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

Annual Report
2002 Operations

By:

Edwin W. Buettner, Senior Fisheries Research Biologist

and

Scott A. Putnam, Senior Fisheries Technician

Idaho Department of Fish and Game
PO Box 25
Boise, ID 83707

Funded by

U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife
Pat Poe, Project Manager
Contract No. 00003992
Project No. 87-127-00

Smolt Monitoring by Federal & Non-Federal Agencies
Administered by Pacific States Marine Fisheries Commission

IDFG 04-11
February 2004

TABLE OF CONTENTS

Page

Table of Contents, continued.

Page

LIST OF FIGURES

LIST OF TABLES

List of Tables, continued.

Page

LIST OF APPENDICES

List of Appendices, continued.

Page

ABSTRACT

This project monitored the daily passage of Chinook salmon *Oncorhynchus tshawytscha*, steelhead trout *O. mykiss,* and sockeye salmon smolts *O. nerka* during the 2002 spring out-migration at migrant traps on the Snake River and Salmon River.

In 2002 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 11.4 times greater in 2002 than in 2001. The wild Chinook catch was 15.5 times greater than the previous year. Hatchery steelhead trout catch was 2.9 times greater than in 2001. Wild steelhead trout catch was 2.8 times greater than the previous year. The Snake River trap collected 3,996 age-0 Chinook salmon of unknown rearing. During 2002, the Snake River trap captured 69 hatchery and 235 wild/natural sockeye salmon and 114 hatchery coho salmon *O. kisutch*. 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 increase in catch in 2002 was due to a 3.1 fold increase in hatchery Chinook production and a more normal spring runoff. Trap operations began on March 10 and were terminated on June 7. The trap was out of operation for a total of four days due to mechanical failure or debris.

Hatchery Chinook salmon catch at the Salmon River trap was 4.2 times greater and wild Chinook salmon catch was 2.4 times greater than in 2001. The hatchery steelhead trout collection in 2002 was 81% of the 2001 numbers. Wild steelhead trout collection in 2002 was 81% of the previous year's catch. Trap operations began on March 10 and were terminated on May 29 due to high flows. The trap was out of operation for four days due to high flow or debris. The increase in hatchery Chinook catch in 2002 was due to a 3.1 fold increase in hatchery production and differences in flow between years. Changes in hatchery and wild steelhead catch are probably due to differences in flow between years.

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 2002 data detected a relation between migration rate and discharge for hatchery and wild Chinook salmon. For hatchery and wild Chinook salmon there was a 4.7-fold and a 3.7-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 1.8-fold and a 1.7-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 2002 data detected a significant relation between migration rate and Lower Granite Reservoir inflow discharge for wild Chinook salmon and hatchery steelhead trout. The analysis was unable to detect a relation between migration rate and discharge for hatchery Chinook salmon. The lack of a detectable relation was probably a result of the migration rate data being spread over a very narrow range of discharge. Not enough data were available to perform the analysis for wild steelhead trout. Migration rate

increased 4.3-fold for wild Chinook salmon and 2.2-fold for hatchery steelhead between 50 kcfs and 100 kcfs.

Fish tagged with passive integrated transponder (PIT) tags at the Snake River trap 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 2000, caution must be used in comparing cumulative interrogation data. Cumulative interrogations at the four dams for fish marked at the Snake River trap were 61% for hatchery Chinook, 68% for wild Chinook, 58% for hatchery steelhead, and 62% for wild steelhead. Cumulative interrogations at the four dams for fish marked at the Salmon River trap were 51% for hatchery Chinook, 59% for wild Chinook salmon, 45% for hatchery steelhead trout, and 54% for wild steelhead trout. Cumulative interrogations were significantly lower in 2002 than in previous years with similar flow.

Authors:

Edwin W. Buettner
Senior Fisheries Research Biologist

Scott A. Putnam
Senior Fisheries Technician

INTRODUCTION

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (PL 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 2002 out-migration 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 2002.

SMOLT MONITORING TRAPS

During the 2002 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). 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 daily to the nearest millimeter. Up to 2,000 fish were examined daily for brands or marks at the Snake River trap. Fish were not examined for brands at the Salmon River trap. Smolts were anesthetized with tricaine methanesulfonate (MS-222) before handling and allowed to recover before being returned to the river.

In 2002, 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.

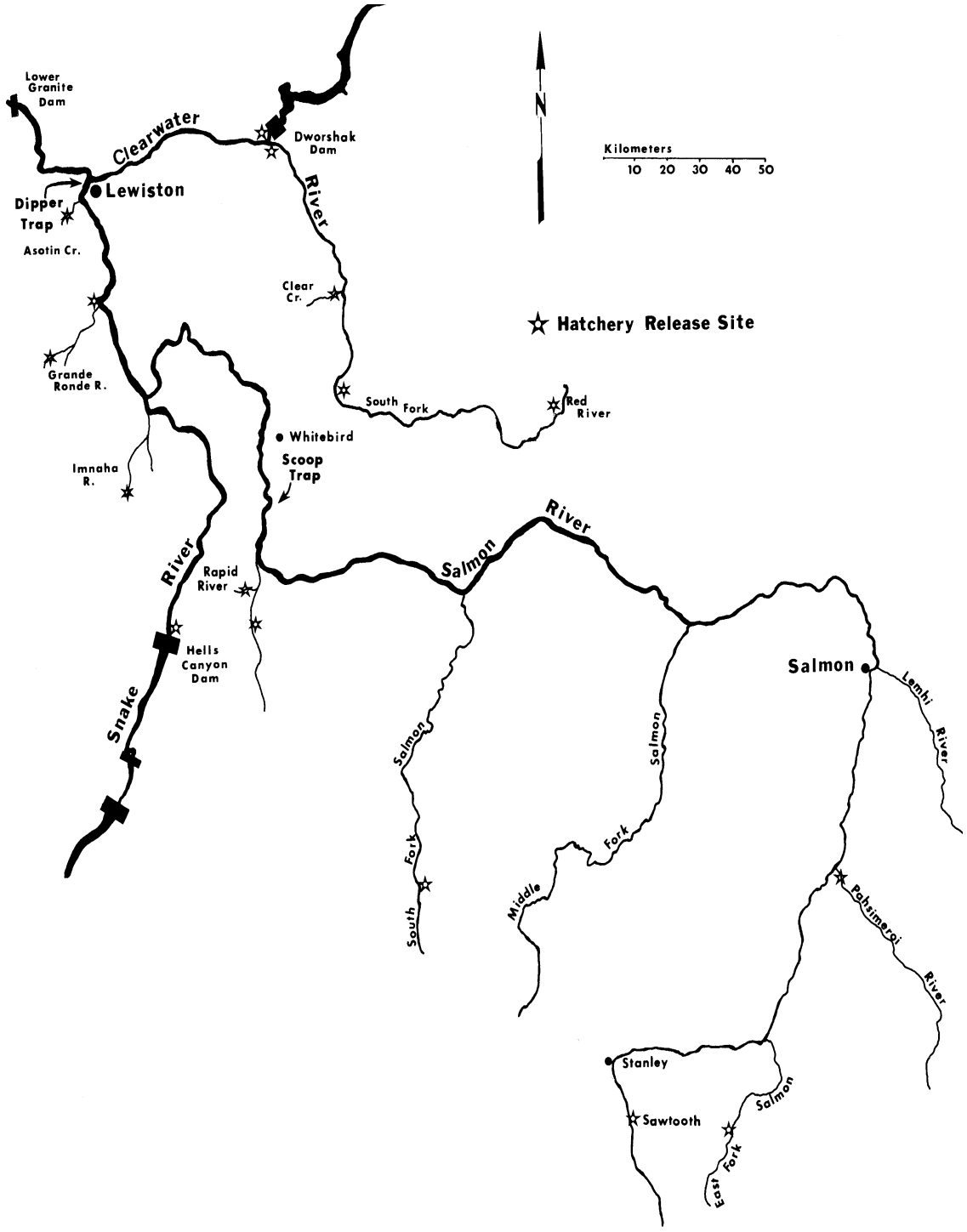

Figure 1. Map of study area

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.

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 10 and continued through June 7. The Snake River trap was out of operation for a total of four days during the 2002 season due to mechanical failure. 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 250 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.

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 10 and continued through May 29 when operations were terminated for the season. The Salmon River trap was out of operation for four days during the 2002 season due to heavy debris loads. 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 2002. 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 2002 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 50th 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). A P-value ≤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 2002 for the Snake River trap, 1989 to 1995 for the Clearwater River trap, and 1993 to 2002 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 release 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	—	—
EF 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
SF 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 four locations in Idaho and five in Oregon (Table 2). A total of 7,612,299 spring Chinook salmon smolts were released at 15 locations in Idaho, and 799,879 were released at seven locations in Oregon during 2002. A total of 1,426,971 spring Chinook salmon presmolts were released at nine locations in Idaho during 2001.

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 1,631,960 summer Chinook salmon were released at four locations in Idaho during 2002. A total of 46,981 summer Chinook salmon presmolts were released at one location in Idaho during 2001.

Fall Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at one location in Idaho and one location in Washington (Table 2). A total of 1,880,678 fall Chinook salmon were released at three locations in Idaho, and 1,158,030 were released from one location in Washington during 2002.

Steelhead Trout

Steelhead trout released into the Snake River drainage upstream of Lower Granite Dam were reared at five locations in Idaho, four in Oregon, and one in Washington (Table 3). A total of 7,543,619 steelhead trout smolts were released at 32 locations in Idaho, and 1,202,319 were released at four locations in Oregon during 2002. A total of 182,722 steelhead trout smolts were released at one location in Washington during 2002. A total of 518,852 were released into the Snake River below Hells Canyon Dam. 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 two locations in Washington (Table 4). A total of 1,064,672 coho smolts were released at three locations in Idaho during 2002. Summer and fall releases of coho salmon have not been included in this report.

Hatchery sockeye salmon that contributed to the 2002 out-migration were reared at one location in Idaho (Table 4). A total of 38,672 sockeye salmon were released at one location during 2002. Summer and fall releases of sockeye salmon were not included in this report.

Table 2. Hatchery Chinook salmon released into the Snake River system upriver from Lower Granite Dam contributing to the 2002 out-migration.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Magruder Corridor (Upper Selway River)	Clearwater	Spring	07/17/01	103,811
Lochsa at Squaw Creek	Clearwater	Spring	07/24/01	13,919
Lochsa at Pete King Creek	Clearwater	Spring	07/24/01	17,025
Colt Killed Creek	Clearwater	Spring	07/25/01	298,742
Red River	Clearwater	Spring	09/28/01	84,238
Crooked River Ponds	Clearwater	Spring	09/28/01	155,887
Powell Rearing Ponds	Clearwater	Spring	10/01/01	559,652
Lochsa at Boulder Creek	Clearwater	Spring	10/10/01	104,207
Meadow Creek	Clearwater	Spring	10/11/01	89,490
North Fork Clearwater	Dworshak	Spring	03/27-28/02	1,000,561 (54,726)
Lolo Creek	Clearwater	Spring	04/02/02	149,185 (1,012)
Mill Creek	Clearwater	Spring	04/03/02	40,433
Kooskia National Fish Hatchery Rack	Kooskia	Spring	04/04/02	498,532 (1,500)
Clear Creek above KNFH	Kooskia	Spring	04/04/02	51,329
Boulder Creek	Clearwater	Spring	04/05/02	101,473
Newsome Creek	Clearwater	Spring	04/05/02	74,555 (1,003)
North Fork Clearwater at Boat Ramp	Clearwater	Spring	04/09/02	206,473
Papoose Creek	Clearwater	Spring	04/10/02	57,461 (750)
Powell Rearing Ponds	Clearwater	Spring	04/10/02	349,890
Red River	Clearwater	Spring	4/10-12/02	350,318 (301)
Crooked River Ponds	Clearwater	Spring	4/10-12/02	726,489 (300)
Meadow Creek	Clearwater	Spring	04/16-26/02	296,841 (1,008)
			Spring Total	**5,330,511**

Table 2. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River continued				
Big Canyon	Lyons Ferry	Fall	04/10-12/02	159,472 (7,500)
Big Canyon	Lyons Ferry	Fall	05/27-28/02	495,215 (2,500)
Big Canyon	Lyons Ferry	Fall	06/18-19/02	505,674 (2,500)
			Fall Total	**1,160,361 (12,500)**
			Drainage Total	**6,490,872 (73,100)**
Salmon River				
Rapid River Hatchery	Rapid River	Spring	03/11-18/02	3,022,980 (183,924)
Little Salmon River at Stinky Springs	Rapid River	Spring	03/14/02	300,018
Sawtooth Hatchery	Sawtooth	Spring	04/09/02	265,642 (246)
Sawtooth Hatchery	Sawtooth	Spring	04/19-23/02	120,119
			Spring Total	**3,708,759 (184,170)**
S Fork Salmon River at Stolle Meadows	McCall	Summer	07/20-23/01	46,981
Johnson Creek	McCall	Summer	03/18-20/02	57,918 (9,984)
S Fork Salmon River at Knox Bridge	McCall	Summer	03/25-28/02	1,064,250 (54,734)
Pahsimeroi Ponds	Pahsimeroi	Summer	04/09-10/02	509,792 (498)
			Summer Total	**1,678,941 (65,216)**
			Drainage Total	**5,387,700 (249,386)**
Snake River				
Lostine River	Lostine Acclimation	Spring	04/14/02	109,015 (15,995)
Catherine Creek	Catherine Creek Acclimation	Spring	04/15/02	180,343 (20,886)
Upper Grande Ronde	Grande Ronde Acclimation	Spring	04/15/02	151,444 (1,096)

Table 2. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Snake River Continued				
Imnaha River	Imnaha Pond	Spring	04/07/02	303,737 (20,983)
Bear Creek	Irrigon	Spring	05/28/02	4,660
Looking Glass Creek	Irrigon	Spring	05/28/02	17,880
Sheep Creek	Irrigon	Spring	05/29/02	32,800
			Spring Total	**799,879 (58,960)**
Pittsburg Landing Acclimation Pond	Lyons Ferry	Fall	04/15-17/02	159,731 (7,500)
Captain John Acclimation Pond	Lyons Ferry	Fall	04/16/02	160,155 (2,500)
Pittsburg Landing Acclimation Pond	Lyons Ferry	Fall	05/27-28/02	399,315 (2,500)
Captain John Acclimation Pond	Lyons Ferry	Fall	05/28/02	498,927 (2,500)
Snake River at Hells Canyon Dam	Oxbow	Fall	05/21/02	161,271 (100)
Captain John Acclimation Pond	Lyons Ferry	Fall	06/20/03	498,948 (2,500)
			Fall Total	**1,878,347 (17,600)**
			Drainage Total	**2,678,226 (76,560)**
			Grand Total	**14,556,798 (399,046)**

