

**SMOLT MONITORING AT THE HEAD OF LOWER GRANITE  
RESERVOIR AND LOWER GRANITE DAM**

**Annual Report  
2003 Operations**

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## ABSTRACT

This project monitored the daily passage of Chinook salmon *Oncorhynchus tshawytscha*, steelhead trout *O. mykiss*, and sockeye salmon *O. nerka* smolts during the 2003 spring out-migration at migrant traps on the Snake River and Salmon River.

In 2003 fish management agencies released significant numbers of hatchery Chinook salmon and steelhead trout above Lower Granite Dam that were not marked with a fin clip or coded-wire tag. Generally, these fish were distinguishable from wild fish by the occurrence of fin erosion.

Total annual hatchery Chinook salmon catch at the Snake River trap was 2.1 times less in 2003 than in 2002. The wild Chinook catch was 1.1 times less than the previous year. Hatchery steelhead trout catch was 1.7 times less than in 2002. Wild steelhead trout catch was 2.1 times less than the previous year. The Snake River trap collected 579 age-0 Chinook salmon of unknown rearing. During 2003, the Snake River trap captured five hatchery and 13 wild/natural sockeye salmon and 36 coho salmon *O. kisutch* of unknown rearing. Differences in trap catch between years are due to fluctuations not only in smolt production, but also differences in trap efficiency and duration of trap operation associated with flow. The significant differences in catch between 2003 and the previous year were due mainly to low flows during much of the trapping season and then very high flows at the end of the season, which terminated the trapping season 12 days earlier than in 2002. Trap operations began on March 9 and were terminated on May 27. The trap was out of operation for a total of zero days due to mechanical failure or debris.

Hatchery Chinook salmon catch at the Salmon River trap was 16.8% less and wild Chinook salmon catch was 1.7 times greater than in 2002. The hatchery steelhead trout collection in 2003 was 5.6% less than in 2002. Wild steelhead trout collection was 19.2% less than the previous year. Trap operations began on March 9 and were terminated on May 24 due to high flows. There were zero days when the trap was out of operation due to high flow or debris. The decrease in hatchery Chinook catch in 2003 was partially due to differences in flow between years because there was a 5.9% increase in hatchery production in the Salmon River drainage in 2003. The decrease in hatchery steelhead catch may be partially due to a 13% decrease in hatchery production in the Salmon River drainage in 2003.

Travel time (d) and migration rate (km/d) through Lower Granite Reservoir for PIT-tagged Chinook salmon and steelhead trout marked at the Snake River trap were affected by discharge. Statistical analysis of 2003 data detected a relation between migration rate and discharge for wild Chinook salmon but was unable to detect a relation for hatchery Chinook. The inability to detect a migration rate discharge relation for hatchery Chinook was probably caused by age 0 fall Chinook being mixed in with the age 1 Chinook. Age 0 fall Chinook migrate much slower than age 1 Chinook, which would confuse the ability to detect the migration rate discharge relation. For wild Chinook salmon there was a 1.4-fold increase in migration rate, respectively, between 50 and 100 kcfs. For steelhead trout tagged at the Snake River trap, statistical analysis detected a significant relation between migration rate and Lower Granite Reservoir inflow discharge. For hatchery and wild steelhead trout, there was a 1.7-fold and a 1.9-fold increase in migration rate, respectively, between 50 and 100 kcfs.

Travel time and migration rate to Lower Granite Dam for fish marked at the Salmon River trap were calculated. Statistical analysis of the 2003 data detected a significant relation between migration rate and Lower Granite Reservoir inflow discharge for hatchery Chinook salmon, wild Chinook salmon and hatchery steelhead trout. Not enough data were available to perform the analysis for wild steelhead trout. Migration rate increased 14-fold for hatchery Chinook salmon, 8.3-fold for wild Chinook salmon and 2.4-fold for hatchery steelhead as discharge increased between 50 kcfs and 100 kcfs.

Fish tagged with passive integrated transponder (PIT) tags at the Snake River and Salmon River traps were interrogated at four dams with PIT tag detection systems (Lower Granite, Little Goose, Lower Monumental, and McNary dams). Because of the addition of the fourth interrogation site (Lower Monumental) in 1993 and the installation of the Removable Spillway Weir at Lower Granite Dam in 2001, caution must be used in comparing cumulative interrogation data. Cumulative interrogations at the four dams for fish marked at the Snake River trap were 65% for hatchery Chinook, 72% for wild Chinook, 66% for hatchery steelhead, and 67% for wild steelhead. Cumulative interrogations at the four dams for fish marked at the Salmon River trap were 48% for hatchery Chinook, 61% for wild Chinook salmon, 57% for hatchery steelhead trout, and 56% for wild steelhead trout.

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## INTRODUCTION

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (P.L. 96-501) directed the Northwest Power Planning Council (NWPPC) to develop programs to mitigate for fish and wildlife losses on the Columbia River system resulting from hydroelectric projects. Section 4(h) of the Act explicitly gives the Bonneville Power Administration (BPA) the authority and responsibility to use its resources "to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project on the Columbia River system."

Water storage and regulation for hydroelectric generation severely reduces flows necessary for downstream migration of juvenile steelhead trout *Oncorhynchus mykiss* and Chinook salmon *O. tshawytscha*. In response to the fishery agencies and Indian tribes recommendations for migration flows, in 1982 the NWPPC Columbia River Basin Fish and Wildlife Program proposed a "water budget" for augmenting spring flows. The federal Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 et seq.) listing of Snake River spring/summer and fall Chinook salmon in 1992 and the development of a National Marine Fisheries Service (NMFS) Biological Opinion (BIOP) for the Federal Columbia River Power System established flow measures for the Snake River. The measures within the BIOP establish flow targets and dates for providing those flows, which replaced the "water budget." This BIOP was replaced with the NMFS 2000 Federal Columbia River Power System BIOP. The reasonable and prudent actions described in Sections 9.6.1 and 9.6.5.3.5.1 of the 2000 BIOP requires monitoring and evaluation of the smolt out-migration. The Idaho Department of Fish and Game (IDFG) monitors the daily passage of smolts at the head of Lower Granite Reservoir. The NMFS established a Technical Management Team (TMT) to oversee implementation of the BIOP measures. The TMT utilizes out-migration monitoring data provided by IDFG and other agencies through the Columbia Basin Smolt Monitoring Project (SMP) as a basis for recommending measures within the flexibility provided by the BIOP to increase smolt survival.

Smolt monitoring is a key component of BIOP implementation under all flow conditions and becomes critical when low flow conditions reduce migration rates. In years of low flow (drought years), knowledge of when most smolts have left tributaries and entered areas that can be affected by releases of stored water allows managers to make informed decisions regarding implementation of measures within the BIOP. Seven low-flow years (1987, 1988, 1990, 1991, 1992, 1994, and 2001) have occurred during this smolt-monitoring project. The indications are that judicious use of the available reservoir storage volumes can greatly enhance the timing and migration rate of juvenile Chinook salmon and steelhead trout.

The IDFG smolt monitoring project also collects other useful data on relative species composition, hatchery and wild ratios, travel time, and migration rate. All wild steelhead trout smolts are PIT tagged to determine timing of wild adult steelhead trout one and two years later as they return to spawn (Prentice et al. 1987). By monitoring smolt passage at the head of Lower Granite Reservoir and at Lower Granite Dam, migration rates (km/d) under various riverine and reservoir conditions can be estimated and compared. It is possible to determine the relative abundance of hatchery and wild stocks, which can be used to document wild stock rebuilding progress. This SMP's information is complementary to other Snake and Columbia River NWPPC-supported projects.

The management information provided by this project includes: 1) information on salmon and steelhead smolt movement at the upper end of the lower Snake River's series of dams; 2)



groups of passive integrated transponder-tagged fish, which are used for postseason survival estimates; and 3) information to assist water managers with in-season management decisions relative to flow augmentation, facility power operations, fish collection and transportation programs, and operation of the Federal Columbia River Power System (FCRPS) to maximize benefits to smolt survival.

## **OBJECTIVES**

1. Provide daily trap catch data at the head of Lower Granite Reservoir for TMT's use in implementing the NMFS Biological Opinion.
2. Provide an interrogation site for PIT-tagged smolts, marked by other projects, at the end of their migration in a riverine environment and the beginning of their migration in a reservoir environment.
3. Determine riverine travel time from the point of release to the smolt traps (index sites) at the upper end of Lower Granite Reservoir for PIT-tagged smolts.
4. Determine reservoir travel time from the head of lower Granite Reservoir to Lower Granite Dam using PIT-tagged smolts marked at the traps and PIT-tagged smolts passing the traps from upriver hatchery releases and rearing areas.
5. Determine cumulative interrogation rate at Lower Granite, Little Goose, Lower Monumental, and McNary dams during the spring out-migration period for PIT-tagged hatchery and wild spring/summer Chinook salmon, and hatchery and wild steelhead trout.
6. Correlate smolt migration rate with river flow for fish moving in riverine and reservoir environments.
7. Determine trap efficiency for each species at each trap over a range of discharges.
8. Evaluate timing of returning adult wild and natural steelhead crossing Lower Granite Dam.

## **METHODS**

### **Releases of Hatchery-Produced Smolts**

Anadromous hatchery release information was reported for hatchery smolts, which contributed to the 2003 outmigration in the Snake River drainage, upstream of Lower Granite Dam. This information included species, number released, date, release location, number PIT-tagged, and hatchery of origin. Not all hatchery produced fish were fin clipped in 2003.

### **SMOLT MONITORING TRAPS**

During the 2003 out-migration, two smolt-monitoring traps were operated to monitor the passage of juvenile Chinook salmon and steelhead trout. A dipper trap (Mason 1966) was located on the Snake River near Lewiston, Idaho. A scoop trap (Raymond and Collins 1974) was located on the Salmon River, near Slate Creek, Idaho (Figure 1). Prior to the 1996 outmigration season, the Fish Passage Center requested that all smolt-monitoring projects reduce handling of fish listed under the Endangered Species Act. To comply with this request, sampling regimes and PIT tag quotas were adjusted at this project's collection sites. Sampling periods were based on a standard workweek (Monday-Friday) with Saturday and Sunday left available, if necessary, to fill weekly PIT tag quotas. Weekly PIT tag quotas for hatchery and wild Chinook salmon were 600 each. Weekly PIT tag quotas for hatchery and wild steelhead trout were 600 and 200, respectively. Smolts were captured, examined, and enumerated daily at the traps and released back into the river. Fork lengths of up to 100 smolts for each species, run, and rearing-type were measured to the nearest millimeter, daily. Up to 2,000 fish were examined daily for hatchery brands at the Snake River trap. Fish were not examined for brands at the Salmon River trap. Smolts were anesthetized before handling with tricaine methanesulfonate (MS-222) and allowed to recover before being returned to the river.

In 2003, the Fish Passage Center requested this SMP to assist the Comparative Survival Study by PIT tagging all wild Chinook in excess of SMP needs. To comply with this request, sampling regimes and PIT tag quotas were adjusted at this project's collection sites. Sampling periods were expanded from the normal five day a week sample period to seven days a week. Funding and PIT tags were made available from the Comparative Survival Study for this task.

Water temperature (°C) and turbidity (m) were recorded daily at each trap using a centigrade thermometer and 20 cm Secchi disk. Snake River discharge was measured at the U.S. Geological Survey (USGS) Anatone gauge (#13334300), 44.4 km upstream from the Snake River trap. Salmon River discharge was measured at the USGS White Bird gauge (#13317000), 16.6 km downstream from the Salmon River trap.

### **Snake River Trap**

The Snake River trap was positioned approximately 40 m downstream from the Interstate Bridge between Lewiston, Idaho and Clarkston, Washington. The trap was attached to bridge piers just east of the drawbridge span by steel cables. This location is at the head of Lower Granite Reservoir, 0.5 km upstream from the convergence of the Snake and Clearwater arms. River width and depth at this location are approximately 260 m and 12 m, respectively.

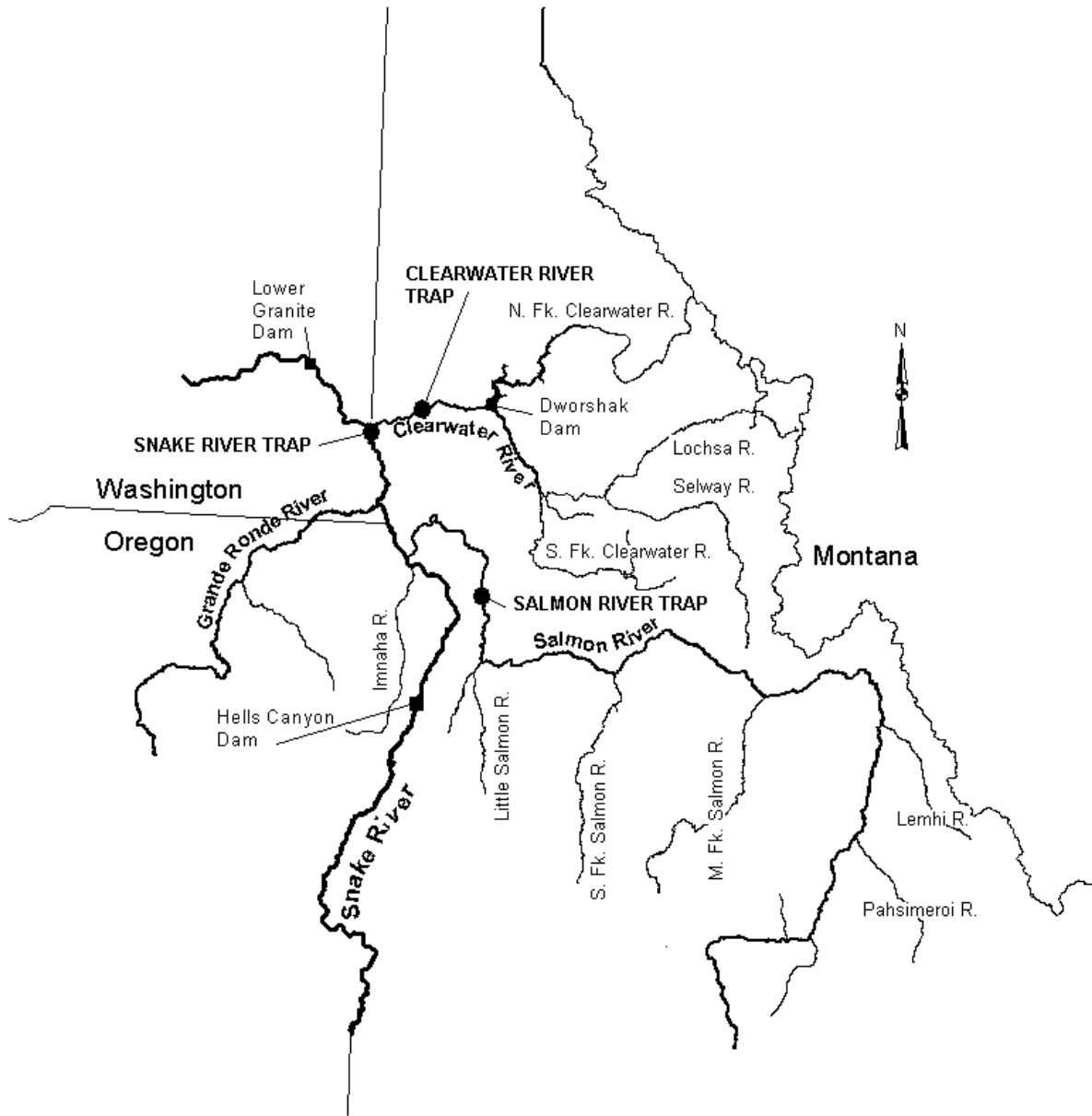


Figure 1. Map of study area

Chinook salmon and steelhead trout smolts were PIT tagged at the Snake River trap to estimate travel time from the head of Lower Granite Reservoir to Lower Granite Dam. Median travel time of the daily PIT-tagged release groups was converted to migration rate. Migration rate was correlated with the mean Lower Granite Reservoir inflow for the number of days equal to the median travel time to determine how changes in discharge affected smolt migration rate through Lower Granite Reservoir.

Snake River trap operations began on March 9 and continued through May 27. The Snake River trap was out of operation for a total of zero days during the period of March 9 through May 27. At that time, trap operations were terminated due to high flow and a very heavy debris load. All fish captured in the Snake River trap were passively interrogated for PIT tags as they entered the live well. Interrogation and tagging information was sent daily to the PTAGIS Data Center (managed by Pacific States Marine Fisheries Commission).

The PIT tag interrogation system on the Snake River trap was converted to the 134 kHz frequency in 2000. The interrogation system consists of an 8-inch PVC pipe with two interrogation coils (D-4 and D-6). Each coil is connected to an exciter card and a PIT tag reader. Exact date and time of capture are recorded for each PIT-tagged fish. Coil efficiency tests were conducted on the dipper trap interrogation system. A total of 500 test tags were sent through the system. The reading efficiency was calculated to be 100% for both coils combined.

### **Salmon River Trap**

The Salmon River trap was located at rkm 103, approximately 17 km upstream from the previous trapping location and 1.6 km downstream from Slate Creek. The scoop trap was operated immediately downstream of the upper U.S. Highway 95 bridge at Twin Bridges. This location was chosen to allow the trap to be operated through a wider range of discharge. River width at this location is approximately 90 m and varies with discharge. The trap is moved laterally across the river to maximize trap efficiency or to avoid damage from large woody debris. Under optimum conditions, the trap is located approximately 10 meters from the north shoreline and is centered in the thalweg.

Chinook salmon and steelhead trout juveniles were tagged with PIT tags at the Salmon River trap to estimate smolt travel time from the lower portion of the Salmon River to Lower Granite Dam. Median travel time for the daily PIT-tagged release groups was converted to migration rate. Migration rate was correlated with mean Lower Granite Reservoir inflow for the median travel time to determine how changes in discharge affected smolt migration rate through the Lower Salmon River and Lower Granite Reservoir.

Trap operations began on March 9 and continued through May 24 when operations were terminated for the season. The Salmon River trap was out of operation for zero days during the 2003 season. All fish were interrogated for PIT tags as they were removed from the live well. The tagging and interrogation files were sent to the PTAGIS Data Center daily.

The Salmon River trap PIT tag interrogation system was converted to the 134 kHz frequency in 2000. The interrogation system consists of a 4-inch PVC pipe with two loop antennas attached to two PIT tag readers (D-8). Coil efficiency tests were conducted on the Salmon River trap interrogation system in 2003. Reader efficiency was calculated at 100% efficiency for both readers combined.

### **Trap Efficiency**

Trap efficiency is the proportion of the migration run that is sampled. Since trap efficiency may change as river discharge changes, efficiency has been estimated several times through the range of discharge at which the trap was operated. A linear regression equation (Ott 1977) describing the relation of trap efficiency and discharge was derived to estimate efficiency

at any given discharge. During the 2003 trap operations, trap efficiencies were not calculated for either of the smolt traps. Previous trap efficiency estimates are reported in Buettner (1991).

### **Travel Time and Migration Rates**

Migration statistics were calculated for hatchery release groups from release sites to traps. Travel time and migration rates to the traps were calculated using median arrival times at the Snake and Salmon River traps. Median arrival (or passage) date is the date the 50<sup>th</sup> percentile fish arrived at the trap or collection facility. Smolts were PIT tagged at the Snake River trap to determine travel time from the head of Lower Granite Reservoir to Lower Granite Dam. Smolts were PIT tagged at the Salmon River trap to determine travel time in a free-flowing section of river plus Lower Granite Reservoir. Distances from selected release points to recovery locations are listed in Table 1. Individual arrival times at the Lower Granite collection facility were determined for each release group. A minimum recapture number, sufficient for use in travel time and migration rate estimates, was derived from an empirical distribution function of the travel time for each individual release group (Steinhorst et al. 1988). If recapture numbers were less than six or less than the number derived from the empirical distribution function, the daily data were combined with another day's data or the data were not used. If they were combined, they were added to daily data from an adjacent release day that had similar discharge and travel time.

Smolt migration rate/discharge relations through Lower Granite Reservoir were investigated using linear regression analysis after both variables were stratified into 5 kcfs discharge intervals (Mosteller and Tukey 1977) and log (ln) transformed (Zar 1984).  $P \leq 0.05$  was used to determine significance. This analysis was performed for the PIT-tagged hatchery Chinook salmon, wild Chinook salmon, hatchery steelhead trout, and wild steelhead trout groups marked at the Snake and Salmon River traps.

### **Interrogation Rates of PIT-Tagged Fish**

Interrogation rates of PIT-tagged fish marked at the head of Lower Granite Reservoir to Lower Granite Dam, Little Goose Dam, Lower Monument Dam, and McNary Dam collection facilities included data from 1987 to 2003 for the Snake River trap, 1989 to 1995 for the Clearwater River trap, and 1993 to 2003 for the Salmon River trap. The data have been examined to ensure that multiple interrogations within a dam and between dams have been removed.

Table 1. River mile and kilometer location for the Snake River drainage.

	Mouth of Columbia River		Mouth of Snake River		Lower Granite Dam		Snake River trap site		Clearwater River trap site		Salmon River trap site	
	mi	km	mi	km	mi	km	mi	km	mi	km	mi	km
Asotin Creek rel. site	470.3	756.7	146.0	234.9	38.5	61.9	6.4	10.3	—	—	—	—
Big Canyon Creek	585.9	942.7	261.6	420.9	154.1	247.9	122.0	196.3	—	—	—	—
Catherine Creek	636.9	1024.8	312.6	503.0	205.1	330.0	173.0	278.4	—	—	—	—
Clearwater R. trap site	470.0	756.2	145.7	234.4	38.2	61.5	—	—	0.0	0.0	—	—
Cottonwood Creek	521.7	839.4	197.4	317.6	89.9	144.6	57.8	93.0	—	—	—	—
Crooked River	604.3	972.3	280.0	450.5	172.5	277.6	—	—	134.3	216.0	—	—
Deer Creek	504.3	811.4	180.0	289.6	72.5	116.7	40.4	65.0	—	—	—	—
Dworshak NFH	504.3	811.4	180.0	289.6	72.5	116.6	—	—	34.3	55.2	—	—
E.F. Salmon @ trap site	873.6	1405.6	549.3	883.8	441.8	710.9	409.7	659.2	—	—	297.0	478.0
Grande Ronde R. mouth	493.0	793.2	168.7	271.4	61.2	98.5	29.1	46.8	—	—	—	—
Hazard Creek	618.7	995.5	294.4	473.7	186.9	300.7	154.8	249.1	—	—	42.1	67.9
Hells Canyon Dam	571.3	919.2	247.0	397.4	139.5	224.5	107.4	172.8	—	—	—	—
Highway 95 boat launch	473.2	761.4	148.9	239.6	41.5	66.8	—	—	3.2	5.1	—	—
Imnaha Coll. Facility	565.6	910.2	241.3	388.3	133.8	215.4	101.7	163.6	—	—	—	—
Imnaha River mouth	516.0	830.3	191.7	309.1	84.2	135.7	52.1	83.8	—	—	—	—
Kooskia NFH	541.6	871.4	217.3	349.6	109.8	176.7	—	—	71.5	115.0	—	—
Little Sheep Creek	553.8	891.1	229.5	369.3	122.0	196.3	89.9	144.6	—	—	—	—
Lookingglass Creek	580.4	933.9	256.1	412.1	148.6	239.1	116.5	187.4	—	—	—	—
Lower Granite Dam	431.8	694.8	107.5	173.0	0.0	0.0	32.1	51.6	38.3	61.5	144.8	232.8
Lower Monumental Dam	365.9	588.7	41.6	66.9	65.9	106.0	98.0	157.7	—	—	192.1	308.9
Pahsimeroi Hatchery	817.5	1315.4	493.2	793.6	385.7	620.6	353.6	568.9	—	—	240.1	387.7
Rapid River Hatchery	605.8	974.7	281.5	452.9	174.0	280.0	141.9	228.3	—	—	29.2	47.1
Red River rearing pond	618.0	994.4	293.7	472.6	186.2	299.6	—	—	148.0	238.1	—	—
Salmon River mouth	512.5	824.6	188.2	302.8	80.7	129.8	48.6	78.2	—	—	64.1	103.0
Salmon River trap site	576.6	927.6	252.3	405.8	144.8	232.8	112.7	181.2	—	—	0.0	0.0
Sawtooth Hatchery	896.7	1444.2	573.3	922.4	465.8	749.5	433.7	697.8	—	—	321.0	516.6
Snake River mouth	324.3	521.8	0.0	0.0	107.5	172.9	139.6	224.6	145.7	234.5	252.3	405.8
Snake River trap site	463.9	746.4	139.6	224.6	32.1	51.6	0.0	0.0	—	—	112.7	181.2
S.F. Salmon @ Knox Bridge	719.7	1158.0	395.4	636.2	287.9	463.2	255.8	411.6	—	—	143.1	230.4
Spring Creek	614.4	988.6	290.1	466.8	182.6	293.8	150.5	242.2	—	—	—	—
Wildcat Creek	546.2	878.8	221.9	357.0	114.4	184.3	82.3	132.4	—	—	—	—

## RESULTS AND DISCUSSION

### Hatchery Releases

#### **Chinook Salmon**

Spring Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at five locations in Idaho and three in Oregon (Table 2). A total of 7,383,872 spring Chinook salmon smolts were released at 15 locations in Idaho, and 1,120,733 were released at five locations in Oregon during 2003. A total of 1,649,919 spring Chinook salmon presmolts were released at nine locations in Idaho during 2002.

