	68	156	0	4	0	0	0	4	0	4	240
30-Aug	0	0	0	4	20	56	0	0	4	0	0	0	0	0	84
31-Aug	0	0	0	0	24	20	0	12	0	0	0	0	0	0	56
1-Sep	0	0	0	0	36	52	0	8	4	0	0	0	0	0	100
2-Sep	0	0	0	0	23	74	0	9	1	0	0	0	0	2	109
3-Sep	0	0	1	0	13	66	0	11	5	0	0	0	0	0	96
4-Sep	0	0	0	2	42	146	0	14	4	0	0	0	0	2	210
5-Sep	0	0	0	0	69	230	0	31	6	0	0	0	0	3	339
6-Sep	0	0	0	0	59	202	0	20	7	0	0	0	1	4	293
7-Sep	0	0	0	1	58	143	0	20	14	0	0	0	3	0	239
8-Sep	0	0	0	3	54	364	0	25	8	0	0	0	0	3	457
9-Sep	0	0	0	1	42	247	0	17	7	0	0	0	0	2	316
10-Sep	0	0	0	1	53	263	0	16	9	0	0	0	0	3	345
11-Sep	0	0	0	1	42	161	0	13	5	0	0	0	0	3	225
12-Sep	0	2	0	0	32	112	0	13	4	0	0	0	0	1	164
13-Sep	0	0	0	0	33	110	0	16	7	0	0	0	0	0	166
14-Sep	0	0	0	0	35	122	0	5	1	0	0	0	0	0	163
15-Sep	0	0	1	0	37	134	0	4	5	0	0	0	0	0	181
16-Sep	0	1	1	0	18	51	0	4	1	0	0	0	0	2	78
17-Sep	0	0	0	2	10	67	0	4	0	0	0	0	1	0	84
18-Sep	0	0	0	1	22	82	0	3	1	0	0	0	0	0	109
19-Sep	0	0	0	0	18	96	0	2	2	0	0	0	0	1	119
20-Sep	1	0	0	0	13	67	0	3	0	0	0	0	0	1	85
21-Sep	0	0	1	0	9	22	0	3	0	0	0	0	0	1	36
22-Sep	0	0	1	0	4	28	0	2	0	0	0	0	0	0	35
23-Sep	1	1	0	0	27	72	0	2	0	0	0	0	0	0	103
24-Sep	2	0	1	0	31	119	0	11	0	0	0	0	0	0	164
25-Sep	1	0	2	0	88	436	0	4	2	0	0	0	0	0	533
26-Sep	2	0	1	1	101	396	0	4	1	0	0	0	0	1	507
27-Sep	3	0	0	0	42	209	0	2	0	0	0	0	0	0	256
28-Sep	2	1	1	0	55	283	0	6	1	0	0	0	0	2	351
29-Sep	0	0	1	1	71	330	0	1	0	0	0	0	0	0	404
30-Sep	0	0	0	0	26	166	0	1	1	0	0	0	0	0	194
1-Oct	3	0	0	0	37	266	0	2	1	0	0	0	0	0	309
2-Oct	0	0	1	1	39	264	0	5	7	0	0	0	0	3	320
3-Oct	0	0	0	2	57	416	0	2	1	0	0	0	0	2	480
4-Oct	0	0	0	2	63	314	0	1	4	0	0	0	0	0	384
5-Oct	0	0	0	0	57	400	0	2	0	0	0	0	0	1	460

Table 1. Daily Smolt Collection Counts, 2003

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Daily Number of Fish Collected

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
6-Oct	1	0	1	0	53	385	0	2	0	0	0	0	1	2	445
7-Oct	2	0	0	0	59	375	0	2	0	0	0	0	0	0	438
8-Oct	1	0	0	0	64	460	0	1	2	0	0	1	0	0	529
9-Oct	1	0	0	0	34	311	0	0	1	0	0	0	0	0	347
10-Oct	0	0	0	0	17	203	0	0	0	0	0	0	0	0	220
11-Oct	0	0	0	0	30	142	0	3	0	0	0	0	0	0	175
12-Oct	0	0	0	1	6	63	0	0	1	0	0	0	0	1	72
13-Oct	0	0	0	0	44	305	0	4	0	0	1	0	0	0	354
14-Oct	0	1	0	1	58	310	0	1	0	0	1	0	0	1	373
15-Oct	1	0	0	0	45	258	0	2	0	0	0	0	0	0	306
16-Oct	0	0	0	2	108	618	0	3	0	0	0	0	0	0	731
17-Oct	0	0	3	2	80	438	0	9	1	0	0	0	0	0	533
18-Oct	1	0	0	0	64	392	0	0	0	0	0	0	0	0	457
19-Oct	1	1	2	3	86	680	0	3	0	0	0	0	0	1	777
20-Oct	0	0	0	2	57	387	0	0	0	0	1	0	0	1	448
21-Oct	0	0	0	1	65	415	0	1	0	0	0	0	0	0	482
22-Oct	0	0	1	0	73	544	0	2	0	0	0	0	0	0	620
23-Oct	0	0	0	0	79	426	0	1	0	0	0	0	0	0	506
24-Oct	0	0	0	0	36	235	0	0	0	0	0	0	0	0	271
25-Oct	0	0	0	0	36	175	0	0	0	0	1	0	0	1	213
26-Oct	0	0	0	0	20	180	0	1	0	0	0	0	0	0	201
27-Oct	0	0	0	0	32	177	0	1	1	0	0	0	0	0	211
28-Oct	0	1	1	0	30	157	0	0	0	0	1	0	0	2	192
29-Oct	0	0	0	1	32	108	0	1	0	0	0	0	1	1	144
30-Oct	0	0	0	1	19	159	0	1	1	0	0	0	0	1	182
31-Oct	1	0	0	0	49	208	0	3	2	3	0	1	0	1	268
Totals	**1,909,005**	**109,209**	**558,393**	**114,580**	**367,097**	**678,866**	**9,045**	**1,869,721**	**466,216**	**7,014**	**2,746**	**4,031**	**10,870**	**75,171**	**6,181,964**

Table 2. Daily Number of Fish Transported from Lower Granite Dam, 2003

Page 1.

Daily Number of Fish Transported

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
26-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Mar	945	40	1,598	0	0	0	89	50	480	10	10	0	0	0	3,222
28-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Mar	2,321	116	1,636	0	0	0	108	120	1,047	0	0	0	0	0	5,348
30-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Mar	1,251	126	1,137	0	0	0	100	70	947	8	10	0	0	0	3,649
1-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Apr	4,229	370	5,222	0	0	0	160	699	2,160	0	20	0	0	20	12,880
3-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Apr	8,495	514	11,570	0	0	0	240	2,000	2,197	0	20	0	0	20	25,056
5-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Apr	5,360	334	8,944	0	0	0	119	3,835	1,797	0	0	0	0	0	20,389
7-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr	4,356	213	6,050	0	0	0	79	3,320	1,759	0	19	0	0	60	15,856
9-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Apr	2,278	218	2,012	0	0	0	99	1,914	675	0	0	0	0	0	7,196
11-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Apr	3,843	275	4,667	0	0	0	320	2,338	688	0	0	0	0	0	12,131
13-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Apr	15,493	1,776	19,821	0	0	0	140	3,220	2,299	0	39	0	0	0	42,788
15-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Apr	12,693	1,249	12,905	0	0	0	400	11,280	6,168	0	0	0	0	0	44,695
17-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Apr	28,369	3,845	17,253	0	0	0	249	22,857	17,525	0	0	0	0	0	90,098
19-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Apr	28,122	3,695	22,901	0	0	0	0	24,199	14,552	0	97	0	0	100	93,666
21-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Apr	50,961	4,000	18,841	0	0	0	200	34,617	6,716	0	0	0	0	0	115,335
23-Apr	47,529	3,135	15,318	0	0	0	0	15,168	2,814	0	0	0	0	0	83,964
24-Apr	47,247	3,730	18,901	0	0	0	299	21,780	2,755	0	0	0	0	0	94,712
25-Apr	77,793	3,729	16,720	0	0	0	0	66,960	4,359	0	145	0	0	0	169,706
26-Apr	46,283	3,582	7,060	0	0	0	0	65,137	6,324	0	0	0	0	0	128,386
27-Apr	97,063	6,862	22,378	0	0	0	149	52,669	7,450	0	0	0	149	448	187,168
28-Apr	63,136	3,426	18,183	0	0	0	149	84,152	13,424	0	0	0	0	149	182,619
29-Apr	35,417	3,580	5,529	0	0	0	0	34,952	8,838	0	0	0	0	149	88,465
30-Apr	46,034	3,402	3,865	0	0	0	149	57,200	9,358	0	148	0	0	0	120,156
1-May	56,124	2,087	16,633	0	0	0	149	34,196	7,250	0	0	0	0	0	116,439
2-May	38,536	2,531	7,714	0	0	0	0	37,612	6,132	0	0	0	148	0	92,673
3-May	36,595	745	7,158	0	0	0	0	17,545	4,878	0	0	0	0	299	67,220
4-May	55,887	2,533	12,982	0	0	0	0	18,492	4,017	0	0	0	0	149	94,060
5-May	46,181	1,640	8,950	0	0	0	0	20,128	4,460	0	0	0	0	299	81,658
6-May	138,488	6,415	30,416	0	0	0	0	36,851	7,080	0	299	0	0	299	219,848
7-May	88,924	5,077	13,262	0	0	0	0	20,779	6,238	0	0	0	0	0	134,280
8-May	97,708	4,922	12,793	0	0	0	0	29,372	7,568	0	0	0	0	149	152,512
9-May	64,688	1,791	6,937	0	0	0	0	42,524	9,335	0	0	0	0	0	125,275
10-May	28,280	1,940	2,666	0	0	0	0	21,631	5,195	0	0	149	0	148	60,009
11-May	38,437	1,044	4,030	0	0	0	0	61,174	9,236	0	0	0	149	149	114,219

Table 2. Daily Number of Fish Transported from Lower Granite Dam, 2003
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Daily Number of Fish Transported

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
12-May	31,127	1,642	2,833	0	0	0	147	32,512	4,461	0	0	0	0	448	73,170
13-May	67,632	3,429	5,653	0	0	0	0	23,187	1,891	0	0	0	0	0	101,792
14-May	60,764	3,583	5,324	0	0	0	299	23,665	6,630	0	0	0	0	148	100,413
15-May	35,819	1,192	4,326	0	0	0	149	30,930	5,840	0	147	0	0	149	78,552
16-May	43,914	1,343	4,892	0	0	0	0	37,196	12,008	0	0	0	0	1,045	100,398
17-May	70,591	2,236	11,681	0	0	0	0	47,049	14,030	0	0	149	149	2,687	148,572
18-May	92,222	3,724	13,248	0	0	0	149	61,756	18,481	0	0	149	447	3,879	194,055
19-May	34,804	1,044	8,789	0	0	0	0	70,561	18,037	0	0	448	1,045	4,774	139,502
20-May	27,953	2,687	8,674	0	0	0	149	52,455	13,171	0	0	0	149	2,386	107,624
21-May	20,551	1,046	4,356	0	0	0	0	24,601	6,914	0	0	0	149	1,493	59,110
22-May	10,221	448	3,266	0	0	0	0	35,153	11,953	299	0	149	0	746	62,235
23-May	7,050	448	4,599	0	0	0	149	25,749	5,038	0	0	0	0	1,343	44,376
24-May	6,097	598	4,011	0	0	0	0	31,770	9,732	0	0	200	500	794	53,702
25-May	10,025	500	6,685	0	0	0	0	43,270	12,685	100	93	0	300	2,900	76,558
26-May	17,334	1,499	16,296	499	0	3,000	99	82,574	21,179	0	100	100	1,000	5,700	149,380
27-May	17,240	1,338	16,494	1,480	0	592	593	122,127	18,192	149	149	145	1,633	9,815	189,947
28-May	9,096	1,045	10,658	1,188	0	146	139	100,672	13,235	445	293	299	742	8,488	146,446
29-May	4,755	593	6,969	3,688	0	1,487	298	39,870	10,423	297	448	145	134	1,707	70,814
30-May	2,388	285	3,010	3,287	0	729	147	14,969	6,440	1,490	0	142	442	2,073	35,402
31-May	1,425	146	116	9,556	8,381	17,438	446	21,690	5,404	887	0	145	443	1,324	67,401
1-Jun	694	448	35	2,914	8,603	12,000	149	11,321	4,583	580	0	424	146	1,878	43,775
2-Jun	668	0	1,285	4,171	5,031	7,622	100	13,356	3,667	471	94	692	294	1,065	38,516
3-Jun	1,080	0	97	2,653	2,933	6,412	99	6,800	2,915	495	0	293	297	1,572	25,646
4-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Jun	1,220	149	0	4,772	5,068	8,896	791	6,216	3,155	1,043	200	49	345	1,964	33,868
6-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Jun	1,077	0	0	4,029	7,262	12,484	647	3,811	2,337	346	100	0	198	1,326	33,617
8-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Jun	1,839	199	717	6,770	29,996	32,921	398	5,408	2,658	148	50	44	348	2,289	83,785
10-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Jun	999	0	497	6,197	38,377	37,088	297	4,021	2,760	50	0	95	148	946	91,475
12-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jun	1,742	0	846	4,124	29,746	38,800	98	4,493	2,544	49	50	50	249	794	83,585
14-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Jun	597	48	400	2,422	13,696	21,467	50	2,794	1,298	0	100	0	48	946	43,866
16-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Jun	270	0	223	4,053	11,746	16,857	100	1,840	895	50	0	0	25	124	36,183
18-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jun	325	25	50	4,853	12,542	17,403	100	1,916	878	0	0	0	98	573	38,763
20-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Jun	220	99	99	9,199	18,880	32,639	100	1,279	794	0	0	50	96	870	64,325
22-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Jun	595	49	199	12,211	35,685	45,845	0	2,078	596	0	0	0	198	695	98,151
24-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Jun	295	150	148	8,608	21,318	31,899	50	2,180	795	0	0	0	50	449	65,942
26-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Jun	250	0	249	4,399	14,784	25,911	50	1,046	446	0	50	0	47	500	47,732
28-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Jun	98	0	0	2,835	10,741	19,310	0	848	144	0	0	0	99	300	34,375
30-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Jul	97	48	197	1,544	11,066	21,098	0	1,597	200	0	0	0	100	1,048	36,995