Table 3. Hatchery steelhead trout released into the Snake River system upriver from Lower Granite Dam contributing to the 2002 out-migration.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Clearwater River	Dworshak	B	4/10/02-4/15/02	105,000
S. Fork Clearwater River at Red House Hole	Dworshak	B	4/15/02-4/19/02	585,699 (900)
Clear Creek	Dworshak	B	4/15/02-4/19/02	264,031 (900)
Clear Creek	Clearwater	B	4/19/02	40,499
S. Fork Clearwater River at Red House Hole	Clearwater	B	4/19/02	138,769 (302)
Clearwater River Direct Release	Dworshak	B	4/21/02-4/24/02	1,365,823 (4,213)
Red River	Clearwater	B	4/25/02	181,316 (298)
Crooked River	Clearwater	B	4/26/02	85,000 (601)
Crooked River Ponds	Clearwater	B	4/29/02	136,027 (601)
Lolo Creek	Clearwater	B	4/29/02	18,000
Meadow Creek	Clearwater	B	4/29/02	26,460
Mill Creek	Clearwater	B	4/29/02	34,000
American River	Hagerman	B	4/30/02-5/10/02	94,232
Newsome Creek	Hagerman	B	5/10/02-5/15/02	85,722
			Drainage Total	**3,160,578 (7,815)**
Salmon River				
Little Salmon River	Hagerman	A	4/01/02-4/15/02	222,124 (299)
Salmon River at Sawtooth	Hagerman	A	4/03/02-4/29/02	781,706 (599)
Little Salmon River at Stinky Springs	Niagara Springs	A	4/06/02-4/07/02	80,329
Little Salmon River at Stinky Springs	Niagara Springs	A	4/07/02-4/11/02	98,280
Squaw Creek Ponds	Magic Valley	B	4/08/02	96,440
Little Salmon River at Stinky Springs	Magic Valley	B	4/08/02-4/09/02	105,167 (300)
Salmon River at Hammer Creek	Magic Valley	A	4/10/02-4/11/02	179,722 (300)

Table 3. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Salmon River, continued				
Little Salmon River at Stinky Springs	Niagara Springs	A	4/11/02-4/13/02	99,861
Lower Hazard Creek	Hagerman	A	4/12/02	46,620
Little Salmon at Stinky Springs	Magic Valley	A	4/12/02	54,000
Salmon River at Colston Corner	Magic Valley	A	4/12/02	39,005
Pahsimeroi Ponds	Niagara Springs	A	4/14/02-5/04/02	831,335 (300)
Salmon River at Wagonhammer	Magic Valley	A	4/15/02	49,194
Salmon River at Lewis Clark	Magic Valley	A	4/15/02	43,415
Salmon River at Shoup Bridge	Magic Valley	A	4/18/02	63,000 (300)
Lemhi River	Magic Valley	A	4/18/02-4/19/02	65,360
Salmon River at Red Rock	Magic Valley	A	4/19/02	41,438 (300)
Salmon River at Eyehole	Magic Valley	A	4/19/02	20,600
Lemhi River	Magic Valley	A	4/19/02	19,248
Salmon River at Eyehole	Magic Valley	A	4/22/02	20,750
Salmon River at Cottonwood CG	Magic Valley	A	4/22/02	62,048
Salmon River at Tunnel Rock	Magic Valley	A	4/22/02	20,750 (300)
Salmon River at Tunnel Rock	Magic Valley	A	4/23/02	29,050
Salmon River at McNabb Point	Magic Valley	A	4/23/02	70,590
Salmon River at Challis	Magic Valley	A	4/24/02	57,600
Squaw Creek	Magic Valley	B	4/24/02-4/25/02	59,356 (300)
Squaw Creek	Magic Valley	B	4/25/02-5/01/02	230,178 (300)
E. Fork Salmon River at Dumpster	Magic Valley	B	4/29/02-4/30/02	157,315
E. Fork Salmon River at Dumpster	Magic Valley	B	5/01/02	56,937
E. Fork Salmon River	Magic Valley	B	5/01/02	3,800
Yankee Fork Dredge Ponds	Magic Valley	A	5/02/02	99,738 (300)
Yankee Fork	Hagerman	A	5/02/02-6/02/02	139,445 (300)

Table 3. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Salmon River, continued				
Hayden Creek Hatchery	Magic Valley	A	5/03/02	37,500
Lemhi River at St. Charles Bridge	Magic Valley	A	5/03/02-5/07/02	223,518 (594)
Little Salmon River at Stinky Springs	Niagara Springs	A	5/05/02-5/07/02	90,778
Little Salmon River at Stinky Springs	Niagara Springs	A	5/07/02-5/09/02	90,844
			Drainage Total	**4,383,041 (4,492)**
Snake River				
Snake River at Hells Canyon Dam	Niagara Springs	A	3/25/02-4/05/02	518,852 (298)
Grand Ronde River	Cottonwood Creek Pond	A	4/01/02-4/30/02	182,722
Spring Creek	Wallowa Acclimation	A	4/04/02	199,837
Spring Creek	Wallowa Acclimation	A	4/05/02	154,495
Deer Creek	Big Canyon	A	4/11/02	86,275 (250)
Little Sheep Creek	Little Sheep	A	4/11/02	121,336
Little Sheep Creek	Irrigon	A	4/11/02-4/12/02 5/09/02-5/10/02	50,000
Deer Creek	Big Canyon	A	4/12/02	82,429
Big Sheep Creek	Irrigon	A	4/17/02	73,819
Big Sheep Creek	Irrigon	A	4/17/02-4/18/02	50,000
Spring Creek	Wallowa Acclimation	A	5/01/02	107,791
Spring Creek	Wallowa Acclimation	A	5/02/02	98,510
Deer Creek	Irrigon	A	5/02/02	1,007
Little Sheep Creek	Little Sheep	A	5/08/02	74,239
Deer Creek	Big Canyon	A	5/08/02	58,975 (250)
Deer Creek	Big Canyon	A	5/09/02	43,606 (250)
			Drainage Total	**1,903,893 (1,048)**
			Grand Total	**9,447,512 (13,355)**

Table 4. Hatchery coho and sockeye salmon released into the Snake River system upstream from Lower Granite Dam contributing to the 2002 out-migration.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Lapwai Creek	Willard	Coho	3/11/02	275,000 (1,000)
Potlatch River	Willard	Coho	3/13/02	275,000 (1,000)
Potlatch River	Eagle Creek	Coho	4/10,12,19/02	277,980
Clear Creek	Dworshak	Coho	5/14/02	236,692 (994)
			Drainage Total	**1,064,672** **(2,994)**
Salmon River				
Redfish Lake Creek	Sawtooth	Sockeye	5/07/02	38,672 (995)
			Drainage Total	**38,672** **(995)**

Smolt Monitoring Traps

Snake River Trap Operation

The Snake River trap captured 7,252 hatchery and 1,458 wild age-1 Chinook salmon, 3,996 age-0 Chinook salmon of unknown rearing, 12,578 hatchery and 2,591 wild steelhead trout, 69 hatchery and 235 unknown rearing sockeye salmon, and 114 coho salmon of unknown rearing in 2002 (Table 5).

Hatchery Chinook salmon first arrived at the trap on March 25 (1 fish). Daily catch remained below 100 fish per day until April 13 when 128 fish were caught. For three days, the daily catch exceeded 1,000 fish per day (1,187 on April 15, 1,104 on April 16, and 1,919 on April 17). Except for 859 on April 18 and 327 on April 19, the daily catch remained less than 100 until May 24 when 212 were collected. Daily catch then stayed less than 100 except for 175 on May 29 and 101 on June 2 until the end of the trap season on June 7 (Figure 2). Less than one percent (29) of the total season catch was collected in March, 84% (6,091) in April, 13% (911) in May, and 3% (221) in June.

Wild Chinook salmon first arrived at the trap on March 15 (one fish). Daily catch remained below 100 fish per day until April 15 when 127 fish were caught. The daily collection remained above 100 per day until April 20 when the catch dropped to 24 fish. Except for 55 fish on May 21, 62 on May 22, and 80 on May 23, the daily catch remained less than 25 until the end of the trap season on June 7 (Figure 2). One percent (14) of the total season catch was collected in March, 72% (1,049) in April, 25% (361) in May, and 2% (34) in June.

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 1993 through 2002.

Year	Species / Run	Snake River Trap	Clearwater River Trap	Salmon River Trap
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
1993	HC	15,271	9,761	28,326
	WC	2,683	320	5,147
	HS	35,183	10,122	73
	WS	3,046	882	9

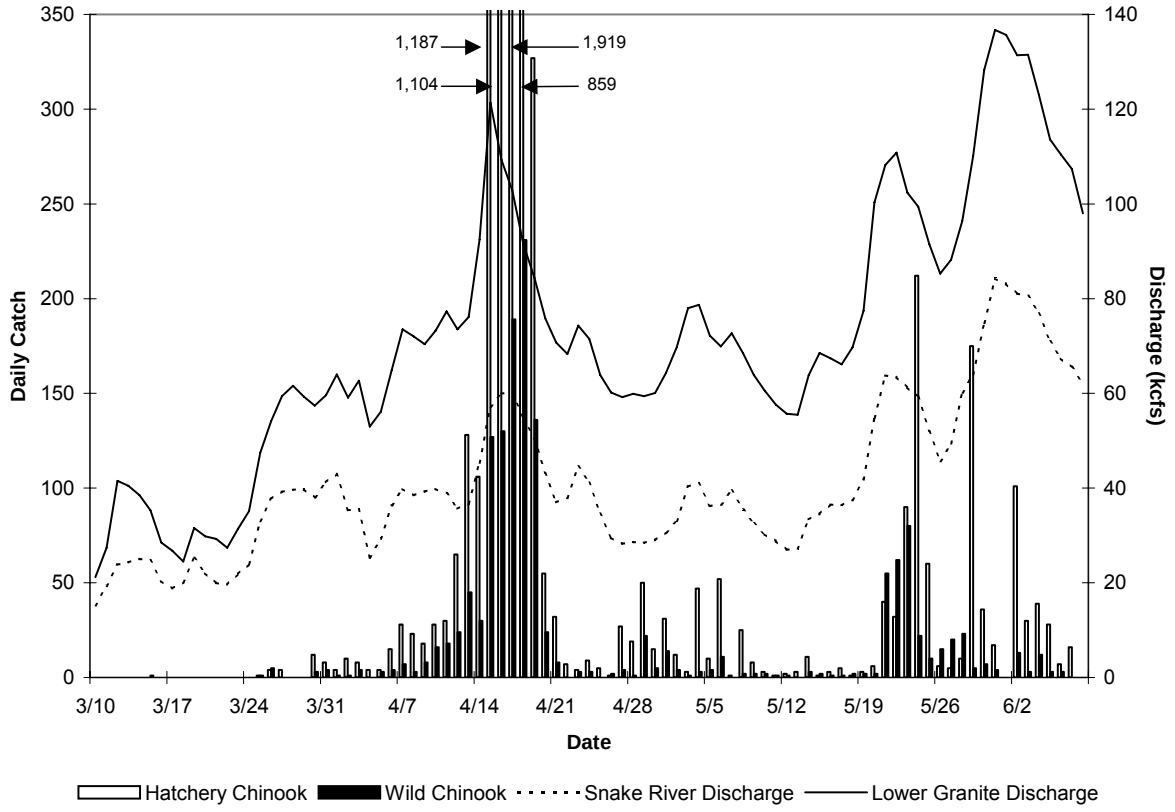

Figure 2. Snake River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Snake River and Lower Granite discharge, 2002

Physical characteristics were used to differentiate between age-0 Chinook salmon and older salmon. This year 3,996 age-0 Chinook salmon were captured before the end of the trap season on June 6. Less than 1% (6) of the total season catch was collected in March, less than 1% (22) in April, 67% (2,684) in May, and 32% (1,284) in June.

Hatchery steelhead trout first arrived at the trap on March 25 (one fish). Daily catch remained below 100 fish per day until April 11 when 102 fish were caught. Except for 67 fish on April 12, the daily collection stayed greater than 100 until April 20 when it declined to 78. Less than 100 fish per day were caught until April 27 when 303 fish were captured. Except for 75 fish on April 28, 25 on May 3, and 39 on May 5, the daily count was greater than 100 fish per day with a peak of 1,375 fish on May 21. Daily catch decreased to fewer than 100 fish per day between May 25 and 28. Except for 27 fish on May 31, the daily catch returned to greater than 100 fish per day until June 3 when it dropped to 68. After June 3, fewer than 50 fish per day were collected until the end of the trap season on June 7 (Figure 3). Less than 1% (five) of the total season catch was collected in March, 25% (3,176) in April, 72% (9,103) in May, and 2% (294) in June.

Wild steelhead trout first arrived at the trap on March 14 (one fish). Daily catch remained below 100 fish per day until April 17 when 117 fish were captured. Except for 114 fish on May 9,

the daily collection remained less than 100 fish per day until May 21 when it peaked at 223. Daily fish counts then remained greater than 100 until May 24 when it declined to 27 fish. The daily fish collection stayed below 100 fish per day until the end of the trapping season on June 7 (Figure 3). Less than 1% (13) of the total season catch was collected in March, 32% (823) in April, 64% (1,666) in May, and 3% (89) in June.

Hatchery sockeye salmon were captured at the Snake River smolt trap. The first one arrived on March 20. No others were collected until May 15 when one more was captured. Then, the daily collection fluctuated between zero and ten fish per day until the end of the trapping season on June 7. About 1% (one) of the total season catch was collected in March, 74% (51) in May, and 25% (17) in June.

Sockeye salmon of unknown origin were collected at the Snake River smolt trap. The first fish arrived on March 25. Three were trapped on April 1. Between May 13 and the end of the trapping season on June 7, the daily collection ranged from zero to 46 fish per day. Less than 1% (one) of the total season catch was collected in March, 1% (three) in April, 82% (193) in May, and 16% (38) in June.

Coho salmon of unknown rearing were captured at the Snake River smolt trap. The first fish arrived on April 1. Daily trap catch remained below 25 for the entire trapping season. About 16% (18) of the total season catch was collected in April, 66% (75) in May, and 18% (21) in June.

Snake River discharge measured at the Anatone gauge ranged from 14.6 kcfs to 41.3 kcfs in March 2002. March average discharge (24.0 kcfs) in 2002 was 3.7 kcfs more than in 2001, 14.3 kcfs less than in 2000, and 40.1 kcfs less than in 1999. The April 2002 discharge ranged from 25.3 kcfs to 60.1 kcfs. April average discharge (39.5 kcfs) in 2002 was 15.7 kcfs more than in 2001, 16.8 kcfs less than in 2000, and 28.0 kcfs less than in 1999. The May 2002 discharge ranged from 27.0 kcfs to 84.2 kcfs. May average discharge (44.9 kcfs) in 2002 was 5.5 kcfs more than in 2001, 8.7 kcfs less than in 2000, and 31.9 kcfs less than in 1999. The June 2002 discharge ranged from 35.3 kcfs to 83.1 kcfs. June average discharge (53.2 kcfs) in 2002 was 30.8 kcfs more than in 2001, 10.5 kcfs more than in 2000, and 46.4 less than in 1999 (Table 6).

Water temperature at the Snake River trap was 4.0°C at the beginning of the trapping season in March. Water temperature gradually increased throughout the sampling season and reached a maximum of 13.5°C in June (Figure 4). Secchi disk transparency measurements were taken daily at the Snake River trap. Transparencies fluctuated throughout the trapping season and ranged from 0.2 m to 2.2 m (Figure 4).