Summer Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at two locations in Idaho (Table 2). A total of 2,333,160 summer Chinook salmon were released at three locations in Idaho during 2002.

Fall Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at two locations in Idaho, one in Washington, and one in Oregon (Table 2). A total of 3,285,860 fall Chinook salmon were released at four locations in Idaho, two in Washington, and one in Oregon during 2003.

#### **Steelhead Trout**

Steelhead trout released into the Snake River drainage upstream of Lower Granite Dam were reared at five locations in Idaho, one in Oregon, and one in Washington (Table 3). A total of 7,408,355 steelhead trout smolts were released at 31 locations in Idaho, and 1,164,661 were released at four locations in Oregon during 2003. A total of 236,627 steelhead trout smolts were released at one location in Washington during 2003. Fall releases of steelhead trout were not included in this report.

#### **Coho and Sockeye Salmon**

Hatchery coho salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at one location in Idaho and one location in Oregon (Table 4). A total of 847,504 coho smolts were released at three locations in Idaho during 2003. Summer and fall releases of coho salmon have not been included in this report.

Hatchery sockeye salmon that contributed to the 2003 out-migration were reared at one location in Idaho and one location in Oregon (Table 4). A total of 140,410 sockeye salmon were released at three locations in Idaho during 2002. No sockeye smolts were released during the spring of 2003.

Table 2. Hatchery Chinook salmon released into the Snake River system upriver from Lower Granite Dam contributing to the 2003 out-migration.

<b>Drainage Release Site</b>	<b>Hatchery</b>	<b>Stock</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Clearwater River</b>				
Lochsa River @ Pete King Creek	Clearwater	Spring	8/04/02	13,348
S Fk Clearwater River @ Red House Hole	Clearwater	Spring	8/04/02	123,677
Squaw Creek	Clearwater	Spring	8/04/02	14,067
Meadow Creek (Selway River)	Clearwater	Spring	8/05-8/02	404,153
S Fk Clearwater River @ Mill Creek	Clearwater	Spring	8/21/02	12,870
Colt Killed Creek	Clearwater	Spring	8/25/02	299,690
Crooked River Ponds	Clearwater	Spring	8/25/02	169,996
Powell Rearing Ponds	Clearwater	Spring	8/25/02	526,762
Red River Rearing Ponds	Clearwater	Spring	9/27/02	85,356
S Fk Clearwater River @ Mill Creek	Clearwater	Spring	3/14/03	43,621
Meadow Creek (Selway River)	Clearwater	Spring	3/17-18/03	287,175 (1,053)
Lolo Creek	Clearwater	Spring	3/19/03	147,488 (1,026)
N Fk Clearwater	Dworshak	Spring	3/19-20/03	1,033,982 (54,665)
Lochsa River @ Boulder Creek	Clearwater	Spring	3/20/03	101,513
Newsome Creek	Clearwater	Spring	3/21/03	74,066 (1,051)
Clear Creek Above Hatchery	Kooskia	Spring	3/26/03	50,018 (1,500)
Kooskia National Fish Hatchery Rack	Kooskia	Spring	3/26/03	547,045
Crooked River Ponds	Clearwater	Spring	3/29/03-4/02/03	630,045 (299)
Powell Rearing Ponds	Clearwater	Spring	4/01/03	353,884 (295)
Red River Rearing Ponds	Clearwater	Spring	4/02/03	351,004 (297)
Papoose Creek	Clearwater	Spring	4/03/03	52,225
			<b>Spring Total</b>	<b>5,321,985 (60,186)</b>
Big Canyon Creek	Lyons Ferry	Fall	4/15-16/03	145,331 (7,494)
North Lapwai Valley	NPTH	Fall	5/27-30/03	191,382 (2,766)
Big Canyon Creek	Lyons Ferry	Fall	6/03/03	506,488 (2,549)
Nez Perce Tribal Hatchery	NPTH	Fall	6/03-05/03	199,632 (3,070)



Table 2. Continued.

<b>Drainage Release Site</b>	<b>Hatchery</b>	<b>Stock</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Clearwater River Continued</b>				
Nez Perce Tribal Hatchery	NPTH	Fall	6/19-21/03	114,964 (2,395)
			<b>Fall Total</b>	<b>1,157,797 (18,274)</b>
			<b>Drainage Total</b>	<b>6,479,782 (78,460)</b>
<b>Salmon River</b>				
Rapid River Hatchery	Rapid River	Spring	3/17/03-04/25/03	2,276,388 (178,930)
Sawtooth Hatchery	Sawtooth	Spring	4/18/03	1,096,739
			<b>Spring Total</b>	<b>3,373,127 (178,930)</b>
E Fk of S Fk Salmon River @ Johnson Creek	McCall	Summer	3/20-21/03	73,000 (12,132)
Pahsimeroi Ponds	Pahsimeroi	Summer	3/29/03-4/07/03	1,205,918 (982)
S Fk Salmon River @ Knox Bridge	McCall	Summer	3/31/03-4/03/03	1,054,242 (74,597)
			<b>Summer Total</b>	<b>2,333,160 (87,711)</b>
			<b>Drainage Total</b>	<b>5,706,287 (266,641)</b>
<b>Snake River</b>				
Grande Ronde Acclimation Pond	Grande Ronde Acclimation	Spring	3/17-23/03	110,049 (990)
Lostine Acclimation Pond	Lookingglass	Spring	3/17-23/03	109,781 (6,667)
Lostine River	Lookingglass	Spring	3/17-23/03	109,869 (6,669)
Snake River @ Hells Canyon Dam	Rapid River	Spring	3/19-20/03	338,679
Catherine Creek Acclimation Pond	Catherine Creek Acclimation	Spring	3/23/03	105,292 (13,707)
Grande Ronde Acclimation Pond	Grande Ronde Acclimation	Spring	3/24/03-4/14/03	26,923 (498)
Grande Ronde Acclimation Pond	Grande Ronde Acclimation	Spring	3/30/03-4/14/03	100,064 (992)
Lostine Acclimation Pond	Lookingglass	Spring	4/01-14/03	132,968 (9,191)
Lostine River	Lookingglass	Spring	4/01-14/03	132,969 (9,192)
Catherine Creek Acclimation Pond	Catherine Creek Acclimation	Spring	4/14/03	24,392 (6,921)
Imnaha Acclimation Pond	Lookingglass	Spring	4/15/03	268,426 (20,904)
			<b>Spring Total</b>	<b>1,459,412 (75,731)</b>

Table 2. Continued.

<b>Drainage Release Site</b>	<b>Hatchery</b>	<b>Stock</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Snake River Continued</b>				
Captain John's Rapid	Lyons Ferry	Fall	4/08/03	151,919 (2,497)
Pittsburg Landing	Lyons Ferry	Fall	4/13-14/03	140,383 (7,492)
Snake River @ Hells Canyon Dam	Umatilla	Fall	5/01-16/03	332,226 (3,000)
Snake River @ Hells Canyon Dam	Oxbow	Fall	5/22/03	209,246 (9,971)
Captain John's Rapid	Lyons Ferry	Fall	5/28/03	512,685 (2,549)
Pittsburg Landing	Lyons Ferry	Fall	6/04/03	390,183 (2,527)
Couse Creek	Lyons Ferry	Fall	6/09-16/03	100,019 (3,000)
Captain John's Rapid	Lyons Ferry	Fall	6/12/03	291,402
			<b>Fall Total</b>	<b>2,128,063 (31,036)</b>
			<b>Drainage Total</b>	<b>3,587,475 (106,767)</b>
			<b>Grand Total</b>	<b>15,773,544 (451,868)</b>

Table 3. Hatchery steelhead trout released into the Snake River system upriver from Lower Granite Dam contributing to the 2003 out-migration.

<b>Drainage Release Site</b>	<b>Hatchery</b>	<b>Stock</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Clearwater River</b>				
Clear Creek	Dworshak	B	4/14-17/03	123,379
S. Fork Clearwater River @Red House Hole	Dworshak	B	4/14-17/03	682,889
Red River Rearing Ponds	Clearwater	B	4/17/03	221,578 (535)
S Fork Clearwater River @ Red House Hole	Clearwater	B	4/17-21/03	145,772 (884)
Meadow Creek	Clearwater	B	4/17-30/03	25,000
Crooked River Ponds	Clearwater	B	4/19/03	296,114 (1,377)
Clear Creek	Clearwater	B	4/21/03	108,052
Clearwater River – Dworshak Hatchery	Dworshak	B	4/21-24/03	1,210,919 (1,500)
Lolo Creek	Clearwater	B	4/22/03	21,650 (525)
S Fork Clearwater River @ Mill Creek	Clearwater	B	4/23/03	43,943
American River	Hagerman	B	4/30/03-5/05/03	102,040 (526)
Newsome Creek	Hagerman	B	5/05-09/03	88,093 (515)
			<b>Drainage Total</b>	<b>3,069,429 (5,862)</b>
<b>Salmon River</b>				
Little Salmon River	Hagerman	B	3/31/03-4/04/03	160,176 (299)
Little Salmon River at Stinky Springs	Niagara Springs	A	4/04-10/03	302,316 (299)
Lemhi River @ County Scale	Magic Valley	A	4/07-08/03	32,858 (298)
Lemhi River @ Hayden Creek	Magic Valley	A	4/07/03	83,456 (299)
Lower Hazard Creek	Hagerman	B	4/07/03	35,549
Squaw Creek Ponds	Magic Valley	B	4/08/03	58,140
Squaw Creek Ponds	Magic Valley	B	4/08-9/03	62,930
Little Salmon River at Stinky Springs	Magic Valley	B	4/09/03-5/01/03	304,501 (300)
Salmon River @ Sawtooth	Hagerman	B	4/09-29/03	748,027 (299)
Hammer Creek	Magic Valley	A	4/11-14/03	189,390 (298)
Pahsimeroi Hatchery	Niagara Springs	A	4/12-20/03	348,483 (299)
Salmon River @ Red Rock	Magic Valley	A	4/14-15/03	93,008 (301)
Salmon River @ Colston Corner	Magic Valley	A	4/15-16/03	131,619 (599)

Table 3. Continued.

<b>Drainage Release Site</b>	<b>Hatchery</b>	<b>Stock</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Salmon River Continued</b>				
Lemhi River	Magic Valley	A	4/16-17/03	76,409
Pahsimeroi River	Magic Valley	A	4/17/03	33,862
Salmon River @ McNabb Point	Magic Valley	A	4/17-18/03	81,215 (300)
Salmon River @ Tunnel Rock	Magic Valley	A	4/17-18/03	12,203
Salmon River @ Tunnel Rock	Magic Valley	A	4/18-21/03	64,340
Squaw Creek	Magic Valley	B	4/21-23/03	171,946 (301)
E Fk Salmon River @ Dumpster	Magic Valley	B	4/23-25/03	215,666
E Fk Salmon River Trap	Magic Valley	B	4/23-25/03	27,707
Valley Creek	Magic Valley	A	4/25/03	45,503 (298)
W Fk Yankee Fk	Magic Valley	A	4/28-29/03	116,086 (300)
Pahsimeroi River	Niagara Springs	A	4/29/03-5/01/03	100,513
Little Salmon River @ Stinky Springs	Niagara Springs	A	5/02-06/03	185,377 (300)
Yankee Fk	Hagerman	B	5/12-14/03	131,659 (298)
			<b>Drainage Total</b>	<b>3,813,039 (5,088)</b>
<b>Snake River</b>				
Snake River Hells Canyon Dam	Niagara Springs	A	3/24/03-4/04/03	525,887 (298)
Little Sheep Creek Facility	Irrigon	A	4/08-09/03	97,966 (522)
Wallowa Hatchery	Irrigon	A	4/11-15/03	331,422 (247)
Big Canyon Facility	Irrigon	A	4/14-16/03	165,232 (249)
Big Sheep Creek	Irrigon	A	4/14/03	114,110 (249)
Grande Ronde	Cottonwood Creek Pond	A	4/15-30/03	236,627
Little Sheep Creek Facility	Irrigon	A	5/06-07/03	136,076 (250)
Wallowa Hatchery	Irrigon	A	5/07-15/03	192,966 (246)
Big Canyon Facility	Irrigon	A	5/08-16/03	126,859 (249)
			<b>Drainage Total</b>	<b>1,927,175 (2,310)</b>
			<b>Grand Total</b>	<b>8,809,643 (13,260)</b>

Table 4. Hatchery coho and sockeye salmon released into the Snake River system upstream from Lower Granite Dam contributing to the 2003 out-migration.

<b>Drainage Release Site</b>	<b>Species</b>	<b>Hatchery</b>	<b>Release Date</b>	<b>No. Released (No. PIT Tagged)</b>
<b>Clearwater River</b>				
Potlatch River	Coho	Eagle Creek	3/11/03	274,125 (1,000)
Lapwai Creek	Coho	Eagle Creek	3/13/03	279,500 (1,000)
Clear Creek	Coho	Dworshak	5/01/03	293,879 (1,000)
			<b>Drainage Total</b>	<b>847,504 (3,000)</b>
<b>Salmon River</b>				
Altural Lake	Sockeye	Bonneville	8/27/02	6,123 (1,463)
Pettit Lake	Sockeye	Bonneville	8/27/02	7,805 (1,434)
Redfish Lake	Sockeye	Bonneville	8/28-29/02	61,500 (1,005)
Redfish Lake	Sockeye	Sawtooth	10/07/02	45,001 (1,015)
Pettit Lake	Sockeye	Sawtooth	10/08/02	19,981 (2,013)
			<b>Drainage Total</b>	<b>140,410 (6,930)</b>

### Smolt Monitoring Traps

#### **Snake River Trap Operation**

The Snake River trap captured 3,395 hatchery and 1,386 wild age-1 Chinook salmon, 579 age-0 Chinook salmon of unknown rearing, 7,319 hatchery and 1,252 wild steelhead trout, five hatchery and 13 unknown rearing sockeye salmon, and 36 coho salmon of unknown rearing in 2003 (Table 5).

Hatchery Chinook salmon first arrived at the trap on March 10 (1 fish). Significant numbers of fish were not trapped until April 15 (111 fish). The daily catch fluctuated between zero and 1,165 fish per day (Figure 2). Less than 2% (47) of the total season catch were collected in March, 25% (861) in April, and 73% (2,487) in May.

Wild Chinook salmon first arrived at the trap on March 11 (1 fish). Significant numbers of fish were not trapped until May 25 (671). The daily catch fluctuated between zero and 671 fish per day (Figure 2). Four percent (54) of the total season catch were collected in March, 21% (293) in April, and 75% (1,039) in May. There is a high probability that a significant number of the fish collected on May 25 were hatchery fall Chinook fry.

Table 5. Historical catch of hatchery Chinook salmon (HC), wild Chinook salmon (WC), hatchery steelhead trout (HS), and wild steelhead trout (WS) collected at the Snake, Clearwater, and Salmon river traps for the out-migration years of 1994 through 2003.

Year	Species / Run	Snake River Trap	Clearwater River Trap	Salmon River Trap
2003	HC	3,395	21,342	35,897
	WC	1,386	1,005	9,339
	HS	7,319	9,257	3,101
	WS	1,252	464	319
2002	HC	7,252	4,985	43,168
	WC	1,458	627	5,548
	HS	12,578	5,652	3,284
	WS	2,591	524	395
2001	HC	636	No Data	10,388
	WC	94		2,274
	HS	4,300		4,079
	WS	926		488
2000	HC	5,566	No Data	22,175
	WC	2,214		3,373
	HS	8,777		2,290
	WS	1,364		336
1999	HC	15,327	No Data	23,180
	WC	6,411		5,079
	HS	7,271		2,554
	WS	1,050		228
1998	HC	3,487	No Data	10,852
	WC	1,063		1,459
	HS	8,001		1,218
	WS	1,116		112
1997	HC	1,543	No Data	2,280
	WC	898		1,065
	HS	1,600		1,267
	WS	196		66
1996	HC	3,163	No Data	6,205
	WC	1,140		1,776
	HS	8,921		9,566
	WS	896		304
1995	HC	26,919	13,475	45,349
	WC	6,564	1,534	9,396
	HS	23,994	8,314	3,948
	WS	1,750	285	499
1994	HC	22,342	32,789	38,902
	WC	1,471	1,343	4,774
	HS	31,662	4,615	7,383
	WS	3,439	1,798	564

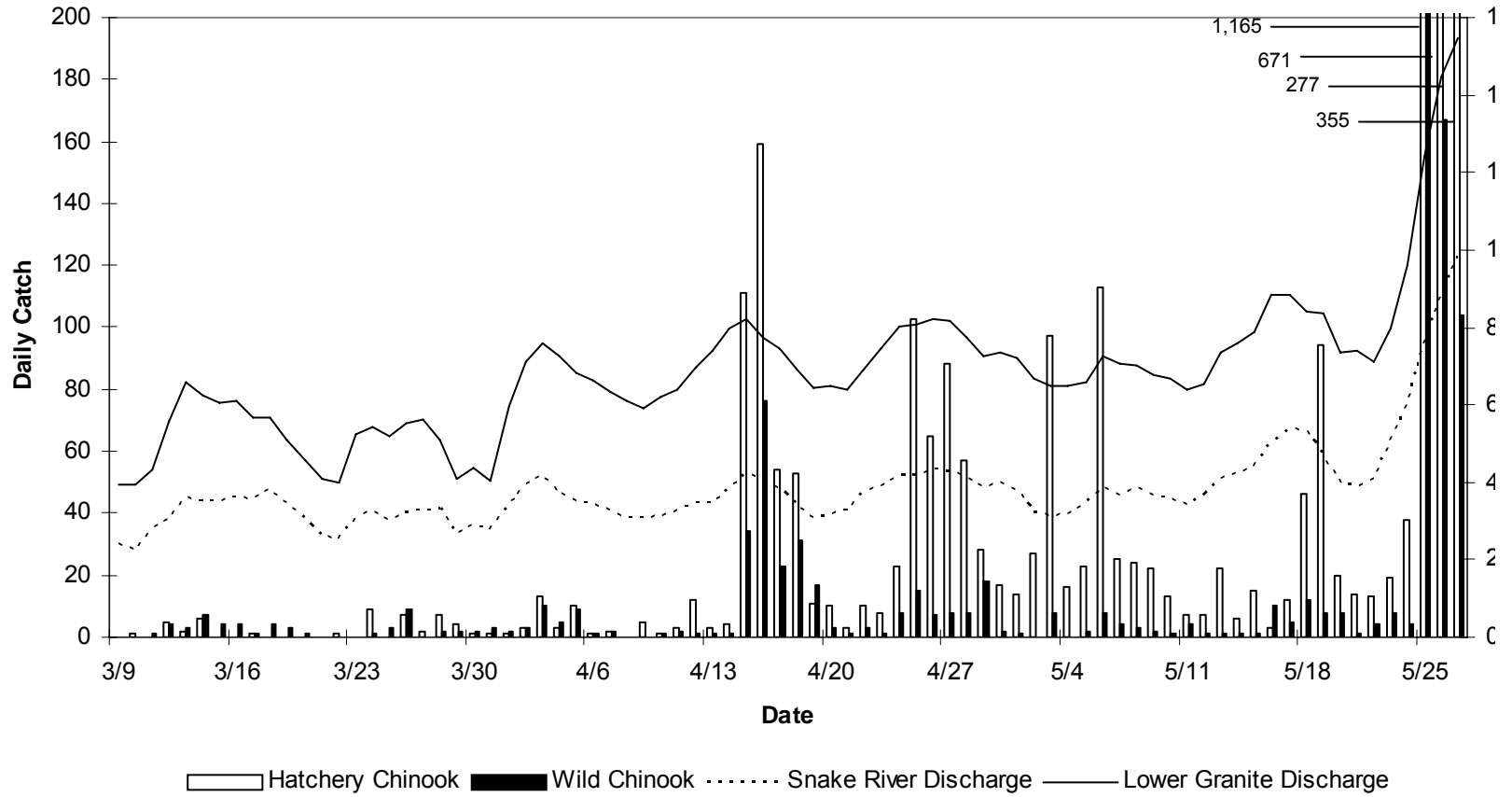


Figure 2. Snake River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Snake River and Lower Granite discharge, 2003.

Physical characteristics were used to differentiate between age-0 Chinook salmon and older salmon. The daily catch fluctuated between zero and 116 fish per day. Twelve percent (72) of the total season catch were collected in March, 7% (39) in April, and 81% (468) in May.

Hatchery steelhead trout first arrived at the trap on March 28 (1 fish). Significant numbers of fish were not trapped until April 15 (212 fish). The daily catch fluctuated between zero and 1,212 fish per day (Figure 3). Less than 1% (6) of the total season catch was collected in March, 27% (1,945) in April, and 73% (5,368) in May.

Wild steelhead trout first arrived at the trap on March 13 (1 fish). Significant numbers of fish were not trapped until May 25 (181 fish). The daily catch fluctuated between zero and 181 fish per day (Figure 3). Four percent (52) of the total season catch were collected in March, 31% (385) in April, and 65% (815) in May.

Hatchery sockeye salmon were captured at the Snake River smolt trap. The first one arrived on May 17. One fish was trapped on May 19, one on May 25, and two on May 26. One hundred percent (5) of the total season catch was collected in May.

Sockeye salmon of unknown origin were collected at the Snake River smolt trap. Two fish arrived on May 19. One was trapped on May 20, five on May 25, and five on May 26. One hundred percent (13) of the total season catch was collected in May.

Coho salmon of unknown rearing were captured at the Snake River smolt trap. Two fish arrived on March 18. Daily trap catch fluctuated between zero and 17 fish per day. About 14% (5) of the total season catch was collected in March, 14% (5) in April, and 72% (26) in May.

Snake River discharge, measured at the Anatone gauge, ranged from 15.4 kcfs to 146.8 kcfs (Table 6). Water temperature at the Snake River trap ranged from 6.0°C to 15.2°C (Figure 4). Secchi disk transparency at the Snake River trap ranged from 0.2 m to 2.1 m (Figure 4).



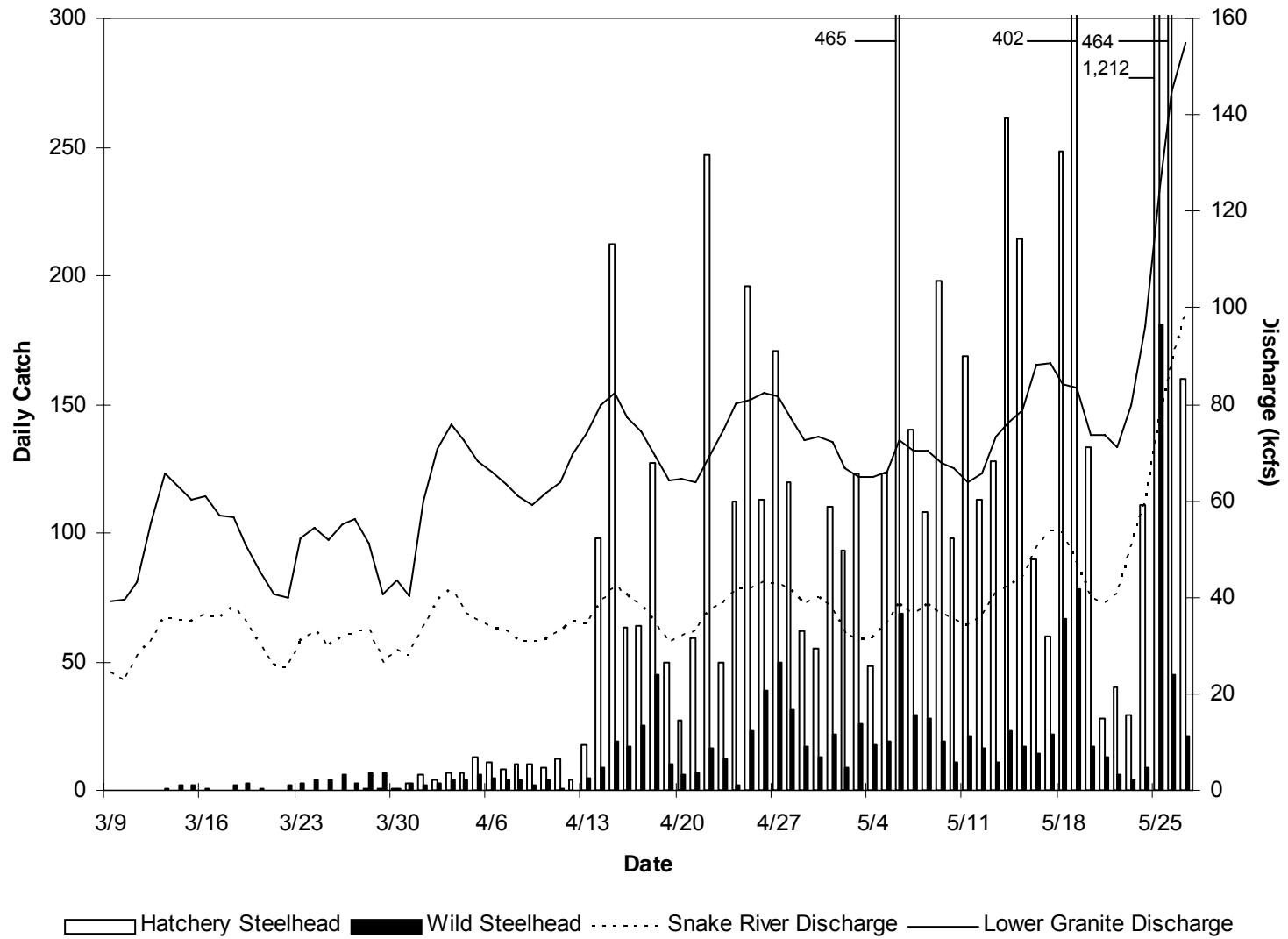


Figure 3. Snake River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Snake River and Lower Granite discharge, 2003.