Table 2. Daily Number of Fish Transported from Lower Granite Dam, 2003
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Daily Number of Fish Transported

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
2-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Jul	0	0	6	1,394	16,233	40,007	0	466	19	0	0	0	0	169	58,294
4-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Jul	130	49	242	873	10,854	29,586	0	538	98	0	0	0	50	150	42,570
6-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Jul	99	0	99	834	6,070	20,668	0	142	96	0	0	0	0	250	28,258
8-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Jul	23	0	23	751	6,841	21,355	0	914	68	0	21	0	25	521	30,542
10-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Jul	0	0	22	556	8,559	25,144	0	437	161	0	0	0	123	368	35,370
12-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jul	38	0	24	99	2,485	10,712	0	463	41	0	0	0	25	318	14,205
14-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Jul	29	0	9	117	2,993	11,380	0	153	97	8	0	0	9	120	14,915
16-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Jul	0	0	10	160	1,984	9,063	0	403	57	0	0	0	10	98	11,785
18-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jul	56	0	30	354	3,035	12,982	0	259	57	0	0	20	10	99	16,902
20-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Jul	29	0	40	178	2,459	11,426	0	169	67	0	0	10	10	180	14,568
22-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Jul	9	0	8	80	1,112	6,740	0	287	48	0	0	0	10	60	8,354
24-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Jul	0	0	0	65	473	2,668	0	276	91	0	0	0	10	40	3,623
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Jul	0	0	5	46	352	1,617	0	214	90	0	0	0	20	35	2,379
28-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Jul	0	0	5	20	306	1,471	0	268	57	0	0	0	5	40	2,172
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Jul	0	0	0	10	272	1,264	0	270	62	0	0	0	5	29	1,912
1-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Aug	0	0	0	10	499	1,756	0	192	54	0	0	0	0	50	2,561
3-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Aug	4	0	5	13	1,425	5,582	0	234	35	0	0	0	5	45	7,348
5-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Aug	0	0	0	80	1,794	6,330	0	96	14	0	0	0	8	22	8,344
7-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Aug	0	0	0	19	879	3,407	5	85	24	0	0	0	5	55	4,479
9-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Aug	0	0	5	10	913	3,954	0	109	20	0	0	0	14	76	5,101
11-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Aug	0	0	0	5	559	2,910	0	80	25	0	0	0	20	68	3,667
13-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Aug	0	0	0	9	436	2,113	0	30	14	0	0	0	20	40	2,662
15-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Aug	0	0	5	5	398	2,097	0	83	5	0	0	0	20	79	2,692
17-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Aug	4	0	0	2	380	1,788	0	40	14	0	0	0	0	35	2,263
19-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Aug	0	0	0	23	275	1,300	0	55	5	0	0	0	10	19	1,687
21-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2. Daily Number of Fish Transported from Lower Granite Dam, 2003
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Daily Number of Fish Transported

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
22-Aug	0	0	0	4	158	533	0	56	19	0	0	0	0	8	778
23-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24-Aug	0	0	0	0	216	1,278	0	20	4	0	0	4	0	4	1,526
25-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Aug	0	0	0	0	254	668	0	12	12	0	3	4	0	0	953
27-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Aug	0	0	0	8	282	600	0	23	16	0	0	0	0	4	933
29-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-Aug	0	0	4	4	86	209	0	4	4	0	0	4	0	4	319
31-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Sep	0	0	0	0	57	71	0	20	4	0	0	0	0	0	152
2-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Sep	0	0	1	0	32	135	0	12	5	0	0	0	0	2	187
4-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Sep	0	0	0	2	107	360	0	0	0	0	0	0	0	5	474
6-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Sep	0	0	0	1	112	342	0	0	0	0	0	0	3	3	461
8-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Sep	0	0	0	3	92	600	0	0	0	0	0	0	0	4	699
10-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Sep	0	0	0	1	91	417	0	0	0	0	0	0	0	6	515
12-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Sep	0	1	0	0	63	214	0	0	0	0	0	0	0	1	279
14-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Sep	0	0	1	0	70	253	0	0	0	0	0	0	0	0	324
16-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	0	1	1	2	25	114	0	0	0	0	0	0	1	2	146
18-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Sep	0	0	0	1	40	176	0	0	0	0	0	0	0	1	218
20-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Sep	1	0	1	0	22	88	0	0	0	0	0	0	0	2	114
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Sep	1	1	1	0	31	98	0	0	0	0	0	0	0	0	132
24-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Sep	3	0	3	0	116	544	0	0	0	0	0	0	0	0	666
26-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Sep	5	0	1	1	137	600	0	0	0	0	0	0	0	1	745
28-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Sep	2	1	2	1	118	604	0	0	0	0	0	0	0	2	730
30-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Oct	3	0	0	0	61	426	0	0	0	0	0	0	0	0	490
2-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Oct	0	0	1	3	95	659	0	0	0	0	0	0	0	5	763
4-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Oct	0	0	0	2	118	696	0	0	0	0	0	0	0	1	817
6-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Oct	3	0	1	0	110	754	0	0	0	0	0	0	1	2	871
8-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Oct	2	0	0	0	95	764	0	0	0	0	0	1	0	0	862
10-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Oct	0	0	0	0	46	343	0	0	0	0	0	0	0	0	389

Table 2. Daily Number of Fish Transported from Lower Granite Dam, 2003
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Daily Number of Fish Transported

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
12-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Oct	0	0	0	1	50	367	0	0	0	0	1	0	0	1	420
14-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Oct	1	1	0	1	103	560	0	0	0	0	1	0	0	1	668
16-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Oct	0	0	3	4	186	1,046	0	0	0	0	0	0	0	0	1,239
18-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Oct	2	1	2	3	149	1,063	0	0	0	0	0	0	0	1	1,221
20-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Oct	0	0	0	3	122	794	0	0	0	0	1	0	0	1	921
22-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Oct	0	0	1	0	152	961	0	0	0	0	0	0	0	0	1,114
24-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Oct	0	0	0	0	72	404	0	0	0	0	1	0	0	1	478
26-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Oct	0	0	0	0	52	356	0	0	0	0	0	0	0	0	408
28-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Oct	0	1	1	1	61	265	0	0	0	0	1	0	1	3	334
30-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Oct	1	0	0	1	68	366	0	0	0	3	0	1	0	2	442
Total	**1,902,585**	**109,039**	**513,536**	**111,212**	**361,090**	**667,092**	**8,996**	**1,848,011**	**433,513**	**6,928**	**2,710**	**3,961**	**10,785**	**74,709**	**6,054,167**

Table 3. Daily Total of Fish Bypassed from Lower Granite Dam, 2003

Page 1.

Daily Number of Fish Bypassed

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
26-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Apr	0	0	441	0	0	0	0	350	360	0	0	0	0	0	1,151
11-Apr	0	0	543	0	0	0	0	350	392	0	0	0	0	0	1,285
12-Apr	0	0	343	0	0	0	0	350	320	0	0	0	0	0	1,013
13-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Apr	0	0	1,317	0	0	0	0	153	123	0	0	0	0	0	1,593
16-Apr	0	0	1,479	0	0	0	0	407	176	0	0	0	0	0	2,062
17-Apr	84	0	1,086	0	0	0	0	300	349	0	0	0	0	0	1,819
18-Apr	70	0	724	0	0	0	0	291	522	0	0	0	0	0	1,607
19-Apr	48	0	679	0	0	0	0	290	1,127	0	0	0	0	0	2,144
20-Apr	44	0	0	0	0	0	0	10	10	0	0	0	0	0	64
21-Apr	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
22-Apr	79	0	1,245	0	0	0	0	378	482	0	0	0	0	0	2,184
23-Apr	53	0	2,306	0	0	0	0	368	475	0	0	0	0	0	3,202
24-Apr	60	0	1,660	0	0	0	0	370	222	0	0	0	0	0	2,312
25-Apr	10	0	1,771	0	0	0	0	350	118	0	0	0	0	0	2,249
26-Apr	93	0	848	0	0	0	0	384	94	0	0	0	0	0	1,419
27-Apr	52	0	0	0	0	0	0	17	13	0	0	0	0	0	82
28-Apr	41	0	0	0	0	0	0	18	8	0	0	0	0	0	67
29-Apr	64	0	1,334	0	0	0	0	717	266	0	0	0	0	0	2,381
30-Apr	55	0	572	0	0	0	0	718	192	0	0	0	0	0	1,537
1-May	59	0	355	0	0	0	0	725	211	0	0	0	0	0	1,350
2-May	51	0	766	0	0	0	0	719	288	0	0	0	0	0	1,824
3-May	57	0	743	0	0	0	0	722	197	0	0	0	0	0	1,719
4-May	43	0	0	0	0	0	0	12	11	0	0	0	0	0	66
5-May	52	0	0	0	0	0	0	17	17	0	0	0	0	0	86
6-May	53	0	914	0	0	0	0	754	233	0	0	0	0	0	1,954
7-May	11	0	1,216	0	0	0	0	735	182	0	0	0	0	0	2,144
8-May	109	0	2,108	0	0	0	0	770	790	0	0	0	0	0	3,777
9-May	53	0	1,268	0	0	0	0	752	215	0	0	0	0	0	2,288
10-May	51	0	616	0	0	0	0	752	1,074	0	0	0	0	0	2,493
11-May	52	0	0	0	0	0	0	17	17	0	0	0	0	0	86

Table 3. Daily Total of Fish Bypassed from Lower Granite Dam, 2003
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Daily Number of Fish Bypassed

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
12-May	52	0	0	0	0	0	0	18	17	0	0	0	0	0	87
13-May	52	0	606	0	0	0	0	682	943	0	0	0	0	0	2,283
14-May	40	0	768	0	0	0	0	671	686	0	0	0	0	0	2,165
15-May	103	0	447	0	0	0	0	695	1,024	0	0	0	0	0	2,269
16-May	58	0	474	0	0	0	0	683	822	0	0	0	0	0	2,037
17-May	60	0	694	0	0	0	0	682	1,187	0	0	0	0	0	2,623
18-May	60	0	0	0	0	0	0	17	18	0	0	0	0	0	95
19-May	59	0	0	0	0	0	0	17	17	0	0	0	0	0	93
20-May	59	0	858	0	0	0	0	507	2,346	0	0	0	0	0	3,770
21-May	61	0	1,173	0	0	0	0	507	1,751	0	0	0	0	0	3,492
22-May	54	0	903	0	0	0	0	507	2,371	0	0	0	0	0	3,835
23-May	72	0	607	0	0	0	0	515	2,272	0	0	0	0	0	3,466
24-May	56	0	967	0	0	0	0	506	1,560	0	0	0	0	0	3,089
25-May	59	0	912	0	0	0	0	17	806	0	0	0	0	0	1,794
26-May	54	0	0	0	0	0	0	17	18	0	0	0	0	0	89
27-May	37	0	2,739	0	0	0	0	367	1,770	0	0	0	0	0	4,913
28-May	76	0	774	0	0	0	0	389	944	0	0	0	0	0	2,183
29-May	44	0	556	0	0	0	0	367	1,058	0	0	0	0	0	2,025
30-May	14	0	2,002	0	0	0	0	350	708	0	0	0	0	0	3,074
31-May	0	0	1,347	0	0	0	0	350	847	0	0	0	0	0	2,544
1-Jun	0	0	1,007	0	0	0	0	0	468	0	0	0	0	0	1,475
2-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Jun	0	0	489	0	0	0	0	210	460	0	0	0	0	0	1,159
4-Jun	2	0	292	0	0	0	0	210	512	0	0	0	0	0	1,016
5-Jun	0	0	496	0	0	0	0	210	412	0	0	0	0	0	1,118
6-Jun	0	0	299	0	0	0	0	210	505	0	0	0	0	0	1,014
7-Jun	0	0	540	0	0	0	0	210	402	0	0	0	0	0	1,152
8-Jun	0	0	175	0	0	0	0	0	0	0	0	0	0	0	175
9-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Jun	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
11-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Jun	0	0	0	0	0	2	0	1	0	0	0	0	0	0	3
21-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Jun	0	0	0	14	0	17	0	0	0	0	0	0	0	0	31
26-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Jun	0	0	0	4	0	11	0	0	0	0	0	0	0	0	15
28-Jun	0	0	0	6	0	9	0	0	0	0	0	0	0	0	15
29-Jun	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6
30-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Jul	0	0	0	1	0	6	0	0	0	0	0	0	0	0	7