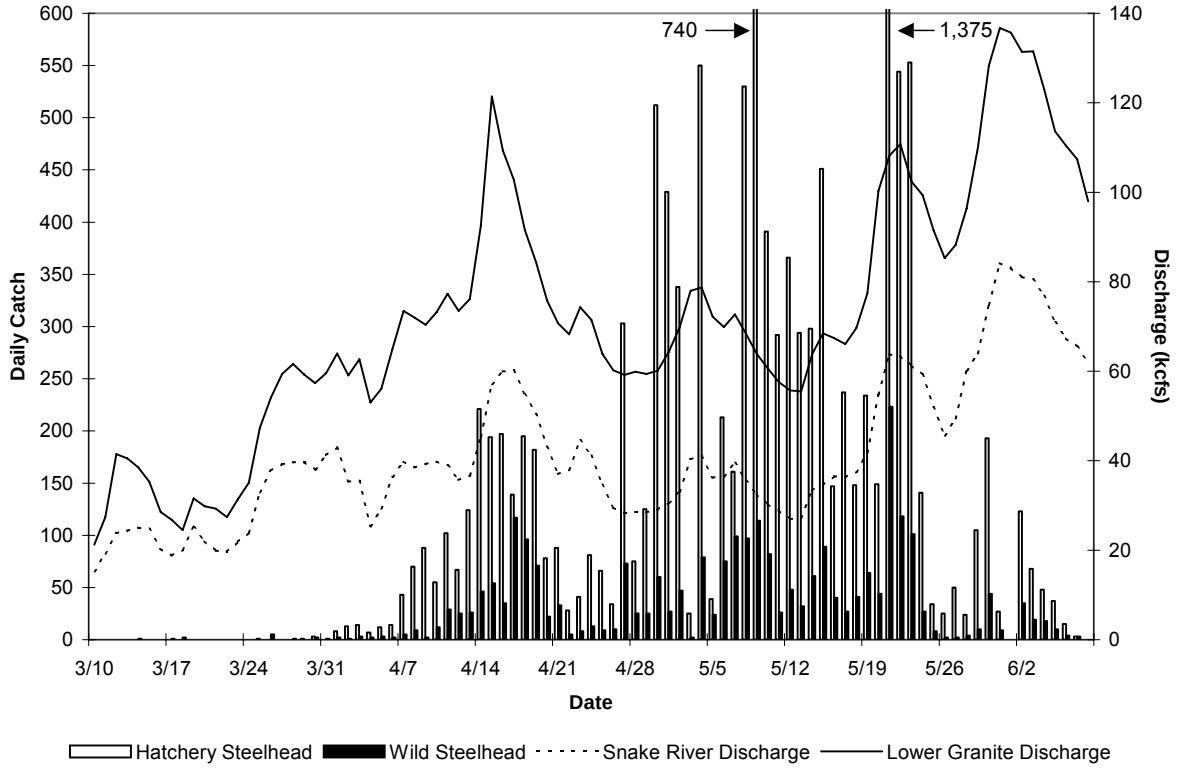

Figure 3. Snake River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Snake River and Lower Granite discharge, 2002.

Table 6. Monthly Snake River discharge at Anatone, Washington and 2002 comparison with previous three years. Comparison data is reported as 2002 discharge minus annual interval discharge.

		2002	1999		2000		2001	
		Discharge (cfs)	Discharge (cfs)	2002 Comparison (kcfs)	Discharge (cfs)	2002 Comparison (kcfs)	Discharge (cfs)	2002 Comparison (kcfs)
March	Min	14,630	30,810	-16.2	31,766	-17.1	13,485	1.1
	Max	41,260	93,638	-52.4	44,764	-3.5	29,141	12.1
	Average	24,046	64,168	-40.1	38,320	-14.3	20,368	3.7
April	Min	25,339	53,945	-28.6	41,174	-15.8	18,146	7.2
	Max	60,143	86,674	-26.5	68,200	-8.1	32,714	27.4
	Average	39,457	67,448	-28.0	56,211	-16.8	23,726	15.7
May	Min	26,963	53,422	-26.5	41,561	-14.6	27,589	-0.6
	Max	84,175	131,604	-47.4	62,436	21.7	58,021	26.2
	Average	44,887	76,835	-31.9	53,603	-8.7	39,361	5.5
June	Min	35,306	68,389	-33.1	24,567	10.7	16,517	18.8
	Max	83,131	127,990	-44.9	59,996	23.1	35,923	47.2
	Average	53,175	99,610	-46.4	42,635	10.5	22,414	30.8

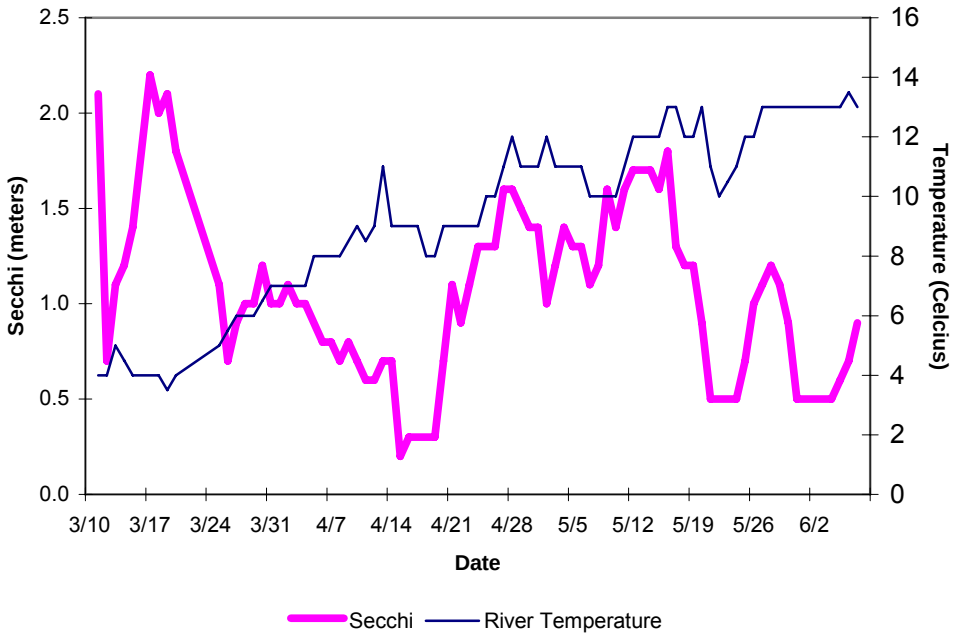

Figure 4. Daily water temperature and Secchi disk transparency for the Snake River at the trap, 2002.

Salmon River Trap Operations

The Salmon River scoop trap captured 43,168 hatchery and 5,548 wild age-1 Chinook salmon, 3,284 hatchery and 395 wild steelhead trout, and 22 hatchery sockeye salmon in 2002 (Table 5).

Hatchery Chinook salmon first appeared on March 14 (149 fish). Except for 74 fish on March 15, the daily catch remained above 100 until April 27 when it dropped to 48. Between March 16 and 25, the daily catch ranged from 148 to 899. On March 26, a peak of 2,142 fish was reached. From March 27 through April 1, the daily catch ranged between 421 and 659. More than 1,000 fish per day were observed between April 2 and 11, range from 1,217 to 3,133 fish per day. Except for 1,838 fish on April 15, the daily catch ranged from 142 to 797 per day until April 27 when it decreased to 48. Between 172 and 248 were collected in the sample period of April 28 through May 1. Daily trap catch then fluctuated between 32 and 84 through May 9. The daily trap catch remained less than 25 until the end of the trapping season on May 29 (Figure 5). About 26% (11,313) of the season total was captured in March, 72% (31,138) in April, and 2% (717) in May.

Wild Chinook salmon first appeared on March 12 (one fish). Daily trap catch remained below 100 until April 2 when 126 fish appeared. Except for 93 fish on April 3, the daily catch ranged from 115 to 584 until April 19 when it decreased to 79. Daily trap catch then ranged between 36 and 96 until April 24. After the 24th, daily trap catch dropped to 22 or less per day

and remained there until the end of the trapping season on May 29 (Figure 5). About 6% (327) of the season total was captured in March, 91% (5,046) in April, and 3% (175) in May.

Hatchery steelhead trout first appeared at the trap on April 1 (two fish). Daily trap catch remained below 100 until April 17 when 156 fish were collected. The daily trap catch then returned below 100 until May 3 (103 fish). Except for 57 fish on May 4, the daily trap catch ranged from 130 to 404 through May 12. Daily trap catch declined to less than 100 on May 13 (63 fish) and remained below that level until the end of the trapping season on May 29 (Figure 6). About 26% (850) of the season total was captured in April and 74% (2,434) in May.

Wild steelhead trout first appeared on April 1 (one fish). The daily trap catch remained below 100 fish throughout the trapping season. Except for 63 fish on April 16 and 74 on April 17, the daily collection was 22 or less until the end of the trapping season on May 29 (Figure 6). About 69% (271) of the season total was captured in April and 31% (124) in May.

Hatchery sockeye salmon first appeared at the trap on May 6 (one fish). Daily trap catch was six or less through the end of the trapping season on May 29. One hundred percent (22) of the season total was captured in May.

No sockeye salmon of unknown rearing were collected during the 2002 trapping season.

Salmon River discharge measured at the White Bird gauge ranged from 3.2 kcfs to 5.5 kcfs in March 2002. March average discharge (4.1 kcfs) in 2002 was 0.5 kcfs less than in 2001, 1.5 kcfs less than in 2000, and 4.1 kcfs less than in 1999. The April 2002 discharge ranged from 6.0 kcfs to 23.4 kcfs. April average discharge (12.4 kcfs) in 2002 was 5.7 kcfs more than in 2001, 3.0 kcfs less than in 2000, and 1.1 kcfs less than in 1999. The May 2002 discharge ranged from 12.5 kcfs to 52.6 kcfs. May average discharge (25.0 kcfs) in 2002 was 4.8 kcfs more than in 2001, 4.2 kcfs less than in 2000, and 9.4 kcfs less than in 1999 (Table 7).

Water temperature at the Salmon River trap was 2.5°C at the beginning of the trapping season in March. Water temperature gradually increased throughout the sampling season and reached a maximum of 12.0°C in May (Figure 7). Secchi disk transparency measurements were taken daily at the Salmon River trap. Transparencies fluctuated throughout the trapping season and ranged from 0.3 m to 2.3 m (Figure 7).

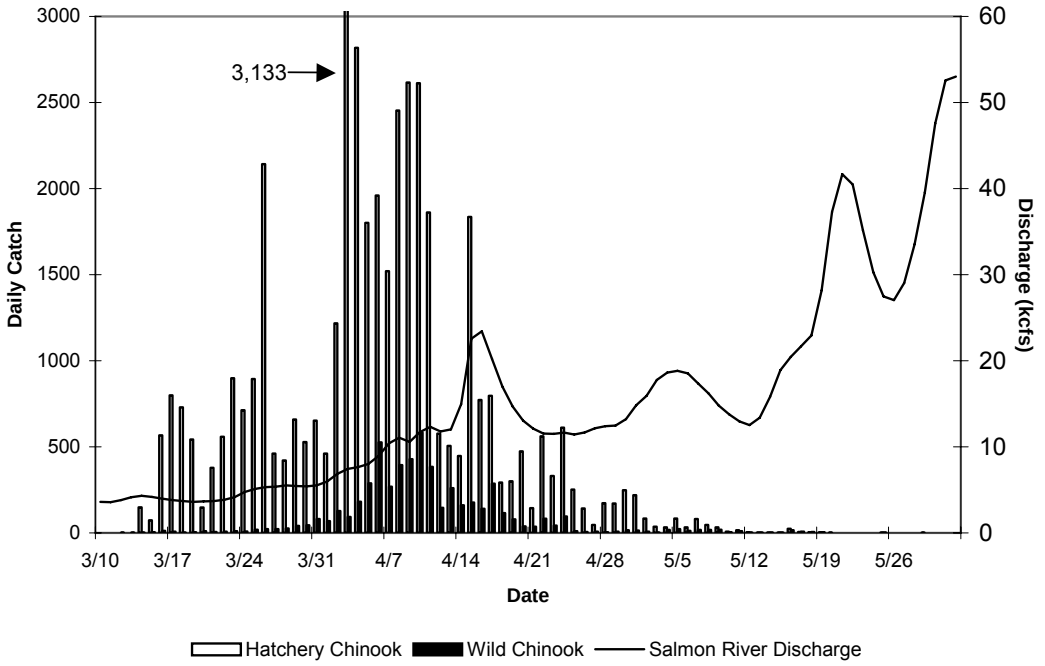

Figure 5. Salmon River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Salmon River discharge, 2002.

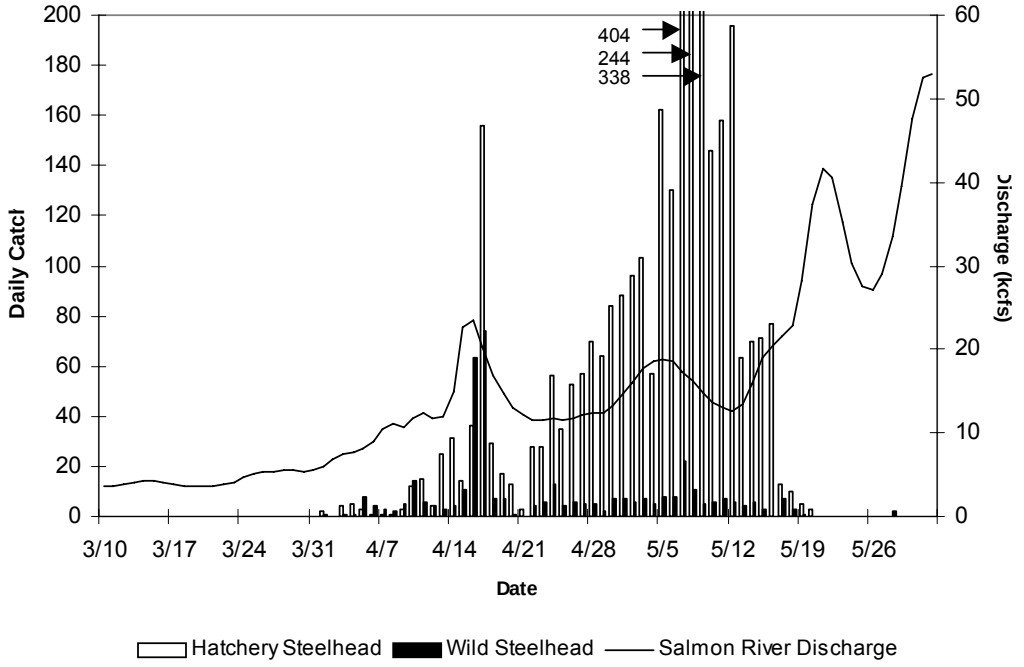

Figure 6. Salmon River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Salmon River discharge, 2002.

Table 7. Monthly Salmon River discharge at White Bird, Idaho and 2002 comparison with previous three years. Comparison data is reported as 2002 discharge minus annual interval discharge.