Table 6. Monthly Snake River discharge at Anatone, Washington, and 2003 comparison with previous three years. Comparison data is reported as 2003 discharge minus annual interval discharge.

		2003	2000		2001		2002	
		Discharge (cfs)	Discharge (cfs)	2003 Comparison (kcfs)	Discharge (cfs)	2003 Comparison (kcfs)	Discharge (cfs)	2003 Comparison (kcfs)
March	Min	15,408	31,766	-16.4	13,485	1.9	14,630	0.8
	Max	37,936	44,764	-6.8	29,141	8.8	41,260	-3.3
	Average	28,250	38,320	-10.1	20,368	7.9	24,046	4.2
April	Min	30,722	41,174	-10.5	18,146	12.6	25,339	5.4
	Max	43,349	68,200	-24.9	32,714	10.6	60,143	-16.8
	Average	36,830	56,211	-19.4	23,726	13.1	39,457	-2.6
May	Min	31,274	41,561	-10.3	27,589	3.7	26,963	4.3
	Max	146,719	62,436	84.3	58,021	88.7	84,175	62.5
	Average	55,989	53,603	2.4	39,361	16.6	44,887	11.1

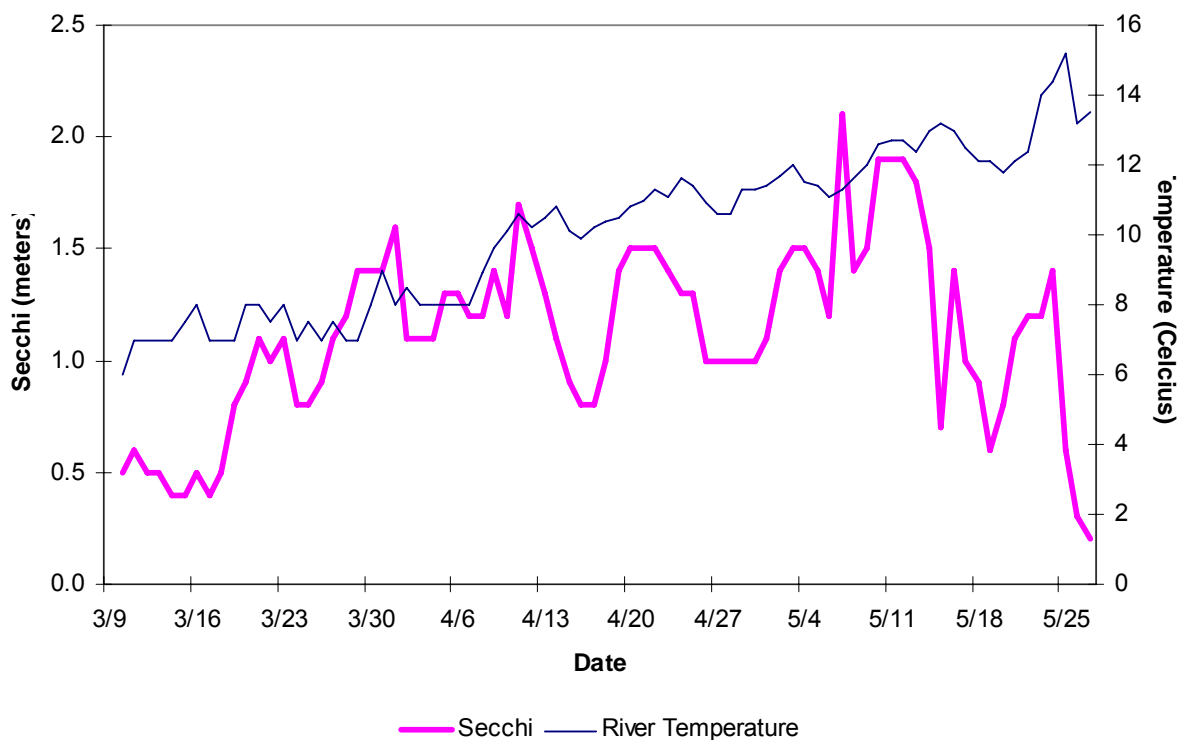


Figure 4. Daily river water temperature and Secchi disk transparency at the Snake River trap, 2003.

## Salmon River Trap Operations

The Salmon River scoop trap captured 35,897 hatchery and 9,339 wild age-1 chinook salmon, 3,101 hatchery and 319 wild steelhead trout, and one hatchery sockeye salmon in 2003 (Table 5).

Hatchery Chinook salmon first appeared on March 13 (3 fish). Significant numbers of fish were not trapped until March 19 (1,079 fish). The daily catch fluctuated between zero and 2,510 fish per day (Figure 5). About 26% (9,136) of the season total was captured in March, 73% (26,229) in April, and 2% (532) in May.

Wild Chinook salmon first appeared on March 11 (2 fish). Significant numbers of fish were not trapped until March 15 (245 fish). The daily catch fluctuated between zero and 650 fish per day (Figure 5). About 41% (3,845) of the season total was captured in March, 56% (5,259) in April, and 3% (235) in May.

Hatchery steelhead trout first appeared at the trap on April 2 (1 fish). Significant numbers of fish were not trapped until April 28 (113 fish). The daily catch fluctuated between zero and 421 fish per day (Figure 6). About 33% (1,036) of the season total was captured in April and 67% (2,065) in May.

Wild steelhead trout first appeared on March 15 (2 fish). The daily catch fluctuated between zero and 17 fish per day (Figure 6). About 7% (23) of the season total was captured in March, 52% (168) in April, and 41% (129) in May.

The only hatchery sockeye salmon was trapped on May 19. One hundred percent (1) of the season total was captured in May.

No sockeye salmon of unknown rearing were collected during the 2003 trapping season.

Salmon River discharge, measured at the White Bird gauge, ranged from 3.8 kcfs to 90.3 kcfs (Table 7). Water temperature at the Salmon River trap ranged from 4.0° C to 12.0°C (Figure 7). Secchi disk transparency ranged from 0.3m to 1.7m (Figure 7).

The trap was operated at a position approximately 10 meters from the north shoreline from March 9 through April 25. The trap position was changed to approximately 35 meters from the north shoreline on April 26 and remained there until April 28 when it was returned to 10 meters. It was moved to avoid large amounts of woody debris that may have damaged the trap. The trap stayed at 10 meters from April 28 through May 15. It was moved to 35 meters on May 16 to avoid large amounts of woody debris and high discharge. The trap remained at 35 meters until the end of the trapping season on May 24.

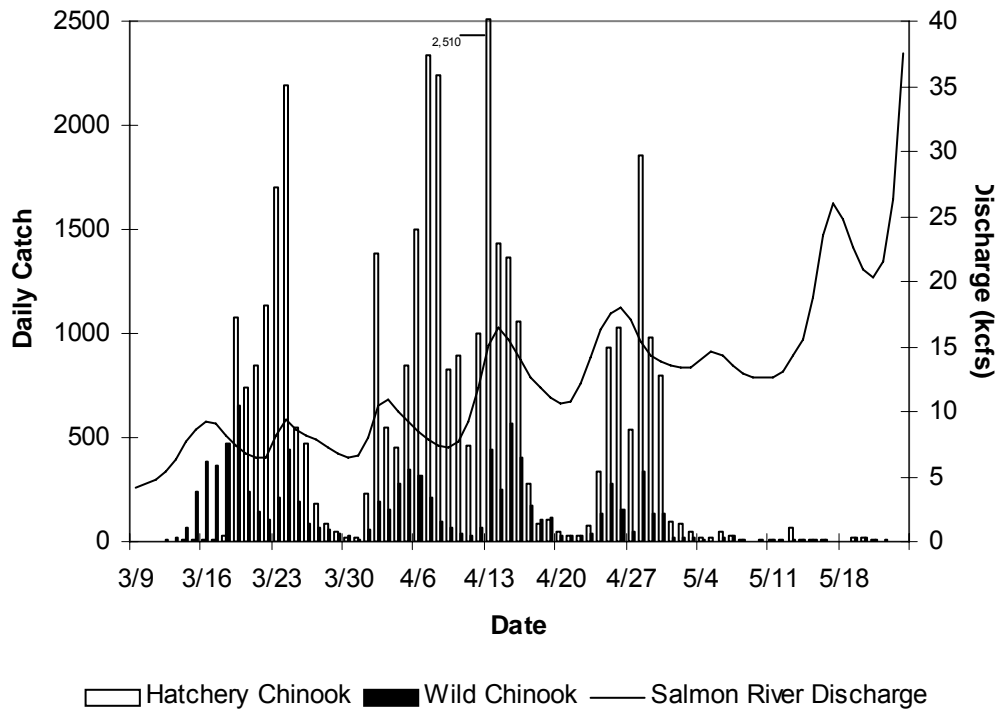


Figure 5. Salmon River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Salmon River discharge, 2003.

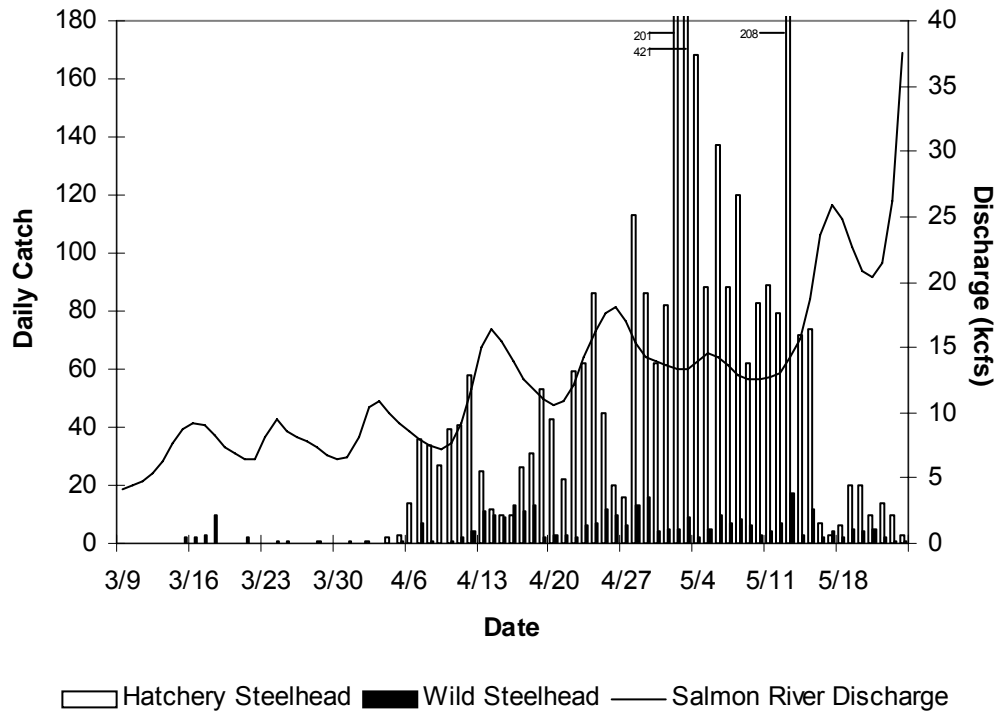


Figure 6. Salmon River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Salmon River discharge, 2003.

Table 7. Monthly Salmon River discharge at White Bird, Idaho, and 2003 comparison with previous three years. Comparison data is reported as 2003 discharge minus annual interval discharge.

		2003	2000		2001		2002	
		Discharge (cfs)	Discharge (cfs)	2003 Comparison (kcfs)	Discharge (cfs)	2003 Comparison (kcfs)	Discharge (cfs)	2003 Comparison (kcfs)
March	Min	3,765	4,903	-1.1	3,149	0.6	3,169	0.6
	Max	9,433	7,594	1.8	6,855	2.6	5,514	3.9
	Average	6,286	5,620	0.7	4,613	1.7	4,137	2.1
April	Min	7,255	6,596	0.7	4,438	2.8	5,962	1.3
	Max	18,041	23,301	-5.3	16,427	1.6	23,423	-5.4
	Average	12,173	15,383	-3.2	6,693	5.5	12,357	-0.2
May	Min	12,588	18,831	-6.2	12,477	0.1	12,543	0.0
	Max	90,290	41,604	48.7	31,168	59.1	52,568	37.7
	Average	30,156	29,226	0.9	20,238	9.9	25,006	5.2

### Travel Time and Migration Rates

#### Release Sites to the Snake River Trap

**Hatchery Spring Chinook Salmon**—In 2003, twenty-nine PIT-tagged hatchery spring Chinook salmon were interrogated at the Snake River trap. Two were from Dworshak National Fish Hatchery (median travel time 50.9 d), one was from the Grande Ronde River (travel time 26.8 d), two were from the Imnaha River weir (median 29.9 d), one was from the Lostine River pond (travel time 49.4 d), and 23 were from Rapid River hatchery (median 46.1 d).

**Wild Spring Chinook Salmon**—In 2003, eleven PIT-tagged wild spring Chinook salmon were interrogated at the Snake River trap. One was from Camas Creek (travel time 288.9 d), one was from Catherine Creek (travel time 84.2 d), two were from the Grande Ronde River (median travel time 33.1 d), one was from Herd Creek (travel time 284.9), one was from Loon Creek (travel time 289.7 d), one was from the Lostine River (travel time 283.1 d), one was from Red River (travel time 22.1 d), and three were from the Sawtooth trap (median 7.7 d).

**Hatchery Summer Chinook Salmon**—In 2003, thirty PIT-tagged hatchery summer Chinook salmon were interrogated at the Snake River trap. Ten were from Johnson Creek (median travel time 66.4 d) and twenty were from Knox Bridge (median 40.4).

**Wild Summer Chinook Salmon**—In 2003, twenty PIT-tagged wild summer Chinook salmon were interrogated at the Snake River trap. Four were from the Imnaha River trap (median travel time 10.2 d), one was from Johnson Creek (travel time 283.7 d), eleven were from the Johnson Creek trap (median 54.7 d), two were from Lake Creek (median 213.7 d), and two were from the Pahsimeroi River trap (median 26.6 d).

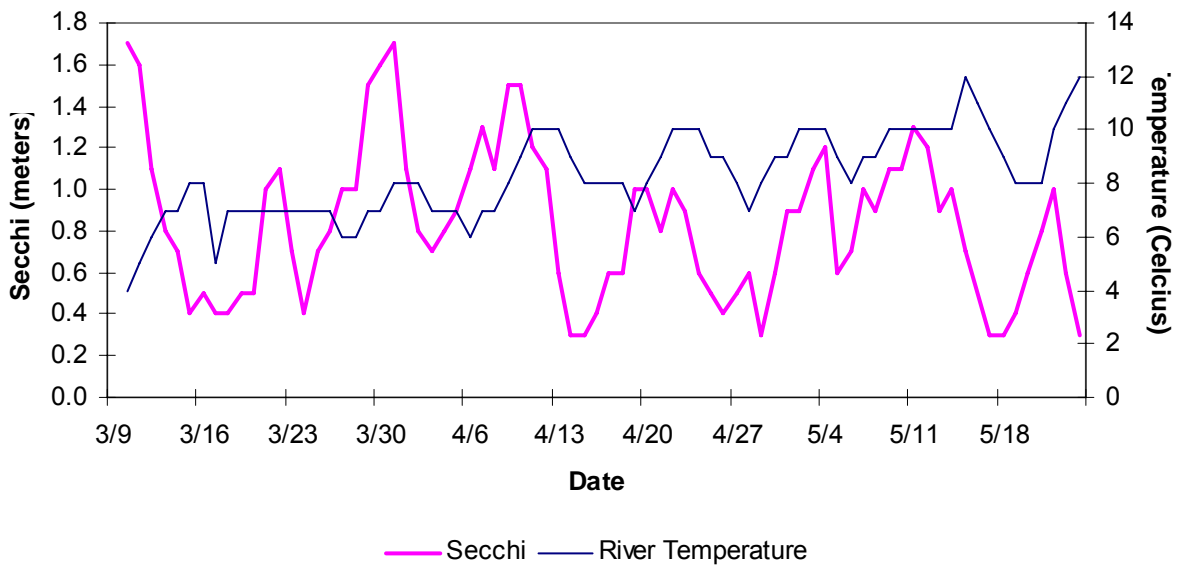


Figure 7. Daily river water temperature and Secchi disk transparency at the Salmon River trap, 2003

**Hatchery Fall Chinook Salmon**—In 2003, twenty-seven PIT-tagged hatchery fall Chinook salmon were interrogated at the Snake River trap. Four were from the Captain John Rapids acclimation pond (median travel time 0.1 d) and 23 were from Hells Canyon Dam (median 3.0 d).

**Hatchery Unknown Run Chinook Salmon**—In 2003, two PIT-tagged hatchery unknown run Chinook salmon were interrogated at the Snake River trap. They were from the Salmon River trap and their median travel time to the Snake River trap was 22.1 d.

**Wild Unknown Run Chinook Salmon**—In 2003, thirteen PIT-tagged wild unknown run Chinook salmon were interrogated at the Snake River trap. Six were from the Salmon River trap (median travel time 21.6 d) and seven were from the Snake River (median 12.1 d).

**Hatchery Summer Steelhead Trout**—In 2003, twenty-three hatchery summer steelhead trout were interrogated at the Snake River trap. Two were from Big Sheep Creek (median travel time 35.8 d), three were from the Grande Ronde River trap (median 0.1 d), four were from the Imnaha River trap (median 9.0 d), two were from the Little Sheep facility (median 41.1 d), one was from the Pahsimeroi River trap (travel time 5.3 d), two were from the East Fork Salmon River (median 13.5 d), two were from the North Fork Salmon River (median 17.1 d), six were from the Salmon River trap (median 3.8), and one was from Squaw Creek (travel time 14.6 d).

**Wild Summer Steelhead Trout**—In 2003, fifteen wild summer steelhead trout were interrogated at the Snake River trap. One was from Catherine Creek (travel time 6.1 d), one was from the Grande Ronde River (travel time 52.3 d), one was from the Grande Ronde River trap (travel time 0.3 d), one was from Herd Creek (travel time 277.8 d), five were from the Imnaha River trap (median travel time 1.9 d), two were from Lookingglass Creek (median 8.6), one was from Marsh Creek trap (travel time 321.5 d), one was from the Minam River (travel time 10.5 d),

one was from the Sawtooth trap (travel time 7.7 d), and one was from the Secesh River (travel time 251.5 d).

**Hatchery Sockeye Salmon**—In 2003, zero hatchery sockeye salmon were interrogated at the Snake River trap.

**Wild Sockeye Salmon**—In 2003, one wild sockeye salmon was interrogated at the Snake River trap. The one wild sockeye salmon was from Redfish Lake Creek (travel time 6.7 d).

### **Release Sites to the Salmon River Trap**

**Hatchery Spring Chinook Salmon**—In 2003, one thousand five hundred and twenty-seven hatchery spring Chinook salmon were interrogated at the Salmon River trap. One thousand five hundred and twenty-two were from the Rapid River Hatchery (median travel time 21.8 d) and five were from the Sawtooth Hatchery (median 10.9 d).

**Wild Spring Chinook Salmon**—In 2003, thirty-nine wild spring Chinook salmon were interrogated at the Salmon River trap. Three were from Big Creek (median travel time 229.0 d), one was from the Lemhi River (travel time 273.1 d), ten were from the Lemhi River weir (median 134.5 d), two were from Marsh Creek (median 242.9 d), eight were from the Marsh Creek trap (median 191.9 d), three were from the East Fork Salmon River trap (median 36.9 d), ten were from the Sawtooth trap (median travel time 28.5 d), and two were from Valley Creek (median 252.5 d).

**Hatchery Summer Chinook Salmon**—In 2003, four hundred sixty-seven hatchery summer Chinook salmon were interrogated at the Salmon River trap. Forty were from Johnson Creek (median travel time 13.4 d), 421 were from Knox Bridge (median 8.8 d), three were from the Pahsimeroi River trap (median 15.9 d), and three were from the South Fork Salmon River trap (median 8.9 d).

**Wild Summer Chinook Salmon**—In 2003, thirty-eight wild summer Chinook salmon were interrogated at the Salmon River trap. Nine were from the Johnson Creek trap (median travel time 172.8 d), three were from Lake Creek (median 231.7 d), three were from the Lower South Fork Salmon River trap (median 181.4 d), 21 were from the Pahsimeroi River trap (median 112.7 d), one was from the Secesh River (travel time 176.6 d), and one was from the South Fork Salmon River trap (travel time 271.9 d).

**Hatchery Summer Steelhead Trout**—In 2003, one hatchery summer steelhead trout was interrogated at the Salmon River trap. The one hatchery summer steelhead trout was from the East Fork Salmon River (travel time 5.9 d).

**Wild Summer Steelhead Trout**—In 2003, two wild summer steelhead trout were interrogated at the Salmon River trap. One was from Chamberlain Creek (travel time 280.9 d) and one was from the Pahsimeroi River trap (travel time 9.5 d).

**Hatchery Sockeye Salmon**—In 2003, zero hatchery sockeye salmon were interrogated at the Salmon River trap.

**Wild Sockeye Salmon**—In 2003, zero wild sockeye salmon was interrogated at the Salmon River trap.

## Head of Lower Granite Reservoir to Lower Granite Dam

The PIT tag sample rate at Lower Granite dam was significantly lower during the 2003 out-migration, due mainly to the installation of a removable spillway weir (RSW). The RSW draws smolts away from the turbine intake and toward the spill. Therefore, a higher percentage of smolts passed the dam by spill in 2003. Because more smolts pass Lower Granite by spill there were more migrants in the river below Lower Granite Dam so the number of smolts interrogated at Little Goose, Lower Monumental, and McNary Dams were greater than normal for this type of flow year.

**Hatchery Chinook Salmon PIT Tag Groups**—Sufficient numbers of hatchery Chinook salmon (2,028 individual fish) were PIT tagged daily at the Snake River trap to provide 24 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 15 through May 27 (Appendix A, Table 1). Median travel time ranged from 11.7 to 3.2 d (4.4 km/d to 15.9 km/d migration rate) and averaged 6.4 d (9.0 km/d).

Age-0 fall Chinook releases began on May 16 and were a significant portion of the trap catch by May 18. Travel time for hatchery Chinook salmon PIT tag groups released from the Snake River trap after May 17 was significantly slower (up to 11.7 d) compared to the four days prior to the arrival of the fall Chinook (2.4 d). The differences in travel time were not due to discharge, because average discharge for the four groups released prior to May 18 was 85.1 kcfs and was 112.9 kcfs for the three groups released after May 17. Because hatchery Chinook PIT tag groups released after May 17 were dominated by age-0 fall Chinook, which travel much slower than spring/summer Chinook, they were not used in the median migration rate/discharge analysis.

When PIT tag groups containing predominantly age-0 fall Chinook are removed, not enough data remains to conduct the regression analysis (Table 8).