Table 3. Daily Total of Fish Bypassed from Lower Granite Dam, 2003
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Daily Number of Fish Bypassed

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
2-Jul	0	0	2	84	867	1,719	0	21	2	0	0	0	0	7	2,702
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Jul	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
18-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jul	0	0	0	2	0	16	0	0	0	0	0	0	0	0	18
20-Jul	0	0	0	0	0	18	0	0	0	0	0	0	0	0	18
21-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Jul	0	0	0	0	0	18	0	0	0	0	0	0	0	0	18
23-Jul	0	0	0	0	0	17	0	0	0	0	0	0	0	0	17
24-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Jul	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
1-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
2-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
3-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
4-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
5-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
6-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Aug	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8
8-Aug	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
9-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Aug	0	0	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	0	0
14-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
15-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
16-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
17-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
18-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
19-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
20-Aug	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
21-Aug	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8

Table 3. Daily Total of Fish Bypassed from Lower Granite Dam, 2003
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Daily Number of Fish Bypassed

Date	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily Total
	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	
22-Aug	0	0	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	0	0
24-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Aug	0	0	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	0	0
28-Aug	0	0	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	0	0
30-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Sep	0	0	0	0	0	0	0	8	1	0	0	0	0	0	9
3-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Sep	0	0	0	0	0	0	0	14	4	0	0	0	0	0	18
5-Sep	0	0	0	0	0	0	0	31	6	0	0	0	0	0	37
6-Sep	0	0	0	0	0	0	0	20	7	0	0	0	0	0	27
7-Sep	0	0	0	0	0	0	0	20	14	0	0	0	0	0	34
8-Sep	0	0	0	0	0	0	0	25	8	0	0	0	0	0	33
9-Sep	0	0	0	0	0	0	0	17	7	0	0	0	0	0	24
10-Sep	0	0	0	0	0	0	0	15	9	0	0	0	0	0	24
11-Sep	0	0	0	0	0	0	0	13	5	0	0	0	0	0	18
12-Sep	0	0	0	0	0	0	0	13	4	0	0	0	0	0	17
13-Sep	0	0	0	0	0	0	0	16	7	0	0	0	0	0	23
14-Sep	0	0	0	0	0	0	0	5	1	0	0	0	0	0	6
15-Sep	0	0	0	0	0	0	0	4	5	0	0	0	0	0	9
16-Sep	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
17-Sep	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
18-Sep	0	0	0	0	0	0	0	3	1	0	0	0	0	0	4
19-Sep	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
20-Sep	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
21-Sep	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
22-Sep	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
23-Sep	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
24-Sep	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8
25-Sep	0	0	0	0	0	0	0	4	2	0	0	0	0	0	6
26-Sep	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
27-Sep	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
28-Sep	0	0	0	0	0	0	0	6	1	0	0	0	0	0	7
29-Sep	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
30-Sep	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
1-Oct	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
2-Oct	0	0	0	0	0	0	0	5	7	0	0	0	0	0	12
3-Oct	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
4-Oct	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3
5-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
6-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
7-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8-Oct	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3
9-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2

Table 3. Daily Total of Fish Bypassed from Lower Granite Dam, 2003
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Daily Number of Fish Bypassed

Date	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
12-Oct	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
13-Oct	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
14-Oct	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
15-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16-Oct	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
17-Oct	0	0	0	0	0	0	0	9	1	0	0	0	0	0	10
18-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Oct	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
20-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Oct	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
22-Oct	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
23-Oct	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
24-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Oct	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
27-Oct	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
28-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Oct	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
30-Oct	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
31-Oct	0	0	0	0	0	0	0	3	2	0	0	0	0	0	5
Total	**2,428**	**0**	**43,461**	**111**	**867**	**1,916**	**0**	**21,034**	**32,516**	**0**	**0**	**0**	**0**	**7**	**102,340**

Table 4. Daily Facility Mortality (raceway, NMFS, Recovery tank and sample) at Lower Granite Dam, 2003

Page 1.

Daily Number of Mortalities

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
26-Mar	2	0	5	0	0	0	1	0	0	0	0	0	0	0	8
27-Mar	3	0	7	0	0	0	0	0	0	0	0	0	0	0	10
28-Mar	13	2	34	0	0	0	2	0	1	0	0	0	0	0	52
29-Mar	86	2	60	0	0	0	0	0	12	0	0	0	0	0	160
30-Mar	22	3	22	0	0	0	0	0	3	2	0	0	0	0	52
31-Mar	17	1	11	0	0	0	0	0	0	0	0	0	0	0	29
1-Apr	10	0	1	0	0	0	0	1	0	0	0	0	0	0	12
2-Apr	11	0	7	0	0	0	0	0	0	0	0	0	0	0	18
3-Apr	12	3	19	0	0	0	0	0	1	0	0	0	0	0	35
4-Apr	33	3	11	0	0	0	0	0	2	0	0	0	0	0	49
5-Apr	23	1	16	0	0	0	0	0	0	0	0	0	0	0	40
6-Apr	77	5	160	0	0	0	1	5	3	0	0	0	0	0	251
7-Apr	19	3	7	0	0	0	0	0	0	0	1	0	0	0	30
8-Apr	25	4	3	0	0	0	1	0	1	0	0	0	0	0	34
9-Apr	9	1	1	0	0	0	0	0	0	0	0	0	0	0	11
10-Apr	16	1	4	0	0	0	1	0	0	0	0	0	0	0	22
11-Apr	7	1	3	0	0	0	0	0	0	0	0	0	0	0	11
12-Apr	10	4	4	0	0	0	0	2	0	0	0	0	0	0	20
13-Apr	16	0	8	0	0	0	0	0	0	0	1	0	0	0	25
14-Apr	51	4	11	0	0	0	0	0	1	0	0	0	0	0	67
15-Apr	5	1	4	0	0	0	0	1	0	0	0	0	0	0	11
16-Apr	30	1	7	0	0	0	0	1	0	0	0	0	0	0	39
17-Apr	26	1	11	0	0	0	1	0	1	0	0	0	0	0	40
18-Apr	28	4	17	0	0	0	0	2	3	0	0	0	0	0	54
19-Apr	29	1	10	0	0	0	0	0	5	0	3	0	0	0	48
20-Apr	54	4	10	0	0	0	0	0	6	0	0	0	0	0	74
21-Apr	15	0	5	0	0	0	0	0	0	0	0	0	0	0	20
22-Apr	30	0	9	0	0	0	0	5	2	0	0	0	0	0	46
23-Apr	75	8	12	0	0	0	0	2	0	0	0	0	0	0	97
24-Apr	122	1	21	0	0	0	0	89	8	0	0	0	0	0	241
25-Apr	104	2	16	0	0	0	0	3	1	0	4	0	0	0	130
26-Apr	40	0	2	0	0	0	0	1	0	0	0	0	0	0	43
27-Apr	47	4	10	0	0	0	0	1	0	0	0	0	0	0	62
28-Apr	107	7	26	0	0	0	0	9	1	0	0	0	0	0	150
29-Apr	38	2	3	0	0	0	0	3	0	0	0	0	0	0	46
30-Apr	382	37	47	0	0	0	0	22	6	0	1	0	0	0	495
1-May	53	3	16	0	0	0	0	4	2	0	0	0	0	0	78
2-May	68	6	27	0	0	0	0	4	0	0	0	0	1	0	106
3-May	61	1	9	0	0	0	0	5	0	0	0	0	0	0	76
4-May	35	4	3	0	0	0	0	3	2	0	0	0	0	0	47
5-May	34	2	5	0	0	0	0	4	1	0	0	0	0	0	46
6-May	114	3	13	0	0	0	0	7	0	0	0	0	0	0	137
7-May	76	2	11	0	0	0	0	4	0	0	0	0	0	0	93
8-May	62	3	8	0	0	0	0	7	0	0	0	0	0	0	80
9-May	34	0	4	0	0	0	0	8	1	0	0	0	0	0	47
10-May	24	0	2	0	0	0	0	5	0	0	0	0	0	1	32

Table 4. Daily Facility Mortality (raceway, NMFS, Recovery tank and sample) at Lower Granite Dam, 2003
Page 2.
Daily Number of Mortalities

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
11-May	16	1	0	0	0	0	0	3	1	0	0	0	0	0	21
12-May	14	0	3	0	0	0	2	7	0	0	0	0	0	0	26
13-May	75	4	10	0	0	0	0	12	2	0	0	0	0	0	103
14-May	110	4	19	0	0	0	0	24	5	0	0	0	0	1	163
15-May	46	2	3	0	0	0	0	17	2	0	2	0	0	0	72
16-May	56	0	7	0	0	0	0	31	6	0	0	0	0	0	100
17-May	93	3	13	0	0	0	0	30	7	0	0	0	0	0	146
18-May	254	7	36	0	0	0	0	18	8	0	0	0	1	2	326
19-May	59	1	17	0	0	0	0	19	6	0	0	0	0	2	104
20-May	46	0	20	0	0	0	0	23	5	0	0	0	0	2	96
21-May	19	0	3	0	0	0	0	7	4	0	0	0	0	0	33
22-May	21	0	10	0	0	0	0	12	4	0	0	0	0	0	47
23-May	10	0	2	0	0	0	0	5	3	0	0	0	0	0	20
24-May	46	2	22	0	0	0	0	24	8	0	0	0	0	6	108
25-May	12	0	3	0	0	0	0	13	9	0	7	0	0	0	44
26-May	11	1	4	1	0	0	1	9	3	0	0	0	0	0	30
27-May	333	5	170	13	0	5	4	193	38	0	0	4	9	36	810
28-May	58	0	52	6	0	3	10	58	10	3	6	0	4	19	229
29-May	123	4	87	43	0	6	1	62	12	2	0	4	15	84	443
30-May	121	14	63	146	0	17	2	54	16	3	0	7	6	17	466
31-May	68	3	30	593	126	174	2	50	18	9	0	4	5	19	1,101
1-Jun	52	0	3	668	203	239	0	172	24	17	0	24	3	62	1,467
2-Jun	32	0	15	329	169	178	0	144	33	29	6	8	6	35	984
3-Jun	20	0	14	147	67	88	1	90	25	5	0	7	3	28	495
4-Jun	4	0	1	29	9	11	4	14	5	1	0	0	0	8	86
5-Jun	11	1	4	48	23	42	5	23	17	6	0	1	5	28	214
6-Jun	8	0	1	21	7	21	2	12	3	1	0	0	0	0	76
7-Jun	15	0	10	50	31	45	1	7	3	3	0	0	2	24	191
8-Jun	10	0	6	108	134	204	2	1	1	1	0	0	1	11	479
9-Jun	1	1	2	20	20	24	0	2	0	1	0	6	1	0	78
10-Jun	0	0	0	17	29	39	0	1	1	0	0	0	0	1	88
11-Jun	1	0	3	136	494	452	3	6	5	0	0	5	2	3	1,110
12-Jun	5	0	2	126	166	166	0	5	3	1	0	0	1	4	479
13-Jun	3	0	2	50	238	284	2	2	3	0	0	0	0	2	586
14-Jun	0	2	0	18	68	82	0	2	1	0	0	0	0	1	174
15-Jun	3	0	0	10	36	51	0	4	1	0	0	0	2	3	110
16-Jun	2	0	1	24	83	146	0	5	2	0	0	0	0	0	263
17-Jun	3	0	1	48	71	147	0	5	3	0	0	0	0	1	279
18-Jun	0	0	0	14	38	60	0	1	0	0	0	0	0	0	113
19-Jun	0	0	0	8	20	37	0	3	2	0	0	0	2	2	74
20-Jun	1	1	1	33	82	133	0	9	3	0	0	0	0	2	265
21-Jun	4	0	0	68	188	306	0	11	3	0	0	0	4	3	587
22-Jun	1	0	1	56	90	184	0	4	0	0	0	0	0	1	337
23-Jun	4	1	0	133	375	571	0	18	4	0	0	0	2	4	1,112
24-Jun	3	0	2	43	113	273	0	9	1	0	0	0	0	1	445
25-Jun	2	0	0	10	19	34	0	11	4	0	0	0	0	0	80
26-Jun	0	0	0	4	4	12	0	0	0	0	0	0	0	0	20
27-Jun	0	0	1	2	12	20	0	4	4	0	0	0	3	0	46
28-Jun	1	0	0	4	2	8	0	0	0	0	0	0	0	0	15
29-Jun	1	0	0	5	7	17	0	2	6	0	0	0	1	0	39
30-Jun	0	0	0	1	12	18	0	0	0	0	0	0	0	0	31

Table 4. Daily Facility Mortality (raceway, NMFS, Recovery tank and sample) at Lower Granite Dam, 2003

Page 3.