		2002	1999		2000		2001	
		Discharge (cfs)	Discharge (cfs)	2002 Comparison (kcfs)	Discharge (cfs)	2002 Comparison (kcfs)	Discharge (cfs)	2002 Comparison (kcfs)
March	Min	3,169	4,938	-1.8	4,903	-1.7	3,149	0.0
	Max	5,514	15,971	-10.5	7,594	-2.1	6,855	-1.3
	Average	4,137	8,260	-4.1	5,620	-1.5	4,613	-0.5
April	Min	5,962	7,690	-1.7	6,596	-0.6	4,438	1.5
	Max	23,423	24,330	-0.9	23,301	0.1	16,427	7.0
	Average	12,357	13,483	-1.1	15,383	-3.0	6,693	5.7
May	Min	12,543	16,319	-3.8	18,831	-6.3	12,477	0.1
	Max	52,568	80,833	-28.3	41,604	11.0	31,168	21.4
	Average	25,006	34,363	-9.4	29,226	-4.2	20,238	4.8

Travel Time and Migration Rates

Release Sites to Snake River Trap

Hatchery Spring Chinook Salmon—In 2002, 186 PIT-tagged hatchery spring Chinook salmon were interrogated at the Snake River trap. Four were from the Catherine Creek Pond (median travel time 17.7 d), one was from the Dworshak National Fish Hatchery (travel time 18.4 d), one was from the Grande Ronde River (travel time 196.2 d), 19 were from the Imnaha River weir (median 25.3 d), 11 were from the Lostine River Pond (median 16.6 d), 149 were from the Rapid River Hatchery (median 28.3 d), and one was from the Sawtooth trap (travel time 8.6 d).

Wild Spring Chinook Salmon—In 2002, eight PIT-tagged wild spring Chinook salmon were interrogated at the Snake River trap. One was from Elk Creek (travel time 259.9 d), one was from the Grande Ronde River trap (travel time 5.3 d), one was from the Lostine River (travel time 147.6 d), two were from the Marsh Creek trap (median 224.4 d), and three were from the Sawtooth trap (median 31.5 d).

Hatchery Summer Chinook Salmon—In 2002, 41 PIT-tagged hatchery summer Chinook salmon were interrogated at the Snake River trap. Two were from the Imnaha River trap (median 4.5 d), 11 were from Johnson Creek (median 64.0 d), and 28 were from Knox Bridge (median 35.4).

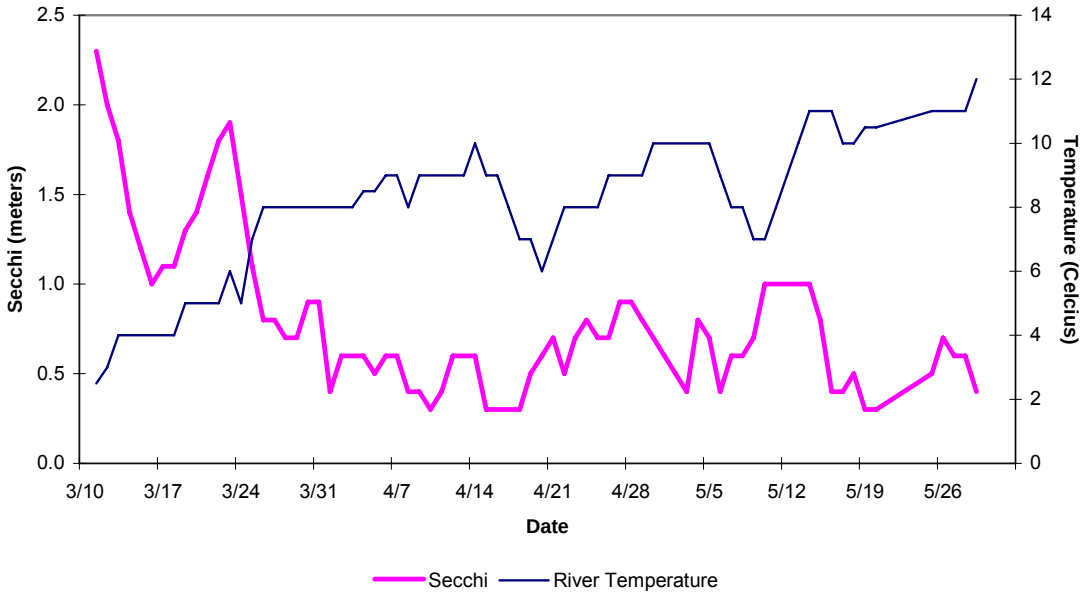

Figure 7. Daily water temperature and Secchi disk transparency for the Salmon River trap, 2002

Wild Summer Chinook Salmon—In 2002, 19 PIT-tagged wild summer Chinook salmon were interrogated at the Snake River trap. Four were from the Imnaha River trap (median travel time 3.4 d), three were from the Johnson Creek trap (median 189.5 d), one was from the Lower South Fork Salmon River trap (travel time 392.1 d), six were from the Pahsimeroi River trap (median 9.7 d), three were from the Secesh River (median 217.9 d), and two were from the South Fork Salmon River trap (median 34.2d).

Hatchery Fall Chinook Salmon—In 2002, 166 PIT-tagged hatchery fall Chinook salmon were interrogated at the Snake River trap. Forty-nine were from the Captain John Rapids Acclimation Pond (median travel time 1.6 d), five from Hells Canyon Dam (median 10.2 d), 40 from Pittsburg Landing Acclimation Facility (median 1.6 d), and 72 from the Snake River (median 0.5 d).

Hatchery Unknown Run Chinook Salmon—In 2002, five 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 12.4 d.

Wild Unknown Run Chinook Salmon—In 2002, 17 PIT-tagged wild unknown run Chinook salmon were interrogated at the Snake River trap. Thirteen were from the Salmon River trap (median 8.3 d), and four were from the Snake River (median 5.8 d).

Hatchery Summer Steelhead Trout—In 2002, 27 hatchery summer steelhead trout were interrogated at the Snake River trap. Two were from the Big Canyon Facility (median travel time 27.8 d), five were from the Grande Ronde River trap (median 1.3 d), four were from the Imnaha River trap (median 2.0 d), one was from the Lemhi River (travel time 5.1 d), four were from the Salmon River (median 10.8 d), four were from the Salmon River trap (median

5.7 d), two were from the Sawtooth Hatchery (median 30.4 d), two were from Squaw Creek (median 8.9 d), two were from the Squaw Creek Acclimation Pond (median 10.4 d), and one was from the Wallowa Hatchery (travel time 48.8 d).

Wild Summer Steelhead Trout—In 2002, 35 wild summer steelhead trout were interrogated at the Snake River trap. Two were from Catherine Creek (median 13.4 d), one was from Chamberlain Creek (travel time 271.1 d), one was from the Grande Ronde River (travel time 9.0 d), 26 were from the Imnaha River trap (median 2.5 d), three were from the Johnson Creek trap (median 258.8 d), one was from the Salmon River trap (travel time 3.2 d), and one was from the Sawtooth trap (travel time 5.8 d).

Hatchery Sockeye Salmon—In 2002, five hatchery sockeye salmon were interrogated at the Snake River trap. One was from Pettit Lake Creek (travel time 16.7 d), and four were from the Redfish Lake Creek trap (median 9.1 d).

Wild Sockeye Salmon—In 2002, two wild sockeye salmon were interrogated at the Snake River trap. One was from Alturas Lake Creek (travel time 10.5 d), and one was from Pettit Lake Creek (travel time 13.4 d).

Release Sites to the Salmon River Trap

Hatchery Spring Chinook Salmon—In 2002, 2,025 hatchery spring Chinook salmon were interrogated at the Salmon River trap. Two thousand twenty-two were from the Rapid River Hatchery (median travel time 17.0 d), and three were from the Sawtooth Hatchery (median 378.8 d).

Wild Spring Chinook Salmon—In 2002, 20 wild spring Chinook salmon were interrogated at the Salmon River trap. Four were from Bear Valley Creek (median 254.9 d), one was from Big Creek (travel time 226.0 d), three from Elk Creek (median 253.1 d), five from the Lemhi River weir (median 149.9 d), one from Marsh Creek (travel time 270.8 d), three from the Marsh Creek trap (median 258.9 d), and three from the Sawtooth trap (median 31.5 d).

Hatchery Summer Chinook Salmon—In 2002, 360 hatchery summer Chinook salmon were interrogated at the Salmon River Trap. Fourteen were from Johnson Creek (median travel time 27.8 d), and 346 were from Knox Bridge (median 17.0 d).

Wild Summer Chinook Salmon—In 2002, 41 wild summer Chinook salmon were interrogated at the Salmon River trap. Twenty-one were from the Johnson Creek trap (median travel time 169.8 d), three were from Lake Creek (median 196.9 d), three were from the Pahsimeroi River trap (median 9.6 d), nine from the Secesh River (median 214.7 d), two were from the South Fork Salmon River (median 230.0 d), and three were from the South Fork Salmon River trap (median 190.0 d).

Hatchery Summer Steelhead Trout—In 2002, three hatchery summer steelhead trout were interrogated at the Salmon River trap. One was from the Lemhi River (travel time 7.8 d), one was from the Little Salmon River (travel time 34.8 d), and one was from the Salmon River (travel time 6.9 d).

Wild Summer Steelhead Trout—In 2002, two wild summer steelhead trout were interrogated at the Salmon River trap. One was from the Johnson Creek trap (travel time 8.6 d), and one was from the Lower South Fork Salmon River trap (travel time 192.6 d).

Head of Lower Granite Reservoir to Lower Granite Dam

The PIT tag sample rate at Lower Granite Dam was significantly lower during the 2002 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 2002. 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 were PIT tagged daily at the Snake River trap to provide 17 daily release groups (1,901 individual fish) for median migration rate calculations through Lower Granite Reservoir from April 10 through May 29 (Appendix A. Table 1). Median travel time ranged from 31.0 to 2.7 d (1.7 km/d to 18.9 km/d migration rate) and averaged 12.0 d (6.6 km/d).

Age-0 fall Chinook releases began on May 21 and were a significant portion of the trap catch by May 23. Travel time for hatchery Chinook salmon PIT tag groups released from the Snake River trap after May 22 was very slow (20.4 d) compared to the two days prior to the arrival of the fall Chinook (3.7 d). The differences in travel time were not due to discharge, because average discharge for the two groups released prior to May 23 was 100.8 kcfs and was 99.1 for the four groups released after May 22. Because hatchery Chinook PIT tag groups released after May 23 were predominantly age-0 fall Chinook, which travel much slower than spring/summer Chinook, they were not used in the median migration rate/discharge analysis.

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 hatchery Chinook salmon groups (Table 9). The equation shows that as discharge increases, migration rate increases.

Sufficient numbers of hatchery Chinook salmon were PIT tagged daily at the Salmon River trap to provide 42 daily release groups (4,531 individual fish) for median migration rate calculations through Lower Granite Reservoir from March 14 through May 9 (Appendix A. Table 5). Median travel time ranged from 43.6 to 10.6 d (5.4 km/d to 22.0 km/d migration rate) and averaged 25.1 d (11.0 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 are 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 were PIT tagged daily at the Snake River trap to provide 11 daily release groups (1,071 individual fish) for median migration rate calculations through Lower Granite Reservoir from April 11 through May 23 (Appendix A. Table 2). Median travel time ranged from 10.3 to 3.0 d (5.0 km/d to 17.4 km/d migration rate) and averaged 6.5 d (8.9 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 were PIT tagged daily at the Salmon River trap to provide 31 daily release groups (5,174 individual fish) for median migration rate calculations through Lower Granite Reservoir from March 25 through May 9 (Appendix A. Table 6). Median travel time ranged from 30.6 to 11.2 d (7.6 km/d to 20.8 km/d migration rate) and averaged 18.3 d (13.7 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 were PIT tagged daily at the Snake River trap to provide 47 daily release groups (4,462 individual fish) for median migration rate calculations through Lower Granite Reservoir from April 7 through June 4 (Appendix A. Table 3). Median travel time ranged from 3.6 to 1.4 d (14.5 km/d to 37.3 km/d migration rate) and averaged 2.3 d (24.1 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 were PIT tagged daily at the Salmon River trap to provide 23 daily release groups (1,667 individual fish) for median migration rate calculations through Lower Granite Reservoir from April 11 through May 16 (Appendix A. Table 7). Median travel time ranged from 10.7 to 3.0 d (21.8 km/d to 76.9 km/d migration rate) and averaged 5.9 d (45.2 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 were PIT tagged daily at the Snake River trap to provide 31 daily release groups (2,055 individual fish) for median migration rate calculations through Lower Granite Reservoir from

April 11 through May 30 (Appendix A. Table 4). Median travel time ranged from 4.2 to 1.6 d (12.2 km/d to 32.8 km/d migration rate) and averaged 2.5 d (21.9 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 of wild steelhead trout were PIT tagged daily at the Salmon River trap to provide two daily release groups (137 individual fish) for median migration rate calculations through Lower Granite Reservoir from April 16 through April 17 (Appendix A. Table 8). Median travel time ranged from 5.4 to 4.4 d (43.5 km/d to 52.7 km/d migration rate) and averaged 4.9 d (48.1 km/d).

Not enough data were 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 2002 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. An 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 and wild Chinook salmon daily PIT tag release groups at Lower Granite Dam is 20.6% and ranges between 4.2% and 50.0% for hatchery fish (Appendix B. Table 1). The mean for wild Chinook salmon is 21.1% and ranged from 0.0% to 43.3% (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 16.7% and 73.9% and averaged 61.4%, and wild Chinook salmon ranged from 50.0% to 81.0% and averaged 68.2% (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 9.5% to 50.0% and averaged 16.9% (Appendix B. Table 5). Wild Chinook salmon ranged from 4.8% to 57.1% and averaged 19.8% (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 35.1% and 75.0% and averaged 50.9% (Table 11). Wild Chinook salmon cumulative interrogation rates ranged between 20.0% and 85.7% and averaged 58.8% (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 0% to 90.9% for hatchery fish (Appendix B. Table 3). Wild

steelhead trout ranged from 0% to 87.7% (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 0% and 93.0% and averaged 70.6% (Table 11). Wild steelhead trout cumulative interrogation rates ranged between 8.3% and 90.8% and averaged 74.6% (Table 11).

Average 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 1% to 59.8% and averaged 23.9% for hatchery fish (Appendix B. Table 3). Wild steelhead trout ranged from 0% to 56.6% and averaged 25.4% (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 16.7% to 82.2% and averaged 57.5% (Table 11). Wild steelhead trout ranged from 12.5% to 87.5% and averaged 61.6% (Table 11).

Average 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, is 16.7% and ranged from 0% to 50% (Appendix B Table 7). Wild steelhead trout ranged from 0% to 42.9% and averaged 24.9% (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 17.7% and 78.6% and averaged 45.1% (Table 11). Wild steelhead trout ranged from 18.2% to 85.7% and averaged 54.1% (Table 11).

Table 8. Migration rates (km/day) stratified by 5 kcfs intervals from the Snake River trap to Lower Granite Dam, 2002.

	Hatchery Chinook		Wild Chinook		Hatchery Steelhead		Wild Steelhead	
Discharge Interval	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured
55–60					19.03	71	16.61	40
60–65	5.90	8			18.61	109	19.53	39
65–70	4.27	27	5.01	12	19.67	61	19.95	50
70–75	4.74	62	6.67	48	20.66	136	18.91	56
75–80			6.40	15	19.21	70	19.23	26
80–85	4.50	28	6.47	50	20.60	100	17.02	47
85–90	4.90	30						
90–95	7.13	10	8.24	39	22.58	77	21.09	47
95–100	5.00	66	8.44	30	26.64	146	26.66	62
100–105	5.25	84	9.73	29	29.26	84	25.45	55
105–110	18.89	6	17.41	14	29.38	134	30.84	116
110–115					27.30	77	24.80	29
115–120					34.90	6		
120–125								
125–130					35.10	36		
130–135					35.02	52		

Table 9. Linear regression statistics for migration rate/discharge relations by species rearing type and trap using data stratifies by 5 kcfs intervals, 2001.