Sufficient numbers of hatchery Chinook salmon (4,486 individual fish) were PIT tagged daily at the Salmon River trap to provide 41 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 18 through May 20 (Appendix A, Table 5). Median travel time ranged from 38.7 to 5.6 d (6.0 km/d to 42.0 km/d migration rate) and averaged 22.9 d (13.1 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 10). Linear regression analysis was unable to detect a significant relation between migration rate from the Salmon River trap to Lower Granite Dam and average Lower Granite inflow for PIT-tagged hatchery Chinook salmon groups (Table 9). It is difficult to detect a relation between migration rate and discharge when the data is spread over a narrow range of discharge as in this case. Eighty-eight percent of the data is spread over three 5 kcfs discharge intervals and 98% of the data is spread over only four discharge intervals.

**Wild Chinook Salmon PIT Tag Groups**—Sufficient numbers of wild Chinook salmon (1,285 individual fish) were PIT tagged daily at the Snake River trap to provide 9 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 15 through May 27 (Appendix A, Table 2). Median travel time ranged from 7.1 to 3.4 d (7.2 km/d to 15.0 km/d migration rate) and averaged 5.3 d (10.4 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 8). Linear regression analysis detected a significant relation between migration rate from the Snake River



trap to Lower Granite Dam and average Lower Granite inflow for PIT-tagged wild Chinook salmon groups (Table 9). The equation shows that as discharge increases, migration rate increases.

Sufficient numbers of wild Chinook salmon (9,223 individual fish) were PIT tagged daily at the Salmon River trap to provide 54 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 13 through May 20 (Appendix A, Table 6). Median travel time ranged from 40.0 to 5.5 d (5.8 km/d to 42.7 km/d migration rate) and averaged 19.4 d (14.3 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 10). Linear regression analysis detected a significant relation between migration rate from the Salmon River trap to Lower Granite Dam and average Lower Granite inflow for PIT-tagged wild Chinook salmon groups (Table 9). The equation shows that as discharge increases, migration rate increases.

**Hatchery Steelhead Trout PIT Tag Groups**—Sufficient numbers of hatchery steelhead trout (1,282 individual fish) were PIT tagged daily at the Snake River trap to provide 42 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 13 through May 27 (Appendix A, Table 3). Median travel time ranged from 3.5 to 1.3 d (14.8 km/d to 38.8 km/d migration rate) and averaged 2.4 d (23.0 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 8). Linear regression analysis detected a significant relation between migration rate in Lower Granite Reservoir and average Lower Granite inflow for PIT tagged hatchery steelhead trout groups (Table 9). The equation shows that as discharge increases, migration rate increases.

Sufficient numbers of hatchery steelhead trout (2,429 individual fish) were PIT tagged daily at the Salmon River trap to provide 32 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 7 through May 22 (Appendix A, Table 7). Median travel time ranged from 10.9 to 3.7 d (21.4 km/d to 63.0 km/d migration rate) and averaged 6.0 d (42.0 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 10). The linear regression analysis detected a significant relation between migration rate from the Salmon River trap to Lower Granite Dam and average Lower Granite discharge for PIT-tagged hatchery steelhead trout groups marked at the Salmon River trap (Table 9). The equation shows that as discharge increases, migration rate increases.

**Wild Steelhead Trout PIT Tag Groups**—Sufficient numbers of wild steelhead trout (1,189 individual fish) were PIT tagged daily at the Snake River trap to provide 17 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 16 through May 27 (Appendix A, Table 4). Median travel time ranged from 3.5 to 1.4 d (14.6 km/d to 37.9 km/d migration rate) and averaged 2.5 d (22.6 km/d).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 8). Linear regression analysis detected a significant relation between migration rate in Lower Granite Reservoir and average Lower Granite inflow for PIT-tagged wild steelhead trout groups (Table 9). The equation shows that as discharge increases, migration rate increases.

Sufficient numbers (268 individual fish) of wild steelhead trout were PIT tagged daily at the Salmon River trap to provide one daily release groups for median migration rate calculations through Lower Granite Reservoir from May 13 (Appendix A, Table 8). Travel time for that group was 4.2 d (55.7 km/d migration rate).

Not enough data was available to perform a linear regression analysis for wild steelhead trout from the Salmon River trap (Table 10).

### **Interrogation of PIT-Tagged Fish**

Interrogation data in 2003 are not directly comparable with the earlier years. All species-run-rearing types will be underestimated due to a reduction in collection efficiency during spill at the dams. During other times of the season, the interrogation rate may vary sporadically due to fluctuations in turbine operations. As the fourth collection facility in the system, Lower Monumental Dam became operational in 1993, and total interrogations may be greater beginning in 1993 than in previous years. A removable spillway weir (RSW) was installed at Lower Granite Dam in 2001 and tested in 2002. The RSW decreased collection efficiency by drawing more smolts to the spill. Therefore, any comparison in trends of cumulative detection at dams must be done cautiously, in a manner that incorporates these additional factors.

After combining to remove groups with small sample size, mean percent interrogation of Snake River trap hatchery Chinook salmon daily PIT tag release groups at Lower Granite Dam is 30.8% and ranges between 11.7% and 52.6% for hatchery fish (Appendix B, Table 1). The mean for wild Chinook salmon is 41.4% and ranged from 21.0% to 58.8% (Appendix B, Table 2). Seasonal cumulative interrogation rate of PIT-tagged hatchery Chinook salmon to Lower Granite, Little Goose, Lower Monumental, and McNary dams ranged between 31.7% and 100%, and averaged 66.6% and wild Chinook salmon ranged from 60.0% to 88.2% and averaged 76.8% (Table 11).

Percent interrogation of Salmon River trap hatchery Chinook salmon daily PIT tag release groups at Lower Granite Dam, after combining to remove groups with small sample size, ranged from 16.0% to 60.0% and averaged 27.7% (Appendix B, Table 5). Wild Chinook salmon ranged from 17.1% to 47.3% and averaged 33.8% (Appendix B, Table 7). Seasonal cumulative interrogation rate of PIT-tagged hatchery Chinook salmon to Lower Granite, Little Goose, Lower Monumental, and McNary dams ranged between 35.0% and 80.0% and averaged 53.2% (Table 11). Wild Chinook salmon cumulative interrogation rates ranged between 36.8% and 88.9% and averaged 61.5% (Table 11).

Percent interrogation of Snake River trap hatchery steelhead trout and wild steelhead trout daily PIT tag release groups at Lower Granite Dam, after combining to remove groups with small sample size, ranged from 10.5% to 59.4% for hatchery fish and averaged 31.4% (Appendix B, Table 3). Wild steelhead trout ranged from 23.1% to 69.2% and averaged 39.0% (Appendix B, Table 4). Seasonal cumulative interrogation rate of PIT-tagged hatchery steelhead trout to Lower Granite, Little Goose, Lower Monumental, and McNary dams ranged between 42.9% and 96.0% and averaged 67.8% (Table 11). Wild steelhead trout cumulative interrogation rates ranged between 42.9% and 92.3% and averaged 65.1% (Table 11).

Percent interrogation of Salmon River trap hatchery steelhead trout daily PIT tag release groups at Lower Granite Dam, after combining to remove groups with small sample size, ranged from 11.3% to 54.8% and averaged 27.4% (Appendix B Table 7). Only one wild steelhead trout

release group contained sufficient recaptures at Lower Granite Dam for statistical analysis (52.9% recapture rate) (Appendix B Table 8). Seasonal cumulative interrogation rate of PIT-tagged hatchery steelhead trout to Lower Granite, Little Goose, Lower Monumental, and McNary dams ranged between 37.5% and 100% and averaged 58.5% (Table 11). Wild steelhead trout ranged from 46.2% to 82.4% and averaged 63.0% (Table 11).

Table 8. Migration rates (km/day) stratified by 5 kcfs intervals from the Snake River trap to Lower Granite Dam, 2003.

Discharge Interval	Hatchery Chinook		Wild Chinook		Hatchery Steelhead		Wild Steelhead	
	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured
65 – 70	10.4	98	8.24	71	19.42	272	17.07	28
70 – 75	6.81	151	9.16	25	17.74	185	17.90	34
75 – 80	9.93	44			21.00	340	19.98	42
80 – 85	12.53	8			25.46	129	21.12	58
85 – 90					27.63	64	32.80	9
90 – 95	6.76	10						
95 – 100					29.75	12		
100 – 105								
105 – 110								
110 – 115								
115 – 120	14.65	10						
120 – 125	5.35	6			31.89	63		
125 – 130	4.41	18						
130 – 135							37.15	76
135 – 140								
140 – 145					33.25	53		
145 – 150			14.99	171	37.26	67	35.27	20
150 – 155								
155 – 160					38.78	52	37.91	8
160 – 165	5.68	75	13.01	33				
165 – 170								
170 – 175								
175 – 180	9.81	56	12.93	27				

Table 9. Linear regression statistics for migration rate/discharge relations by species, rearing type and trap using data stratifies by 5-kcfs intervals, 2003.

Species	Trap	N	Intercept	Slope	r <sup>2</sup>	P
Hatchery Chinook	Snake	10	3.549	-0.317	0.080	0.429
	Salmon	6	-13.520	3.826	0.815	0.014
Wild Chinook	Snake	5	0.076	0.498	0.860	0.023
	Salmon	6	-10.164	3.048	0.814	0.014
Hatchery Steelhead	Snake	10	-0.330	0.793	0.889	<0.001
	Salmon	5	-1.582	1.253	0.826	0.033
Wild Steelhead	Snake	8	-0.866	0.905	0.826	0.002
	Salmon	1	-	-	-	-

Table 10. Migration rates (km/day) stratified by 5 kcfs intervals from the Salmon River trap to Lower Granite Dam, 2003.

Discharge Interval	Hatchery Chinook		Wild Chinook		Hatchery Steelhead		Wild Steelhead	
	Migration Rate	Number Recaptured	Migration Rate	Number Recaptured	Migration Rate	Number Recaptured	Migration Rate	Number Recaptured

	(km/day)		(km/day)		(km/day)		(km/day)
55 – 60	8.84	12	7.89	510			
60 – 65	6.38	99	7.70	718			
65 – 70	10.32	242	12.80	563	37.94	211	
70 – 75	11.34	672	16.54	1293	37.57	153	
75 – 80					49.59	105	
80 – 85	41.01	26	42.70	6	55.86	89	55.69
85 – 90							9
90 – 95	36.11	14					
95 – 100							
100 – 105			34.94	7	62.09	6	

Table 11. Interrogations of PIT-tagged fish from the Snake River trap, 1987-2003; Clearwater River trap, 1989-1995; and Salmon River trap 1993-2003, at downstream collection facilities.

Site	Year	Species <sup>a</sup>	Number Interrogated / Site									Grand Total Ints	Total % Obs.
			No. Tagged	Ints at Lower Granite	% GRJ	Ints at Little Goose	% GOJ	Ints at Lower Monumental	% LMJ	Ints at McNary	% MCJ		
Snake	2003	CH	2,047	557	27.2%	470	23.0%	123	6.0%	173	8.5%	1,323	64.6%
	2002	CH	1,901	391	20.6%	428	22.5%	346	18.2%	2	0.1%	1,167	61.4%
	2001	CH	413	291	70.5%	51	12.3%	8	1.9%	4	1.0%	354	85.7%
	2000	CH	3,963	1,179	29.8%	677	17.1%	188	4.7%	195	4.9%	2,239	56.5%
	1999	CH	4,268	997	23.4%	1,515	35.5%	516	12.1%	206	4.8%	3,234	75.8%
	1998	CH	2,303	1,077	46.8%	510	22.2%	192	8.3%	71	3.1%	1,850	80.3%
	1997	CH	—	—	—	—	—	—	—	—	—	—	—
	1996	CH	1,450	497	34.3%	259	17.9%	189	13.0%	40	2.8%	985	67.9%
	1995	CH	3,927	1,646	41.9%	643	16.4%	430	11.0%	153	3.9%	2,872	73.1%
	1994	CH	2,844	885	31.1%	332	11.7%	223	7.8%	329	11.6%	1,769	62.2%
	1993	CH	3,203	1,336	41.7%	494	15.4%	246	7.7%	134	4.2%	2,210	69.0%
1992	CH	410	166	40.5%	83	20.2%	—	0.0%	48	11.7%	297	72.4%	
Snake	2003	CW	1,311	399	30.4%	327	24.9%	125	9.5%	90	6.9%	941	71.8%
	2002	CW	1,393	294	21.1%	448	32.2%	207	14.9%	1	0.1%	950	68.2%
	2001	CW	43	26	60.5%	3	7.0%	—	0.0%	1	2.3%	30	69.8%
	2000	CW	1,989	550	27.7%	480	24.1%	144	7.2%	112	5.6%	1,286	64.7%
	1999	CW	3,624	804	22.2%	1,515	41.8%	567	15.6%	121	3.3%	3,007	83.0%
	1998	CW	961	442	46.0%	190	19.8%	89	9.3%	42	4.4%	763	79.4%
	1997	CW	—	—	—	—	—	—	—	—	—	—	—
	1996	CW	842	269	31.9%	190	22.6%	119	14.1%	40	4.8%	618	73.4%
	1995	CW	2,067	1,023	49.5%	366	17.7%	216	10.5%	68	3.3%	1,673	80.9%
	1994	CW	934	354	37.9%	95	10.2%	82	8.8%	83	8.9%	614	65.7%
	1993	CW	1,125	576	51.2%	150	13.3%	57	5.1%	46	4.1%	829	73.7%
	1992	CU	615	249	40.5%	106	17.2%	—	0.0%	72	11.7%	427	69.4%
	1991	CU	2,131	929	43.6%	409	19.2%	—	0.0%	115	5.4%	1,453	68.2%
	1990	CU	2,245	956	42.6%	310	13.8%	—	0.0%	180	8.0%	1,446	64.4%
1989	CU	6,222	2,384	38.3%	1,367	22.0%	—	0.0%	482	7.7%	4,233	68.0%	
1988	CU	3,767	1,237	32.8%	543	14.4%	—	0.0%	299	7.9%	2,079	55.2%	
1987 <sup>b</sup>	CU	3,275	1,067	32.6%	338	10.3%	—	0.0%	308	9.4%	1,713	52.3%	
Snake	2003	SH	4,177	1,282	30.7%	881	21.1%	508	12.2%	86	2.1%	2,757	66.0%
	2002	SH	5,031	1,200	23.9%	875	17.4%	818	16.3%	2	0.0%	2,895	57.5%
	2001	SH	3,156	2,082	66.0%	115	3.6%	24	0.8%	6	0.2%	2,227	70.6%
	2000	SH	3,717	2,122	57.1%	342	9.2%	203	5.5%	41	1.1%	2,708	72.9%
	1999	SH	3,990	1,185	29.7%	1,175	29.4%	537	13.5%	89	2.2%	2,986	74.8%

Table 11. Continued.

Site	Year	Species <sup>a</sup>	Number Interrogated / Site									Grand Total Ints	Total % Obs.
			No. Tagged	Ints at Lower Granite	% GRJ	Ints at Little Goose	% GOJ	Ints at Lower Monumental	% LMJ	Ints at McNary	% MCJ		
Snake,	1998	SH	4,274	2,230	52.2%	640	15.0%	303	7.1%	61	1.4%	3,234	75.7%

continued	1997	SH	1,459	750	51.4%	328	22.5%	123	8.4%	12	0.8%	1,213	83.1%
	1996	SH	1,363	675	49.5%	247	18.1%	139	10.2%	24	1.8%	1,085	79.6%
	1995	SH	2,244	1,477	65.8%	236	10.5%	165	7.4%	19	0.8%	1,897	84.5%
	1994	SH	3,239	1,298	40.1%	216	6.7%	112	3.5%	40	1.2%	1,666	51.4%
	1993	SH	2,521	1,925	76.4%	235	9.3%	63	2.5%	13	.5%	2,236	88.7%
	1992	SH	3,904	1,496	38.3%	227	5.8%	—	0.0%	30	0.8%	1,753	44.9%
	1991	SH	2,577	2,032	78.9%	268	10.4%	—	0.0%	11	0.4%	2,311	89.7%
	1990	SH	3,112	2,272	73.0%	282	9.1%	—	0.0%	33	1.1%	2,587	83.1%
	1989	SH	2,525	1,773	70.2%	268	10.6%	—	0.0%	35	1.4%	2,076	82.2%
	1988	SH	1,743	1,069	61.3%	190	10.9%	—	0.0%	12	0.7%	1,271	72.9%
	1987	SH	827	324	39.2%	52	6.3%	—	0.0%	6	0.7%	382	46.2%
Snake	2003	SW	1,208	397	32.9%	300	24.8%	77	6.4%	32	2.6%	806	66.7%
	2002	SW	2,518	639	25.4%	472	18.7%	439	17.4%	1	0.0%	1,551	61.6%
	2001	SW	884	716	81.0%	56	6.3%	14	1.6%	1	0.1%	787	89.0%
	2000	SW	1,312	5879	44.9%	214	16.3%	105	8.0%	28	2.1%	936	71.3%
	1999	SW	923	254	27.5%	304	32.9%	111	12.0%	19	2.1%	688	74.5%
	1998	SW	1,088	624	57.4%	154	14.2%	81	7.4%	8	0.7%	867	79.7%
	1997	SW	148	82	55.4%	38	25.7%	6	4.1%	1	0.7%	127	85.8%
	1996	SW	655	293	44.7%	137	20.9%	67	10.2	12	1.8%	509	77.7%
	1995	SW	1,537	967	62.9%	195	12.7%	122	7.9%	13	0.8%	1,297	84.4%
	1994	SW	2,840	1,546	54.4%	319	11.2%	158	5.6%	51	1.8%	2,074	73.0%
	1993	SW	2,867	1,982	69.1%	267	9.3%	133	4.6%	32	1.1%	2,414	84.2%
	1992	SW	2,538	1,511	59.5%	307	12.1%	—	0.0%	31	1.2%	1,849	72.9%
Snake	1991	SW	3,549	2,266	63.8%	625	17.6%	—	0.0%	66	1.9%	2,957	83.3%
	1990	SW	3,078	2,016	65.5%	356	11.6%	—	0.0%	60	1.9%	2,432	79.0%
	1989	SW	1,798	1,170	65.1%	240	13.3%	—	0.0%	52	2.9%	1,462	81.3%
	1988	SW	1,186	698	58.9%	166	14.0%	—	0.0%	20	1.7%	884	74.5%
	1987	SW	464	229	49.4%	48	10.3%	—	0.0%	8	1.7%	285	61.4%
Clearwater	1995	CH	2,467	950	38.5%	414	16.8%	269	10.9%	109	4.4%	1,742	70.6%
	1994	CH	1,998	500	25.0%	192	9.6%	188	9.4%	247	12.4%	1,127	56.4%
	1993	CH	1,624	553	34.1%	193	11.9%	106	6.5%	77	4.7%	929	57.2%
	1992	CH	5,200	1,654	31.8%	745	14.3%	—	0.0%	429	8.3%	2,828	54.4%
Clearwater	1995	CW	1,051	464	44.1%	173	16.5%	88	8.4%	37	3.5%	762	72.5%
	1994	CW	761	308	40.5%	94	12.4%	81	10.6%	41	5.4%	524	68.9%
	1993	CW	298	134	45.0%	43	14.4%	25	8.4%	18	6.0%	220	73.8%
	1992	CU	1,461	502	34.4%	202	13.8%	—	0.0%	136	9.3%	840	57.5%
	1991	CU	3,943	1,483	37.6%	668	16.9%	—	0.0%	235	6.0%	2,386	60.5%
	1990	CU	4,242	1,359	32.0%	674	15.9%	—	0.0%	281	6.6%	2,314	54.6%
	1989	CU	2,441	756	31.0%	452	18.5%	—	0.0%	140	5.7	1,348	55.2%
Clearwater	1995	SH	867	602	69.4%	69	8.0%	56	6.5%	3	0.3%	730	84.2%
	1994	SH	1,250	729	58.3%	119	9.5%	30	2.4%	10	0.8%	888	71.0%
	1993	SH	1,102	813	73.8%	79	7.2%	24	2.2%	6	0.5%	922	83.7%
	1992	SH	1,567	823	52.5%	118	7.5%	—	0.0%	6	0.4%	947	60.4%
	1991	SH	1,215	926	76.2%	89	7.3%	—	0.0%	3	0.2%	1,018	83.8%
	1990	SH	1,228	880	71.7%	63	5.1%	—	0.0%	10	0.8%	953	77.6%
	1989	SH	290	173	59.7%	16	5.5%	—	0.0%	2	0.7%	191	65.9%
Clearwater	1995	SW	268	157	58.6%	40	14.9%	16	6.0%	1	0.4%	214	79.9%
	1994	SW	1,297	421	32.5%	150	11.6%	106	8.2%	24	1.9%	701	54.0%
	1993	SW	849	560	66.0%	106	12.5%	58	6.8%	9	1.1%	733	86.3%
	1992	SW	2,996	1,599	53.4%	477	15.9%	—	0.0%	113	3.8%	2,189	73.1%
	1991	SW	1,300	767	59.0%	126	9.7%	—	0.0%	22	1.7%	915	70.4%
	1990	SW	727	409	56.3%	102	14.0%	—	0.0%	28	3.9%	539	74.1%
	1989	SW	104	53	51.0%	16	15.4%	—	0.0%	3	2.9%	72	69.2%
Salmon	2003	CH	4,492	1,120	24.9%	576	12.8%	97	2.2%	365	8.1%	2,158	48.0%
	2002	CH	5,049	853	16.9%	818	16.2%	892	17.7%	5	0.1%	2,568	50.9%
	2001	CH	4,564	2,740	60.0%	519	11.4%	99	2.2%	37	0.8%	3,395	74.4%
	2000	CH	4,804	1,486	30.9%	708	14.7%	214	4.5%	230	4.8%	2,638	54.9%

Table 11. Continued.

Site	Year	Species <sup>a</sup>	No. Tagged	Number Interrogated / Site								Grand Total Ints	Total % Obs.
				Ints at Lower Granite	% GRJ	Ints at Little Goose	% GOJ	Ints at Lower Monumental	% LMJ	Ints at McNary	% MCJ		
Salmon,	1999	CH	5,611	1128	20.1%	1,551	27.6%	604	10.8%	240	4.3%	3,523	62.8%

continued	1998	CH	3,025	1098	36.3%	565	18.7%	201	6.6%	87	2.9%	1951	64.5%
	1997	CH	—	—	—	—	—	—	—	—	—	—	—
	1996	CH	2,554	618	24.2%	343	13.4%	258	10.1%	67	2.6%	1,286	50.4%
	1995	CH	5,074	1,777	35.0%	757	14.9%	531	10.5%	186	3.7%	3,251	64.1%
	1994	CH	3,633	870	23.9%	322	8.9%	258	7.1%	358	9.9%	1,808	49.8%
	1993	CH	3,138	1,144	36.5%	385	12.3%	233	7.4%	157	5.0%	1,919	61.2%
Salmon	2003	CW	9,242	3,130	33.9%	1,459	15.8%	276	3.0%	799	8.6%	5,664	61.3%
	2002	CW	5,467	1,082	19.8%	1,358	24.8%	773	14.1%	1	0.0%	3,214	58.8%
	2001	CW	1,899	1,385	72.9%	174	9.2%	18	0.9%	4	0.2%	1,581	83.3%
	2000	CW	2,069	654	31.6%	494	23.9%	163	7.9%	103	5.0%	1,414	68.3%
	1999	CW	3,628	833	23.0%	1,500	41.3%	421	11.6%	125	3.4%	2,879	79.4%
	1998	CW	1,416	657	46.4%	305	21.5%	105	7.4%	70	4.9%	1,137	80.3%
	1997	CW	—	—	—	—	—	—	—	—	—	—	—
	1996	CW	1,425	381	26.7%	289	20.3%	181	12.7%	31	2.2%	882	61.9%
	1995	CW	3,937	1,790	45.5%	689	17.5%	366	9.3%	122	3.1%	2,967	75.4%
	1994	CW	2,913	1,113	38.2%	287	9.9%	188	6.5%	202	6.9%	1,790	61.4%
	1993	CW	2,169	1,112	51.3%	286	13.2%	125	5.8%	91	4.2%	1,614	74.4%
Salmon	2003	SH	2,444	592	24.2%	442	18.1%	299	12.2%	58	2.4%	1,391	56.9%
	2002	SH	2,060	331	16.1%	272	13.2%	325	15.8%	1	0.0%	929	45.1%
	2001	SH	3,152	2,244	71.2%	81	2.6%	24	0.8%	2	0.1%	2,351	74.6%
	2000	SH	2,130	1,209	56.8%	153	7.2%	70	3.3%	21	1.0%	1,453	68.2%
	1999	SH	2,266	718	31.7%	614	27.1%	214	9.4%	32	1.4%	1,578	69.6%
	1998	SH	1,117	608	54.4%	158	14.2%	76	6.8%	7	0.6%	849	76.0%
	1997	SH	1,252	627	50.1%	213	17.0%	118	9.4%	1	0.1%	960	76.6%
	1996	SH	1,410	598	42.4%	205	14.5%	140	9.9%	24	1.7%	967	68.6%
	1995	SH	1,556	937	60.2%	190	12.2%	118	7.6%	14	0.9%	1,259	80.9%
	1994	SH	2,596	1,001	38.6%	164	6.3%	70	2.7%	36	1.4%	1,271	49.0%
	1993	SH	1,641	1,203	73.3%	112	6.8%	44	2.7%	13	0.8%	1,372	83.6%
Salmon	2003	SW	312	101	32.4%	45	14.4%	16	5.1%	12	3.8%	174	55.8%
	2002	SW	390	97	24.9%	71	18.2%	43	11.0%	0	0.0%	211	54.1%
	2001	SW	485	366	75.5%	19	3.9%	4	0.8%	5	1.0%	394	81.2%
	2000	SW	336	141	42.0%	56	16.7%	18	5.4%	5	1.5%	220	65.5%
	1999	SW	227	56	24.7%	75	33.0%	27	11.9%	5	2.2%	163	71.8%
	1998	SW	112	56	50.0%	13	11.6%	10	8.9%	1	0.9%	80	71.4%
	1997	SW	59	38	64.4%	6	10.2%	5	8.5%	0	0.0%	49	83.1%
	1996	SW	251	112	44.6%	49	19.5%	21	8.4%	1	0.4%	183	72.9%
	1995	SW	435	251	57.7%	59	13.6%	32	7.4%	1	0.2%	343	78.9%
	1994	SW	532	260	48.9%	44	8.3%	32	6.0%	10	1.9%	346	65.0%
	1993	SW	902	575	63.7%	73	8.1%	36	4.0%	5	0.6%	689	76.4%

<sup>a</sup> CH = Hatchery Chinook, CW = wild Chinook, CU = unknown Chinook, SH = hatchery steelhead, SW = wild steelhead.  
Bias may exist as only "quality" fish were tagged.