Daily Number of Mortalities

Date	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
1-Jul	3	2	3	4	22	58	0	3	0	0	0	0	0	2	97
2-Jul	0	0	19	77	733	1,107	0	58	6	0	0	0	0	6	2,006
3-Jul	0	0	0	6	77	195	0	1	0	0	0	0	0	0	279
4-Jul	0	1	3	6	51	151	0	0	0	0	0	0	0	0	212
5-Jul	20	0	5	21	195	613	0	12	2	0	0	0	0	0	868
6-Jul	1	0	0	2	65	193	0	0	4	0	0	0	0	0	265
7-Jul	0	0	1	14	115	339	0	8	0	0	0	0	0	0	477
8-Jul	2	0	0	4	22	54	0	0	7	0	4	0	0	0	93
9-Jul	0	0	2	20	137	391	0	11	0	0	0	0	0	4	565
10-Jul	0	0	0	2	34	96	0	2	10	0	0	0	0	3	147
11-Jul	0	0	3	17	107	403	0	11	4	0	0	0	2	4	551
12-Jul	0	0	1	8	51	160	0	2	1	0	0	0	0	1	224
13-Jul	12	0	0	18	189	503	0	10	8	0	0	0	0	6	746
14-Jul	0	0	0	1	3	30	0	1	1	0	0	0	0	0	36
15-Jul	1	0	1	2	14	76	0	6	2	2	0	0	1	0	105
16-Jul	0	0	0	7	62	236	0	7	3	0	0	0	0	2	317
17-Jul	0	0	0	3	4	38	0	0	0	0	0	0	0	0	45
18-Jul	1	0	0	0	5	18	0	0	2	0	0	0	0	0	26
19-Jul	3	0	0	4	20	73	0	1	1	0	0	0	0	1	103
20-Jul	0	0	0	1	6	45	0	0	2	0	0	0	0	0	54
21-Jul	1	0	0	1	15	71	0	1	1	0	0	0	0	0	90
22-Jul	0	0	0	2	8	41	0	1	0	0	0	0	0	0	52
23-Jul	1	0	2	8	30	94	0	2	2	0	0	0	0	0	139
24-Jul	0	0	0	1	15	46	0	3	0	0	0	0	0	0	65
25-Jul	0	0	0	4	17	86	0	6	4	0	0	0	0	0	117
26-Jul	0	0	0	2	4	37	0	1	1	0	0	0	0	0	45
27-Jul	0	0	0	2	9	56	0	0	4	0	0	0	0	0	71
28-Jul	0	0	0	1	3	36	0	0	1	0	0	0	0	0	41
29-Jul	0	0	0	4	6	33	0	2	2	0	0	0	0	0	47
30-Jul	0	0	0	0	0	14	0	0	2	0	0	0	0	1	17
31-Jul	0	0	0	0	3	18	0	0	1	0	0	0	0	0	22
1-Aug	0	0	0	0	3	12	0	0	0	0	0	0	0	0	15
2-Aug	0	0	0	0	3	13	0	3	1	0	0	0	0	0	20
3-Aug	1	0	0	1	0	14	0	0	0	0	0	0	0	0	16
4-Aug	0	0	0	1	10	36	0	1	0	0	0	0	0	0	48
5-Aug	0	0	0	2	5	12	0	0	0	0	0	0	0	0	19
6-Aug	0	0	0	1	16	47	0	1	1	0	0	0	1	2	69
7-Aug	0	0	0	1	6	18	0	0	1	0	0	0	0	0	26
8-Aug	0	0	0	0	10	24	0	0	0	0	0	0	0	0	34
9-Aug	0	0	0	0	10	14	0	1	0	0	0	0	1	1	27
10-Aug	0	0	0	0	7	22	0	0	0	0	0	0	0	3	32
11-Aug	0	0	0	0	4	6	0	0	0	0	0	0	0	0	10
12-Aug	0	0	0	0	7	14	0	0	0	0	0	0	0	2	23
13-Aug	0	0	0	0	1	5	0	0	0	0	0	0	0	0	6
14-Aug	0	0	0	1	3	8	0	0	1	0	0	0	0	0	13
15-Aug	0	0	0	0	3	7	0	1	0	0	0	0	0	0	11
16-Aug	0	0	0	0	9	13	0	1	0	0	0	0	0	1	24
17-Aug	0	0	0	0	4	5	0	0	0	0	0	0	0	0	9
18-Aug	1	0	0	3	1	8	0	0	1	0	0	0	0	0	14
19-Aug	0	0	0	0	2	6	0	0	0	0	0	0	0	0	8
20-Aug	0	0	0	2	3	16	0	0	0	0	0	0	0	1	22

Table 4. Daily Facility Mortality (raceway, NMFS, Recovery tank and sample) at Lower Granite Dam, 2003

Page 4.

Daily Number of Mortalities

Date	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily Total
	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	
21-Aug	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
22-Aug	0	0	0	0	2	4	0	0	1	0	0	0	0	0	7
23-Aug	0	0	0	0	3	7	0	0	0	0	0	0	0	0	10
24-Aug	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
25-Aug	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2
26-Aug	0	0	0	0	2	7	0	0	0	0	0	0	0	0	9
27-Aug	0	0	0	0	1	8	0	0	0	0	0	0	0	0	9
28-Aug	0	0	0	0	1	4	0	1	0	0	0	0	0	0	6
29-Aug	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
30-Aug	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
31-Aug	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
1-Sep	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
2-Sep	0	0	0	0	4	4	0	0	0	0	0	0	0	0	8
3-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
4-Sep	0	0	0	0	3	15	0	0	0	0	0	0	0	0	18
5-Sep	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
6-Sep	0	0	0	0	4	0	0	0	0	0	0	0	0	1	5
7-Sep	0	0	0	0	1	3	0	0	0	0	0	0	1	0	5
8-Sep	0	0	0	1	1	6	0	0	0	0	0	0	0	1	9
9-Sep	0	0	0	0	3	5	0	0	0	0	0	0	0	0	8
10-Sep	0	0	0	1	4	4	0	1	0	0	0	0	0	0	10
11-Sep	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
12-Sep	0	1	0	0	2	4	0	0	0	0	0	0	0	0	7
13-Sep	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
14-Sep	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
15-Sep	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
16-Sep	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4
17-Sep	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
18-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
19-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
20-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Sep	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
24-Sep	0	0	0	0	1	6	0	3	0	0	0	0	0	0	10
25-Sep	0	0	0	0	2	5	0	0	0	0	0	0	0	0	7
26-Sep	0	0	0	0	5	3	0	0	0	0	0	0	0	0	8
27-Sep	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
28-Sep	0	0	0	0	4	3	0	0	0	0	0	0	0	0	7
29-Sep	0	0	0	0	4	6	0	0	0	0	0	0	0	0	10
30-Sep	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
1-Oct	0	0	0	0	1	5	0	0	0	0	0	0	0	0	6
2-Oct	0	0	0	0	1	13	0	0	0	0	0	0	0	0	14
3-Oct	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8
4-Oct	0	0	0	0	1	7	0	0	2	0	0	0	0	0	10
5-Oct	0	0	0	0	1	11	0	0	0	0	0	0	0	0	12
6-Oct	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
7-Oct	0	0	0	0	1	4	0	0	0	0	0	0	0	0	5
8-Oct	0	0	0	0	2	5	0	0	0	0	0	0	0	0	7
9-Oct	0	0	0	0	1	2	0	0	1	0	0	0	0	0	4
10-Oct	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1

Table 4. Daily Facility Mortality (raceway, NMFS, Recovery tank and sample) at Lower Granite Dam, 2003
Page 5.
Daily Number of Mortalities

	Yearling Chinook			Subyearling Chinook				Steelhead		Sockeye/Kokanee		Coho			Daily
Date	Clipped	No Clip, cwt	No Clip	Clipped	No Clip,cwt	No Clip	Fry	Clipped	No Clip	Clipped	No Clip	Clipped	No Clip,cwt	No Clip	Total
11-Oct	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3
12-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Oct	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
14-Oct	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
15-Oct	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
16-Oct	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
17-Oct	0	0	0	0	2	7	0	0	0	0	0	0	0	0	9
18-Oct	0	0	0	0	0	7	0	0	0	0	0	0	0	0	7
19-Oct	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
20-Oct	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
21-Oct	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6
22-Oct	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
23-Oct	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
24-Oct	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
25-Oct	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
26-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Oct	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
28-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Oct	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
30-Oct	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
31-Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3,980**	**196**	**1,386**	**3,288**	**5,140**	**9,949**	**49**	**1,599**	**467**	**86**	**36**	**70**	**85**	**455**	**26,786**

Table 5. Daily Descaling in Percent at Lower Granite Dam, 2003

Page 1.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Daily	River Conditions		
Date	Clipped	No clip	Clipped	No clip	Clipped	No clip	Clipped	No clip	All	Total	Total Q (kcfs)	Spill (kcfs)	Temp. (C)
26-Mar	12.12%	1.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.85%	54.05	0	7.2
27-Mar	1.72%	2.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.61%	57.3	0	7.3
28-Mar	7.69%	2.27%	0.00%	0.00%	0.00%	2.63%	0.00%	0.00%	0.00%	4.56%	56.48	0	7.1
29-Mar	6.61%	2.41%	0.00%	0.00%	0.00%	1.52%	0.00%	0.00%	0.00%	3.91%	50.42	0	7.3
30-Mar	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	44.5	0	7.3
31-Mar	3.39%	5.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.05%	36.43	0	7.4
1-Apr	0.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	47.78	0	7.3
2-Apr	1.75%	0.25%	0.00%	0.00%	0.00%	0.64%	0.00%	0.00%	0.00%	0.77%	69.65	0	7.5
3-Apr	3.10%	0.78%	0.00%	0.00%	0.00%	3.33%	0.00%	0.00%	0.00%	1.90%	71.44	0	8.4
4-Apr	4.15%	2.32%	0.00%	0.00%	2.86%	0.00%	0.00%	0.00%	0.00%	2.72%	77.79	20.28	8.3
5-Apr	4.43%	0.00%	0.00%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	1.32%	69.51	20.24	7.6
6-Apr	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	67.04	19.34	7.5
7-Apr	1.87%	0.00%	0.00%	0.00%	0.00%	2.27%	0.00%	0.00%	0.00%	0.70%	66.45	20.22	7.2
8-Apr	1.83%	0.00%	0.00%	0.00%	2.35%	0.00%	0.00%	0.00%	0.00%	1.11%	61.6	20.11	7.3
9-Apr	1.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	62.63	21.09	7.5
10-Apr	1.96%	1.41%	0.00%	0.00%	1.69%	0.00%	0.00%	0.00%	0.00%	1.48%	60.62	21.87	7.8
11-Apr	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	0.41%	59.5	24.12	8.3
12-Apr	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.84%	66.14	20.16	8.5
13-Apr	0.38%	0.33%	0.00%	0.00%	3.03%	0.00%	0.00%	0.00%	0.00%	0.59%	69.38	20.18	9.0
14-Apr	1.59%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	75.88	21.15	9.4
15-Apr	2.44%	1.08%	0.00%	0.00%	1.15%	1.64%	0.00%	0.00%	0.00%	1.52%	81.41	20.52	9.3
16-Apr	0.76%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	80.79	19.59	9.1
17-Apr	1.25%	0.38%	0.00%	0.00%	0.84%	0.69%	0.00%	0.00%	0.00%	0.82%	76.8	20.24	8.9
18-Apr	2.42%	1.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	72.38	20.22	8.7
19-Apr	0.00%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	69.51	20.39	8.7
20-Apr	1.29%	1.44%	0.00%	0.00%	0.69%	0.00%	0.00%	0.00%	0.00%	0.97%	64.02	20.74	8.8
21-Apr	1.14%	0.00%	0.00%	0.00%	0.67%	3.23%	0.00%	0.00%	0.00%	0.88%	63.09	20.49	9.0
22-Apr	2.41%	4.17%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	2.51%	64.63	19.62	9.3
23-Apr	0.94%	2.19%	0.00%	0.00%	1.92%	40.91%	0.00%	0.00%	0.00%	2.92%	71.93	20.38	9.4
24-Apr	0.32%	0.61%	0.00%	0.00%	1.34%	5.00%	0.00%	0.00%	0.00%	0.77%	76.14	21.2	9.9
25-Apr	2.12%	2.70%	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	1.92%	79.9	20.5	10.0
26-Apr	2.27%	2.63%	0.00%	0.00%	2.05%	0.00%	0.00%	0.00%	0.00%	2.08%	81.25	19.63	9.7
27-Apr	1.23%	0.51%	0.00%	0.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.96%	83.45	20.4	9.5
28-Apr	2.37%	0.69%	0.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	1.64%	79.84	22.3	9.4
29-Apr	6.78%	1.43%	0.00%	0.00%	3.38%	1.64%	0.00%	0.00%	0.00%	4.30%	75.05	20.51	9.1
30-Apr	4.59%	1.92%	0.00%	0.00%	3.14%	3.13%	0.00%	0.00%	0.00%	3.60%	73.42	20.51	9.1
1-May	2.96%	3.20%	0.00%	0.00%	2.56%	2.04%	0.00%	0.00%	0.00%	2.82%	72.42	20.53	9.3
2-May	3.92%	1.35%	0.00%	0.00%	5.88%	6.98%	0.00%	0.00%	0.00%	4.62%	70.38	19.64	9.7
3-May	0.41%	0.00%	0.00%	0.00%	1.64%	0.00%	0.00%	0.00%	0.00%	0.66%	66.99	21.25	9.9
4-May	1.07%	1.92%	0.00%	0.00%	3.23%	7.41%	0.00%	0.00%	0.00%	1.90%	65.48	21.08	9.8
5-May	0.97%	0.00%	0.00%	0.00%	3.73%	0.00%	0.00%	0.00%	0.00%	1.47%	64.15	20.5	10.0
6-May	1.84%	1.59%	0.00%	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	2.37%	69.06	19.59	10.1
7-May	2.02%	2.31%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	1.98%	72.32	20.24	9.9
8-May	1.07%	0.00%	0.00%	0.00%	2.99%	3.57%	0.00%	0.00%	0.00%	1.44%	68.76	20.29	9.7
9-May	1.15%	1.49%	0.00%	0.00%	2.78%	3.13%	0.00%	0.00%	0.00%	1.88%	70.79	20.44	9.6
10-May	2.65%	8.57%	0.00%	0.00%	5.41%	4.76%	0.00%	0.00%	0.00%	4.33%	67.27	21.36	10.0
11-May	2.75%	2.94%	0.00%	0.00%	5.87%	8.20%	0.00%	0.00%	0.00%	4.86%	65.1	20.55	10.2