Species	Trap	N	Intercept	Slope	r^2	P
Hatchery	Snake	9	-7.755	2.210	0.620	0.012
Chinook	Salmon	5	-0.846	0.725	0.132	0.548
Wild	Snake	8	-6.296	1.890	0.771	0.004

Chinook	Salmon	5	-6.436	2.114	0.901	0.014
Hatchery	Snake	14	-0.508	0.831	0.889	<0.001
Steelhead	Salmon	7	-1.035	1.134	0.827	0.005
Wild	Snake	12	-0.166	0.738	0.754	<0.001
Steelhead	Salmon	2	—	—	—	—

Table 10. Migration rates (km/day) stratified by 5 kcfs intervals from the Salmon River trap to Lower Granite Dam, 2002.

	Hatchery Chinook		Wild Chinook		Hatchery Steelhead		Wild Steelhead	
Discharge Interval	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured	Migration Rate (km/day)	Number Recaptured
50 – 60	6.65	29						
60 – 65	8.56	86			32.97	38		
65 – 70	13.03	379	10.51	110	45.18	71		
70 – 75	8.12	219	14.19	136	48.80	80		
75 – 80	8.83	116	13.43	260				
80 – 85			16.82	390	45.06	661	43.48	23
85 – 90			19.61	142	24.51	6		
90 – 95					59.92	12	52.72	23
95 – 100								
100 – 105					58.75	17		
105 – 110					76.94	7		

Table 11. Interrogations of PIT-tagged fish from the Snake River trap, 1987-2002; Clearwater River trap, 1989-1995; and Salmon River trap 1993-2002, at downstream collection facilities.

				Number Interrogated / Site									
Site	Year	Species[a]	No. Tagged	Ints at Lower Granite	% GRJ	Ints at Little Goose	% GOJ	Ints at Lower Monu-mental	% LMJ	Ints at McNary	% MCJ	Grand Total Ints	Total % Obs.
Snake	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	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[b]	CU	3,275	1,067	32.6%	338	10.3%	—	0.0%	308	9.4%	1,713	52.3%
Snake	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%
	1998	SH	4,274	2,230	52.2%	640	15.0%	303	7.1%	61	1.4%	3,234	75.7%
	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	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%
	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%

Table 11. Continued.

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

[a] CH = Hatchery Chinook, CW = wild Chinook, CU = unknown Chinook, SH = hatchery steelhead, SW = wild steelhead.

[b] Bias may exist as only "quality" fish were tagged.

SUMMARY

Hatchery spring/summer Chinook salmon releases above Lower Granite Dam for 2002 were 284% of the previous year's release. Hatchery fall Chinook salmon releases were 140% of the previous year. Hatchery steelhead trout releases were 99% of 2001 numbers. Hatchery sockeye releases were 278% of 2001 numbers. Hatchery coho releases were 180% of last year's. Hatchery production of spring/summer Chinook salmon in the Clearwater River drainage

was 442%, the Snake River and non-Idaho tributaries 190%, and the Salmon River drainage 223% of 2001 production. Hatchery production of steelhead trout in the Clearwater River drainage was 100%, the Snake River and non-Idaho tributaries was 96%, and the Salmon River was 99% of last year's total. Hatchery production of Chinook salmon and steelhead trout released above Lower Granite Dam was 14,556,798 and 9,447,512, respectively, in 2002. Significant numbers of hatchery sockeye salmon (38,672) and hatchery coho salmon (1,064,672) were released in 2002.

The Snake River trap was operated on the east side of the river from March 10 through June 7 and was out of operation for four days during this period due to high flow and mechanical failures. The Snake River trap captured 7,252 age-1 hatchery and 1,458 wild Chinook salmon, 3,996 age-0 Chinook salmon of unknown rearing, 12,578 hatchery and 2,591 wild steelhead trout, 69 hatchery sockeye, 235 sockeye/kokanee of unknown rearing, and 114 coho of unknown rearing.

The Salmon River trap was operated on the east side of the river from March 10 through May 29 and was out of operation for four days during this period due to heavy debris. The Salmon River trap captured 43,168 age-1 hatchery and 5,548 wild Chinook salmon, 3,284 hatchery and 395 wild steelhead trout, and 22 hatchery sockeye salmon.

Significant migration rate/discharge relations were detected for hatchery and wild Chinook salmon released from the Snake River trap to Lower Granite Dam. A migration rate/discharge relation was not detected for hatchery Chinook salmon from the Salmon River trap to Lower Granite Dam because the migration data was spread over a very narrow range of discharge. 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 2002 must be compared with caution due to the addition of a new collection facility at Lower Monumental Dam in 1993 and the RSW in 2001. For most species and rearing types, the cumulative interrogation rate in 2002 at the Snake River collector dams and McNary Dam was significantly lower than in previous years.

LITERATURE CITED

Beeman, J. W., and D. W. Rondorf. Unpublished Draft Report. Estimating the effects of river flow, smoltification, and other biotic and abiotic variables on the travel time of juvenile salmonids in the Columbia and Snake rivers. Report of the U.S. Fish and Wildlife Service to Bonneville Power Administration, Portland, Oregon.

Buettner, E. W., and S. A. Putnam. 1991. Smolt monitoring at the head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Buettner, E. W., and A. F. Brimmer. 1992. Smolt monitoring at the head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Buettner, E. W., and A. F. Brimmer. 1994. Smolt monitoring at the head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Giorgi, E., G. A. Swan, W. S. Zaugg, T. Coley, and T. Y. Barila. 1988. Susceptibility of Chinook salmon smolts to bypass systems at hydroelectric dams. Fish Management 8:25-29.

Mason, J. E. 1966. The migrant dipper: a trap for downstream migrating fish. Progressive Fish Culturist 28:96-102.

Mosteller, F., and J. W. Tukey. 1977. Data analysis and regression. Addison-Wesley Publishing, Reading, Massachusetts.

Ostle, B., and R. W. Mensing. 1975. Statistics in Research, 3rd Edition. The Iowa State University Press, Ames, Iowa.

Ott, L. 1977. An introduction to statistical methods and data analysis. Duxbury Press, North Scituate, Massachusetts.

Prentice, E. F., T. A. Flagg, and S. McCutcheon. 1987. A study to determine the biological feasibility of a new fish tagging system, 1986-1987. Report of U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northwest and Alaska Fisheries Center to Bonneville Power Administration, Project 83-19, Portland, Oregon.

Raymond, H. L., and G. B. Collins. 1974. Techniques for appraisal of migrating juvenile anadromous fish populations in the Columbia River Basin. IN: Symposium on methodology for the survey, monitoring and appraisal of fishery resources in lakes and large rivers. Food and Agricultural Organization of the United Nations, European Inland Fisheries Advisory Commission, EIFAC/74/I/Symposium-24, Rome, Italy.

Steinhorst, K., B. Dennis, A. Byrne, and A. Polymenopoulos. 1988. Tools for analyzing fish travel time. Report of University of Idaho Statistical Consulting Center to Idaho Department of Fish and Game, Boise, Idaho.

Zar, J. H. 1984. Biostatistical analysis, 2nd edition. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/27/02[b]	5.77	0.00	0.00	5.77	5.77	1	4	25.00%	60.057	8.9
04/01/02[b]	19.08	0.00	0.00	4.87	33.29	2	4	50.00%	77.680	2.7
04/02/02[b]	10.99	0.00	0.00	10.99	10.99	1	6	16.67%	67.650	4.7
04/03/02[b]	9.93	0.00	0.00	9.93	9.93	1	8	12.50%	68.427	5.2
04/04/02[b]	11.61	0.00	0.00	11.00	12.22	2	4	50.00%	77.938	4.4
04/05/02[b]	9.34	0.00	0.00	9.34	9.34	1	2	50.00%	72.950	5.5
04/06/02[b]	8.03	0.00	0.00	2.88	29.27	4	14	28.57%	74.822	6.4
04/07/02[b]	11.47	0.00	0.00	5.01	30.28	5	23	21.74%	86.133	4.5
04/08/02[b]	11.17	0.00	0.00	7.35	26.48	5	21	23.81%	87.042	4.6
04/09/02[b]	5.89	0.00	0.00	4.58	26.42	3	17	17.65	83.486	8.8
04/10/02	9.90	5.53	35.56	5.53	35.56	7	25	28.00%	88.900	5.2
04/11/02[b]	4.95	0.00	0.00	3.52	22.50	5	27	18.52%	91.683	10.4
04/12/02	7.24	4.27	16.79	3.85	21.09	10	59	16.95%	93.950	7.1
04/13/02	10.74	6.10	20.52	2.59	34.57	23	123	18.70%	86.558	4.8
04/14/02	3.64	3.01	8.46	2.15	30.55	21	96	21.88%	103.520	14.2
04/15/02	11.47	8.06	18.51	2.22	21.29	28	151	18.54%	82.850	4.5
04/16/02	18.14	13.97	19.40	3.11	33.51	23	116	19.83%	73.800	2.8
04/17/02	12.66	9.11	17.85	2.48	26.43	26	117	22.22%	71.579	4.1
04/18/02	11.46	7.43	16.45	3.35	18.89	21	115	18.26%	69.933	4.5
04/21/02	14.95	3.89	15.79	3.89	15.79	6	31	19.35%	67.525	3.5
04/22/02[b]	5.79	0.00	0.00	5.79	5.79	1	6	16.67%	65.329	8.9
04/24/02[b]	3.44	0.00	0.00	3.44	3.44	1	8	12.50%	63.700	15.0
04/27/02[b]	5.71	0.00	0.00	5.71	5.71	1	24	4.17%	64.386	9.0
04/28/02[b]	9.03	0.00	0.00	6.50	9.46	3	19	15.79%	68.500	5.7
04/29/02[b]	4.93	0.00	0.00	3.66	5.38	4	47	8.51%	68.383	10.5
04/30/02[b]	4.71	0.00	0.00	3.49	8.76	4	13	30.77%	70.517	10.9
05/01/02	5.46	4.47	7.63	3.44	15.62	13	30	43.33%	72.150	9.4
05/02/02[b]	3.94	0.00	0.00	3.70	4.18	2	12	16.67%	73.720	13.1
05/03/02[b]	4.26	0.00	0.00	4.26	4.26	1	3	33.33%	74.300	12.1
05/04/02[b]	7.08	0.00	0.00	5.46	10.55	5	44	11.36%	68.013	7.3
05/05/02[b]	5.44	0.00	0.00	5.44	5.44	1	9	11.11%	67.967	9.5
05/06/02	8.75	2.50	12.40	2.50	12.40	8	46	17.39%	63.670	5.9
05/07/02[b]	6.71	0.00	0.00	6.71	6.71	1	1	100.00%	62.288	7.7
05/08/02[b]	7.61	0.00	0.00	6.28	9.40	4	24	16.67%	62.389	6.8
05/09/02[b]	8.25	0.00	0.00	7.89	8.61	2	8	25.00%	62.122	6.3
05/14/02[b]	4.21	0.00	0.00	3.56	4.45	3	9	33.33%	67.100	12.3
05/17/02[b]	2.98	0.00	0.00	2.98	2.98	1	5	20.00%	78.375	17.3
05/16/02[b]	2.39	0.00	0.00	2.39	2.39	1	3	33.33%	95.300	21.6
05/21/02	2.73	2.04	4.08	2.04	4.08	6	35	17.14%	105.200	18.9
05/22/02	4.65	3.12	6.94	3.12	6.94	7	31	22.58%	96.267	11.1
05/23/02	5.51	4.63	6.65	3.00	17.44	20	83	24.10%	96.186	9.4
05/24/02	23.12	16.47	25.15	2.77	36.50	46	210	21.90%	101.363	2.2
05/25/02	21.76	20.48	24.53	7.32	33.49	17	60	28.33%	101.448	2.4
05/26/02[b]	22.75	0.00	0.00	7.68	29.56	3	6	50.00%	101.258	2.3
05/28/02[b]	16.52	0.00	0.00	4.01	29.03	2	10	20.00%	105.889	3.1
05/29/02	31.02	23.66	37.10	3.11	57.99	39	140	27.86%	97.463	1.7

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
04/02/02[b]	10.12	0.00	0.00	10.12	10.12	1	1	100.00%	66.882	5.1
04/03/02[b]	7.26	0.00	0.00	7.26	7.26	1	4	25.00%	65.725	7.1
04/05/02[b]	8.30	0.00	0.00	5.95	10.64	2	3	66.67%	70.778	6.2
04/07/02[b]	6.55	0.00	0.00	6.13	6.98	2	7	28.57%	76.063	7.9
04/08/02[b]	24.93	0.00	0.00	6.39	43.46	2	3	66.67%	76.150	2.1
04/09/02[b]	6.10	0.00	0.00	5.89	6.32	2	8	25.00%	83.486	8.5
04/10/02[b]	8.84	0.00	0.00	4.53	17.19	4	16	25.00%	90.210	5.8
04/11/02	4.81	2.94	7.74	2.94	7.74	6	17	35.29%	91.683	10.7
04/12/02[b]	5.59	0.00	0.00	4.19	6.36	5	24	20.83%	95.314	9.2
04/13/02	6.09	3.05	16.48	1.88	16.90	13	43	30.23%	96.871	8.5
04/14/02	3.83	2.01	6.50	1.84	13.68	13	30	43.33%	103.520	13.5
04/15/02	6.63	3.47	9.97	2.51	19.78	33	164	20.12%	90.538	7.8
04/16/02	7.97	6.44	9.45	2.23	29.01	50	213	23.47%	83.189	6.5
04/17/02	8.06	4.39	10.60	3.11	17.27	15	56	26.79%	78.144	6.4
04/18/02	7.73	6.22	8.56	3.33	17.08	48	313	15.34%	73.411	6.7
04/19/02	10.31	5.89	23.25	5.29	29.77	12	47	25.53%	67.964	5.0
04/20/02[b]	12.14	0.00	0.00	4.98	16.66	4	23	17.39%	65.954	4.3
04/29/02[b]	5.32	0.00	0.00	5.10	7.27	4	21	19.05%	68.383	9.7
05/01/02[b]	5.14	0.00	0.00	3.64	6.65	4	14	28.57%	72.150	10.0
05/02/02[b]	3.47	0.00	0.00	3.47	3.47	1	4	25.00%	74.675	14.9
05/06/02[b]	5.62	0.00	0.00	5.19	6.06	2	11	18.18%	64.129	9.2
05/08/02[b]	6.38	0.00	0.00	6.38	6.38	1	2	50.00%	60.800	8.1
05/14/02[b]	2.96	0.00	0.00	2.96	2.96	1	3	33.33%	66.450	17.4
05/19/02[b]	2.65	0.00	0.00	2.65	2.65	1	1	100.00%	99.175	19.5
05/21/02	2.96	2.70	5.34	1.94	8.53	14	54	25.93%	105.200	17.4
05/22/02	7.72	6.19	10.03	2.49	10.42	16	58	27.59%	101.378	6.7
05/23/02	6.14	4.82	6.69	3.45	16.95	17	76	22.37%	96.186	8.4
05/24/02[b]	8.15	0.00	0.00	6.71	42.16	5	22	22.73%	107.956	6.3
05/25/02[B]	17.01	0.00	0.00	3.48	30.53	2	10	20.00%	108.122	3.0
05/26/02[B]	43.40	0.00	0.00	35.52	51.29	2	15	13.33%	87.875	1.2
05/27/02[b]	30.84	0.00	0.00	16.82	34.27	4	19	21.05%	98.022	1.7
05/28/02[B]	18.97	0.00	0.00	5.01	44.58	3	21	14.29%	103.415	2.7
06/02/02[B]	3.82	0.00	0.00	3.76	3.88	2	12	16.67%	121.980	13.5
06/04/02[B]	3.61	0.00	0.00	3.46	3.76	2	12	16.67%	110.480	14.3