## SUMMARY

Hatchery spring/summer Chinook salmon releases above Lower Granite Dam for 2003 were 108% of the previous year's release. Hatchery fall Chinook salmon releases were 108% of the previous year. Hatchery steelhead trout releases were 93% of 2002 numbers. Hatchery sockeye releases were 363% of 2002 numbers. Hatchery coho releases were 80% of last year's. Hatchery production of spring/summer Chinook salmon in the Clearwater River drainage was 100%, the Snake River and non-Idaho tributaries 182%, and the Salmon River drainage 106% of 2002 production. Hatchery production of steelhead trout in the Clearwater River drainage was 97%, the Snake River and non-Idaho tributaries was 101%, and the Salmon River was 87% of last year's total. Hatchery production of Chinook salmon and steelhead trout released above Lower Granite Dam was 15,773,544 and 8,809,643, respectively, in 2003. Significant numbers of hatchery sockeye salmon (140,410) and hatchery coho salmon (847,504) were released in 2003.

The Snake River trap was operated on the east side of the river from March 9 through May 27, 2003 and was out of operation for zero days during this period due to high flow and mechanical failures. The Snake River trap captured 3,395 age-1 hatchery and 1,386 wild Chinook salmon, 579 age-0 Chinook salmon of unknown rearing, 7,319 hatchery and 1,252 wild steelhead trout, five hatchery sockeye, 13 sockeye/kokanee of unknown rearing, and 36 coho of unknown rearing.

The Salmon River trap was operated in the thalweg for most of the season, which ran March 9 through May 24, 2003 and was out of operation for zero days during this period due to heavy debris. The Salmon River trap captured 35,897 age-1 hatchery and 9,339 wild Chinook salmon, 3,101 hatchery and 319 wild steelhead trout, and one hatchery sockeye salmon.

Significant migration rate/discharge relations were detected for wild Chinook salmon released from the Snake River trap to Lower Granite Dam. The statistical analysis was unable to detect a migration rate/discharge relation for hatchery Chinook salmon from the Snake River trap to Lower Granite Dam because age 0 and age 1 Chinook salmon smolts were combined in the data set. Age 0 Chinook salmon migrate significantly slower than age 1 Chinook salmon.

A significant migration rate/discharge relation was detected for wild Chinook salmon released from the Salmon River trap to Lower Granite Dam. Significant migration rate/discharge relations were detected for hatchery steelhead trout and wild steelhead trout released from the Snake River trap to Lower Granite Dam. A significant migration rate/discharge relation was detected for hatchery steelhead trout from the Salmon River trap to Lower Granite Dam, but not enough data were available to run the analysis for wild steelhead trout. In all instances where the migration rate/discharge relation was significant, the same trend was seen; as discharge increased, migration rate increased.

The four-dam interrogation rates for 2003 must be compared with caution due to the addition of a new collection facility at Lower Monumental Dam in 1993 and the RSW at Lower Granite Dam in 2000. Since the installation and operation of the RSW at Lower Granite Dam interrogation rates at Lower Granite Dam have decreased and interrogation rates at the other three collector dams have increased. The RSW was not operated in 2001 due to very low runoff.

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## **APPENDICES**

Appendix A. Table 1. PIT-tagged hatchery Chinook salmon travel time with 95% confidence intervals from the Snake River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/24/03 <sup>b</sup>	9.13	0.00	0.00	5.51	23.67	5	9	55.56%	52.410	5.7
03/26/03 <sup>b</sup>	30.37	0.00	0.00	19.15	41.59	2	7	28.57%	65.619	1.7
03/25/03 <sup>b</sup>	6.44	0.00	0.00	6.44	6.44	1	7	14.29%	54.600	8.0
03/29/03 <sup>b</sup>	38.75	0.00	0.00	38.75	38.75	1	4	25.00%	68.415	1.3
03/30/03 <sup>b</sup>	20.02	0.00	0.00	20.02	20.02	1	1	100.00%	66.552	2.6
04/01/03 <sup>b</sup>	6.33	0.00	0.00	6.33	6.33	1	1	100.00%	68.114	8.2
04/03/03 <sup>b</sup>	18.90	0.00	0.00	8.07	24.86	3	11	27.27%	69.040	2.7
04/05/03 <sup>b</sup>	15.34	0.00	0.00	8.55	24.27	3	8	37.50%	68.706	3.4
04/11/03 <sup>b</sup>	5.38	0.00	0.00	5.38	5.38	1	3	33.33%	74.550	9.6
04/12/03 <sup>b</sup>	13.61	0.00	0.00	9.73	17.49	2	10	20.00%	73.793	3.8
04/13/03 <sup>b</sup>	15.80	0.00	0.00	7.03	24.56	2	3	66.67%	74.629	3.3
04/15/03	8.45	7.28	9.60	2.88	23.48	45	102	44.12%	71.100	6.1
04/16/03	7.92	7.11	8.77	3.67	21.10	46	131	35.11%	70.867	6.5
04/17/03	8.86	5.26	20.95	3.99	45.22	14	45	31.11%	72.340	5.8
04/18/03	6.55	5.53	9.18	3.39	18.97	14	46	30.43%	70.863	7.9
04/19/03 <sup>b</sup>	6.57	0.00	0.00	6.16	6.98	2	10	20.00%	74.488	7.9
04/20/03 <sup>b</sup>	4.09	0.00	0.00	3.10	10.07	3	10	30.00%	70.520	12.6
04/21/03 <sup>b</sup>	3.23	0.00	0.00	3.23	3.23	1	2	50.00%	71.975	16.0
04/22/03 <sup>b</sup>	5.12	0.00	0.00	4.04	10.19	4	10	40.00%	78.117	10.1
04/23/03 <sup>b</sup>	4.64	0.00	0.00	3.12	7.80	4	7	57.14%	79.450	11.1
04/24/03	4.12	3.06	6.02	3.06	6.02	8	19	42.11%	80.420	12.5
04/25/03	6.54	5.50	7.85	3.51	19.57	29	100	29.00%	75.863	7.9
04/26/03	4.47	3.64	8.09	3.64	8.09	7	60	11.67%	77.420	11.5
04/27/03	6.95	4.84	8.66	4.10	10.30	16	79	20.25%	71.725	7.4
04/28/03	5.75	4.76	7.00	2.92	13.94	16	56	28.57%	70.329	9.0
04/29/03	6.66	5.59	8.112	5.49	8.43	11	27	40.74%	69.175	7.7
04/30/03 <sup>b</sup>	7.04	0.00	0.00	4.47	10.18	5	15	33.33%	68.888	7.3
05/01/03 <sup>b</sup>	6.01	0.00	0.00	4.54	11.06	4	13	30.77%	68.257	8.6
05/02/03	3.67	3.57	5.40	2.99	7.89	11	26	42.31%	67.020	14.1
05/03/03	5.01	3.97	7.07	2.59	22.15	27	88	30.68%	68.183	10.3
05/04/03 <sup>b</sup>	4.03	0.00	0.00	2.99	11.45	4	13	30.77%	68.820	12.8
05/05/03	5.14	3.39	7.26	3.39	7.26	7	21	33.33%	68.917	10.0
05/06/03	6.08	5.81	6.82	2.82	11.56	28	107	26.17%	68.143	8.5
05/07/03 <sup>b</sup>	5.32	0.00	0.00	3.71	6.29	3	23	13.04%	67.400	9.7
05/08/03	5.11	5.01	7.14	5.01	7.14	7	23	30.43%	67.900	10.1
05/09/03	4.14	3.21	8.52	3.21	8.52	7	21	33.33%	67.420	12.5
05/10/03 <sup>b</sup>	3.43	0.00	0.00	3.16	3.70	2	11	18.18%	67.350	15.0
05/11/03 <sup>b</sup>	3.07	0.00	0.00	3.07	3.07	1	7	14.29%	69.725	16.8
05/12/03 <sup>b</sup>	4.27	0.00	0.00	2.84	4.29	3	6	50.00%	76.280	12.1
05/13/03	3.24	3.02	4.01	3.02	4.01	8	21	38.10%	79.100	15.9
05/17/03 <sup>b</sup>	3.09	0.00	0.00	2.00	3.43	4	6	66.67%	82.875	16.7
05/15/03 <sup>b</sup>	2.04	0.00	0.00	1.43	2.15	4	14	28.57%	85.133	25.3
05/13/03 <sup>b</sup>	2.47	0.00	0.00	2.47	2.47	1	3	33.33%	86.933	20.9
05/17/03	2.15	0.00	0.00	1.88	3.23	4	11	36.36%	85.367	24.0
05/18/03	7.63	2.29	14.43	2.06	20.92	10	46	21.74%	92.289	6.8
05/19/03	11.70	5.49	16.70	3.12	29.88	18	93	19.35%	125.015	4.4
05/20/03	9.65	3.53	12.46	3.53	12.46	6	19	31.58%	121.345	5.3
05/21/03 <sup>b</sup>	6.13	0.00	0.00	3.66	10.48	4	14	28.57%	106.343	8.4
05/22/03	6.29	0.00	0.00	3.08	9.50	2	13	15.38%	118.300	8.2
05/23/03	3.52	2.49	6.67	2.34	14.38	10	19	52.63%	119.900	14.7
05/24/03 <sup>b</sup>	2.95	0.00	0.00	1.68	15.49	4	36	11.11%	129.950	17.5
05/25/03	9.62	6.82	13.44	1.31	25.95	39	194	20.10%	162.409	5.4
05/26/03	8.58	5.64	14.49	1.40	22.19	36	202	17.82%	166.240	6.0
05/27/03	5.26	3.82	8.28	1.53	28.27	56	195	28.72%	178.133	9.8

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 2. PIT-tagged wild Chinook salmon travel time with 95% confidence intervals from the Snake River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/25/03 <sup>b</sup>	10.68	0.00	0.00	10.51	10.85	2	3	66.67%	57.183	4.8
03/26/03 <sup>b</sup>	9.01	0.00	0.00	6.43	18.33	4	8	50.00%	56.620	5.7
03/28/03 <sup>b</sup>	21.06	0.00	0.00	17.04	25.08	2	2	100.00%	64.773	2.5
03/30/03 <sup>b</sup>	8.91	0.00	0.00	8.51	9.32	2	2	100.00%	62.160	5.8
04/02/03 <sup>b</sup>	7.61	0.00	0.00	5.08	10.15	2	3	66.67%	66.533	6.8
04/03/03 <sup>b</sup>	24.95	0.00	0.00	18.87	26.83	3	10	30.00%	71.442	2.1
04/04/03 <sup>b</sup>	32.12	0.00	0.00	32.12	32.12	1	5	20.00%	70.758	1.6
04/05/03 <sup>b</sup>	7.10	0.00	0.00	4.14	8.54	3	9	33.33%	64.138	7.3
04/06/03 <sup>b</sup>	7.61	0.00	0.00	7.61	7.61	1	1	100.00%	66.556	6.8
04/07/03 <sup>b</sup>	12.11	0.00	0.00	8.44	15.79	2	2	100.00%	69.262	4.3
04/10/03 <sup>b</sup>	3.84	0.00	0.00	3.84	3.84	1	1	100.00%	69.880	13.4
04/11/03 <sup>b</sup>	11.94	0.00	0.00	11.94	11.94	1	2	50.00%	71.346	4.3
04/12/03 <sup>b</sup>	5.09	0.00	0.00	5.09	5.09	1	1	100.00%	76.300	10.1
04/13/03 <sup>b</sup>	6.10	0.00	0.00	6.10	6.10	1	1	100.00%	74.500	8.5
04/15/03	5.21	3.50	7.96	2.34	12.30	17	34	50.00%	72.033	9.9
04/16/03	6.99	5.84	7.74	3.62	43.67	38	76	50.00%	69.700	7.4
04/17/03	6.82	4.02	11.12	4.02	11.12	8	19	42.11%	70.050	7.6
04/18/03	5.20	4.87	7.49	3.77	12.79	15	30	50.00%	67.650	9.9
04/19/03	4.96	3.78	7.32	3.78	7.32	8	17	47.06%	69.483	10.4
04/20/03 <sup>b</sup>	5.02	0.00	0.00	4.41	5.63	2	3	66.67%	72.233	10.3
04/21/03 <sup>b</sup>	5.89	0.00	0.00	5.89	5.89	1	1	100.00%	76.057	8.8
04/22/03 <sup>b</sup>	4.49	0.00	0.00	4.49	4.49	1	3	33.33%	77.440	11.5
04/23/03 <sup>b</sup>	3.22	0.00	0.00	3.22	3.22	1	1	100.00%	79.450	16.0
04/24/03 <sup>b</sup>	6.46	0.00	0.00	3.00	6.91	3	6	50.00%	78.300	8.0
04/25/03 <sup>b</sup>	4.97	0.00	0.00	3.84	11.86	4	15	26.67%	77.983	10.4
04/26/03 <sup>b</sup>	4.58	0.00	0.00	4.32	4.85	2	7	28.57%	76.567	11.3
04/27/03 <sup>b</sup>	5.70	0.00	0.00	4.04	6.09	3	8	37.50%	72.700	9.1
04/29/03	7.12	6.49	9.93	5.92	13.95	10	17	58.82%	69.175	7.2
05/03/03 <sup>b</sup>	3.35	0.00	0.00	2.65	4.05	2	8	25.00%	67.100	15.4
05/06/03 <sup>b</sup>	5.21	0.00	0.00	4.30	6.12	2	8	25.00%	68.583	9.9
05/07/03 <sup>b</sup>	5.32	0.00	0.00	4.75	5.89	2	4	50.00%	67.400	9.7
05/08/03 <sup>b</sup>	4.06	0.00	0.00	3.51	4.62	2	3	66.67%	66.800	12.7
05/09/03 <sup>b</sup>	3.72	0.00	0.00	3.72	3.72	1	2	50.00%	67.420	13.9
05/11/03 <sup>b</sup>	3.06	0.00	0.00	3.06	3.06	1	4	25.00%	69.725	16.9
05/12/03 <sup>b</sup>	4.04	0.00	0.00	4.04	4.04	1	1	100.00%	76.380	12.8
05/13/03 <sup>b</sup>	19.63	0.00	0.00	19.63	19.63	1	1	100.00%	117.676	2.6
05/14/03 <sup>b</sup>	3.76	0.00	0.00	3.76	3.76	1	1	100.00%	83.100	13.7
05/16/03 <sup>b</sup>	19.14	0.00	0.00	2.49	35.79	2	10	20.00%	126.255	2.7
05/17/03 <sup>b</sup>	2.10	0.00	0.00	2.10	2.10	1	5	20.00%	85.367	24.6
05/18/03 <sup>b</sup>	5.24	0.00	0.00	3.03	33.60	4	12	33.33%	77.617	9.8
05/19/03 <sup>b</sup>	4.96	0.00	0.00	3.71	6.22	2	8	25.00%	79.633	10.4
05/20/03 <sup>b</sup>	5.08	0.00	0.00	3.90	5.61	4	8	50.00%	86.383	10.2
05/22/03 <sup>b</sup>	3.47	0.00	0.00	3.47	3.47	1	4	25.00%	92.750	14.9
05/23/03 <sup>b</sup>	4.04	0.00	0.00	2.48	5.59	2	8	25.00%	119.900	12.8
05/25/03	3.44	3.22	3.74	1.15	25.78	171	654	26.15%	145.300	15.0
05/26/03	3.97	3.37	4.69	1.77	26.39	33	157	21.02%	163.300	13.0
05/27/03	3.99	3.17	5.65	1.21	29.74	27	100	27.00%	175.720	12.9

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 3. PIT-tagged hatchery steelhead trout travel time with 95% confidence intervals from the Snake River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/03/03 <sup>b</sup>	6.32	0.00	0.00	6.32	6.32	1	1	100.00%	61.586	8.2
03/31/03 <sup>b</sup>	3.13	0.00	0.00	3.13	3.13	1	3	33.33%	61.725	16.5
04/01/03 <sup>b</sup>	3.24	0.00	0.00	2.92	5.38	4	5	80.00%	69.750	15.9
04/02/03 <sup>b</sup>	2.58	0.00	0.00	2.22	2.94	2	4	50.00%	71.850	20.0
04/03/03 <sup>b</sup>	3.94	0.00	0.00	3.24	4.80	3	6	50.00%	69.240	13.1
04/04/03 <sup>b</sup>	7.85	0.00	0.00	3.93	11.77	2	7	28.57%	65.067	6.6
04/05/03 <sup>b</sup>	5.96	0.00	0.00	3.17	21.74	5	13	38.46%	63.329	8.7
04/06/03 <sup>b</sup>	11.46	0.00	0.00	3.69	23.57	5	11	45.45%	69.417	4.5
04/07/03 <sup>b</sup>	3.97	0.00	0.00	3.82	4.86	3	7	42.86%	61.820	13.0
04/08/03 <sup>b</sup>	11.70	0.00	0.00	5.37	18.02	2	9	22.22%	69.346	4.4
04/09/03 <sup>b</sup>	4.39	0.00	0.00	3.61	12.08	5	9	55.56%	65.700	11.8
04/10/03 <sup>b</sup>	13.40	0.00	0.00	7.36	19.43	2	8	25.00%	70.664	3.9
04/11/03 <sup>b</sup>	2.95	0.00	0.00	2.62	3.77	4	12	33.33%	71.900	17.5
04/12/03 <sup>b</sup>	2.73	0.00	0.00	2.53	2.92	2	4	50.00%	76.525	18.9
04/13/03	1.76	1.51	2.38	1.46	2.60	10	18	55.56%	78.767	29.3
04/14/03	2.43	2.13	2.81	1.55	12.81	48	97	49.48%	79.900	21.2
04/15/03	2.86	2.57	3.18	1.83	18.69	72	211	34.12%	75.800	18.0
04/16/03	2.97	2.58	4.64	2.30	9.65	19	63	30.16%	71.300	17.4
04/17/03	2.02	1.81	2.71	1.63	3.15	15	62	24.19%	69.267	25.5
04/18/03	2.97	2.69	3.38	1.87	9.49	36	124	29.03%	65.475	17.4
04/19/03	2.72	2.56	3.83	2.41	38.28	19	49	38.78%	65.525	19.0
04/20/03	2.55	2.18	15.70	1.78	41.23	11	26	42.31%	68.100	20.3
04/21/03	3.44	2.49	3.72	1.79	14.53	17	54	31.48%	71.975	15.0
04/22/03	2.50	2.47	2.75	1.55	31.92	75	239	31.38%	76.250	20.6
04/23/03	1.84	1.72	2.15	1.65	31.32	15	49	30.61%	78.533	28.1
04/24/03	2.37	1.80	2.70	1.46	23.43	49	110	44.55%	81.067	21.8
04/25/03	2.05	1.67	2.49	1.53	10.11	28	121	23.14%	81.500	25.1
04/27/03	2.59	2.46	2.75	2.33	13.11	42	120	35.00%	76.225	20.0
04/28/03	2.36	1.78	2.71	1.56	14.37	28	115	24.35%	74.467	21.9
04/29/03	2.77	1.83	3.15	1.67	4.70	13	62	20.97%	71.250	18.6
04/30/03	2.53	1.74	3.50	1.49	3.50	10	54	18.52%	69.325	20.4
05/01/03	3.48	2.51	5.51	2.47	14.03	11	105	10.48%	67.225	14.8
05/02/03	2.62	2.52	2.69	2.46	3.72	16	88	18.18%	65.625	19.7
05/03/03	2.66	2.52	3.41	1.76	5.15	21	120	17.50%	67.100	19.4
05/04/03	2.45	1.67	2.55	1.36	9.32	21	47	44.68%	67.800	21.1
05/05/03	2.80	2.60	3.63	2.00	6.16	35	116	30.17%	69.800	18.4
05/06/03	3.47	2.95	3.74	2.03	10.38	53	207	25.60%	70.250	14.9
05/07/03	2.95	2.40	3.44	1.69	20.78	30	122	24.59%	68.750	17.5
05/08/03	2.63	2.46	2.73	2.09	3.52	15	104	14.42%	67.125	19.6
05/09/03	1.88	1.78	3.43	1.49	14.36	15	98	15.31%	66.067	27.4
05/11/03	3.10	2.55	4.41	1.90	14.01	17	99	17.17%	69.725	16.6
05/12/03	2.70	2.55	2.80	1.70	3.89	28	100	28.00%	73.400	19.1
05/13/03	1.86	1.77	2.96	1.49	12.10	24	98	24.49%	76.033	27.7
05/14/03	1.71	1.64	1.96	1.45	7.51	41	100	41.00%	81.000	30.1
05/15/03	2.01	1.76	2.70	1.58	11.30	29	99	29.29%	85.133	25.7
05/16/03	1.72	1.66	1.80	1.48	5.03	21	84	25.00%	86.933	30.1
05/17/03	1.85	1.45	2.49	1.44	2.78	14	50	28.00%	85.367	27.9
05/18/03	2.55	2.09	2.73	1.48	9.83	33	101	32.67%	78.725	20.2
05/19/03	2.78	2.62	3.65	2.51	4.33	21	100	21.00%	75.500	18.6
05/20/03	2.68	2.10	2.92	1.61	5.61	27	100	27.00%	74.525	19.2
05/21/03 <sup>b</sup>	2.56	0.00	0.00	1.53	2.67	4	24	16.67%	80.175	20.2
05/22/03	2.04	1.61	2.60	1.58	2.69	11	35	31.43%	82.300	25.3
05/23/03	1.73	1.64	2.67	1.59	4.54	12	25	48.00%	99.967	29.7
05/24/03	1.62	1.54	1.72	1.39	5.54	63	106	59.43%	121.633	31.9
05/25/03	1.55	1.50	1.67	1.32	4.77	53	102	51.96%	141.233	33.2
05/26/03	1.39	1.35	1.42	1.23	4.65	67	133	50.38%	149.800	37.3
05/27/03	1.33	1.25	1.49	1.10	6.60	52	139	37.41%	156.200	38.8