Table 5. Daily Descaling in Percent at Lower Granite Dam, 2003
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	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Daily	River Conditions		
Date	Clipped	No clip	Clipped	No clip	Clipped	No clip	Clipped	No clip	All	Total	Total Q (kcfs)	Spill (kcfs)	Temp. (C)
12-May	2.40%	0.00%	0.00%	0.00%	7.87%	3.33%	0.00%	0.00%	0.00%	4.71%	63.34	19.63	10.8
13-May	2.44%	4.62%	0.00%	0.00%	8.13%	10.53%	0.00%	0.00%	0.00%	4.17%	68.43	21.24	10.7
14-May	2.23%	1.56%	0.00%	0.00%	3.70%	2.04%	0.00%	0.00%	0.00%	2.49%	73.7	21.13	11.3
15-May	1.68%	0.00%	0.00%	0.00%	1.42%	0.00%	0.00%	0.00%	0.00%	1.30%	76.64	20.52	11.1
16-May	1.70%	0.00%	0.00%	0.00%	3.17%	1.18%	0.00%	0.00%	0.00%	2.05%	80.42	19.64	11.2
17-May	1.27%	0.00%	0.00%	0.00%	6.56%	2.94%	0.00%	0.00%	0.00%	2.96%	90.69	20.42	11.6
18-May	0.97%	0.88%	0.00%	0.00%	3.62%	4.84%	0.00%	0.00%	10.00%	2.39%	88.12	21.28	11.1
19-May	1.71%	0.00%	0.00%	0.00%	5.31%	4.96%	0.00%	0.00%	0.00%	3.75%	83.55	20.51	10.8
20-May	0.00%	0.00%	0.00%	0.00%	5.95%	1.92%	0.00%	0.00%	11.76%	3.36%	79.2	19.63	10.5
21-May	2.90%	2.27%	0.00%	0.00%	8.33%	1.72%	0.00%	0.00%	0.00%	4.77%	73.99	20.52	10.3
22-May	0.00%	0.00%	0.00%	0.00%	8.40%	1.06%	0.00%	0.00%	33.33%	5.23%	73.8	21.26	10.2
23-May	0.00%	2.63%	0.00%	0.00%	3.98%	4.08%	0.00%	0.00%	11.11%	3.43%	73.7	20.5	10.5
24-May	6.67%	0.00%	0.00%	0.00%	4.02%	0.88%	0.00%	0.00%	6.67%	3.35%	80.88	20.51	11.2
25-May	4.95%	0.00%	0.00%	0.00%	6.73%	3.76%	0.00%	100.00%	0.00%	5.13%	104.1	20.46	12.2
26-May	3.55%	0.57%	0.00%	0.00%	5.70%	4.29%	0.00%	0.00%	4.41%	4.45%	132.31	39.26	13.2
27-May	0.87%	4.65%	10.00%	0.00%	3.06%	1.49%	0.00%	0.00%	5.19%	3.03%	149.99	56.85	12.2
28-May	3.23%	4.76%	0.00%	0.00%	4.29%	3.16%	0.00%	0.00%	1.56%	3.92%	155.46	61.63	11.5
29-May	3.13%	0.00%	4.35%	0.00%	6.30%	1.30%	0.00%	0.00%	0.00%	4.12%	157.58	63.75	11.8
30-May	0.00%	0.00%	0.00%	0.00%	9.00%	2.08%	0.00%	0.00%	0.00%	3.94%	178.34	84	12.2
31-May	0.00%	0.00%	0.00%	0.00%	10.14%	0.00%	0.00%	0.00%	0.00%	3.24%	192.40	98.23	12.0
1-Jun	0.00%	0.00%	0.00%	0.00%	1.30%	2.94%	0.00%	0.00%	17.65%	1.70%	210.77	116.75	12.0
2-Jun	0.00%	0.00%	0.00%	0.00%	8.40%	5.71%	0.00%	0.00%	0.00%	3.42%	178.92	84.76	12.0
3-Jun	0.00%	0.00%	0.00%	0.00%	4.29%	0.00%	0.00%	0.00%	5.00%	1.54%	163.89	70.11	12.0
4-Jun	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	14.29%	0.00%	12.50%	3.11%	142.4	49.05	12.7
5-Jun	0.00%	18.18%	0.00%	0.00%	10.53%	0.00%	0.00%	0.00%	3.13%	2.93%	128.13	41.33	13.0
6-Jun	0.00%	16.67%	0.00%	0.00%	6.67%	2.86%	20.00%	0.00%	7.14%	2.24%	117.25	29.4	13.2
7-Jun	8.33%	0.00%	0.00%	0.42%	2.50%	3.33%	0.00%	0.00%	0.00%	1.03%	112.48	27.18	13.5
8-Jun	0.00%	0.00%	1.33%	0.00%	7.81%	3.70%	0.00%	0.00%	3.33%	0.98%	109.79	24.98	13.9
9-Jun	5.00%	0.00%	0.00%	0.30%	9.52%	0.00%	0.00%	0.00%	4.17%	0.95%	110.28	26.62	14.3
10-Jun	0.00%	0.00%	2.74%	0.12%	5.45%	5.00%	100.00%	0.00%	0.00%	0.86%	108.38	30.75	14.6
11-Jun	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%	0.13%	110.36	30.69	14.7
12-Jun	0.00%	0.00%	0.00%	0.00%	4.26%	0.00%	0.00%	0.00%	0.00%	0.20%	109.85	25.28	14.7
13-Jun	5.88%	10.00%	0.00%	0.00%	2.33%	0.00%	0.00%	0.00%	0.00%	0.45%	100.53	20.49	15.0
14-Jun	0.00%	16.67%	0.00%	0.33%	2.86%	5.56%	0.00%	0.00%	0.00%	1.01%	94.03	20.13	15.1
15-Jun	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.21%	82.1	20.38	15.1
16-Jun	14.29%	0.00%	0.00%	1.22%	6.67%	6.67%	0.00%	0.00%	0.00%	1.54%	79.7	21.23	16.0
17-Jun	0.00%	50.00%	0.00%	0.18%	2.33%	4.76%	0.00%	0.00%	0.00%	0.56%	84	20.43	16.2
18-Jun	0.00%	0.00%	0.00%	0.60%	7.50%	0.00%	0.00%	0.00%	0.00%	0.84%	81.76	20.3	16.4
19-Jun	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	0.00%	0.00%	0.00%	0.14%	79.27	20.34	16.6
20-Jun	0.00%	0.00%	1.25%	0.21%	0.00%	6.67%	0.00%	0.00%	0.00%	0.49%	74.58	20.31	16.9
21-Jun	0.00%	0.00%	0.35%	0.00%	9.09%	6.67%	0.00%	0.00%	3.13%	0.31%	72.75	0	17.0
22-Jun	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	10.00%	0.17%	63.68	0	17.1
23-Jun	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	56	0	16.8
24-Jun	0.00%	0.00%	1.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	62.13	0	16.3
25-Jun	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	55.15	0	16.3
26-Jun	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	47.71	0	17.0
27-Jun	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	46.3	0	16.9
28-Jun	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	41.17	0	17.3
29-Jun	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.9	0	18.6
30-Jun	0.00%	0.00%	5.26%	0.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	39.7	0	18.5
1-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	37.42	0	17.8

Table 5. Daily Descaling in Percent at Lower Granite Dam, 2003
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	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Daily	River Conditions		
Date	Clipped	No clip	Clipped	No clip	Clipped	No clip	Clipped	No clip	All	Total	Total Q (kcfs)	Spill (kcfs)	Temp. (C)
2-Jul	0.00%	0.00%	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	40	0	18.5
3-Jul	0.00%	0.00%	0.00%	0.34%	16.67%	0.00%	0.00%	0.00%	0.00%	0.49%	36.88	0	19.0
4-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	34.53	0	19.5
5-Jul	0.00%	0.00%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	33.86	0	19.6
6-Jul	0.00%	0.00%	0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	36.69	0	19.8
7-Jul	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	27.83	0	20.1
8-Jul	0.00%	0.00%	14.29%	0.33%	0.00%	0.00%	0.00%	100.00%	0.00%	0.90%	34.16	0	19.9
9-Jul	0.00%	100.00%	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	36.54	0	20.0
10-Jul	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	6.67%	0.28%	36.24	0	21.0
11-Jul	0.00%	0.00%	0.00%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	34.38	0	21.0
12-Jul	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.25%	35.56	0	20.2
13-Jul	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	0.54%	38.45	0	19.9
14-Jul	0.00%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.46%	34.4	0	20.0
15-Jul	0.00%	0.00%	0.00%	0.20%	0.00%	12.50%	0.00%	0.00%	0.00%	0.29%	34.16	0	20.0
16-Jul	0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.79%	27.35	4.1	20.7
17-Jul	0.00%	0.00%	0.00%	0.66%	3.13%	20.00%	0.00%	0.00%	0.00%	0.86%	35.13	0	19.8
18-Jul	0.00%	0.00%	5.26%	0.00%	5.88%	33.33%	0.00%	0.00%	0.00%	0.41%	31.58	0	19.8
19-Jul	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	31.36	0	19.6
20-Jul	0.00%	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	31.91	0	19.5
21-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.41	0	20.3
22-Jul	0.00%	0.00%	0.00%	0.23%	8.33%	0.00%	0.00%	0.00%	0.00%	0.44%	31.54	0	21.0
23-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	32.25	0	21.0
24-Jul	0.00%	0.00%	0.00%	0.00%	5.88%	25.00%	0.00%	0.00%	50.00%	1.52%	34.94	0	21.1
25-Jul	0.00%	0.00%	0.00%	0.66%	0.00%	9.09%	0.00%	0.00%	33.33%	1.44%	30.37	0	20.9
26-Jul	0.00%	0.00%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.39%	28.78	0	20.8
27-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	20.00%	0.92%	26.88	0	21.4
28-Jul	0.00%	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%	28.43	0	21.8
29-Jul	0.00%	0.00%	0.00%	0.00%	8.00%	0.00%	0.00%	0.00%	0.00%	0.90%	28.35	0	21.8
30-Jul	0.00%	0.00%	0.00%	0.00%	3.13%	0.00%	0.00%	0.00%	0.00%	0.53%	27.82	0	22.0
31-Jul	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	29.65	1.87	22.6
1-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.89	0	21.9
2-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	29.31	0	21.6
3-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.6	0	21.6
4-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.58	0	21.5
5-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.35	0	21.5
6-Aug	0.00%	0.00%	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.37%	26.65	0	20.8
7-Aug	0.00%	0.00%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.38%	29.5	0	21.2
8-Aug	0.00%	0.00%	0.00%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	30.61	0	20.3
9-Aug	0.00%	0.00%	0.00%	0.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.74%	30.93	0	20.3
10-Aug	0.00%	0.00%	0.00%	0.86%	14.29%	33.33%	0.00%	0.00%	0.00%	1.32%	31.03	0	20.1
11-Aug	0.00%	0.00%	0.00%	1.35%	10.00%	0.00%	0.00%	0.00%	7.69%	1.77%	28.92	0	20.4
12-Aug	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.30%	31.23	0	20.6
13-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	27.58	0	20.4
14-Aug	0.00%	0.00%	0.00%	0.36%	33.33%	0.00%	0.00%	0.00%	0.00%	0.69%	23.23	0	20.7
15-Aug	0.00%	0.00%	0.00%	0.58%	0.00%	0.00%	0.00%	0.00%	0.00%	0.53%	25.14	0	21.4
16-Aug	0.00%	0.00%	0.00%	0.62%	0.00%	0.00%	0.00%	0.00%	0.00%	0.58%	26.03	0	21.3
17-Aug	0.00%	0.00%	0.00%	1.09%	16.67%	0.00%	0.00%	0.00%	0.00%	1.40%	26.78	0	20.5
18-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	22.2	0	20.7
19-Aug	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	25.08	0	21.4
20-Aug	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	0.62%	27.6	0	21.3
21-Aug	0.00%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	24	0	20.7