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
04/01/02[b]	15.04	0.00	0.00	15.04	15.04	1	8	12.50%	74.938	3.4
04/02/02[b]	10.14	0.00	0.00	3.21	31.35	5	13	38.46%	66.882	5.1
04/03/02[b]	5.52	0.00	0.00	3.64	7.41	2	12	16.67%	64.667	9.3
04/04/02[b]	4.24	0.00	0.00	4.01	4.57	3	7	42.86%	63.900	12.2
04/05/02[b]	3.45	0.00	0.00	3.16	3.68	3	12	25.00%	66.625	15.0
04/06/02[b]	6.11	0.00	0.00	3.09	17.26	4	14	28.57%	72.114	8.4
04/07/02	3.55	2.87	4.99	2.78	10.27	12	43	27.91%	73.280	14.5
04/08/02	3.14	2.54	3.25	2.33	8.38	16	70	22.86%	73.225	16.5
04/09/02	3.42	2.96	3.75	2.40	19.60	16	86	18.60%	73.600	15.1
04/10/02	3.10	2.78	3.82	2.33	15.25	20	55	36.36%	75.025	16.6
04/11/02	3.05	2.44	3.24	1.77	4.80	33	102	32.35%	79.850	16.9
04/12/02	2.29	2.14	2.56	1.87	2.92	34	67	50.75%	80.700	22.5
04/13/02	1.99	1.88	2.25	1.38	5.09	57	124	45.97%	96.667	26.0
04/14/02	1.90	1.75	2.07	1.14	20.33	64	122	52.46%	107.733	27.1
04/15/02	1.92	1.82	2.18	1.22	14.87	70	176	39.77%	111.167	26.8
04/16/02	1.83	1.76	2.01	1.22	12.78	50	110	45.45%	101.233	28.3
04/17/02	2.24	1.97	2.72	1.78	12.10	39	66	59.09%	92.933	23.1
04/18/02	2.63	2.20	2.98	1.84	31.26	66	200	33.00%	80.625	19.6
04/21/02	2.46	2.39	2.68	1.61	24.48	52	87	59.77%	71.100	21.0
04/22/02	2.67	1.98	3.51	1.75	4.26	9	28	32.14%	69.500	19.3
04/23/02	2.78	2.42	4.52	2.42	4.52	7	33	21.21%	67.475	18.6
04/24/02	2.84	2.67	3.45	2.42	8.43	21	79	26.58%	63.700	18.2
04/25/02	3.14	2.62	4.19	1.88	11.65	16	64	25.00%	60.800	16.4
04/26/02	2.45	1.59	6.52	1.59	6.52	7	32	21.88%	59.767	21.1
04/27/02	2.74	2.63	2.86	1.82	10.44	56	290	19.31%	59.650	18.9
04/28/02[b]	2.78	0.00	0.00	2.57	3.09	3	73	4.11%	60.925	18.5
04/29/02	2.70	2.61	18.95	2.61	18.95	6	111	5.41%	63.400	19.1
04/30/02[b]	2.63	0.00	0.00	1.64	3.62	2	200	1.00%	68.050	19.6
05/01/02[b]	3.95	0.00	0.00	3.95	3.95	1	50	2.00%	72.600	13.1
05/02/02	1.69	1.60	2.45	1.55	3.37	11	60	18.33%	75.500	30.5
05/03/02[b]	1.94	0.00	0.00	1.58	2.65	5	25	20.00%	76.300	26.7
05/04/02	1.75	1.41	2.30	1.36	6.07	20	74	27.03%	73.600	29.4
05/05/02	1.91	1.58	9.37	1.58	9.98	11	36	30.56%	71.600	27.1
05/06/02	2.67	2.08	3.00	1.64	9.95	20	202	9.90%	68.750	19.3
05/07/02	2.66	2.39	3.25	2.37	7.30	11	158	6.96%	66.425	19.4
05/08/02	2.84	2.15	4.05	2.15	5.57	9	195	4.62%	62.650	18.1
05/09/02	2.81	2.07	5.85	2.07	5.85	8	31	25.81%	59.450	18.4
05/10/02[b]	3.42	0.00	0.00	3.42	3.42	1	13	7.69%	57.350	15.1
05/12/02	2.82	2.76	2.94	2.44	9.45	43	200	21.50%	60.875	18.3
05/13/02	2.26	1.77	2.92	1.77	5.43	14	171	8.19%	62.600	22.8
05/14/02[b]	1.96	0.00	0.00	1.89	2.04	2	62	3.23%	66.567	26.3
05/15/02	2.44	1.89	3.45	1.73	7.62	14	67	20.90%	67.333	21.2
05/16/02	3.08	2.86	3.28	2.84	3.42	9	63	14.29%	70.150	16.8
05/17/02	2.62	2.25	2.73	2.25	2.73	6	36	16.67%	78.375	19.7
05/19/02	1.76	1.68	2.44	1.47	5.96	32	107	29.91%	95.300	29.3
05/20/02	1.77	1.73	1.85	1.53	4.46	38	93	40.86%	106.433	29.1
05/21/02	1.51	1.44	1.56	1.24	5.31	32	100	32.00%	107.133	34.3
05/22/02	1.68	1.60	1.95	1.34	4.10	34	104	32.69%	104.200	30.7
05/23/02	2.05	1.84	2.35	1.53	11.46	43	96	44.79%	97.767	25.2
05/24/02	2.45	2.03	2.54	1.61	12.69	30	100	30.00%	92.067	21.1
05/26/02	2.01	1.75	4.04	1.75	4.04	8	25	32.00%	89.967	25.6
05/27/02	1.86	1.60	2.59	1.43	2.63	14	48	29.17%	98.233	27.8
05/28/02	1.61	1.51	2.50	1.51	2.50	7	21	33.33%	111.600	32.0
05/29/02	1.52	1.38	1.60	1.27	2.68	23	101	22.77%	125.033	33.9
05/30/02	1.49	1.41	1.61	1.21	2.19	19	191	9.95%	133.567	34.6
05/31/02[b]	2.00	0.00	0.00	1.91	2.41	4	27	14.81%	134.600	25.7
06/01/02	1.43	1.32	1.64	1.26	2.22	12	43	27.91%	133.550	36.1
06/02/02	1.48	1.44	1.66	1.18	2.44	21	80	26.25%	131.450	34.8
06/03/02	1.38	1.25	2.00	1.10	4.89	13	67	19.40%	127.250	37.3
06/04/02	1.48	1.23	1.96	1.23	1.96	6	48	12.50%	118.300	34.9
06/05/02[b]	1.51	0.00	0.00	1.17	1.85	2	35	5.71%	110.467	34.2
06/06/02[b]	1.60	0.00	0.00	1.56	1.66	3	14	21.43%	105.267	32.3

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/26/02[b]	78.61	0.00	0.00	78.61	78.61	1	4	0.00%	80.620	0.7
04/01/02[b]	11.98	0.00	0.00	11.98	11.98	1	2	0.00%	67.369	4.3
04/04/02[b]	36.57	0.00	0.00	36.57	36.57	1	2	0.00%	72.934	1.4
04/05/02[b]	10.96	0.00	0.00	10.96	10.96	1	3	0.00%	80.017	4.7
04/06/02[b]	11.77	0.00	0.00	11.77	11.77	1	2	0.00%	84.500	4.4
04/10/02[b]	3.37	0.00	0.00	3.37	3.37	1	12	0.00%	75.025	15.3
04/11/02	2.94	2.23	3.52	2.06	4.82	12	27	0.00%	79.850	17.5
04/12/02	2.51	2.32	2.61	2.28	3.45	13	25	0.00%	90.875	20.5
04/13/02	1.76	1.71	2.43	1.59	2.48	9	26	0.00%	96.667	29.3
04/14/02	1.86	1.67	1.99	1.39	3.12	26	46	0.00%	107.733	27.8
04/15/02	2.08	1.74	2.33	1.44	7.74	29	58	0.00%	111.167	24.8
04/16/02	2.43	1.79	2.83	1.65	6.17	21	62	0.00%	101.233	21.2
04/17/02	2.42	2.19	3.12	1.84	8.89	34	77	0.00%	92.933	21.3
04/18/02	3.24	2.69	3.47	1.82	9.26	38	138	0.00%	80.625	15.9
04/19/02	3.41	2.74	10.76	2.74	10.76	8	25	0.00%	74.800	15.1
04/20/02	2.87	2.46	3.43	1.95	4.47	9	22	0.00%	72.275	18.0
04/21/02	2.77	2.57	3.73	2.26	5.94	10	32	0.00%	71.200	18.6
04/22/02[b]	11.99	0.00	0.00	11.99	11.99	1	5	0.00%	66.738	4.3
04/23/02[b]	2.51	0.00	0.00	2.51	2.51	1	8	0.00%	67.475	20.5
04/24/02	3.34	2.42	4.13	2.42	4.13	7	13	0.00%	63.700	15.5
04/26/02[b]	3.48	0.00	0.00	3.46	3.51	2	10	0.00%	59.675	14.8
04/27/02	2.60	2.47	2.75	2.38	2.89	10	73	0.00%	59.650	19.9
04/28/02[b]	3.42	0.00	0.00	3.42	3.42	1	23	0.00%	60.925	15.1
04/29/02[b]	33.34	0.00	0.00	33.34	33.34	1	25	0.00%	82.150	1.5
04/30/02[b]	2.56	0.00	0.00	2.55	2.87	3	59	0.00%	68.050	20.2
05/02/02	2.49	1.86	2.99	1.78	4.15	14	47	0.00%	75.500	20.7
05/03/02[b]	2.54	0.00	0.00	2.54	2.54	1	2	0.00%	74.700	20.3
05/04/02	2.30	2.27	5.35	1.85	8.83	12	77	0.00%	73.600	22.4
05/05/02[b]	2.25	0.00	0.00	1.78	8.26	5	24	0.00%	71.600	22.9
05/06/02	2.45	1.89	3.51	1.89	3.51	8	73	0.00%	70.367	21.1
05/07/02	2.83	2.44	3.75	2.31	7.89	18	99	18.18%	66.425	18.3
05/08/02	2.50	2.37	3.23	2.19	5.40	23	95	24.21%	62.650	20.7
05/09/02	3.05	2.85	3.74	1.58	4.73	21	110	19.09%	59.450	16.9
05/10/02	4.23	3.19	7.39	2.47	11.49	9	81	11.11%	58.640	12.2
05/11/02[b]	3.71	0.00	0.00	2.98	4.07	4	25	16.00%	60.220	13.9
05/12/02	2.61	2.42	3.03	2.36	3.95	9	47	19.15%	60.875	19.8
05/13/02[b]	2.43	0.00	0.00	1.95	6.78	3	31	9.68%	62.600	21.3
05/14/02	2.01	1.47	2.71	1.47	2.71	6	55	10.91%	66.567	25.7
05/15/02	2.61	2.26	2.66	1.64	3.87	26	80	32.50%	67.925	19.8
05/16/02	3.04	2.69	3.49	2.52	3.61	9	38	23.68%	70.150	17.0
05/17/02[b]	2.51	0.00	0.00	2.17	2.85	2	26	7.69%	78.375	20.6
05/18/02	2.39	1.76	2.58	1.47	2.97	9	41	21.95%	82.467	21.6
05/19/02	1.67	1.62	2.01	1.45	2.69	16	62	25.81%	95.300	31.0
05/20/02	1.71	1.63	1.94	1.48	2.47	17	44	38.64%	106.433	30.2
05/21/02	1.61	1.54	1.71	1.17	3.65	73	222	32.88%	107.133	32.1
05/22/02	1.84	1.64	2.55	1.44	10.36	34	116	29.31%	104.200	28.1
05/23/02	2.14	1.95	2.36	1.61	7.03	37	100	37.00%	97.767	24.2
05/24/02[b]	3.13	0.00	0.00	2.52	7.96	5	26	19.23%	91.100	16.5
05/28/02[b]	1.74	0.00	0.00	1.47	2.52	3	4	75.00%	111.600	29.6
05/29/02[b]	2.11	0.00	0.00	1.52	2.90	4	10	40.00%	125.033	24.5
05/30/02	1.57	1.41	2.19	1.41	2.19	8	44	18.18%	133.567	32.8
05/31/02[b]	2.49	0.00	0.00	2.20	2.78	2	9	22.22%	134.600	20.7
06/01/02[b]	1.51	0.00	0.00	1.31	1.71	2	15	13.33%	132.867	34.1
06/02/02[b]	1.73	0.00	0.00	1.47	2.94	5	19	26.32%	128.633	29.9
06/03/02[b]	2.01	0.00	0.00	1.38	4.37	5	19	26.32%	122.700	25.7
06/04/02[b]	1.43	0.00	0.00	1.21	1.51	3	17	17.65%	118.300	36.1
06/05/02[b]	3.54	0.00	0.00	1.18	3.82	3	8	37.50%	104.060	14.6
06/06/02[b]	2.73	0.00	0.00	2.73	2.73	1	4	25.00%	101.675	18.9
06/07/02[b]	1.57	0.00	0.00	1.57	1.57	1	3	33.33%	98.767	33.0