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 4. PIT-tagged wild steelhead trout travel time with 95% confidence intervals from the Snake River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>b</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/25/03 <sup>b</sup>	7.85	0.00	0.00	5.95	18.21	4	4	100.00%	52.189	6.6
03/26/03 <sup>b</sup>	10.43	0.00	0.00	4.48	47.95	5	6	83.33%	57.664	4.9
03/27/03 <sup>b</sup>	26.35	0.00	0.00	26.35	26.35	1	3	33.33%	64.570	2.0
03/28/03 <sup>b</sup>	5.31	0.00	0.00	4.78	6.79	4	7	57.14%	51.050	9.7
03/29/03 <sup>b</sup>	6.23	0.00	0.00	3.41	7.44	3	6	50.00%	57.671	8.3
03/31/03 <sup>b</sup>	2.89	0.00	0.00	2.83	2.95	2	3	66.67%	61.725	17.8
04/03/03 <sup>b</sup>	3.29	0.00	0.00	2.97	3.60	2	4	50.00%	70.650	15.7
04/04/03 <sup>b</sup>	4.03	0.00	0.00	3.71	4.35	2	4	50.00%	66.220	12.8
04/05/03 <sup>b</sup>	3.61	0.00	0.00	2.78	4.44	2	5	40.00%	63.540	14.3
04/06/03 <sup>b</sup>	18.43	0.00	0.00	18.43	18.43	1	5	20.00%	69.426	2.8
04/07/03 <sup>b</sup>	3.46	0.00	0.00	3.00	3.92	2	3	66.67%	61.325	14.9
04/10/03 <sup>b</sup>	14.51	0.00	0.00	3.55	25.48	2	4	50.00%	71.894	3.6
04/11/03 <sup>b</sup>	11.54	0.00	0.00	11.54	11.54	1	1	100.00%	71.346	4.5
04/13/03 <sup>b</sup>	2.83	0.00	0.00	2.83	2.83	1	5	20.00%	78.425	18.2
04/14/03 <sup>b</sup>	3.06	0.00	0.00	2.25	5.64	3	8	37.50%	78.500	16.9
04/15/03 <sup>b</sup>	2.34	0.00	0.00	2.03	2.91	4	18	22.22%	78.000	22.1
04/16/03	2.49	2.15	3.01	2.15	3.01	7	17	41.18%	73.633	20.7
04/17/03	2.73	0.00	0.00	1.99	19.64	5	25	20.00%	68.125	18.9
04/18/03	3.53	3.06	4.21	2.61	4.94	12	43	27.91%	66.26	14.6
04/19/03 <sup>b</sup>	3.09	0.00	0.00	2.56	7.08	5	10	50.00%	65.525	16.7
04/20/03 <sup>b</sup>	3.52	0.00	0.00	3.52	3.52	1	6	16.67%	70.520	14.7
04/21/03 <sup>b</sup>	2.57	0.00	0.00	2.20	3.30	4	7	57.14%	71.975	20.1
04/22/03	2.46	2.37	3.74	1.99	4.49	9	16	56.25%	74.733	21.0
04/23/03 <sup>b</sup>	3.05	0.00	0.00	1.76	4.35	2	12	16.67%	79.450	16.9
04/24/03 <sup>b</sup>	4.59	0.00	0.00	4.59	4.59	1	2	50.00%	79.133	11.2
04/25/03	2.43	2.15	3.46	1.85	9.62	9	23	39.13%	81.500	21.2
04/26/03	2.71	2.60	3.49	2.49	8.56	9	39	23.08%	78.450	19.1
04/27/03	2.48	2.38	2.67	2.30	5.96	13	50	26.00%	77.200	20.8
04/28/03	2.56	0.00	0.00	1.65	2.86	3	31	9.68%	73.925	20.2
04/29/03 <sup>b</sup>	2.97	0.00	0.00	2.74	4.46	3	17	17.65%	71.250	17.4
04/30/03 <sup>b</sup>	3.46	0.00	0.00	2.98	3.78	5	13	38.46%	69.352	14.9
05/01/03 <sup>b</sup>	3.40	0.00	0.00	2.28	4.54	5	21	23.81%	67.225	15.2
05/02/03 <sup>b</sup>	2.69	0.00	0.00	2.46	2.92	2	9	22.22%	65.625	19.2
05/03/03	2.70	2.49	5.37	2.47	6.00	10	26	38.46%	67.100	19.1
05/04/03 <sup>b</sup>	2.80	0.00	0.00	1.94	4.16	5	18	27.78%	68.450	18.4
05/05/03	2.78	2.40	3.89	2.40	3.89	6	19	31.58%	69.800	18.6
05/06/03	3.39	2.77	4.43	2.44	4.60	18	67	26.87%	70.25	15.2
05/07/03 <sup>b</sup>	3.10	0.00	0.00	2.43	3.67	5	29	17.24%	68.750	16.6
05/08/03 <sup>b</sup>	2.47	0.00	0.00	2.32	2.68	5	27	18.52%	68.200	20.9
05/09/03 <sup>b</sup>	2.64	0.00	0.00	2.56	2.74	3	18	16.67%	65.925	19.5
05/10/03 <sup>b</sup>	3.46	0.00	0.00	2.42	4.23	5	11	45.45%	67.350	14.9
05/11/03 <sup>b</sup>	2.59	0.00	0.00	2.45	3.66	3	21	14.29%	69.725	20.0
05/12/03 <sup>b</sup>	2.97	0.00	0.00	2.66	3.27	2	16	12.50%	73.400	17.4
05/13/03 <sup>b</sup>	2.23	0.00	0.00	1.96	2.51	2	11	18.18%	76.033	23.1
05/14/03	2.09	1.49	3.57	1.49	3.57	8	23	34.78%	81.000	24.7
05/15/03 <sup>b</sup>	1.71	0.00	0.00	1.44	4.51	4	16	25.00%	85.133	30.1
05/16/03 <sup>b</sup>	1.90	0.00	0.00	1.70	2.47	5	13	38.46%	86.933	27.2
05/17/03	1.57	1.48	1.82	1.42	1.86	9	20	45.00%	85.367	32.8
05/18/03	2.44	2.36	2.68	1.51	5.60	32	66	48.48%	80.367	21.1
05/19/03	2.60	2.49	2.72	2.26	4.94	20	74	27.03%	75.500	19.9
05/20/03 <sup>b</sup>	2.55	0.00	0.00	2.48	2.62	2	17	11.76%	74.525	20.2
05/21/03	2.90	2.49	4.92	1.64	5.55	9	13	69.23%	80.175	17.8
05/22/03 <sup>b</sup>	2.71	0.00	0.00	2.71	2.71	1	6	16.67%	92.750	19.0
05/24/03 <sup>b</sup>	1.62	0.00	0.00	1.31	3.52	5	9	55.56%	121.633	31.9
05/25/03	1.39	1.33	1.50	1.09	2.98	76	178	42.70%	134.400	37.1
05/26/03	1.46	1.31	1.76	1.19	4.08	20	43	46.51%	149.800	35.3
05/27/03	1.36	1.05	1.81	1.05	1.81	8	21	38.10%	156.200	37.9

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 5. PIT-tagged hatchery Chinook salmon travel time with 95% confidence intervals from the Salmon River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/01/03 <sup>b</sup>	32.85	0.00	0.00	22.73	42.98	2	8	25.00%	59.600	7.1
03/15/03 <sup>b</sup>	28.11	0.00	0.00	20.89	51.38	4	9	44.44%	56.897	8.3
03/16/03 <sup>b</sup>	45.79	0.00	0.00	40.92	50.65	2	10	20.00%	63.913	5.1
03/17/03 <sup>b</sup>	23.91	0.00	0.00	16.46	28.41	4	10	40.00%	55.796	9.8
03/18/03	26.43	21.97	39.18	14.53	48.23	12	25	48.00%	57.248	8.8
03/19/03	37.33	35.12	38.44	16.30	59.09	59	333	17.72%	62.368	6.3
03/20/03	37.46	33.78	44.06	28.94	48.18	19	119	15.97%	63.192	6.2
03/21/03	34.18	31.90	41.91	8.37	57.15	21	103	20.39%	62.651	6.8
03/24/03	33.80	31.34	38.63	23.07	53.77	36	119	30.25%	65.834	6.9
03/25/03	33.10	29.58	36.76	17.07	82.34	30	121	24.79%	66.171	7.1
03/26/03	38.66	31.98	41.79	22.94	53.08	33	134	24.63%	67.255	6.0
03/27/03	35.91	33.39	46.02	25.03	55.39	35	162	21.60%	67.705	6.5
03/28/03	35.00	30.42	49.06	23.58	51.22	17	64	26.56%	68.022	6.7
03/30/03	21.03	14.03	28.12	14.03	28.12	7	20	35.00%	66.468	11.1
03/31/03 <sup>b</sup>	32.67	0.00	0.00	17.93	38.08	4	19	21.05%	69.956	7.2
04/01/03	29.47	25.91	34.12	17.90	45.00	43	203	21.18%	71.137	7.9
04/02/03	33.17	27.17	40.96	22.12	53.96	24	122	19.67%	70.859	7.0
04/03/03	32.52	27.77	36.04	14.03	48.50	32	120	26.67%	70.909	7.2
04/04/03	31.11	23.11	38.28	16.35	43.58	24	116	20.69%	70.700	7.5
04/07/03	28.51	21.87	33.71	13.83	42.86	29	121	23.97%	70.943	8.2
04/08/03	28.93	20.14	38.11	10.28	48.55	21	120	17.50%	71.170	8.1
04/09/03	28.11	22.10	36.05	8.31	41.35	34	119	28.57%	71.528	8.3
04/10/03	25.24	18.47	27.28	11.23	35.51	29	104	27.88%	72.008	9.3
04/11/03	19.49	15.85	23.43	7.05	36.07	35	139	25.18%	73.780	12.0
04/14/03	22.92	20.57	25.30	10.66	34.02	31	120	25.83%	72.742	10.2
04/15/03	27.17	21.04	30.65	8.24	36.53	27	122	22.13%	71.421	8.6
04/16/03	25.45	21.26	30.20	9.48	39.89	30	119	25.21%	71.231	9.2
04/17/03	22.99	20.26	26.18	9.15	39.50	31	121	25.62%	71.279	10.2
04/08/03	18.96	15.66	25.12	10.95	31.36	15	83	18.07%	71.590	12.3
04/19/03	19.75	16.63	25.38	15.63	26.00	10	37	27.03%	71.457	11.8
04/21/03	16.65	10.37	23.53	10.37	23.53	8	32	25.00%	72.439	14.0
04/22/03 <sup>b</sup>	20.97	0.00	0.00	7.23	24.50	5	29	17.24%	71.695	11.1
04/23/03	20.06	18.09	23.12	11.03	28.34	19	70	27.14%	71.805	11.6
04/24/03	18.14	14.20	19.25	6.05	32.52	78	319	24.45%	71.574	12.9
04/25/03	13.22	12.73	19.19	4.57	23.48	33	133	24.81%	72.571	17.7
04/28/03	14.01	12.48	15.79	7.96	26.67	35	122	28.69%	69.013	16.7
04/29/03	14.87	11.68	17.07	6.19	25.93	30	121	24.79%	69.206	15.7
04/30/03	16.04	13.49	18.51	10.79	23.11	32	121	26.45%	70.676	14.6
05/01/03	16.41	15.02	19.22	9.23	25.50	24	92	26.09%	71.571	14.2
05/02/03	15.19	12.92	17.43	6.13	24.41	25	83	30.12%	71.525	15.4
05/03/03	12.24	10.27	13.16	9.03	21.52	19	47	40.43%	69.300	19.1
05/04/03	12.62	11.98	13.50	8.93	17.06	12	20	60.00%	72.336	18.5
05/05/03 <sup>b</sup>	12.37	0.00	0.00	8.39	21.59	5	14	35.71%	72.908	18.9
05/06/03	11.38	10.15	12.49	7.05	19.56	18	46	39.13%	73.492	20.5
05/07/03	10.75	9.10	16.84	9.10	16.84	8	28	28.57%	74.442	21.7
05/08/03 <sup>b</sup>	10.06	0.00	0.00	7.49	10.63	4	10	40.00%	74.809	23.2
05/09/03 <sup>b</sup>	11.27	0.00	0.00	11.27	11.27	1	1	100.00%	75.808	20.7
05/10/03 <sup>b</sup>	7.22	0.00	0.00	7.11	7.44	3	6	50.00%	75.113	32.4
05/11/03 <sup>b</sup>	6.16	0.00	0.00	5.96	6.52	4	8	50.00%	76.329	37.9
05/12/03 <sup>b</sup>	6.83	0.00	0.00	5.42	8.24	2	10	20.00%	79.750	34.2
05/13/03	5.70	4.89	6.69	3.49	9.61	26	61	42.62%	81.786	41.0
05/14/03	6.45	0.00	0.00	4.53	6.93	3	12	25.00%	81.800	36.2
05/15/03 <sup>b</sup>	5.16	0.00	0.00	5.11	5.22	2	7	28.57%	82.750	45.3
05/16/03	4.63	0.00	0.00	3.23	9.47	4	13	30.77%	81.950	50.4
05/19/03	7.37	5.51	16.55	5.51	16.55	8	22	36.36%	93.325	31.7
05/20/03	5.56	4.53	6.11	4.53	6.11	6	20	30.00%	94.714	42.0
05/21/03 <sup>b</sup>	5.13	0.00	0.00	4.2	7.17	4	13	30.77%	98.250	45.5
05/22/03 <sup>b</sup>	5.02	0.00	0.00	4.49	5.55	2	4	50.00%	111.767	46.6

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 6. PIT-tagged wild Chinook salmon travel time with 95% confidence intervals from the Salmon River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/12/03 <sup>b</sup>	45.99	0.00	0.00	35.06	56.91	2	5	40.00%	61.548	5.1
03/13/03	39.98	22.42	52.64	22.42	52.64	7	16	43.75%	60.922	5.8
03/14/03	31.11	25.82	36.42	15.16	60.01	28	71	39.44%	58.334	7.5
03/15/03	29.69	26.22	34.86	16.40	65.12	73	245	29.80%	58.194	7.9
03/16/03	29.49	27.97	33.84	16.06	71.37	116	384	30.21%	58.120	7.9
03/17/03	30.05	27.88	32.00	15.02	62.25	132	368	35.87%	59.426	7.8
03/18/03	29.04	27.16	30.90	11.41	60.32	161	468	34.40%	59.513	8.0
03/19/03	31.92	29.76	33.09	12.43	62.96	212	650	32.62%	60.645	7.3
03/20/03	33.97	30.18	35.53	11.37	59.99	90	243	37.04%	61.660	6.9
03/21/03	30.84	27.87	33.16	11.61	67.97	58	140	41.43%	61.519	7.6
03/22/03	26.38	22.08	31.91	11.52	57.45	25	107	23.36%	61.704	8.9
03/23/03	30.00	26.89	31.16	8.96	55.24	59	208	28.37%	63.139	7.8
03/24/03	29.76	28.60	30.26	8.92	65.51	154	446	34.53%	63.855	7.9
03/25/03	27.77	23.56	30.65	8.72	56.34	60	193	31.09%	63.810	8.4
03/26/03	26.30	23.45	30.40	16.65	53.83	29	91	31.87%	64.044	8.9
03/27/03	24.75	21.15	32.84	9.95	53.28	24	70	34.29%	64.385	9.4
03/28/03	26.01	23.43	32.93	18.84	35.71	14	55	25.45%	65.248	9.0
03/29/03	20.61	14.65	42.90	14.65	42.90	7	41	17.07%	65.377	11.3
03/30/03	23.94	14.07	56.02	14.07	56.02	6	28	21.43%	66.800	9.8
03/31/03 <sup>b</sup>	16.09	0.00	0.00	14.34	55.39	5	13	38.46%	67.424	14.5
04/01/03	20.93	15.24	25.17	9.78	54.40	26	55	47.27%	68.700	11.2
04/02/03	21.18	19.99	24.12	10.07	49.10	73	191	38.22%	69.377	11.0
04/03/03	20.28	18.94	22.72	10.33	45.97	60	155	38.71%	69.305	11.5
04/04/03	19.31	18.88	20.39	8.58	52.61	100	275	36.36%	68.975	12.1
04/05/03	18.81	17.88	19.92	8.38	52.45	129	349	36.96%	69.360	12.4
04/06/03	18.56	17.31	20.09	7.79	47.64	117	320	36.56%	69.995	12.6
04/07/03	19.89	17.18	21.95	9.19	50.42	71	202	35.15%	71.310	11.7
04/08/03	15.18	12.42	18.01	7.72	46.75	41	90	45.56%	69.325	15.4
04/09/03	14.91	11.20	17.96	7.10	37.95	22	71	30.99%	70.538	15.7
04/10/03	14.11	11.72	17.96	11.54	37.31	11	34	32.35%	71.300	16.6
04/11/03	14.10	7.36	21.99	7.22	26.09	11	33	33.33%	72.567	16.6
04/12/03	11.40	10.83	14.99	6.08	43.45	23	70	32.86%	71.975	20.5
04/13/03	13.16	11.73	14.05	4.87	42.71	159	427	37.24%	74.079	17.7
04/14/03	12.00	10.98	12.89	6.39	37.65	77	245	31.43%	74.085	19.5
04/15/03	12.47	11.38	14.97	6.25	45.38	195	556	35.07%	74.200	18.7
04/16/03	19.38	17.47	20.06	6.96	42.93	131	407	32.19%	72.025	12.1
04/17/03	13.46	10.82	17.75	6.20	39.21	65	166	39.16%	73.450	17.4
04/18/03	13.99	12.11	17.79	6.88	38.99	30	107	28.04%	72.867	16.7
04/19/03	14.90	12.59	16.30	5.62	43.29	33	115	28.70%	72.106	15.7
04/20/03	12.60	6.34	29.81	6.34	29.81	7	25	28.00%	73.179	18.5
04/21/03	11.91	9.41	15.03	5.96	16.29	9	31	29.03%	73.831	19.6
04/22/03	13.66	8.46	34.74	8.46	34.74	6	27	22.22%	73.300	17.1
04/23/03	14.01	13.12	24.01	6.94	36.51	17	40	42.50%	73.367	16.7
04/24/03	12.08	11.03	13.09	5.92	32.64	40	130	30.77%	73.500	19.3
04/25/03	11.31	10.56	12.20	6.04	30.87	92	261	35.25%	72.942	20.7
04/26/03	11.84	10.20	15.28	6.30	31.00	48	151	31.79%	71.938	19.7
04/27/03	10.34	9.15	14.66	8.05	29.76	20	48	41.67%	71.155	22.6
04/28/03	14.84	11.83	17.97	6.37	31.56	101	323	31.27%	69.288	15.7
04/29/03	19.65	17.04	20.99	7.90	29.09	40	136	29.41%	72.871	11.9
04/30/03	19.07	17.46	24.56	8.92	30.47	43	130	33.08%	72.880	12.3
05/01/03	15.50	9.66	25.63	9.66	25.63	7	22	31.82%	71.571	15.1
05/02/03	17.89	13.07	26.49	12.73	26.76	9	24	37.50%	72.921	13.1
05/03/03	11.50	5.52	22.74	5.52	22.74	6	15	40.00%	69.300	20.3
05/04/03 <sup>b</sup>	12.30	0.00	0.00	8.96	15.63	2	5	40.00%	71.092	19.0
05/06/03 <sup>b</sup>	14.51	0.00	0.00	11.34	17.69	2	19	10.53%	74.800	16.1
05/07/03	10.94	8.31	16.71	7.78	18.51	10	25	40.00%	74.442	21.4
05/08/03 <sup>b</sup>	10.49	0.00	0.00	10.49	10.49	1	6	16.67%	74.809	22.3
05/09/03 <sup>b</sup>	7.98	0.00	0.00	7.98	7.98	1	1	100.00%	74.289	29.3
05/11/03 <sup>b</sup>	7.10	0.00	0.00	5.81	8.40	2	6	33.33%	77.288	32.9
05/12/03 <sup>b</sup>	6.52	0.00	0.00	6.52	6.52	1	3	33.33%	79.750	35.8
05/13/03	5.47	4.27	12.81	4.27	12.81	6	14	42.86%	81.483	42.7
05/14/03 <sup>b</sup>	10.03	0.00	0.00	8.51	11.55	2	5	40.00%	81.209	23.3
05/15/03 <sup>b</sup>	4.54	0.00	0.00	4.30	5.10	3	9	33.33%	82.750	51.4

Appendix A. Table 6. Continued

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
05/16/03 <sup>b</sup>	3.60	0.00	0.00	3.37	10.56	3	9	33.33%	83.580	64.8
05/19/03 <sup>b</sup>	6.64	0.00	0.00	6.44	8.73	4	13	30.77%	93.325	35.2
05/20/03	6.69	6.00	8.38	6.00	8.38	7	22	31.82%	102.238	34.9
05/21/03 <sup>b</sup>	10.16	0.00	0.00	5.72	14.59	2	7	28.57%	133.464	23.0
05/22/03 <sup>b</sup>	5.80	0.00	0.00	4.53	7.69	3	6	50.00%	118.300	40.3

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix A. Table 7. PIT-tagged hatchery steelhead trout travel time with 95% confidence intervals from the Salmon River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
04/07/03	9.72	7.04	12.87	5.82	24.63	12	36	33.33%	69.718	24.0
04/08/03	10.93	6.77	16.73	6.77	16.73	6	34	17.65%	69.733	21.4
04/09/03	9.01	4.77	22.53	4.77	22.53	8	27	29.63%	71.170	25.9
04/10/03	7.65	6.75	10.72	4.37	21.10	18	39	46.15%	72.511	30.6
04/11/03	4.86	3.74	7.97	3.36	11.11	9	41	21.95%	74.550	48.1
04/12/03	6.50	5.50	10.43	3.59	30.06	22	58	37.93%	73.913	35.9
04/13/03	5.93	4.61	7.94	4.00	27.17	10	24	41.67%	74.500	39.4
04/14/03 <sup>b</sup>	19.06	0.00	0.00	7.38	30.74	2	12	16.67%	73.600	12.3
04/15/03 <sup>b</sup>	6.62	0.00	0.00	6.62	6.62	1	10	10.00%	70.663	35.3
04/16/03 <sup>b</sup>	4.65	0.00	0.00	4.65	4.65	1	10	10.00%	68.933	50.2
04/17/03 <sup>b</sup>	16.55	0.00	0.00	6.51	26.58	2	26	7.69%	72.067	14.1
04/18/03	5.77	4.53	7.76	3.83	37.74	17	31	54.84%	69.443	40.5
04/19/03	6.69	5.75	8.82	4.91	29.80	12	53	22.64%	72.488	34.9
04/21/03	6.65	4.65	10.23	3.72	11.75	9	22	40.91%	76.225	35.1
04/22/03	4.76	3.65	6.85	3.50	23.88	23	59	38.98%	78.117	49.0
04/23/03	4.61	3.90	6.46	3.51	23.02	17	62	27.42%	79.450	50.7
04/24/03	4.87	4.31	5.94	3.51	23.77	23	85	27.06%	79.133	47.9
04/25/03	5.56	3.46	11.97	3.46	11.97	8	41	19.51%	77.171	42.0
04/26/03 <sup>b</sup>	4.27	0.00	0.00	3.70	5.51	3	20	15.00%	77.420	54.7
04/27/03 <sup>b</sup>	4.77	0.00	0.00	3.86	5.67	2	16	12.50%	73.983	49.0
04/28/03	6.40	3.77	15.96	3.52	21.25	21	113	18.58%	70.329	36.5
04/29/03	5.38	4.48	15.60	3.87	19.58	10	79	12.66%	69.150	43.5
04/30/03	5.88	4.51	10.84	4.51	10.84	7	62	11.29%	68.671	39.7
05/01/03	4.63	4.00	6.50	3.72	8.64	15	82	18.29%	67.900	50.5
05/02/03	6.53	4.77	9.00	3.51	24.51	41	201	20.40%	67.938	35.8
05/03/03	5.38	4.19	10.56	2.78	23.52	17	57	29.82%	68.183	43.4
05/05/03	7.61	5.06	12.17	4.18	21.63	17	88	19.32%	68.478	30.7
05/06/03	6.36	4.84	7.89	4.65	20.53	24	137	17.52%	68.143	36.7
05/07/03	5.81	5.09	9.21	4.70	20.10	15	78	19.23%	68.257	40.2
05/08/03	5.74	4.77	7.58	2.76	16.65	30	112	26.79%	69.071	40.7
05/09/03	6.14	4.16	8.52	3.83	10.65	10	52	19.23%	70.257	38.1
05/10/03	6.08	4.80	8.23	4.49	16.59	23	83	27.71%	73.200	38.4
05/11/03	5.06	4.64	5.68	3.50	15.77	20	81	24.69%	74.300	46.2
05/12/03	3.99	3.76	4.81	2.93	15.69	25	72	34.72%	76.380	58.5
05/13/03	4.51	3.95	4.68	2.66	14.79	54	203	26.60%	81.483	51.8
05/14/03	3.80	3.53	4.69	2.62	12.16	19	71	26.76%	83.100	61.4
05/15/03	3.71	3.51	4.80	2.50	11.99	16	72	22.22%	84.600	63.0
05/16/03 <sup>b</sup>	4.58	0.00	0.00	4.58	4.58	1	7	14.29%	81.950	51.0
05/19/03 <sup>b</sup>	4.29	0.00	0.00	2.64	5.65	4	19	21.05%	76.340	54.4
05/20/03 <sup>b</sup>	5.13	0.00	0.00	3.60	6.51	4	20	20.00%	86.383	45.5
05/21/03 <sup>b</sup>	3.62	0.00	0.00	3.59	4.61	3	10	30.00%	88.960	64.6
05/22/03	3.76	2.68	4.68	2.68	4.68	6	14	42.86%	103.140	62.1
05/23/03 <sup>b</sup>	2.97	0.00	0.00	2.60	6.33	5	10	50.00%	111.150	78.6

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.