Table 5. Daily Descaling in Percent at Lower Granite Dam, 2003
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Date	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Daily	River Conditions		
	Clipped	No clip	Clipped	No clip	Clipped	No clip	Clipped	No clip	All	Total	Total Q (kcfs)	Spill (kcfs)	Temp. (C)
22-Aug	0.00%	0.00%	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	1.04%	20.93	0	20.8
23-Aug	0.00%	0.00%	0.00%	1.45%	0.00%	0.00%	0.00%	0.00%	0.00%	1.42%	20.93	0	20.8
24-Aug	0.00%	0.00%	0.00%	1.81%	0.00%	0.00%	0.00%	0.00%	0.00%	1.76%	20.75	0	20.4
25-Aug	0.00%	0.00%	0.00%	3.45%	0.00%	0.00%	0.00%	0.00%	0.00%	3.31%	20.88	0	20.3
26-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.63	0	21.2
27-Aug	0.00%	0.00%	0.00%	3.96%	0.00%	0.00%	0.00%	0.00%	0.00%	3.67%	31.5	0	20.5
28-Aug	0.00%	0.00%	0.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	28.09	0	20.9
29-Aug	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.67%	15.49	9.28	20.1
30-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	28.48	1.11	20.7
31-Aug	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	24.54	0	21.0
1-Sep	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	4.00%	21.29	0	20.8
2-Sep	0.00%	0.00%	0.00%	2.25%	0.00%	0.00%	0.00%	0.00%	0.00%	1.98%	21.81	0	20.7
3-Sep	0.00%	0.00%	0.00%	0.00%	18.18%	0.00%	0.00%	0.00%	0.00%	2.11%	24.44	0	21.5
4-Sep	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	0.00%	0.50%	25.39	0	21.0
5-Sep	0.00%	0.00%	0.00%	6.06%	0.00%	0.00%	0.00%	0.00%	0.00%	5.34%	26.2	0	21.0
6-Sep	0.00%	0.00%	0.00%	0.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	24.93	0	21.2
7-Sep	0.00%	0.00%	0.00%	2.03%	0.00%	0.00%	0.00%	0.00%	0.00%	1.71%	25.5	0	20.7
8-Sep	0.00%	0.00%	0.00%	11.19%	0.00%	0.00%	0.00%	0.00%	50.00%	10.49%	23.95	0	20.0
9-Sep	0.00%	0.00%	0.00%	0.71%	17.65%	0.00%	0.00%	0.00%	0.00%	1.62%	26.48	0	20.0
10-Sep	0.00%	0.00%	0.00%	4.22%	0.00%	0.00%	0.00%	0.00%	0.00%	3.88%	21.96	0	20.0
11-Sep	0.00%	0.00%	0.00%	1.00%	7.69%	0.00%	0.00%	0.00%	0.00%	1.35%	21.58	0	19.7
12-Sep	0.00%	0.00%	0.00%	2.17%	23.08%	0.00%	0.00%	0.00%	0.00%	3.82%	21.74	0	19.1
13-Sep	0.00%	0.00%	0.00%	1.44%	6.25%	0.00%	0.00%	0.00%	0.00%	1.85%	21.37	0	0.0
14-Sep	0.00%	0.00%	0.00%	3.85%	20.00%	0.00%	0.00%	0.00%	0.00%	4.32%	21.04	0	18.9
15-Sep	0.00%	0.00%	0.00%	4.79%	0.00%	0.00%	0.00%	0.00%	0.00%	4.52%	18.25	0	18.6
16-Sep	0.00%	100.00%	0.00%	1.54%	0.00%	0.00%	0.00%	0.00%	0.00%	4.05%	19.21	0	18.5
17-Sep	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	2.47%	18.98	0	17.9
18-Sep	0.00%	0.00%	0.00%	2.91%	0.00%	0.00%	0.00%	0.00%	0.00%	2.78%	18.17	0	18.0
19-Sep	0.00%	0.00%	0.00%	7.08%	0.00%	0.00%	0.00%	0.00%	0.00%	6.78%	18.85	0	18.1
20-Sep	0.00%	0.00%	0.00%	1.25%	0.00%	0.00%	0.00%	0.00%	0.00%	1.18%	19.62	0	17.9
21-Sep	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	19.2	0	17.8
22-Sep	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	5.71%	18.21	0	18.1
23-Sep	0.00%	0.00%	0.00%	19.59%	0.00%	0.00%	0.00%	0.00%	0.00%	18.81%	23.08	0	18.3
24-Sep	50.00%	0.00%	0.00%	19.58%	0.00%	0.00%	0.00%	0.00%	0.00%	18.83%	21.24	0	18.2
25-Sep	0.00%	0.00%	0.00%	12.38%	0.00%	0.00%	0.00%	0.00%	0.00%	12.17%	21.38	0	18.5
26-Sep	50.00%	0.00%	0.00%	5.11%	0.00%	0.00%	0.00%	0.00%	0.00%	5.21%	18.21	0	18.5
27-Sep	0.00%	0.00%	0.00%	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	3.16%	20.46	0	18.6
28-Sep	0.00%	0.00%	0.00%	3.63%	16.67%	0.00%	0.00%	0.00%	0.00%	3.78%	19.33	0	18.7
29-Sep	0.00%	0.00%	100.00%	6.39%	0.00%	0.00%	0.00%	0.00%	0.00%	6.60%	14.71	0	18.8
30-Sep	0.00%	0.00%	0.00%	4.21%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%	15.07	0	18.8
1-Oct	0.00%	0.00%	0.00%	4.38%	0.00%	0.00%	0.00%	0.00%	0.00%	4.29%	18.25	0	18.7
2-Oct	0.00%	0.00%	0.00%	12.80%	0.00%	0.00%	0.00%	0.00%	0.00%	12.09%	16.53	0	18.7
3-Oct	0.00%	0.00%	0.00%	6.88%	0.00%	0.00%	0.00%	0.00%	0.00%	6.78%	18.82	0	18.9
4-Oct	0.00%	0.00%	0.00%	4.07%	0.00%	0.00%	0.00%	0.00%	0.00%	4.01%	17.12	0	19.0
5-Oct	0.00%	0.00%	0.00%	4.49%	0.00%	0.00%	0.00%	0.00%	0.00%	4.46%	18.03	0	18.9
6-Oct	0.00%	0.00%	0.00%	3.22%	0.00%	0.00%	0.00%	0.00%	0.00%	3.17%	15.57	0	18.7
7-Oct	0.00%	0.00%	0.00%	7.46%	0.00%	0.00%	0.00%	0.00%	0.00%	7.39%	15.48	0	18.7
8-Oct	0.00%	0.00%	0.00%	5.42%	0.00%	0.00%	0.00%	0.00%	100.00%	5.56%	17.29	0	18.5
9-Oct	0.00%	0.00%	0.00%	2.63%	0.00%	0.00%	0.00%	0.00%	0.00%	2.62%	15.18	0	18.3
10-Oct	0.00%	0.00%	0.00%	2.74%	0.00%	0.00%	0.00%	0.00%	0.00%	2.74%	16.25	3.46	18.0
11-Oct	0.00%	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%	0.00%	0.00%	1.16%	16.89	2.68	18.0

Table 5. Daily Descaling in Percent at Lower Granite Dam, 2003
Page 5.

	Yearling Chinook		Subyearling Chinook		Steelhead		Sockeye/Kokanee		Coho	Daily	River Conditions		
Date	Clipped	No clip	Clipped	No clip	Clipped	No clip	Clipped	No clip	All	Total	Total Q (kcfs)	Spill (kcfs)	Temp. (C)
12-Oct	0.00%	0.00%	0.00%	2.90%	0.00%	0.00%	0.00%	0.00%	0.00%	2.78%	14.29	0	17.8
13-Oct	0.00%	0.00%	0.00%	2.59%	0.00%	0.00%	0.00%	0.00%	0.00%	2.55%	14.71	0	17.6
14-Oct	0.00%	0.00%	0.00%	4.95%	0.00%	0.00%	0.00%	100.00%	0.00%	5.15%	14.9	0	17.3
15-Oct	0.00%	0.00%	0.00%	6.35%	0.00%	0.00%	0.00%	0.00%	0.00%	6.29%	14.69	0	17.1
16-Oct	0.00%	0.00%	0.00%	4.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.67%	16.76	0	16.9
17-Oct	0.00%	0.00%	0.00%	4.91%	0.00%	0.00%	0.00%	0.00%	0.00%	4.77%	15.09	0	16.7
18-Oct	0.00%	0.00%	0.00%	3.34%	0.00%	0.00%	0.00%	0.00%	0.00%	3.33%	15.65	2.96	16.7
19-Oct	0.00%	33.33%	0.00%	4.59%	0.00%	0.00%	0.00%	0.00%	0.00%	4.65%	14.49	0	16.4
20-Oct	0.00%	0.00%	50.00%	4.30%	0.00%	0.00%	0.00%	0.00%	0.00%	4.48%	14.63	0	16.0
21-Oct	0.00%	0.00%	0.00%	4.43%	0.00%	0.00%	0.00%	0.00%	0.00%	4.41%	16.14	0	15.7
22-Oct	0.00%	100.00%	0.00%	4.24%	0.00%	0.00%	0.00%	0.00%	0.00%	4.38%	14.63	0	15.7
23-Oct	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%	0.00%	0.00%	0.00%	3.39%	15.76	0	15.3
24-Oct	0.00%	0.00%	0.00%	3.73%	0.00%	0.00%	0.00%	0.00%	0.00%	3.73%	14.75	0	14.8
25-Oct	0.00%	0.00%	0.00%	0.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.95%	14.99	0	14.5
26-Oct	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.98%	13.58	0	14.5
27-Oct	0.00%	0.00%	0.00%	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	3.81%	14.19	0	14.5
28-Oct	0.00%	0.00%	0.00%	8.56%	0.00%	0.00%	0.00%	100.00%	0.00%	8.85%	14.33	0	14.5
29-Oct	0.00%	0.00%	0.00%	10.07%	0.00%	0.00%	0.00%	0.00%	0.00%	9.79%	14.58	0	14.2
30-Oct	0.00%	0.00%	100.00%	3.39%	0.00%	0.00%	0.00%	0.00%	0.00%	3.87%	14.84	0	13.9
31-Oct	0.00%	0.00%	0.00%	5.06%	0.00%	0.00%	0.00%	0.00%	0.00%	4.85%	15.89	0	13.4

Appendix 2

Pit-tag Tables

Table 1. Hatchery Yearling Spring Chinook PIT-tag detections by tag site detected weekly at LGR, 2003.

				WEEK																				
Organization	Tag Site	Release Site	Release Dates	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	Total
ICFWRU,NMFS,FPC	Rapid R. Hat.	Rapid R. Hat.	3/17/03	11	39	415	4,523	10,146	12,146	6,895	7,983	347	3	2	1	0	0	0	0	0	0	0	0	0	42,511
USFWS	Dworshak NFH	DWORNF	3/19-3/20/03	193	178	252	831	1,724	2,075	1,646	2,054	1,407	142	150	72	42	6	5	4	1	0	0	0	0	10,782
ODFW,FPC,NPT	Lookingglass Hat.	various	3/12-4/1/03	126	134	263	1,261	2,509	2,770	1,970	1,124	184	13	2	1	3	0	0	0	0	0	0	0	0	10,360
USFWS,NPT,IDFG	Clearwater Hat.	Various	7/31-4/3/03	20	13	51	177	206	100	45	45	36	7	7	0	4	0	0	1	0	1	0	0	0	713
USFWS	Kooskia National Fish Hat.	Various	3/26/03	1	3	23	50	73	70	39	8	7	2	1	0	0	0	0	0	0	0	0	0	0	277
ODFW	GRNTRP	GRNTRP	3/17-6/4/03	67	61	54	93	73	37	9		1	1	1	0	0	0	0	0	0	0	0	0	0	397
IDFG	Sawtooth Hat.	Sawtooth Trap	4/18/03	0	0	0	0	3	62	77	38	8	0	0	0	0	0	0	0	0	0	0	0	0	188
NPT	Meadow Cr.	Meadow Cr.	4/11-6/12/03	0	0	0	0	0	2	4	4	10	3	9	4	6	3	4	2	1	0	0	0	0	52
CTUIR	Lookingglass Cr.	Lookingglass Cr.	5/31-3/15/03	1	7	11	4	1	2	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	32
NPT	Nez Perce Tribal Hatchery			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5	2	3	2	5	24
IDFG	Powell Rearing Pond	Powell Rearing Pond	9/27/02	8	3	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
IDFG	Crooked R. Pond	Crooked R. Pond	9/19/02	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
ODFW	GRAND2	GRAND2	3/14/03	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
																								Total	65,358

Table 2. Hatchery Yearling Summer Chinook PIT-tag detections by tag site detected weekly at LGR, 2003.

				WEEK																				
Organization	Tag Site	Release Site	Release Dates	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	Total
IDFG,FPC,ICFWRU,NPT	McCall Hat.	Various	7/16/02-3/31/03	0	0	8	510	1,839	3,376	2,723	5,256	880	126	20	5	6	2	3	1	0	0	0	0	0	14,755
IDFG	Pahsimeroi Pond	Pahsimeroi R. Trap	3/29/03	0	0	2	38	71	45	20	16	1	0	0	0	0	0	0	0	0	0	0	0	0	193
IDFG	S. Fk. Salmon R. Trap	S. Fk. Salmon R. Trap	9/27/02-5/16/03	0	0	0	2	1	2	1	4	11	13	6	2	2	1	1	0	0	0	0	0	0	46
IDFG	Salmon Trap	Salmon Trap	3/26-5/3/03	0	0	0	2	1	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	13
NPT	Imnaha Trap	Imnaha Trap	4/3-4/23/03	0	0	0	3	1	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13
																								Total	15,020

Table 3. Wild Yearling Chinook PIT-tag detections by tag site detected weekly at LGR, 2003.