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/14/02	35.14	31.88	44.18	26.98	65.02	29	149	19.46%	59.178	6.6
03/15/02	41.42	24.81	49.48	24.81	49.48	7	74	9.46%	61.924	5.6
03/16/02	38.64	31.48	48.51	20.06	63.18	46	377	12.20%	62.540	6.0
03/18/02	39.16	28.52	46.70	26.75	50.72	16	121	13.22%	64.260	6.0
03/19/02	36.00	28.84	46.43	26.84	55.00	16	121	13.22%	65.454	6.5
03/20/02	43.61	30.03	45.48	24.19	59.88	23	118	19.49%	65.889	5.4
03/21/02	30.00	25.76	39.17	20.04	46.32	18	120	15.00%	66.955	7.8
03/22/02	33.55	23.70	44.68	17.62	50.79	22	121	18.18%	68.429	7.0
03/25/02	39.08	28.47	40.16	21.53	42.11	18	121	14.88%	70.300	6.0
03/26/02	29.38	22.35	39.59	15.47	48.53	18	120	15.00%	72.993	8.0
03/27/02	28.79	19.54	39.39	15.22	54.15	23	120	19.17%	73.320	8.1
03/28/02	22.24	18.65	29.98	18.01	39.30	12	120	10.00%	74.596	10.5
03/29/02	17.88	15.19	23.70	11.16	36.48	18	117	15.38%	72.384	13.1
03/30/02[b]	16.81	0.00	0.00	16.81	16.81	1	2	50.00%	73.111	13.9
04/01/02	29.02	14.46	33.10	13.79	44.47	14	120	11.67%	73.370	8.0
04/02/02	31.83	22.72	33.65	12.08	40.19	28	120	23.33%	73.573	7.3
04/03/02	32.30	30.53	32.93	11.36	44.32	25	119	21.01%	73.970	7.2
04/04/02	29.63	23.04	30.63	11.19	38.30	21	119	17.65%	74.390	7.9
04/05/02	26.10	15.29	29.40	10.31	31.05	18	121	14.88%	75.059	9.0
04/08/02	26.34	16.67	33.38	8.35	36.73	19	121	15.70%	76.244	8.9
04/09/02	26.85	21.37	34.65	7.27	40.08	22	120	18.33%	76.025	8.7
04/10/02	27.63	24.75	34.55	10.18	41.21	21	124	16.94%	75.845	8.5
04/11/02	24.57	23.52	31.15	6.84	41.36	16	121	13.22%	76.350	9.5
04/12/02	27.01	22.59	31.56	15.71	39.50	20	118	16.95%	75.461	8.6
04/15/02	29.57	22.08	33.14	18.55	35.63	24	121	19.83%	72.016	7.9
04/16/02	33.51	19.48	34.77	5.16	44.65	18	121	14.88%	71.200	7.0
04/17/02	29.72	25.60	32.43	6.50	35.46	29	121	23.97%	68.881	7.9
04/18/02	30.22	24.51	31.36	14.49	36.05	31	191	16.23%	67.813	7.7
04/19/02	25.13	18.36	30.27	15.58	31.19	10	47	21.28%	66.881	9.3
04/22/02	14.24	12.59	20.15	7.47	27.68	21	120	17.50%	67.313	16.4
04/23/02	17.04	12.49	21.39	7.00	27.74	26	120	21.67%	67.061	13.7
04/24/02	12.68	11.44	14.24	6.02	25.72	26	119	21.85%	66.700	18.4
04/25/02	13.99	11.69	20.45	5.11	25.27	28	135	20.74%	66.713	16.7
04/26/02	12.05	8.77	19.50	7.86	21.61	14	110	12.73%	67.146	19.4
04/29/02	13.36	9.27	16.58	5.34	21.10	28	121	23.14%	66.529	17.5
04/30/02	14.43	9.03	17.17	7.25	19.33	15	120	12.50%	66.087	16.2
05/01/02	16.59	13.59	17.45	4.75	20.78	22	123	17.89%	66.828	14.1
05/02/02	14.83	13.42	16.49	7.71	19.86	17	83	20.48%	66.806	15.8
05/03/02[b]	16.37	0.00	0.00	10.57	17.50	5	36	13.89%	67.424	14.3
05/04/02	14.00	11.39	16.14	11.39	16.14	6	32	18.75%	66.053	16.7
05/05/02	12.30	9.33	13.89	7.91	16.47	17	80	21.25%	64.800	19.0
05/06/02[b]	13.32	0.00	0.00	11.21	16.08	4	30	13.33%	65.521	17.5
05/07/02	12.67	10.81	15.32	9.67	15.46	11	76	14.47%	67.693	18.4
05/08/02	12.20	11.48	13.50	10.13	14.52	9	46	19.57%	67.308	19.2
05/09/02	10.62	9.03	19.32	9.03	19.32	7	28	25.00%	67.208	22.0
05/10/02[b]	9.74	0.00	0.00	7.28	9.99	3	6	50.00%	67.509	24.0
05/11/02[b]	8.84	0.00	0.00	8.69	10.73	5	16	31.25%	68.200	26.4
05/15/02[b]	5.58	0.00	0.00	5.58	5.58	1	1	100.00%	79.657	41.9
05/16/02[b]	5.44	0.00	0.00	5.32	7.82	3	22	13.64%	81.517	42.9
05/17/02[b]	4.71	0.00	0.00	4.71	4.71	1	5	20.00%	88.750	49.6
05/25/02[b]	3.26	0.00	0.00	3.26	3.26	1	2	50.00%	90.350	71.7

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/14/02[b]	32.32	0.00	0.00	32.32	32.32	1	2	50.00%	55.355	7.2
03/16/02[b]	35.34	0.00	0.00	29.87	40.80	2	12	16.67%	61.578	6.6
03/19/02[b]	27.53	0.00	0.00	15.02	40.05	2	3	66.67%	61.462	8.5
03/20/02[b]	27.22	0.00	0.00	27.22	27.22	1	10	10.00%	62.529	8.6
03/21/02[b]	30.92	0.00	0.00	18.47	43.37	2	5	40.00%	67.072	7.6
03/22/02[b]	29.86	0.00	0.00	27.44	32.27	2	7	28.57%	68.290	7.8
03/23/02[b]	22.96	0.00	0.00	22.96	22.96	1	10	10.00%	64.792	10.2
03/24/02[b]	24.44	0.00	0.00	24.44	24.44	1	9	11.11%	69.428	9.6
03/25/02	21.50	18.97	27.79	18.97	27.79	6	19	31.58%	69.470	10.9
03/26/02[b]	15.03	0.00	0.00	15.03	15.03	1	21	4.76%	62.519	15.5
03/27/02	18.73	13.83	25.00	13.83	25.00	6	23	26.09%	69.350	12.5
03/28/02	18.48	16.69	25.82	16.69	25.82	8	26	30.77%	69.874	12.6
03/29/02	20.27	15.19	26.15	13.15	27.90	10	41	24.39%	74.748	11.5
03/30/02	17.77	15.44	27.71	13.81	30.59	10	45	22.22%	74.674	13.1
03/31/02	16.20	14.86	21.09	9.41	34.39	17	80	21.25%	74.035	14.4
04/01/02	14.57	13.89	15.15	9.95	43.99	21	68	30.88%	74.938	16.0
04/02/02	16.16	14.86	22.67	10.40	57.65	25	126	19.84%	78.200	14.5
04/03/02	13.77	11.68	22.79	8.79	48.36	17	93	18.28%	78.580	17.0
04/04/02	16.77	12.87	23.71	9.15	55.11	41	171	23.98%	79.917	13.9
04/05/02	12.85	11.31	17.24	5.94	56.45	63	283	22.26%	82.471	18.2
04/06/02	12.46	10.87	17.64	6.12	48.29	99	521	19.00%	84.500	18.8
04/07/02	12.43	10.90	17.40	7.08	50.50	56	264	21.21%	86.000	18.8
04/08/02	17.96	13.07	20.22	6.60	46.23	70	390	17.95%	80.484	13.0
04/09/02	11.60	9.38	15.96	6.26	43.97	86	422	20.38%	86.077	20.1
04/10/02	13.73	10.40	16.81	4.64	49.20	104	581	17.90%	84.180	17.0
04/11/02	18.48	12.67	23.20	4.40	66.68	77	378	20.37%	78.532	12.6
04/12/02	17.52	11.48	22.52	5.92	40.72	32	143	22.38%	77.626	13.3
04/13/02	14.35	11.99	20.47	4.10	45.53	54	257	21.01%	81.467	16.3
04/14/02	14.95	8.88	21.79	3.27	36.19	29	161	18.01%	79.075	15.6
04/15/02	21.85	14.64	33.14	4.31	46.75	39	173	22.54%	75.583	10.7
04/16/02	14.44	9.43	18.20	4.14	35.66	31	136	22.79%	74.093	16.2
04/17/02	18.31	17.17	22.75	4.20	42.63	47	274	17.15%	71.847	12.8
04/18/02	27.73	16.62	33.40	6.64	37.14	17	112	15.18%	67.807	8.4
04/19/02	30.58	16.46	33.89	15.20	35.19	10	79	12.66%	68.384	7.6
04/20/02	19.81	13.78	31.76	13.78	31.76	8	38	21.05%	67.710	11.8
04/21/02	28.90	14.56	32.77	14.56	32.77	7	36	19.44%	67.603	8.1
04/22/02	26.93	15.03	29.94	11.49	32.29	16	78	20.51%	66.325	8.7
04/23/02	26.01	17.13	29.09	10.73	31.19	9	41	21.95%	66.252	9.0
04/24/02	20.83	12.64	28.43	9.48	30.42	16	96	16.67%	65.177	11.2
04/25/02[b]	11.59	0.00	0.00	11.50	11.67	2	10	20.00%	66.792	20.2
04/27/02[b]	11.46	0.00	0.00	7.88	27.19	4	7	57.14%	67.725	20.4
04/28/02[b]	7.59	0.00	0.00	7.59	7.59	1	4	25.00%	68.033	30.8
04/30/02[b]	8.23	0.00	0.00	8.01	19.00	3	15	20.00%	70.467	28.4
05/04/02[b]	18.49	0.00	0.00	9.62	25.78	4	17	23.53%	73.026	12.6
05/05/02[b]	11.98	0.00	0.00	9.64	13.86	3	20	15.00%	64.800	19.5
05/06/02[b]	19.42	0.00	0.00	19.42	19.42	1	11	9.09%	76.495	12.0
05/08/02[b]	12.20	0.00	0.00	10.26	14.19	4	17	23.53%	67.308	19.2
05/09/02	11.23	8.95	21.64	8.95	21.64	7	19	36.84%	67.208	20.8
05/10/02[b]	9.72	0.00	0.00	9.72	9.72	1	3	33.33%	67.509	24.0
05/11/02[b]	8.29	0.00	0.00	8.07	8.51	2	10	20.00%	64.633	28.2
05/14/02[b]	6.64	0.00	0.00	6.64	6.64	1	1	100.00%	77.675	35.2
05/16/02[b]	5.51	0.00	0.00	5.50	5.66	3	15	20.00%	85.700	42.4
05/17/02[b]	4.80	0.00	0.00	4.80	4.80	1	6	16.67%	88.750	48.7
05/18/02[b]	3.61	0.00	0.00	3.61	3.61	1	5	20.00%	93.280	64.8

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
04/03/02[b]	14.72	0.00	0.00	14.72	14.72	1	4	25.00%	79.394	15.9
04/05/02[b]	19.82	0.00	0.00	9.35	30.29	2	3	66.67%	79.214	11.8
04/07/02[b]	9.87	0.00	0.00	9.87	9.87	1	1	100.00%	85.636	23.7
04/08/02[b]	7.79	0.00	0.00	7.79	7.79	1	1	100.00%	85.078	30.0
04/10/02[b]	5.68	0.00	0.00	5.68	5.68	1	12	8.33%	89.043	41.1
04/11/02	9.53	5.82	11.74	5.82	11.74	6	15	40.00%	88.673	24.5
04/12/02[b]	4.66	0.00	0.00	4.66	4.66	1	4	25.00%	95.933	50.1
04/13/02	4.01	3.35	4.91	3.32	6.41	10	25	40.00%	100.420	58.3
04/14/02	3.04	2.89	6.28	2.89	6.28	7	31	22.58%	106.500	76.9
04/15/02	3.93	3.13	15.75	3.13	15.75	7	14	50.00%	101.900	59.4
04/16/02	3.90	3.09	7.37	2.84	17.64	12	36	33.33%	92.780	59.9
04/17/02	5.18	4.20	7.47	2.82	33.45	44	156	28.21%	82.267	45.1
04/18/02	9.95	4.50	28.85	4.50	28.85	7	29	24.14%	70.891	23.5
04/22/02[b]	6.28	0.00	0.00	5.46	16.58	5	28	17.86%	65.329	37.2
04/23/02[b]	5.96	0.00	0.00	3.92	7.57	5	26	19.23%	64.057	39.2
04/24/02[b]	4.65	0.00	0.00	3.90	6.03	4	54	7.41%	62.350	50.2
04/25/02[b]	16.38	0.00	0.00	3.85	26.66	4	35	11.43%	65.818	14.3
04/26/02[b]	11.91	0.00	0.00	8.20	15.62	2	53	3.77%	67.146	19.6
04/27/02[b]	8.56	0.00	0.00	8.56	8.56	1	52	1.92%	67.150	27.3
04/28/02	8.46	5.83	22.85	5.83	22.85	6	70	8.57%	68.033	27.6
04/29/02[b]	7.05	0.00	0.00	4.86	22.68	5	64	7.81%	69.050	33.2
04/30/02	5.62	5.46	8.56	3.45	19.29	10	84	11.90%	70.429	41.5
05/01/02	4.84	4.48	8.09	2.65	11.15	18	86	20.93%	72.150	48.3
05/02/02	4.13	3.67	4.68	3.49	8.82	22	96	22.92%	73.720	56.6
05/03/02	3.35	2.81	5.67	2.57	6.86	11	103	10.68%	74.700	69.8
05/04/02	4.51	2.83	13.16	2.83	13.16	6	57	10.53%	70.983	51.8
05/05/02	5.64	3.88	13.02	3.29	21.72	16	150	10.67%	66.486	41.4
05/06/02	4.35	3.70	16.42	3.63	17.73	9	121	7.44%	67.120	53.8
05/07/02	6.00	5.13	7.86	3.67	16.19	18	120	15.00%	62.071	39.0
05/08/02	7.98	4.17	14.41	4.02	24.52	10	87	11.49%	62.389	29.3
05/09/02	9.03	4.83	15.22	4.48	22.87	10	62	16.13%	62.880	25.9
05/10/02	10.71	4.99	14.52	4.99	14.52	6	59	10.17%	70.900	21.8
05/13/02	5.56	3.56	12.05	3.56	12.05	7	61	11.48%	66.914	42.0
05/14/02	5.36	4.59	7.81	3.53	16.80	18	64	28.13%	68.817	43.6
05/15/02	4.29	3.69	5.72	3.56	14.50	15	67	22.39%	69.820	54.5
05/16/02	5.20	3.89	6.53	3.50	12.25	17	74	22.97%	81.517	44.9
05/17/02[b]	8.43	0.00	0.00	8.43	8.43	1	13	7.69%	91.756	27.7
05/18/02[b]	4.20	0.00	0.00	3.61	4.78	2	10	20.00%	93.280	55.7
05/19/02[b]	7.61	0.00	0.00	2.90	11.06	3	5	60.00%	95.944	30.7

[a] Confidence intervals calculated with nonparametric statistics.

[b] 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, 2002.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Level[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
04/03/02[b]	14.04	0.00	0.00	14.04	14.04	1	1	100.00%	78.580	16.6
04/05/02[b]	13.07	0.00	0.00	6.65	36.38	3	8	37.50%	82.471	17.9
04/06/02[b]	8.97	0.00	0.00	8.97	8.97	1	4	25.00%	79.480	26.0
04/07/02[b]	37.50	0.00	0.00	37.50	37.50	1	3	33.33%	72.846	6.2
04/09/02[b]	5.65	0.00	0.00	5.65	5.65	1	5	20.00%	83.486	41.4
04/10/02[b]	4.34	0.00	0.00	4.03	7.29	3	14	21.43%	78.520	53.9
04/11/02[b]	3.60	0.00	0.00	3.60	3.60	1	5	20.00%	88.160	64.9
04/13/02[b]	8.53	0.00	0.00	2.54	14.51	2	3	66.67%	89.290	27.4
04/14/02[b]	2.73	0.00	0.00	2.73	2.73	1	4	25.00%	106.500	85.6
04/15/02[b]	6.99	0.00	0.00	2.91	11.06	2	11	18.18%	90.538	33.4
04/16/02	4.43	3.59	7.52	2.92	32.24	23	63	36.51%	92.780	52.7
04/17/02	5.37	4.29	8.46	3.50	31.13	23	74	31.08%	82.267	43.5
04/18/02[b]	5.24	0.00	0.00	4.19	5.41	3	7	42.86%	77.517	44.6
04/19/02[b]	6.32	0.00	0.00	5.49	7.15	2	7	28.57%	72.700	36.9
04/20/02[b]	4.55	0.00	0.00	4.55	4.55	1	1	100.00%	70.750	51.3
04/24/02[b]	5.28	0.00	0.00	4.62	5.95	2	13	15.38%	62.350	44.2
04/25/02[b]	13.05	0.00	0.00	13.05	13.05	1	4	25.00%	66.914	17.9
04/28/02[b]	20.59	0.00	0.00	20.59	20.59	1	5	20.00%	66.350	11.3
04/30/02[b]	9.83	0.00	0.00	9.83	9.83	1	7	14.29%	68.973	23.8
05/01/02[b]	17.10	0.00	0.00	4.53	21.05	3	7	42.86%	66.828	13.7
05/02/02[b]	4.68	0.00	0.00	3.78	5.58	2	6	33.33%	73.550	49.9
05/03/02[b]	4.62	0.00	0.00	3.67	5.57	2	7	28.57%	73.333	50.6
05/05/02[b]	5.53	0.00	0.00	4.73	6.34	2	8	25.00%	66.486	42.2
05/07/02[b]	7.56	0.00	0.00	3.55	10.85	4	22	18.18%	62.978	30.9
05/08/02[b]	7.84	0.00	0.00	7.84	7.84	1	11	9.09%	62.389	29.8
05/09/02[b]	5.34	0.00	0.00	5.27	5.42	2	5	40.00%	59.517	43.7
05/10/02[b]	15.20	0.00	0.00	15.20	15.20	1	6	16.67%	78.431	15.4
05/12/02[b]	6.03	0.00	0.00	6.03	6.03	1	6	16.67%	63.814	38.8
05/14/02[b]	4.33	0.00	0.00	4.32	4.35	2	6	33.33%	67.100	53.9
05/15/02[b]	4.14	0.00	0.00	4.14	4.14	1	3	33.33%	69.820	56.5
05/17/02[b]	4.96	0.00	0.00	3.26	9.29	3	7	42.86%	88.750	47.1

[a] Confidence intervals calculated with nonparametric statistics.