Appendix A. Table 8. PIT-tagged wild steelhead trout travel time with 95% confidence intervals from the Salmon River Trap to Lower Granite Dam, 2003.

Release Date	Median Travel Time	Lower Confidence Interval <sup>a</sup>	Upper Confidence Interval <sup>a</sup>	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/15/03 <sup>b</sup>	38.37	0.00	0.00	38.37	38.37	1	2	50.00%	60.751	6.1
03/16/03 <sup>b</sup>	24.48	0.00	0.00	24.48	24.48	1	2	50.00%	55.768	9.5
03/17/03 <sup>b</sup>	30.28	0.00	0.00	30.28	30.28	1	3	33.33%	59.426	7.7
03/18/03 <sup>b</sup>	28.50	0.00	0.00	18.32	31.80	5	10	50.00%	59.513	8.2
03/21/03 <sup>b</sup>	9.89	0.00	0.00	9.89	9.89	1	2	50.00%	47.873	23.6
04/12/03 <sup>b</sup>	4.05	0.00	0.00	4.05	4.05	1	4	25.00%	71.975	57.7
04/13/03 <sup>b</sup>	5.05	0.00	0.00	3.91	17.41	5	10	50.00%	76.200	46.2
04/14/03 <sup>b</sup>	7.30	0.00	0.00	3.89	13.43	4	9	44.44%	71.988	32.0
04/16/03 <sup>b</sup>	5.86	0.00	0.00	5.51	15.47	3	13	23.08%	69.000	39.9
04/17/03 <sup>b</sup>	5.93	0.00	0.00	4.04	7.68	5	11	45.45%	68.600	39.4
04/18/03 <sup>b</sup>	9.66	0.00	0.00	4.57	12.20	5	13	38.46%	73.455	24.2
04/21/03 <sup>b</sup>	6.54	0.00	0.00	3.69	9.39	2	3	66.67%	76.225	35.7
04/22/03 <sup>b</sup>	4.90	0.00	0.00	4.06	5.74	2	2	100.00%	78.117	47.7
04/23/03 <sup>b</sup>	4.39	0.00	0.00	4.24	4.54	2	6	33.33%	79.860	53.2
04/24/03 <sup>b</sup>	4.87	0.00	0.00	3.14	7.48	4	7	57.14%	79.133	47.9
04/25/03 <sup>b</sup>	4.40	0.00	0.00	4.31	5.31	4	9	44.44%	78.920	53.1
04/26/03 <sup>b</sup>	18.94	0.00	0.00	15.24	22.64	2	10	20.00%	71.350	12.3
04/28/03 <sup>b</sup>	5.41	0.00	0.00	3.48	7.14	4	13	30.77%	71.233	43.2
04/29/03 <sup>b</sup>	7.35	0.00	0.00	5.43	10.92	4	16	25.00%	69.175	31.8
04/30/03 <sup>b</sup>	4.90	0.00	0.00	4.90	4.90	1	4	25.00%	68.017	47.7
05/02/03 <sup>b</sup>	4.66	0.00	0.00	4.66	4.66	1	5	20.00%	67.583	50.1
05/03/03 <sup>b</sup>	4.56	0.00	0.00	4.29	4.83	2	9	22.22%	68.183	51.2
05/05/03 <sup>b</sup>	3.73	0.00	0.00	3.73	3.73	1	5	20.00%	69.380	62.6
05/06/03 <sup>b</sup>	7.32	0.00	0.00	7.05	7.58	2	10	20.00%	68.800	31.9
05/07/03 <sup>b</sup>	4.75	0.00	0.00	4.05	5.45	2	7	28.57%	67.400	49.1
05/08/03 <sup>b</sup>	5.50	0.00	0.00	4.47	7.04	5	8	62.50%	69.071	42.4
05/09/03 <sup>b</sup>	4.87	0.00	0.00	4.02	4.98	4	6	66.67%	68.867	47.9
05/10/03 <sup>b</sup>	5.33	0.00	0.00	5.33	5.33	1	3	33.33%	70.683	43.9
05/11/03 <sup>b</sup>	5.51	0.00	0.00	5.51	5.51	1	4	25.00%	76.329	42.4
05/12/03 <sup>b</sup>	6.26	0.00	0.00	4.57	7.96	2	7	28.57%	79.200	37.3
05/13/03	4.20	3.67	4.79	3.49	6.22	9	17	52.94%	80.980	55.7
05/14/03 <sup>b</sup>	7.66	0.00	0.00	7.66	7.66	1	3	33.33%	79.722	30.5
05/15/03 <sup>b</sup>	4.17	0.00	0.00	2.84	5.50	2	12	16.67%	84.600	56.0
05/16/03 <sup>b</sup>	2.79	0.00	0.00	2.79	2.79	1	2	50.00%	86.100	83.9
05/17/03 <sup>b</sup>	2.95	0.00	0.00	2.76	3.15	2	4	50.00%	82.400	79.1
05/19/03 <sup>b</sup>	3.77	0.00	0.00	3.55	3.98	2	5	40.00%	76.340	62.0
05/20/03 <sup>b</sup>	4.64	0.00	0.00	4.56	4.72	2	4	50.00%	86.383	50.3
05/21/03 <sup>b</sup>	4.07	0.00	0.00	3.64	4.51	2	5	40.00%	88.960	57.3
05/22/03 <sup>b</sup>	3.73	0.00	0.00	3.73	3.73	1	2	50.00%	103.140	62.7
05/23/03 <sup>b</sup>	2.63	0.00	0.00	2.63	2.63	1	1	100.00%	111.150	88.9

<sup>a</sup> Confidence intervals calculated with nonparametric statistics.

<sup>b</sup> Not used in statistical analysis because analysis showed too few recaptures.

Appendix B. Table 1. PIT-tagged hatchery Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2003.

Date	Number Released	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/24/03	9	5	55.56%		0.00%		0.00%	1	11.11%	6	66.67%
03/26/03	7	2	28.57%		0.00%		0.00%	2	28.57%	4	57.14%
03/27/03	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
03/28/03	7	1	14.29%	2	28.57%		0.00%	1	14.29%	4	57.14%
03/29/03	4	1	25.00%	1	25.00%	1	25.00%		0.00%	3	75.00%
03/30/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
03/31/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/01/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/02/03	3		0.00%	1	33.33%		0.00%		0.00%	1	33.33%
04/03/03	11	3	27.27%	2	18.18%		0.00%	2	18.18%	7	63.64%
04/04/03	3		0.00%	1	33.33%		0.00%		0.00%	1	33.33%
04/05/03	8	3	37.50%	1	12.50%		0.00%	2	25.00%	6	75.00%
04/07/03	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
04/09/03	3		0.00%		0.00%	1	33.33%		0.00%	1	33.33%
04/10/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/11/03	3	1	33.33%	2	66.67%		0.00%		0.00%	3	100.00%
04/12/03	10	2	20.00%	1	10.00%		0.00%	2	20.00%	5	50.00%
04/13/03	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/14/03	4		0.00%	2	50.00%		0.00%		0.00%	2	50.00%
04/15/03	102	45	44.12%	19	18.63%	2	1.96%	6	5.88%	72	70.59%
04/16/03	131	46	35.11%	22	16.79%	4	3.05%	22	16.79%	94	71.76%
04/17/03	45	14	31.11%	4	8.89%	1	2.22%	10	22.22%	29	64.44%
04/18/03	46	14	30.43%	8	17.39%	1	2.17%	4	8.70%	27	58.70%
04/19/03	10	2	20.00%	1	10.00%		0.00%	1	10.00%	4	40.00%
04/20/03	10	3	30.00%	4	40.00%		0.00%		0.00%	7	70.00%
04/21/03	2	1	50.00%		0.00%		0.00%	1	50.00%	2	100.00%
04/22/03	10	4	40.00%	1	10.00%		0.00%		0.00%	5	50.00%
04/23/03	7	4	57.14%		0.00%		0.00%		0.00%	4	57.14%
04/24/03	19	8	42.11%	6	31.58%		0.00%	5	26.32%	19	100.00%
04/25/03	100	29	29.00%	21	21.00%	2	2.00%	7	7.00%	59	59.00%
04/26/03	60	7	11.67%	3	5.00%	1	1.67%	8	13.33%	19	31.67%
04/27/03	79	16	20.25%	13	16.46%	2	2.53%	10	12.66%	41	51.90%
04/28/03	56	16	28.57%	3	5.36%	2	3.57%	5	8.93%	26	46.43%
04/29/03	27	11	40.74%	3	11.11%		0.00%	3	11.11%	17	62.96%
04/30/03	15	5	33.33%	3	20.00%		0.00%		0.00%	8	53.33%
05/01/03	13	4	30.77%	2	15.38%	1	7.69%	1	7.69%	8	61.54%
05/02/03	26	11	42.31%	6	23.08%		0.00%	1	3.85%	18	69.23%
05/03/03	88	27	30.68%	16	18.18%	5	5.68%	10	11.36%	58	65.91%
05/04/03	13	4	30.77%	2	15.38%		0.00%	2	15.38%	8	61.54%
05/05/03	21	7	33.33%	6	28.57%		0.00%		0.00%	13	61.90%
05/06/03	107	28	26.17%	21	19.63%	2	1.87%	11	10.28%	62	57.94%
05/07/03	23	3	13.04%	5	21.74%	2	8.70%	1	4.35%	11	47.83%
05/08/03	23	7	30.43%	3	13.04%	1	4.35%	3	13.04%	14	60.87%
05/09/03	21	7	33.33%	4	19.05%		0.00%		0.00%	11	52.38%
05/10/03	11	2	18.18%	2	18.18%	2	18.18%	2	18.18%	8	72.73%
05/11/03	7	1	14.29%	2	28.57%	2	28.57%		0.00%	5	71.43%
05/12/03	6	3	50.00%	1	16.67%		0.00%		0.00%	4	66.67%
05/13/03	21	8	38.10%	5	23.81%		0.00%	1	4.76%	14	66.67%
05/14/03	6	4	66.67%		0.00%		0.00%		0.00%	4	66.67%
05/15/03	14	4	28.57%	4	28.57%	1	7.14%	3	21.43%	12	85.71%
05/16/03	3	1	33.33%	1	33.33%		0.00%	1	33.33%	3	100.00%
05/17/03	11	4	36.36%	3	27.27%	1	9.09%	2	18.18%	10	90.91%
05/18/03	46	10	21.74%	18	39.13%	4	8.70%	3	6.52%	35	76.09%
05/19/03	93	18	19.35%	31	33.33%	9	9.68%	5	5.38%	63	67.74%
05/20/03	19	6	31.58%	7	36.84%	1	5.26%		0.00%	14	73.68%
05/21/03	14	4	28.57%	6	42.86%		0.00%		0.00%	10	71.43%
05/22/03	13	2	15.38%	7	53.85%	1	7.69%		0.00%	10	76.92%
05/23/03	19	10	52.63%	5	26.32%	1	5.26%	1	5.26%	17	89.47%
05/24/03	36	4	11.11%	13	36.11%	4	11.11%	4	11.11%	25	69.44%
05/25/03	194	39	20.10%	44	22.68%	29	14.95%	11	5.67%	123	63.40%
05/26/03	202	36	17.82%	69	34.16%	19	9.41%	9	4.46%	133	65.84%
05/27/03	195	56	28.72%	60	30.77%	21	10.77%	10	5.13%	147	75.38%

Appendix B. Table 2. PIT-tagged wild Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/24/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/25/03	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
03/26/03	8	4	50.00%	2	25.00%		0.00%		0.00%	6	75.00%
03/28/03	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
03/29/03	2		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/30/03	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
03/31/03	3		0.00%	1	33.33%		0.00%	1	33.33%	2	66.67%
04/01/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/02/03	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/03/03	10	3	30.00%	1	10.00%		0.00%	3	30.00%	7	70.00%
04/04/03	5	1	20.00%	1	20.00%		0.00%	2	40.00%	4	80.00%
04/05/03	9	3	33.33%	2	22.22%		0.00%	1	11.11%	6	66.67%
04/06/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/07/03	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/10/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/11/03	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
04/12/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/13/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/14/03	1		0.00%		0.00%		0.00%	1	100.00%	1	100.00%
04/15/03	34	17	50.00%	5	14.71%	1	2.94%	5	14.71%	28	82.35%
04/16/03	76	38	50.00%	13	17.11%	1	1.32%	4	5.26%	56	73.68%
04/17/03	19	8	42.11%	5	26.32%		0.00%	2	10.53%	15	78.95%
04/18/03	30	15	50.00%	5	16.67%	2	6.67%	4	13.33%	26	86.67%
04/19/03	17	8	47.06%	3	17.65%	1	5.88%	3	17.65%	15	88.24%
04/20/03	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/21/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/22/03	3	1	33.33%		0.00%		0.00%		0.00%	1	33.33%
04/23/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/24/03	6	3	50.00%	1	16.67%		0.00%		0.00%	4	66.67%
04/25/03	15	4	26.67%	4	26.67%		0.00%	1	6.67%	9	60.00%
04/26/03	7	2	28.57%	1	14.29%		0.00%	1	14.29%	4	57.14%
04/27/03	8	3	37.50%	2	25.00%	1	12.50%	1	12.50%	7	87.50%
04/28/03	7		0.00%	2	28.57%		0.00%		0.00%	2	28.57%
04/29/03	17	10	58.82%		0.00%	1	5.88%	2	11.76%	13	76.47%
04/30/03	2		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/01/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/03/03	8	2	25.00%	2	25.00%		0.00%	1	12.50%	5	62.50%
05/05/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/06/03	8	2	25.00%	1	12.50%		0.00%		0.00%	3	37.50%
05/07/03	4	2	50.00%	1	25.00%		0.00%	1	25.00%	4	100.00%
05/08/03	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
05/09/03	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
05/10/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/11/03	4	1	25.00%		0.00%		0.00%	1	25.00%	2	50.00%
05/12/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/13/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/14/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/15/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/16/03	10	2	20.00%	2	20.00%	1	10.00%		0.00%	5	50.00%
05/17/03	5	1	20.00%	1	20.00%		0.00%	2	40.00%	4	80.00%
05/18/03	12	4	33.33%	5	41.67%		0.00%	1	8.33%	10	83.33%
05/19/03	8	2	25.00%	3	37.50%	2	25.00%		0.00%	7	87.50%
05/20/03	8	4	50.00%	2	25.00%		0.00%		0.00%	6	75.00%
05/21/03	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
05/22/03	4	1	25.00%		0.00%		0.00%	1	25.00%	2	50.00%
05/23/03	8	2	25.00%	1	12.50%	2	25.00%		0.00%	5	62.50%
05/24/03	4		0.00%	2	50.00%		0.00%	1	25.00%	3	75.00%
05/25/03	654	171	26.15%	181	27.68%	86	13.15%	31	4.74%	469	71.71%
05/26/03	157	33	21.02%	38	24.20%	20	12.74%	15	9.55%	106	67.52%
05/27/03	100	27	27.00%	36	36.00%	7	7.00%	5	5.00%	75	75.00%

Appendix B. Table 3. PIT-tagged hatchery steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/28/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/29/03	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
03/30/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
03/31/03	3	1	33.33%	1	33.33%		0.00%		0.00%	2	66.67%
04/01/03	5	4	80.00%		0.00%	1	20.00%		0.00%	5	100.00%
04/02/03	4	2	50.00%		0.00%		0.00%		0.00%	2	50.00%
04/03/03	6	3	50.00%	2	33.33%		0.00%		0.00%	5	83.33%
04/04/03	7	2	28.57%		0.00%	3	42.86%	1	14.29%	6	85.71%
04/05/03	13	5	38.46%	2	15.38%	2	15.38%	1	7.69%	10	76.92%
04/06/03	11	5	45.45%		0.00%	1	9.09%		0.00%	6	54.55%
04/07/03	7	3	42.86%		0.00%	2	28.57%	1	14.29%	6	85.71%
04/08/03	9	2	22.22%	3	33.33%		0.00%		0.00%	5	55.56%
04/09/03	9	5	55.56%	1	11.11%	1	11.11%		0.00%	7	77.78%
04/10/03	8	2	25.00%	1	12.50%	1	12.50%	1	12.50%	5	62.50%
04/11/03	12	4	33.33%	2	16.67%	2	16.67%		0.00%	8	66.67%
04/12/03	4	2	50.00%		0.00%		0.00%		0.00%	2	50.00%
04/13/03	18	10	55.56%	3	16.67%		0.00%		0.00%	13	72.22%
04/14/03	97	48	49.48%	14	14.43%	6	6.19%		0.00%	68	70.10%
04/15/03	211	72	34.12%	32	15.17%	22	10.43%	4	1.90%	130	61.61%
04/16/03	63	19	30.16%	20	31.75%	5	7.94%	3	4.76%	47	74.60%
04/17/03	62	15	24.19%	10	16.13%	10	16.13%	2	3.23%	37	59.68%
04/18/03	124	36	29.03%	24	19.35%	18	14.52%	5	4.03%	83	66.94%
04/19/03	49	19	38.78%	7	14.29%	3	6.12%		0.00%	29	59.18%
04/20/03	26	11	42.31%	3	11.54%	1	3.85%	1	3.85%	16	61.54%
04/21/03	54	17	31.48%	7	12.96%	7	12.96%	1	1.85%	32	59.26%
04/22/03	239	75	31.38%	43	17.99%	17	7.11%	8	3.35%	143	59.83%
04/23/03	49	15	30.61%	11	22.45%	7	14.29%		0.00%	33	67.35%
04/24/03	110	49	44.55%	10	9.09%	15	13.64%		0.00%	74	67.27%
04/25/03	121	28	23.14%	16	13.22%	15	12.40%	4	3.31%	63	52.07%
04/27/03	120	42	35.00%	15	12.50%	13	10.83%	7	5.83%	77	64.17%
04/28/03	115	28	24.35%	22	19.13%	17	14.78%	2	1.74%	69	60.00%
04/29/03	62	13	20.97%	10	16.13%	10	16.13%	2	3.23%	35	56.45%
04/30/03	54	10	18.52%	9	16.67%	4	7.41%	4	7.41%	27	50.00%
05/01/03	105	11	10.48%	14	13.33%	18	17.14%	2	1.90%	45	42.86%
05/02/03	88	16	18.18%	16	18.18%	17	19.32%	1	1.14%	50	56.82%
05/03/03	120	21	17.50%	26	21.67%	15	12.50%	2	1.67%	64	53.33%
05/04/03	47	21	44.68%	3	6.38%	2	4.26%	1	2.13%	27	57.45%
05/05/03	116	35	30.17%	12	10.34%	13	11.21%	1	0.86%	61	52.59%
05/06/03	207	53	25.60%	40	19.32%	29	14.01%	2	0.97%	124	59.90%
05/07/03	122	30	24.59%	27	22.13%	18	14.75%	4	3.28%	79	64.75%
05/08/03	104	15	14.42%	35	33.65%	18	17.31%	4	3.85%	72	69.23%
05/09/03	98	15	15.31%	27	27.55%	14	14.29%	3	3.06%	59	60.20%
05/11/03	99	17	17.17%	32	32.32%	14	14.14%	3	3.03%	66	66.67%
05/12/03	100	28	28.00%	24	24.00%	11	11.00%	3	3.00%	66	66.00%
05/13/03	98	24	24.49%	17	17.35%	19	19.39%	2	2.04%	62	63.27%
05/14/03	100	41	41.00%	18	18.00%	14	14.00%	1	1.00%	74	74.00%
05/15/03	99	29	29.29%	20	20.20%	16	16.16%	2	2.02%	67	67.68%
05/16/03	84	21	25.00%	17	20.24%	18	21.43%	1	1.19%	57	67.86%
05/17/03	50	14	28.00%	12	24.00%	6	12.00%	1	2.00%	33	66.00%
05/18/03	101	33	32.67%	35	34.65%	16	15.84%		0.00%	84	83.17%
05/19/03	100	21	21.00%	50	50.00%	9	9.00%	1	1.00%	81	81.00%
05/20/03	100	27	27.00%	38	38.00%	16	16.00%		0.00%	81	81.00%
05/21/03	24	4	16.67%	10	41.67%	5	20.83%		0.00%	19	79.17%
05/22/03	35	11	31.43%	11	31.43%	7	20.00%		0.00%	29	82.86%
05/23/03	25	12	48.00%	11	44.00%	1	4.00%		0.00%	24	96.00%
05/24/03	106	63	59.43%	19	17.92%	9	8.49%		0.00%	91	85.85%
05/25/03	102	53	51.96%	23	22.55%	4	3.92%		0.00%	80	78.43%
05/26/03	133	67	50.38%	36	27.07%	5	3.76%	3	2.26%	111	83.46%
05/27/03	139	52	37.41%	39	28.06%	11	7.91%	2	1.44%	104	74.82%

Appendix B. Table 4. PIT-tagged wild steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2003.