Organization	Tag Site	Release Site	Release Dates	WEEK																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	Total
ODFW	GRNTRP	GRNTRP	3/10-6/8/03	29	52	140	187	140	97	45	38	35	29	26	20	15	4	2	1	1	0	0	0	0	861
IDFG	Sawtooth Trap	Sawtooth Trap	1/1/02-6/16/03	2	7	8	50	60	94	44	96	254	83	23	19	6	3	3	1	1	0	0	0	0	754
NPT	Lolo Cr.	Lolo Cr.	10/5/02-6/22/03	4	5	7	8	11	20	14	26	56	66	139	45	27	7	5	4	5	0	0	0	0	449
IDFG	American R.	American R.	10/15/02-6/26/03	0	0	0	0	3	0	2	3	20	20	75	47	106	65	54	7	12	2	0	0	0	416
IDFG	Marsh Cr. Trap	Marsh Cr. Trap	6/14/02-6/14/03	1	7	17	58	33	38	19	43	63	30	19	6	6	4	7	4	1	0	0	0	0	356
ODFW	Lostine R.	Lostine R.	8/14/02-4/25/03	2	12	37	52	43	33	18	33	48	8	2	0	0	0	1	0	0	0	0	0	0	289
IDFG	Lemhi R. Weir	Lemhi R. Weir	5/23/02-6/17/03	7	10	31	66	72	20	10	18	3	0	1	2	9	2	6	3	2	0	0	0	0	262
ODFW	Catherine Cr.	Catherine Cr.	6/11/02-5/8/03	0	1	7	11	25	21	16	30	80	30	9	6	1	0	0	0	0	0	0	0	0	237
ODFW	GRAND2	GRAND2	9/30/02-5/28/03	2	1	6	9	34	42	18	53	57	8	0	1	0	0	0	0	0	0	0	0	0	231
ODFW	Minam R.	Minam R.	8/20/02-4/25/03	4	20	23	28	26	24	15	24	30	6	0	0	0	0	0	0	0	0	0	0	0	200
IDFG	Crooked Fk. Cr. Trap	Crooked Fk. Cr. Trap	7/15/02-5/14/03	2	2	3	7	15	18	12	12	27	11	18	8	7	4	0	0	1	0	0	0	1	148
NPT	Newsome Cr.	Newsome Cr.	9/17/02-6/10/03	1	0	2	1	6	8	5	7	19	8	10	12	23	10	4	1	2	0	0	0	0	119
IDFG	Red R. Trap	Red R.	2/28/03-5/17/03	0	0	0	0	2	1	0	3	7	9	24	13	27	8	8	4	1	0	0	0	0	107
NMFS	BIG2C	BIG2C	8/15/02-8/22/02	0	0	6	12	19	14	6	20	13	7	2	0	1	0	0	0	0	0	0	0	0	100
CTUIR	Lookingglass Cr.	Lookingglass Cr.	1/10/02-6/27/03	13	21	22	15	9	2	0	1	1	0	0	0	2	1	0	0	0	0	0	1	0	88
IDFG	Crooked R. Trap	Crooked R. Trap	4/29/03-6/25/03	0	0	0	0	0	0	0	1	6	3	9	7	19	10	7	3	4	0	0	0	1	70
IDFG	Fish Cr. Trap	Fish Cr. Trap	9/19/02-10/30/02	3	2	2	9	14	15	4	6	8	0	4	0	0	0	0	0	0	0	0	0	0	67
NMFS	Loon Cr.	Loon Cr.	8/8-8/9/2002	0	0	0	4	3	8	10	12	22	2	0	0	0	0	0	0	0	0	0	0	0	61
USFWS	Clear Cr.	Clear Cr.	8/8/02-5/20/03	0	0	1	5	10	5	8	6	17	6	0	0	0	0	0	0	1	0	0	0	0	59
IDFG	Colt Kill Cr. - Replaces WHITSC	Colt Kill Cr.	8/8/02-5/9/03	0	0	0	2	0	6	3	2	10	8	14	2	5	2	2	0	0	0	0	0	0	56
NPT	Meadow Cr.	Meadow Cr.	4/7/03-5/23/03	0	0	0	1	4	2	2	6	15	7	5	3	3	2	1	1	0	0	0	0	0	52
NMFS	Marsh Cr.	Marsh Cr.	7/31/02	0	2	4	6	8	6	4	8	8	3	1	0	0	0	0	0	0	0	0	0	0	50
NMFS	Valley Cr.	Valley Cr.	8/2-8/6/02	2	1	3	5	4	4	4	6	19	2	0	0	0	0	0	0	0	0	0	0	0	50
ODFW	Imnaha R.	Imnaha R.	8/26-8/28/02	0	0	0	6	9	6	10	7	3	2	0	0	0	0	0	0	0	0	0	0	0	43
NPT	Papoose Cr.	Papoose Cr.	8/2-8/28/02	0	0	0	2	3	5	1	3	9	5	9	3	1	1	0	0	0	0	0	0	0	42
NMFS	Bear Valley Cr.	Bear Valley Cr.	7/24-7/25/02	0	0	5	8	5	4	2	4	9	1	2	1	0	0	0	0	0	0	0	0	0	41
IDFG	Red R. Trap	Red R. Trap	9/24/02-6/30/03	0	0	0	1	2	3	2	2	3	1	1	2	5	7	2	4	3	0	0	0	0	38
NMFS	Herd Cr.	Herd Cr.	8/13/02	0	1	2	8	5	8	4	5	3	1	0	0	0	0	0	0	0	0	0	0	0	37
SHOBAN	East Fk. Salmon R. Weir	East Fk. Salmon R. Trap	4/18-5/5/03	0	0	0	0	0	2	3	16	10	3	0	1	0	0	1	0	0	0	0	0	0	36
NMFS	Camas Cr.	Camas Cr.	8/9/02	0	0	0	0	2	6	1	3	10	3	2	0	0	0	0	0	0	0	0	0	0	27
NMFS	Elk Cr.	Elk Cr.	7/26-7/27/02	1	0	0	5	6	4	2	3	4	2	0	0	0	0	0	0	0	0	0	0	0	27
NMFS	Capehorn Cr.	Capehorn Cr.	8/1/02	0	0	1	3	2	5	0	6	6	1	0	1	0	0	0	0	0	0	0	0	0	25
NMFS	Sulfer Cr.	Sulfer Cr.	7/31-8/1/02	0	0	0	2	0	3	1	2	8	3	4	1	1	0	0	0	0	0	0	0	0	25
IDFG	Red R. Trap			0	0	0	0	0	0	0	0	2	2	6	2	5	1	2	0	0	0	0	0	0	20
NPT	Squaw Cr.	Squaw Cr.	8/2/02	0	0	1	2	3	1	1	2	5	3	0	0	0	0	0	0	0	0	0	0	0	18
NMFS	West Fk. Chamberlain Cr.	West Fk. Chamberlain Cr.	8/20-8/21/02	0	0	0	2	1	3	0	4	6	0	0	0	0	0	0	0	0	0	0	0	0	16
SHOBAN	West Fk. Yankee Fk.	West Fk. Yankee Fk.	3/26/02-5/23/03	0	0	0	1	0	0	0	1	0	3	2	3	3	1	2	0	0	0	0	0	0	16
IDFG	Crooked R. Trap	Crooked R.	3/27-3/29/03	0	0	0	0	0	1	3	1	1	1	2	1	1	2	1	0	0	0	0	0	0	14
IDFG	Lemhi R.	Lemhi R.	6/27/02	0	1	0	5	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
SHOBAN	East Fk. Salmon R. Trap	East Fk. Salmon R. Trap	8/8/02-3/26/03	0	0	0	0	2	0	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	11
IDFG	American R.			0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	5
SHOBAN	East Fk. Salmon R.	East Fk. Salmon R.	5/23/03	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	4
SHOBAN	East Fk. Salmon R.	East Fk. Salmon R. Trap	4/5/03	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
USFWS	Pete King Cr.	Pete King Cr.	7/23-7/24/02	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
NPT	Meadow Cr.	Meadow Cr.	4/10/03	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	Crooked R. Trap			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
NMFS	Chamberlain Cr.	Chamberlain Cr.	8/21/02	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
																							Total	5,547

Table 4. Wild Yearling Summer Chinook PIT-tag detections by tag site detected weekly at LGR, 2003.

				WEEK																			
Organization	Tag Site	Release Site	Release Dates	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
NPT	Imnaha Trap	Imnaha Trap	5/15/02-6/25/03	49	157	389	485	481	303	173	171	127	17	4	12	11	4	11	4	2	1	0	0	0	2,401
IDFG	Pahsimeroi R. Trap	Pahsimeroi R. Trap	1/1/02-6/19/03	1	17	37	157	151	74	19	30	7	53	61	62	94	38	58	18	10	0	1	1	1	890
NPT	Johnson Cr.and Trap	Johnson Cr.and Trap	6/27/02-5/22/03	1	8	31	97	78	107	45	121	184	137	33	15	12	3	3	2	1	0	0	0	0	878
NMFS,IDFG	S. Fk. Salmon R. and Trap	S. Fk. Salmon R. and Trap	8/17/01-6/19/03	1	2	11	48	36	42	10	34	50	50	17	5	8	1	6	0	2	0	0	0	0	323
NMFS,NPT	Secesh R.	Secesh R.	8/11/01-6/21/03	2	12	27	40	29	29	4	26	27	28	14	9	8	5	5	2	1	0	0	0	0	268
NPT,NMFS	Lake Cr.	Lake Cr.	4/17/02-6/14/03	0	5	15	25	23	9	3	7	22	25	17	8	8	8	2	0	0	0	1	0	0	178
																								Total	4938

Table 5. Hatchery yearling fall chinook (elastomers) PIT-tag detections by release site detected weekly at LGR, 2003.

				WEEK																				
Organization	Tag Site	Release Site	Release Dates	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	Total
NPT	Big Canyon Cr. Acc. Fac.	Big Canyon Acc. Fac.	4/1-4/10/03	0	0	0	829	1,043	371	164	97	41	12	6	3	0	0	0	0	0	0	0	0	0	2,566
NPT	Capt. John Rapids Acc. Pond	Capt. John Acc. Fac.	4/1-4/10/03	0	0	118	451	310	58	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	947
NPT	Pittsburg Landing Acc. Fac.	Pittsburg Landing Acc. Fac.	4/1-4/10/03	0	0	0	1,002	1,271	342	80	18	17	2	0	2	0	0	0	0	0	0	0	0	0	2,734
																								Total	6,247

Table 6. Hatchery Sub-Yearling Chinook PIT-tag detections by release site detected weekly at LGR, 2003.

				WEEK																						
Organization	Tag Site	Release Site	Release Dates	1-9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
NMFS,WDFW,USFWS	Lyons Ferry Hat.,Snake R.	Snake R.-Clearwater R. to Salmon R.	5/29/02-6/18/03	161	489	2,910	6,455	9,543	1,770	500	158	87	13	41	13	4	3	0	1	2	0	4	1	3	2	0	22,160
NPT,NMFS	Pittsburg Landing Acc. Fac.,LFH	Pittsburg Landing Acc. Fac.	5/24/02-6/4/03	2	124	1,133	1,724	2,507	454	116	29	18	1	8	2	2	0	0	0	0	0	0	0	0	0	0	6,120
NPT	Nez Perce Tribal Hatchery	Nez Perce Tribal Hatchery	6/02/03-6/19/03	0	0	531	279	202	125	144	92	50	5	28	21	15	7	3	9	0	5	5	6	4	9	3	1,543
IDFG	Oxbow Dam	Hells Canyon Dam	5/22/03	18	463	544	265	91	11	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1,395
NPT	Big Canyon Cr. Acc. Fac.	Big Canyon Acc. Fac.	5/27/02-6/3/03	11	0	286	148	198	112	100	18	7	2	2	1	3	0	0	2	0	0	1	0	2	0	0	893
NPT	N. Valley Acc. Pond	NLVP	5/29/03	0	164	244	59	58	28	22	8	8	1	2	0	0	1	0	0	0	0	0	0	1	1	0	597
NPT	Capt. John Rapids Acc. Pond	Capt. John Acc. Fac.	6/18/02-5/26/03	7	256	154	43	35	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	497
ODFW	Umatilla Hat.			83	189	58	16	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	352
IDFG	Snake Trap	Snake Trap	4/15-4/18/03	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
NMFS	Lower Monumental Dam	IHR-Forebay within 0.5 km of Spillway	7/6/02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
																									Total		33,571

Table 7. Wild Steelhead PIT-tag detections, by tag site detected weekly at LGR, 2003.