Date	Number									Grand	
	Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Total Ints	Total % Obs.
03/24/03	4		0.00%	2	50.00%		0.00%		0.00%	2	50.00%
03/25/03	4	4	100.00%		0.00%		0.00%		0.00%	4	100.00%
03/26/03	6	5	83.33%		0.00%		0.00%		0.00%	5	83.33%
03/27/03	3	1	33.33%		0.00%	1	33.33%		0.00%	2	66.67%
03/28/03	7	4	57.14%		0.00%		0.00%		0.00%	4	57.14%
03/29/03	6	3	50.00%	1	16.67%	1	16.67%		0.00%	5	83.33%
03/30/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/31/03	3	2	66.67%		0.00%	1	33.33%		0.00%	3	100.00%
04/01/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/02/03	3		0.00%		0.00%		0.00%	1	33.33%	1	33.33%
04/03/03	4	2	50.00%		0.00%	1	25.00%		0.00%	3	75.00%
04/04/03	4	2	50.00%		0.00%		0.00%		0.00%	2	50.00%
04/05/03	5	2	40.00%	1	20.00%		0.00%		0.00%	3	60.00%
04/06/03	5	1	20.00%	1	20.00%		0.00%		0.00%	2	40.00%
04/07/03	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/08/03	4		0.00%		0.00%	1	25.00%		0.00%	1	25.00%
04/09/03	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
04/10/03	4	2	50.00%	1	25.00%		0.00%		0.00%	3	75.00%
04/11/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/13/03	5	1	20.00%	2	40.00%	1	20.00%		0.00%	4	80.00%
04/14/03	8	3	37.50%	2	25.00%		0.00%		0.00%	5	62.50%
04/15/03	18	4	22.22%	3	16.67%	1	5.56%		0.00%	8	44.44%
04/16/03	17	7	41.18%	4	23.53%		0.00%		0.00%	11	64.71%
04/17/03	25	5	20.00%	7	28.00%	1	4.00%	1	4.00%	14	56.00%
04/18/03	43	12	27.91%	12	27.91%	1	2.33%	1	2.33%	26	60.47%
04/19/03	10	5	50.00%	1	10.00%		0.00%		0.00%	6	60.00%
04/20/03	6	1	16.67%		0.00%	1	16.67%		0.00%	2	33.33%
04/21/03	7	4	57.14%	1	14.29%		0.00%		0.00%	5	71.43%
04/22/03	16	9	56.25%	5	31.25%		0.00%		0.00%	14	87.50%
04/23/03	12	2	16.67%	1	8.33%	1	8.33%		0.00%	4	33.33%
04/24/03	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/25/03	23	9	39.13%	2	8.70%	1	4.35%		0.00%	12	52.17%
04/26/03	39	9	23.08%	5	12.82%	2	5.13%	1	2.56%	17	43.59%
04/27/03	50	13	26.00%	10	20.00%	2	4.00%	4	8.00%	29	58.00%
04/28/03	31	3	9.68%	9	29.03%	4	12.90%	1	3.23%	17	54.84%
04/29/03	17	3	17.65%	7	41.18%	2	11.76%		0.00%	12	70.59%
04/30/03	13	5	38.46%	1	7.69%	1	7.69%	1	7.69%	8	61.54%
05/01/03	21	5	23.81%	3	14.29%		0.00%	1	4.76%	9	42.86%
05/02/03	9	2	22.22%	1	11.11%		0.00%		0.00%	3	33.33%
05/03/03	26	10	38.46%	4	15.38%		0.00%	1	3.85%	15	57.69%
05/04/03	18	5	27.78%	1	5.56%	1	5.56%	2	11.11%	9	50.00%
05/05/03	19	6	31.58%	4	21.05%	1	5.26%	1	5.26%	12	63.16%
05/06/03	67	18	26.87%	8	11.94%	4	5.97%	1	1.49%	31	46.27%
05/07/03	29	5	17.24%	9	31.03%	3	10.34%	2	6.90%	19	65.52%
05/08/03	27	5	18.52%	5	18.52%		0.00%	2	7.41%	12	44.44%
05/09/03	18	3	16.67%	6	33.33%	3	16.67%		0.00%	12	66.67%
05/10/03	11	5	45.45%	2	18.18%	2	18.18%		0.00%	9	81.82%
05/11/03	21	3	14.29%	5	23.81%	2	9.52%		0.00%	10	47.62%
05/12/03	16	2	12.50%	7	43.75%		0.00%	2	12.50%	11	68.75%
05/13/03	11	2	18.18%	2	18.18%		0.00%	3	27.27%	7	63.64%
05/14/03	23	8	34.78%	3	13.04%	1	4.35%	3	13.04%	15	65.22%
05/15/03	16	4	25.00%	3	18.75%	1	6.25%	1	6.25%	9	56.25%
05/16/03	13	5	38.46%		0.00%		0.00%	1	7.69%	6	46.15%
05/17/03	20	9	45.00%	2	10.00%	5	25.00%	1	5.00%	17	85.00%
05/18/03	66	32	48.48%	18	27.27%	7	10.61%		0.00%	57	86.36%
05/19/03	74	20	27.03%	38	51.35%	7	9.46%		0.00%	65	87.84%
05/20/03	17	2	11.76%	13	76.47%		0.00%		0.00%	15	88.24%
05/21/03	13	9	69.23%	2	15.38%	1	7.69%		0.00%	12	92.31%
05/22/03	6	1	16.67%	3	50.00%	1	16.67%		0.00%	5	83.33%
05/23/03	4		0.00%	1	25.00%	1	25.00%		0.00%	2	50.00%
05/24/03	9	5	55.56%	1	11.11%	1	11.11%		0.00%	7	77.78%
05/25/03	178	76	42.70%	59	33.15%	11	6.18%		0.00%	146	82.02%
05/26/03	43	20	46.51%	13	30.23%		0.00%	1	2.33%	34	79.07%
05/27/03	21	8	38.10%	8	38.10%	2	9.52%		0.00%	18	85.71%

Appendix B. Table 5. PIT-tagged hatchery Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River Trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/13/03	3		0.00%		0.00%		0.00%	1	33.33%	1	33.33%
03/14/03	8	2	25.00%	2	25.00%		0.00%	1	12.50%	5	62.50%
03/15/03	9	4	44.44%	1	11.11%		0.00%		0.00%	5	55.56%
03/16/03	10	2	20.00%	1	10.00%		0.00%	2	20.00%	5	50.00%
03/17/03	10	4	40.00%	3	30.00%		0.00%		0.00%	7	70.00%
03/18/03	25	12	48.00%	2	8.00%	1	4.00%	4	16.00%	19	76.00%
03/19/03	333	59	17.72%	41	12.31%	3	0.90%	30	9.01%	133	39.94%
03/20/03	119	19	15.97%	18	15.13%	4	3.36%	12	10.08%	53	44.54%
03/21/03	103	21	20.39%	10	9.71%		0.00%	5	4.85%	36	34.95%
03/24/03	119	36	30.25%	17	14.29%	1	0.84%	6	5.04%	60	50.42%
03/25/03	121	30	24.79%	11	9.09%	2	1.65%	9	7.44%	52	42.98%
03/26/03	134	33	24.63%	13	9.70%	2	1.49%	12	8.96%	60	44.78%
03/27/03	162	35	21.60%	15	9.26%	2	1.23%	13	8.02%	65	40.12%
03/28/03	64	17	26.56%	6	9.38%	1	1.56%	8	12.50%	32	50.00%
03/30/03	20	7	35.00%	4	20.00%		0.00%	1	5.00%	12	60.00%
03/31/03	19	4	21.05%	3	15.79%		0.00%		0.00%	7	36.84%
04/01/03	203	43	21.18%	15	7.39%	4	1.97%	27	13.30%	89	43.84%
04/02/03	122	24	19.67%	12	9.84%	2	1.64%	11	9.02%	49	40.16%
04/03/03	120	32	26.67%	8	6.67%	2	1.67%	11	9.17%	53	44.17%
04/04/03	116	24	20.69%	18	15.52%		0.00%	8	6.90%	50	43.10%
04/07/03	121	29	23.97%	11	9.09%	5	4.13%	11	9.09%	56	46.28%
04/08/03	120	21	17.50%	19	15.83%	3	2.50%	9	7.50%	52	43.33%
04/09/03	119	34	28.57%	7	5.88%	4	3.36%	12	10.08%	57	47.90%
04/10/03	104	29	27.88%	11	10.58%	1	0.96%	10	9.62%	51	49.04%
04/11/03	139	35	25.18%	19	13.67%	5	3.60%	10	7.19%	69	49.64%
04/12/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/14/03	120	31	25.83%	20	16.67%		0.00%	8	6.67%	59	49.17%
04/15/03	122	27	22.13%	15	12.30%	3	2.46%	10	8.20%	55	45.08%
04/16/03	119	30	25.21%	15	12.61%	2	1.68%	6	5.04%	53	44.54%
04/17/03	121	31	25.62%	8	6.61%		0.00%	11	9.09%	50	41.32%
04/18/03	83	15	18.07%	8	9.64%	2	2.41%	10	12.05%	35	42.17%
04/19/03	37	10	27.03%	1	2.70%	1	2.70%	6	16.22%	18	48.65%
04/21/03	32	8	25.00%	4	12.50%		0.00%	3	9.38%	15	46.88%
04/22/03	29	5	17.24%	2	6.90%		0.00%	6	20.69%	13	44.83%
04/23/03	70	19	27.14%	6	8.57%	2	2.86%	5	7.14%	32	45.71%
04/24/03	319	78	24.45%	35	10.97%	9	2.82%	24	7.52%	146	45.77%
04/25/03	133	33	24.81%	22	16.54%	4	3.01%	13	9.77%	72	54.14%
04/28/03	122	35	28.69%	19	15.57%	3	2.46%	5	4.10%	62	50.82%
04/29/03	121	30	24.79%	16	13.22%	5	4.13%	14	11.57%	65	53.72%
04/30/03	121	32	26.45%	24	19.83%	2	1.65%	6	4.96%	64	52.89%
05/01/03	92	24	26.09%	21	22.83%	4	4.35%	4	4.35%	53	57.61%
05/02/03	83	25	30.12%	13	15.66%	3	3.61%	7	8.43%	48	57.83%
05/03/03	47	19	40.43%	11	23.40%	1	2.13%	2	4.26%	33	70.21%
05/04/03	20	12	60.00%	2	10.00%	2	10.00%		0.00%	16	80.00%
05/05/03	14	5	35.71%	3	21.43%		0.00%		0.00%	8	57.14%
05/06/03	46	18	39.13%	12	26.09%	1	2.17%		0.00%	31	67.39%
05/07/03	28	8	28.57%	5	17.86%	1	3.57%	2	7.14%	16	57.14%
05/08/03	10	4	40.00%	2	20.00%		0.00%		0.00%	6	60.00%
05/09/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/10/03	6	3	50.00%	1	16.67%	1	16.67%		0.00%	5	83.33%
05/11/03	8	4	50.00%		0.00%		0.00%		0.00%	4	50.00%
05/12/03	10	2	20.00%	1	10.00%	1	10.00%	2	20.00%	6	60.00%
05/13/03	61	26	42.62%	14	22.95%	5	8.20%	3	4.92%	48	78.69%
05/14/03	12	3	25.00%	3	25.00%	1	8.33%	1	8.33%	8	66.67%
05/15/03	7	2	28.57%	2	28.57%	1	14.29%		0.00%	5	71.43%
05/16/03	13	4	30.77%	3	23.08%		0.00%	3	23.08%	10	76.92%
05/18/03	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
05/19/03	22	8	36.36%	8	36.36%		0.00%		0.00%	16	72.73%
05/20/03	20	6	30.00%	7	35.00%		0.00%		0.00%	13	65.00%
05/21/03	13	4	30.77%	4	30.77%	1	7.69%		0.00%	9	69.23%
05/22/03	4	2	50.00%	1	25.00%		0.00%	1	25.00%	4	100.00%

Appendix B. Table 6. PIT-tagged wild Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/11/03	2		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/12/03	5	2	40.00%		0.00%		0.00%		0.00%	2	40.00%
03/13/03	16	7	43.75%	3	18.75%		0.00%		0.00%	10	62.50%
03/14/03	71	28	39.44%	12	16.90%	3	4.23%	5	7.04%	48	67.61%
03/15/03	245	73	29.80%	44	17.96%	5	2.04%	25	10.20%	147	60.00%
03/16/03	384	116	30.21%	75	19.53%	11	2.86%	32	8.33%	234	60.94%
03/17/03	368	132	35.87%	60	16.30%	10	2.72%	34	9.24%	236	64.13%
03/18/03	468	161	34.40%	75	16.03%	11	2.35%	48	10.26%	295	63.03%
03/19/03	650	212	32.62%	99	15.23%	15	2.31%	67	10.31%	393	60.46%
03/20/03	243	90	37.04%	39	16.05%	6	2.47%	14	5.76%	149	61.32%
03/21/03	140	58	41.43%	14	10.00%	5	3.57%	11	7.86%	88	62.86%
03/22/03	107	25	23.36%	23	21.50%	2	1.87%	11	10.28%	61	57.01%
03/23/03	208	59	28.37%	36	17.31%	5	2.40%	19	9.13%	119	57.21%
03/24/03	446	154	34.53%	62	13.90%	15	3.36%	36	8.07%	267	59.87%
03/25/03	193	60	31.09%	33	17.10%	3	1.55%	18	9.33%	114	59.07%
03/26/03	91	29	31.87%	21	23.08%		0.00%	5	5.49%	55	60.44%
03/27/03	70	24	34.29%	9	12.86%	3	4.29%	2	2.86%	38	54.29%
03/28/03	55	14	25.45%	9	16.36%	2	3.64%	3	5.45%	28	50.91%
03/29/03	41	7	17.07%	14	34.15%	1	2.44%	3	7.32%	25	60.98%
03/30/03	28	6	21.43%	7	25.00%	1	3.57%	1	3.57%	15	53.57%
03/31/03	13	5	38.46%	3	23.08%	1	7.69%	2	15.38%	11	84.62%
04/01/03	55	26	47.27%	8	14.55%	2	3.64%	2	3.64%	38	69.09%
04/02/03	191	73	38.22%	26	13.61%	3	1.57%	15	7.85%	117	61.26%
04/03/03	155	60	38.71%	23	14.84%	2	1.29%	11	7.10%	96	61.94%
04/04/03	275	100	36.36%	51	18.55%	5	1.82%	31	11.27%	187	68.00%
04/05/03	349	129	36.96%	66	18.91%	12	3.44%	27	7.74%	234	67.05%
04/06/03	320	117	36.56%	52	16.25%	15	4.69%	35	10.94%	219	68.44%
04/07/03	202	71	35.15%	30	14.85%	3	1.49%	14	6.93%	118	58.42%
04/08/03	90	41	45.56%	13	14.44%		0.00%	11	12.22%	65	72.22%
04/09/03	71	22	30.99%	8	11.27%	2	2.82%	6	8.45%	38	53.52%
04/10/03	34	11	32.35%	6	17.65%	3	8.82%	3	8.82%	23	67.65%
04/11/03	33	11	33.33%	4	12.12%	1	3.03%	3	9.09%	19	57.58%
04/12/03	70	23	32.86%	15	21.43%	3	4.29%	5	7.14%	46	65.71%
04/13/03	427	159	37.24%	66	15.46%	13	3.04%	37	8.67%	275	64.40%
04/14/03	245	77	31.43%	36	14.69%	4	1.63%	22	8.98%	139	56.73%
04/15/03	556	195	35.07%	91	16.37%	6	1.08%	45	8.09%	337	60.61%
04/16/03	407	131	32.19%	61	14.99%	20	4.91%	35	8.60%	247	60.69%
04/17/03	166	65	39.16%	17	10.24%	3	1.81%	15	9.04%	100	60.24%
04/18/03	107	30	28.04%	15	14.02%	3	2.80%	10	9.35%	58	54.21%
04/19/03	115	33	28.70%	14	12.17%	1	0.87%	18	15.65%	66	57.39%
04/20/03	25	7	28.00%	3	12.00%		0.00%	1	4.00%	11	44.00%
04/21/03	31	9	29.03%	5	16.13%		0.00%	5	16.13%	19	61.29%
04/22/03	27	6	22.22%	3	11.11%	2	7.41%	5	18.52%	16	59.26%
04/23/03	40	17	42.50%	4	10.00%	1	2.50%	6	15.00%	28	70.00%
04/24/03	130	40	30.77%	23	17.69%	7	5.38%	14	10.77%	84	64.62%
04/25/03	261	92	35.25%	30	11.49%	10	3.83%	24	9.20%	156	59.77%
04/26/03	151	48	31.79%	16	10.60%	4	2.65%	14	9.27%	82	54.30%
04/27/03	48	20	41.67%	2	4.17%	1	2.08%	7	14.58%	30	62.50%
04/28/03	323	101	31.27%	47	14.55%	22	6.81%	19	5.88%	189	58.51%
04/29/03	136	40	29.41%	22	16.18%	5	3.68%	7	5.15%	74	54.41%
04/30/03	130	43	33.08%	21	16.15%	9	6.92%	5	3.85%	78	60.00%
05/01/03	22	7	31.82%	1	4.55%	2	9.09%	3	13.64%	13	59.09%
05/02/03	24	9	37.50%	4	16.67%	1	4.17%	2	8.33%	16	66.67%
05/03/03	15	6	40.00%	2	13.33%		0.00%		0.00%	8	53.33%
05/04/03	5	2	40.00%	1	20.00%		0.00%		0.00%	3	60.00%
05/05/03	4		0.00%	2	50.00%		0.00%	1	25.00%	3	75.00%
05/06/03	19	2	10.53%	4	21.05%		0.00%	1	5.26%	7	36.84%
05/07/03	25	10	40.00%	3	12.00%	2	8.00%	1	4.00%	16	64.00%
05/08/03	6	1	16.67%	2	33.33%	1	16.67%		0.00%	4	66.67%
05/09/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/10/03	3		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/11/03	6	2	33.33%	2	33.33%		0.00%		0.00%	4	66.67%

Appendix B. Table 6.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
05/12/03	3	1	33.33%	1	33.33%		0.00%		0.00%	2	66.67%
05/13/03	14	6	42.86%	3	21.43%		0.00%		0.00%	9	64.29%
05/14/03	5	2	40.00%	1	20.00%		0.00%		0.00%	3	60.00%
05/15/03	9	3	33.33%	3	33.33%	1	11.11%		0.00%	7	77.78%
05/16/03	9	3	33.33%	3	33.33%	2	22.22%		0.00%	8	88.89%
05/17/03	4		0.00%	2	50.00%	1	25.00%		0.00%	3	75.00%
05/18/03	4		0.00%	2	50.00%		0.00%	1	25.00%	3	75.00%
05/19/03	13	4	30.77%	2	15.38%	1	7.69%	1	7.69%	8	61.54%
05/20/03	22	7	31.82%	4	18.18%	1	4.55%	1	4.55%	13	59.09%
05/21/03	7	2	28.57%	1	14.29%	1	14.29%		0.00%	4	57.14%
05/22/03	6	3	50.00%		0.00%	1	16.67%		0.00%	4	66.67%
05/23/03	2		0.00%		0.00%	1	50.00%		0.00%	1	50.00%



Appendix B. Table 7. PIT-tagged hatchery steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
04/02/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/04/03	2		0.00%		0.00%		0.00%	1	50.00%	1	50.00%
04/05/03	3		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/07/03	36	12	33.33%	5	13.89%	4	11.11%	1	2.78%	22	61.11%
04/08/03	34	6	17.65%	7	20.59%	2	5.88%		0.00%	15	44.12%
04/09/03	27	8	29.63%	5	18.52%	2	7.41%	1	3.70%	16	59.26%
04/10/03	39	18	46.15%	3	7.69%	2	5.13%	1	2.56%	24	61.54%
04/11/03	41	9	21.95%	10	24.39%	3	7.32%		0.00%	22	53.66%
04/12/03	58	22	37.93%	9	15.52%	3	5.17%	2	3.45%	36	62.07%
04/13/03	24	10	41.67%	3	12.50%	3	12.50%		0.00%	16	66.67%
04/14/03	12	2	16.67%	1	8.33%	1	8.33%		0.00%	4	33.33%
04/15/03	10	1	10.00%	2	20.00%	2	20.00%		0.00%	5	50.00%
04/16/03	10	1	10.00%	3	30.00%		0.00%		0.00%	4	40.00%
04/17/03	26	2	7.69%	8	30.77%	2	7.69%		0.00%	12	46.15%
04/18/03	31	17	54.84%	5	16.13%	1	3.23%	1	3.23%	24	77.42%
04/19/03	53	12	22.64%	5	9.43%	6	11.32%		0.00%	23	43.40%
04/21/03	22	9	40.91%	2	9.09%	3	13.64%	1	4.55%	15	68.18%
04/22/03	59	23	38.98%	8	13.56%	4	6.78%	1	1.69%	36	61.02%
04/23/03	62	17	27.42%	10	16.13%	5	8.06%	2	3.23%	34	54.84%
04/24/03	85	23	27.06%	9	10.59%	10	11.76%	3	3.53%	45	52.94%
04/25/03	41	8	19.51%	6	14.63%	4	9.76%	1	2.44%	19	46.34%
04/26/03	20	3	15.00%	2	10.00%	4	20.00%	2	10.00%	11	55.00%
04/27/03	16	2	12.50%		0.00%	3	18.75%	1	6.25%	6	37.50%
04/28/03	113	21	18.58%	16	14.16%	9	7.96%	6	5.31%	52	46.02%
04/29/03	79	10	12.66%	14	17.72%	12	15.19%	1	1.27%	37	46.84%
04/30/03	62	7	11.29%	12	19.35%	10	16.13%	2	3.23%	31	50.00%
05/01/03	82	15	18.29%	14	17.07%	12	14.63%	2	2.44%	43	52.44%
05/02/03	201	41	20.40%	48	23.88%	34	16.92%	4	1.99%	127	63.18%
05/03/03	57	17	29.82%	9	15.79%	4	7.02%	1	1.75%	31	54.39%
05/05/03	88	17	19.32%	17	19.32%	18	20.45%	1	1.14%	53	60.23%
05/06/03	137	24	17.52%	31	22.63%	22	16.06%	3	2.19%	80	58.39%
05/07/03	78	15	19.23%	18	23.08%	12	15.38%	2	2.56%	47	60.26%
05/08/03	112	30	26.79%	21	18.75%	19	16.96%		0.00%	70	62.50%
05/09/03	52	10	19.23%	5	9.62%	6	11.54%		0.00%	21	40.38%
05/10/03	83	23	27.71%	19	22.89%	7	8.43%	1	1.20%	50	60.24%
05/11/03	81	20	24.69%	15	18.52%	10	12.35%	3	3.70%	48	59.26%
05/12/03	72	25	34.72%	10	13.89%	7	9.72%	2	2.78%	44	61.11%
05/13/03	203	54	26.60%	34	16.75%	23	11.33%	9	4.43%	120	59.11%
05/14/03	71	19	26.76%	11	15.49%	8	11.27%	2	2.82%	40	56.34%
05/15/03	72	16	22.22%	15	20.83%	11	15.28%		0.00%	42	58.33%
05/16/03	7	1	14.29%	1	14.29%	2	28.57%		0.00%	4	57.14%
05/17/03	3		0.00%	2	66.67%	1	33.33%		0.00%	3	100.00%
05/18/03	6		0.00%	1	16.67%	2	33.33%		0.00%	3	50.00%
05/19/03	19	4	21.05%	8	42.11%	2	10.53%		0.00%	14	73.68%
05/20/03	20	4	20.00%	10	50.00%	1	5.00%		0.00%	15	75.00%
05/21/03	10	3	30.00%	3	30.00%		0.00%		0.00%	6	60.00%
05/22/03	14	6	42.86%	2	14.29%	2	14.29%		0.00%	10	71.43%
05/23/03	10	5	50.00%	3	30.00%	1	10.00%	1	10.00%	10	100.00%

Appendix B. Table 8. PIT-tagged wild steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2003.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/15/03	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
03/16/03	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
03/17/03	3	1	33.33%		0.00%		0.00%		0.00%	1	33.33%
03/18/03	10	5	50.00%		0.00%	1	10.00%	1	10.00%	7	70.00%
03/21/03	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
03/24/03	1		0.00%		0.00%		0.00%	1	100.00%	1	100.00%
03/25/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
03/28/03	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
03/31/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/05/03	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
04/07/03	7		0.00%	2	28.57%		0.00%		0.00%	2	28.57%
04/08/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/10/03	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/11/03	2		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/12/03	4	1	25.00%		0.00%		0.00%		0.00%	1	25.00%
04/13/03	10	5	50.00%	1	10.00%	1	10.00%		0.00%	7	70.00%
04/14/03	9	4	44.44%		0.00%		0.00%		0.00%	4	44.44%
04/15/03	9		0.00%	4	44.44%		0.00%		0.00%	4	44.44%
04/16/03	13	3	23.08%		0.00%		0.00%	2	15.38%	5	38.46%
04/17/03	11	5	45.45%	3	27.27%		0.00%		0.00%	8	72.73%
04/18/03	13	5	38.46%		0.00%	1	7.69%		0.00%	6	46.15%
04/19/03	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
04/20/03	2		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/21/03	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/22/03	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/23/03	6	2	33.33%	1	16.67%	1	16.67%		0.00%	4	66.67%
04/24/03	7	4	57.14%	1	14.29%		0.00%		0.00%	5	71.43%
04/25/03	9	4	44.44%	2	22.22%		0.00%		0.00%	6	66.67%
04/26/03	10	2	20.00%	3	30.00%		0.00%		0.00%	5	50.00%
04/27/03	6		0.00%		0.00%	1	16.67%		0.00%	1	16.67%
04/28/03	13	4	30.77%	2	15.38%		0.00%		0.00%	6	46.15%
04/29/03	16	4	25.00%	3	18.75%		0.00%	1	6.25%	8	50.00%
04/30/03	4	1	25.00%		0.00%		0.00%		0.00%	1	25.00%
05/01/03	5		0.00%	1	20.00%	1	20.00%		0.00%	2	40.00%
05/02/03	5	1	20.00%	2	40.00%		0.00%		0.00%	3	60.00%
05/03/03	9	2	22.22%		0.00%		0.00%	1	11.11%	3	33.33%
05/04/03	2		0.00%		0.00%	1	50.00%		0.00%	1	50.00%
05/05/03	5	1	20.00%	1	20.00%	2	40.00%	1	20.00%	5	100.00%
05/06/03	10	2	20.00%	3	30.00%		0.00%		0.00%	5	50.00%
05/07/03	7	2	28.57%	1	14.29%		0.00%		0.00%	3	42.86%
05/08/03	8	5	62.50%		0.00%		0.00%		0.00%	5	62.50%
05/09/03	6	4	66.67%		0.00%		0.00%		0.00%	4	66.67%
05/10/03	3	1	33.33%	1	33.33%		0.00%		0.00%	2	66.67%
05/11/03	4	1	25.00%	1	25.00%		0.00%		0.00%	2	50.00%
05/12/03	7	2	28.57%		0.00%		0.00%	2	28.57%	4	57.14%
05/13/03	17	9	52.94%	2	11.76%	3	17.65%		0.00%	14	82.35%
05/14/03	3	1	33.33%		0.00%		0.00%		0.00%	1	33.33%
05/15/03	12	2	16.67%		0.00%		0.00%	3	25.00%	5	41.67%
05/16/03	2	1	50.00%		0.00%	1	50.00%		0.00%	2	100.00%
05/17/03	4	2	50.00%	1	25.00%	1	25.00%		0.00%	4	100.00%
05/18/03	2		0.00%	1	50.00%	1	50.00%		0.00%	2	100.00%
05/19/03	5	2	40.00%	2	40.00%	1	20.00%		0.00%	5	100.00%
05/20/03	4	2	50.00%		0.00%		0.00%		0.00%	2	50.00%
05/21/03	5	2	40.00%	1	20.00%		0.00%		0.00%	3	60.00%
05/22/03	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
05/23/03	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%

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