Organization	Tag Site	Release Sites	Release Dates	WEEK																							Total
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23-31	
NPT	Imnaha Trap	Imnaha Trap	3/31/02-6/20/03	16	41	27	63	284	202	344	665	209	5	19	13	2	1	0	0	0	0	0	0	0	0	0	1,891
IDFG	Fish Cr. Trap	Fish Cr. Trap	5/29/01-4/26/03	7	34	82	152	194	77	78	161	30	3	1	0	0	0	0	0	0	0	0	0	0	0	0	819
IDFG	Snake Trap	Snake Trap	3/25-5/27/03	9	12	6	38	47	36	47	75	124	3	0	0	0	0	0	0	0	0	0	0	0	0	0	397
IDFG	Clear Cr.	Clear Cr.	4/24/02-6/2/03	2	8	14	24	48	44	24	44	16	0	4	0	0	0	0	0	0	0	0	0	0	0	0	228
ODFW	GRNTRP	GRNTRP	4/23/02-6/4/03	6	4	2	11	13	7	6	27	81	55	6	0	0	0	0	0	0	0	0	0	0	0	0	218
CTUIR	Lookingglass Cr.	Lookingglass Cr.	7/05/00-6/11/03	8	4	1	7	17	12	8	27	73	21	8	6	3	1	0	0	0	0	0	0	0	0	0	196
ODFW	Lostine R.	Lostine R.	9/27/01-5/22/03	3	4	4	5	5	5	7	24	93	21	1	1	2	0	0	0	0	0	0	0	0	0	0	175
IDFG	Clearwater Trap	Clearwater Trap	3/25-5/15/03	3	8	5	18	6	15	45	66	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167
IDFG	Chamberlain Cr.	Chamberlain Cr.	7/20/00-7/7/02	2	0	4	51	25	10	0	34	11	2	0	1	1	0	0	0	0	0	0	0	0	0	0	141
ODFW	Minam R.	Minam R.	10/11/01-5/20/03	3	0	3	9	23	13	8	17	58	4	1	0	0	0	0	0	0	0	0	0	0	0	0	139
IDFG	Crooked Fk. Cr. Trap	Crooked Fk. Cr. Trap	6/19/01-5/14/03	2	0	14	40	30	7	7	23	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	126
ODFW	Catherine Cr.	Catherine Cr.	7/16/01-5/23/03	2	0	1	7	16	6	10	13	42	13	0	1	0	0	0	0	0	0	1	0	0	0	0	112
ODFW	GRAND2	GRAND2	9/30/02-6/4/03	0	2	4	4	7	9	11	15	47	10	2	0	1	0	0	0	0	0	0	0	0	0	0	112
IDFG	Salmon Trap	Salmon Trap	3/15-5/23/03	1	3	4	16	20	13	15	21	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	101
IDFG	Pahsimeroi R. Trap	Pahsimeroi R. Trap	9/25/01-6/5/03	0	0	0	5	5	8	6	17	27	2	1	2	0	0	0	0	0	0	0	0	0	0	0	73
IDFG	Camas Cr.	Camas Cr.	8/15-8/16/03	1	0	4	30	12	3	0	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
IDFG	Moose Cr. (Selway R.)	Moose Cr. (Selway R.)	8/02-8/5/02	1	2	16	20	14	3	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
IDFG	Brushy Fk. Cr.	Brushy Fk. Cr.	8/3/01-7/25/02	1	1	5	25	14	4	1	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	62
IDFG	Sawtooth Trap	Sawtooth Trap	9/18/01-5/20/03	0	0	0	0	5	8	3	11	29	5	0	0	0	0	0	0	0	0	0	0	0	0	0	61
NPT	Johnson Cr. Trap	Johnson Cr. Trap	5/12/01-5/21/03	4	1	1	9	8	6	2	14	8	1	1	0	1	0	0	0	0	0	0	0	0	0	0	56
IDFG	BIG2C	BIG2C	8/22/01-8/21/02	0	0	3	12	6	3	0	19	1	3	1	0	1	0	0	0	0	0	0	0	0	0	0	49
IDFG	Bargamin Cr.	Bargamin Cr.	7/7/01-7/13/02	0	0	2	11	6	6	6	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
IDFG	Colt Kill Cr. - Replaces WHITSC	Colt Kill Cr.	7/5/02-5/14/03	1	0	6	3	8	1	1	17	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
IDFG	S. Fk. Salmon R. Trap	S. Fk. Salmon R. Trap	3/31/01-4/25/03	1	2	2	6	5	8	3	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	38
NPT	Secesh R.	Secesh R.	5/16/00-9/20/02	1	0	1	12	3	7	4	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
IDFG	Marsh Cr. Trap	Marsh Cr. Trap	6/1/01-5/14/03	0	0	2	4	2	4	1	9	10	2	2	0	0	0	0	0	0	0	0	0	0	0	0	36
IDFG	Lick Cr.	Lick Cr.	7/24/01-8/16/02	1	1	2	2	6	4	3	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
IDFG	Fish Cr.	Fish Cr.	3/15/01-7/22/02	1	2	5	5	8	1	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
IDFG	Loon Cr.	Loon Cr.	8/18-8/20/02	0	0	0	7	5	1	3	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	29
IDFG	Whitebird Cr.	Whitebird Cr.	6/28-6/30/02	0	0	1	4	5	3	1	10	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	28
IDFG	Sulfer Cr.	Sulfer Cr.	7/14/01-8/19/02	0	0	0	2	4	6	1	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
IDFG	Horse Cr.	Horse Cr.	7/10/01-7/16/02	0	0	0	3	5	1	3	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
IDFG	Lower S. Fk. Salmon R. Trap	L. S. Fk. Salmon R. Trap	6/5/01-10/29/02	2	1	1	4	5	0	2	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
IDFG	Middle Fk. Salmon R.	Middle Fk. Salmon R.	8/19-8/20/02	0	0	0	3	3	3	0	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
IDFG	Gedney Cr.	Gedney Cr.	7/23/01-8/4/02	0	0	3	2	5	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
IDFG	MOOS2N	MOOS2N	8/10-8/12/01	1	0	1	7	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
IDFG	Lemhi R. Weir	Lemhi R. Weir	5/30/02-6/1/03	0	0	0	0	2	0	0	0	1	5	4	0	0	0	0	0	0	0	0	0	0	0	0	12
NPT	Lake Cr.	Lake Cr.	4/20/01-8/27/02	0	2	2	1	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
IDFG	Bear Valley Cr.	Bear Valley Cr.	7/25/01-7/25/02	0	0	0	1	1	0	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
IDFG	Boulder Cr.	Boulder Cr.	8/7/00-8/21/01	0	1	1	3	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
IDFG	Crooked R. Trap	Crooked R. Trap	6/1/01-6/24/02	0	0	0	1	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
IDFG	Slate Cr.	Slate Cr.	6/24/01-7/2/02	0	0	0	2	1	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
IDFG	West Fk. Chamberlain Cr.	West Fk. Chamberlain Cr.	7/24/01-8/20/02	1	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
IDFG	YELLJC	YELLJC	8/16/02	0	0	0	4	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8
NMFS	Lower Granite Dam	LGR - Barge Transport	4/24/01-6/7/03	0	0	0	1	0	0	0	2	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	8
IDFG	Herd Cr.	Herd Cr.	8/12/02	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
IDFG	Storm Cr.	Storm Cr.	7/24-7/25/00	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
IDFG	Crooked Fk. Cr.	Crooked Fk. Cr.	8/7/01	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IDFG	Elk Cr.	Elk Cr.	8/11/00-7/26/02	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IDFG	Red R. Trap	Red R. Trap	6/4-6/21/02	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IDFG	Marsh Cr.	Marsh Cr.	8/17/00-8/3/01	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
IDFG	Secesh R.	Secesh R.	8/25/01	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
IDFG	West Fk. Gedney Cr.	West Fk. Gedney Cr.	8/4/02	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
NPT	Johnson Cr.	Johnson Cr.	7/26/01	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
IDFG	Boulder Cr. Trap	Boulder Cr.	7/22/02	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	Crooked Fk. Cr.	Crooked Fk. Cr. Trap	5/22/03	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	Johns Cr.	Johns Cr.	7/16/01	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	Rush Cr.	Rush Cr.	8/22/01	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	Valley Cr.	Valley Cr.	8/5/02	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
IDFG	White Sand Cr. - Replaced by COLTK	Colt Kill Creek	9/10/00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
NPT	Newsome Cr.	Newsome Cr.	10/2/00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ODFW	N. Fk. Catherine Cr.	N. Fk. Catherine Cr.	6/27/01	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SHOBAN	East Fk. Salmon R. Weir	East Fk. Salmon R. Trap	5/5/03	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
																										Total	5,820

Table 8. Hatchery Steelhead PIT-tag detections, by tag site detected weekly at LGR, 2003.

Organization	Tag Site	Release Sites	Release Dates	WEEK																				Total
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	
IDFG	Snake Trap	Snake Trap	3/30-5/27/03	0	15	61	193	222	124	177	182	283	25	0	0	0	0	0	0	0	0	0	0	1,282
NPT	Imnaha Trap	Imnaha Trap	3/23-6/14/03	0	0	11	121	246	174	151	357	188	12	0	0	1	0	0	0	0	0	0	0	1,261
ODFW	Irrigon Hat.	Various	4/10/02-5/15/03	1	0	0	33	30	20	39	72	231	75	26	27	32	26	29	44	33	23	12	4	2	759
USFWS,IDFG	Clearwater Hat.	Various	4/25/02-4/23/03	0	0	0	100	203	109	64	120	95	24	10	2	2	0	0	0	0	0	0	0	0	729
ODFW	GRNTRP	GRNTRP	04/13-6/8/03	0	0	1	167	99	26	34	56	164	104	10	1	0	0	0	0	0	0	0	0	0	662
IDFG	Magic Valley Hat.	Various	4/07-4/28/03	0	0	17	41	139	65	103	98	83	36	7	3	0	0	1	0	0	1	0	0	0	594
IDFG	Salmon Trap	Salmon Trap	4/7-5/23/03	0	0	29	56	90	81	109	176	50	1	0	0	0	0	0	0	0	0	0	0	0	592
IDFG	Hagerman NFH	Various	4/9-5/14/03	0	0	16	32	29	10	32	174	141	29	31	17	4	2	0	1	2	0	0	0	0	520
USFWS	Dworshak NFH	DWORMS	4/22/02-4/21/03	0	0	0	11	212	32	27	51	27	0	2	1	0	0	0	0	0	0	0	0	0	363
IDFG	Niagara Springs Hat.	Various	4/1-5/3/03	0	0	6	16	35	18	29	58	86	26	2	0	0	0	0	0	0	1	0	0	0	277
IDFG	Squaw Cr. Acc. Pond	Squaw Cr. Acc. Pond	4/29-6/3/03	0	0	0	0	0	2	14	33	14	4	54	20	2	2	1	1	0	0	1	0	0	148
USFWS	Clearwater R.	Clearwater R.	7/1/02	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
USFWS	N. Fk. Clearwater R.	N. Fk. Clearwater R.	9/3/02	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
																							Total		7,189

Table 9. Hatchery Sockeye PIT-tag detections, by release site detected weekly at LGR, 2003.

Organization	Tag Site	Release Site	Release Dates	WEEK																				Total
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	
SHOBAN,IDFG	Various	Pettit Lake and Cr.	8/27/02-5/20/03	0	0	0	0	0	0	0	0	102	268	37	2	0	0	0	0	0	0	0	0	0	409
IDFG	Various	Redfish Lake and Cr.	8/29/02-5/29/03	0	0	0	0	0	0	0	16	51	91	13	0	0	1	1	0	0	0	0	0	0	173
IDFG	Bonneville Hat.	Alturus Lake	8/27/02	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	4
																							Total		586

Table 10. Wild Sockeye PIT-tag detections, by tag and release site detected weekly at LGR, 2003.

Organization	Tag Site	Release Site	Release Dates	WEEK																				Total
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	
IDFG	Redfish Lake Cr.	Redfish Lake Cr.	4/24-5/28/03	0	0	0	0	0	0	1	39	42	28	2	1	0	0	0	0	0	0	0	0	0	113
																							Total		113

Table 11. Hatchery Coho PIT-tag detections, by release site detected weekly at LGR, 2003.

Organization	Tag Site	Release Site	Release Dates	WEEK																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-31	Total
NPT	Kooskia National Fish Hat.	Kooskia NFH	4/10/03	0	0	0	0	0	0	1	39	94	22	6	4	2	0	0	0	0	0	0	0	0	168
USFWS	Eagle Cr.	Lapwai Cr.	3/13/03	0	0	0	0	0	1	1	29	47	48	13	1	0	0	0	0	0	0	0	0	0	140
NPT	Clearwater Hat.	S. Fk. Clearwater R.	7/8/02	0	0	0	0	0	0	0	0	1	4	5	2	8	5	3	1	0	0	1	0	0	30
USFWS	Eagle Cr.	Potlatch R.	3/11/03	0	0	0	0	2	1	1	4	14	1	3	1	0	0	1	0	0	0	0	0	0	28
NPT	Clearwater Hat.	Eldorado Cr.	6/28/01-7/8/02	0	0	0	0	0	0	0	0	1	1	1	3	5	4	3	4	1	0	0	0	0	23
NPT	Clearwater Hat.	Meadow Cr.	7/8/02	0	0	0	0	0	0	0	0	1	0	8	2	1	1	1	0	0	0	0	0	0	14
																								Total	403