[b] Not used in statistical analysis because analysis showed too few recaptures.

Appendix B. Table 1. Release location not listed in table headings for Appendix B. 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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/26/02	4	0	0.00%	1	25.00%	2	50.00%	0	0.00%	3	75.00%
03/27/02	4	1	25.00%	1	25.00%	1	25.00%	0	0.00%	3	75.00%
04/01/02	4	2	50.00%	0	0.00%	0	0.00%	0	0.00%	2	50.00%
04/02/02	6	1	16.67%	0	0.00%	0	0.00%	0	0.00%	1	16.67%
04/03/02	8	1	12.50%	4	50.00%	0	0.00%	0	0.00%	5	62.50%
04/04/02	4	2	50.00%	2	50.00%	0	0.00%	0	0.00%	4	100.00%
04/05/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
04/06/02	14	4	28.57%	3	21.43%	1	7.14%	0	0.00%	8	57.14%
04/07/02	23	5	21.74%	7	30.43%	5	21.74%	0	0.00%	14	73.91%
04/08/02	21	5	23.81%	3	14.29%	4	19.05%	0	0.00%	12	57.14%
04/09/02	17	3	17.65%	2	11.76%	4	23.53%	1	5.88%	10	58.82%
04/10/02	25	7	28.00%	4	16.00%	5	20.00%	0	0.00%	16	64.00%
04/11/02	27	5	18.52%	4	14.81%	4	14.81%	0	0.00%	13	48.15%
04/12/02	59	10	16.95%	17	28.81%	10	16.95%	0	0.00%	37	62.71%
04/13/02	123	23	18.70%	25	20.33%	30	24.39%	0	0.00%	78	63.41%
04/14/02	96	21	21.88%	21	21.88%	20	20.83%	0	0.00%	62	64.58%
04/15/02	151	28	18.54%	39	25.83%	23	15.23%	0	0.00%	90	59.60%
04/16/02	116	23	19.83%	24	20.69%	22	18.97%	1	0.86%	70	60.34%
04/17/02	117	26	22.22%	25	21.37%	22	18.80%	0	0.00%	73	62.39%
04/18/02	115	21	18.26%	24	20.87%	24	20.87%	0	0.00%	69	60.00%
04/21/02	31	6	19.35%	4	12.90%	6	19.35%	0	0.00%	16	51.61%
04/22/02	6	1	16.67%	0	0.00%	1	16.67%	0	0.00%	2	33.33%
04/23/02	4	0	0.00%	2	50.00%	1	25.00%	0	0.00%	3	75.00%
04/24/02	8	1	12.50%	2	25.00%	2	25.00%	0	0.00%	5	62.50%
04/25/02	5	0	0.00%	1	20.00%	2	40.00%	0	0.00%	3	60.00%
04/26/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/27/02	24	1	4.17%	6	25.00%	7	29.17%	0	0.00%	14	58.33%
04/28/02	19	3	15.79%	5	26.32%	1	5.26%	0	0.00%	9	47.37%
04/29/02	47	4	8.51%	9	19.15%	14	29.79%	0	0.00%	27	57.45%
04/30/02	13	4	30.77%	0	0.00%	2	15.38%	0	0.00%	6	46.15%
05/01/02	30	13	43.33%	3	10.00%	5	16.67%	0	0.00%	21	70.00%
05/02/02	12	2	16.67%	1	8.33%	2	16.67%	0	0.00%	5	41.67%
05/03/02	3	1	33.33%	1	33.33%	0	0.00%	0	0.00%	2	66.67%
05/04/02	44	5	11.36%	11	25.00%	12	27.27%	0	0.00%	28	63.64%
05/05/02	9	1	11.11%	2	22.22%	2	22.22%	0	0.00%	5	55.56%
05/06/02	46	8	17.39%	4	8.70%	7	15.22%	0	0.00%	19	41.30%
05/07/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
05/08/02	24	4	16.67%	5	20.83%	6	25.00%	0	0.00%	15	62.50%
05/09/02	8	2	25.00%	1	12.50%	1	12.50%	0	0.00%	4	50.00%
05/10/02	3	0	0.00%	1	33.33%	1	33.33%	0	0.00%	2	66.67%
05/11/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
05/12/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/13/02	3	0	0.00%	1	33.33%	1	33.33%	0	0.00%	2	66.67%
05/14/02	9	3	33.33%	1	11.11%	2	22.22%	0	0.00%	6	66.67%
05/15/02	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	1	100.00%
05/16/02	2	0	0.00%	0	0.00%	2	100.00%	0	0.00%	2	100.00%
05/17/02	5	1	20.00%	2	40.00%	1	20.00%	0	0.00%	4	80.00%
05/18/02	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	1	100.00%
05/19/02	3	1	33.33%	0	0.00%	0	0.00%	0	0.00%	1	33.33%
05/20/02	5	0	0.00%	2	40.00%	1	20.00%	0	0.00%	3	60.00%
05/21/02	35	6	17.14%	11	31.43%	6	17.14%	0	0.00%	23	65.71%
05/22/02	31	7	22.58%	14	45.16%	0	0.00%	0	0.00%	21	67.74%
05/23/02	83	20	24.10%	29	34.94%	10	12.05%	0	0.00%	59	71.08%
05/24/02	210	46	21.90%	65	30.95%	35	16.67%	0	0.00%	146	69.52%
05/25/02	60	17	28.33%	8	13.33%	7	11.67%	0	0.00%	32	53.33%
05/26/02	6	3	50.00%	2	33.33%	0	0.00%	0	0.00%	5	83.33%
05/27/02	5	0	0.00%	0	0.00%	3	60.00%	0	0.00%	3	60.00%
05/28/02	10	2	20.00%	2	20.00%	1	10.00%	0	0.00%	5	50.00%
05/29/02	140	39	27.85%	23	16.43%	20	14.29%	0	0.00%	82	58.57%
05/31/02	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
06/01/02	2	0	0.00%	0	0.00%	1	50.00%	0	0.00%	1	50.00%

Appendix B. Table 1 Continued.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
06/02/02	4	0	0.00%	0	0.00%	2	50.00%	0	0.00%	2	50.00%
06/03/02	3	0	0.00%	1	33.33%	2	66.67%	0	0.00%	3	100.00%
06/04/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
06/05/02	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	1	100.00%
06/06/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
Totals	**1901**	**391**	**20.57%**	**428**	**22.51%**	**346**	**18.20%**	**2**	**0.11%**	**1167**	**61.39%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/26/02	5	0	0.00%	2	40.00%	0	0.00%	0	0.00%	2	40.00%
04/01/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/02/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
04/03/02	4	1	25.00%	1	25.00%	0	0.00%	0	0.00%	2	50.00%
04/05/02	3	2	66.67%		0.00%	1	33.33%	0	0.00%	3	100.00%
04/06/02	4	0	0.00%	1	25.00%	1	25.00%	0	0.00%	2	50.00%
04/07/02	7	2	28.57%	1	14.29%	1	14.29%	0	0.00%	4	57.14%
04/08/02	3	2	66.67%	0	0.00%	0	0.00%	0	0.00%	2	66.67%
04/09/02	8	2	25.00%	2	25.00%	0	0.00%	0	0.00%	4	50.00%
04/10/02	16	4	25.00%	4	25.00%	2	12.50%	0	0.00%	10	62.50%
04/11/02	17	6	35.29%	6	35.29%	0	0.00%	0	0.00%	12	70.59%
04/12/02	24	5	20.83%	7	29.17%	4	16.67%	0	0.00%	16	66.67%
04/13/02	43	13	30.23%	9	20.93%	8	18.60%	0	0.00%	30	69.77%
04/14/02	30	13	43.33%	4	13.33%	2	6.67%	0	0.00%	19	63.33%
04/15/02	164	33	20.12%	48	29.27%	27	16.46%	0	0.00%	108	65.85%
04/16/02	213	50	23.47%	65	30.52%	36	16.90%	0	0.00%	151	70.89%
04/17/02	56	15	26.79%	10	17.86%	12	21.43%	0	0.00%	37	66.07%
04/18/02	313	48	15.34%	121	38.66%	53	16.93%	0	0.00%	222	70.93%
04/19/02	47	12	25.53%	11	23.40%	10	21.28%	0	0.00%	33	70.21%
04/20/02	23	4	17.39%	9	39.13%	3	13.04%	0	0.00%	16	69.57%
04/21/02	8	0	0.00%	4	50.00%	1	12.50%	0	0.00%	5	62.50%
04/23/02	2	0	0.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%
04/24/02	3	0	0.00%	1	33.33%	0	0.00%	0	0.00%	1	33.33%
04/26/02	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	1	100.00%
04/27/02	4	0	0.00%	4	100.00%	0	0.00%	0	0.00%	4	100.00%
04/28/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/29/02	21	4	19.05%	3	14.29%	6	28.57%	0	0.00%	13	61.90%
04/30/02	5	0	0.00%	4	80.00%	1	20.00%	0	0.00%	5	100.00%
05/01/02	14	4	28.57%	3	21.43%	3	21.43%	0	0.00%	10	71.43%
05/02/02	4	1	25.00%	1	25.00%	0	0.00%	0	0.00%	2	50.00%
05/03/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/04/02	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/05/02	4	0	0.00%	1	25.00%	1	25.00%	0	0.00%	2	50.00%
05/06/02	11	2	18.18%	4	36.36%	2	18.18%	0	0.00%	8	72.73%
05/08/02	2	1	50.00%	1	50.00%	0	0.00%	0	0.00%	2	100.00%
05/09/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/10/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/11/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/12/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/14/02	3	1	33.33%	0	0.00%	1	33.33%	0	0.00%	2	66.67%
05/15/02	2	0	0.00%	2	100.00%	0	0.00%	0	0.00%	2	100.00%
05/18/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/19/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
05/20/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/21/02	54	14	25.93%	23	42.59%	4	7.41%	0	0.00%	41	75.93%
05/22/02	58	16	27.59%	27	46.55%	4	6.90%	0	0.00%	47	81.03%
05/23/02	76	17	22.37%	28	36.84%	6	7.89%	1	1.32%	52	68.42%
05/24/02	22	5	22.73%	8	36.36%	3	13.64%	0	0.00%	16	72.73%
05/25/02	10	2	20.00%	3	30.00%	2	20.00%	0	0.00%	7	70.00%
05/26/02	15	2	13.33%	4	26.67%	2	13.33%	0	0.00%	8	53.33%
05/27/02	19	4	21.05%	5	26.32%	2	10.53%	0	0.00%	11	57.89%
05/28/02	21	3	14.29%	7	33.33%	1	4.76%	0	0.00%	11	52.38%
05/31/02	4	0	0.00%	1	25.00%	2	50.00%	0	0.00%	3	75.00%
06/02/02	12	2	16.67%	4	33.33%	0	0.00%	0	0.00%	6	50.00%
06/03/02	3	0	0.00%	1	33.33%	1	33.33%	0	0.00%	2	66.67%
06/04/02	12	2	16.67%	4	33.33%	3	25.00%	0	0.00%	9	75.00%
06/05/02	2	0	0.00%	1	50.00%	1	50.00%	0	0.00%	2	100.00%
06/06/02	3	0	0.00%	2	66.67%	0	0.00%	0	0.00%	2	66.67%
Totals	**1393**	**294**	**21.11%**	**448**	**32.16%**	**207**	**14.86%**	**1**	**0.07%**	**950**	**68.20%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
04/01/02	8	1	12.50%	2	25.00%	0	0.00%	0	0.00%	3	37.50%
04/02/02	13	5	38.46%	1	7.69%	1	7.69%	0	0.00%	7	53.85%
04/03/02	12	2	16.67%	0	0.00%	0	0.00%	0	0.00%	2	16.67%
04/04/02	7	3	42.86%	2	28.57%	0	0.00%	0	0.00%	5	71.43%
04/05/02	12	3	25.00%	1	8.33%	0	0.00%	0	0.00%	4	33.33%
04/06/02	14	4	28.57%	2	14.29%	0	0.00%	0	0.00%	6	42.86%
04/07/02	43	12	27.91%	8	18.60%	2	4.65%	0	0.00%	22	51.16%
04/08/02	70	16	22.86%	20	28.57%	6	8.57%	0	0.00%	42	60.00%
04/09/02	86	16	18.60%	34	39.53%	1	1.16%	0	0.00%	51	59.30%
04/10/02	55	20	36.36%	18	32.73%	2	3.64%	0	0.00%	40	72.73%
04/11/02	102	33	32.35%	38	37.25%	3	2.94%	0	0.00%	74	72.55%
04/12/02	67	34	50.75%	8	11.94%	4	5.97%	0	0.00%	46	68.66%
04/13/02	124	57	45.97%	15	12.10%	7	5.65%	0	0.00%	79	63.71%
04/14/02	122	64	52.46%	16	13.11%	12	9.84%	0	0.00%	92	75.41%
04/15/02	176	70	39.77%	21	11.93%	20	11.36%	0	0.00%	111	63.07%
04/16/02	110	50	45.45%	18	16.36%	5	4.55%	0	0.00%	73	66.36%
04/17/02	66	39	59.09%	7	10.61%	5	7.58%	0	0.00%	51	77.27%
04/18/02	200	66	33.00%	35	17.50%	26	13.00%	0	0.00%	127	63.50%
04/19/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/21/02	87	52	59.77%	5	5.75%	11	12.64%	0	0.00%	68	78.16%
04/22/02	28	9	32.14%	5	17.86%	3	10.71%	0	0.00%	17	60.71%
04/23/02	33	7	21.21%	7	21.21%	7	21.21%	0	0.00%	21	63.64%
04/24/02	79	21	26.58%	10	12.66%	18	22.78%	0	0.00%	49	62.03%
04/25/02	64	16	25.00%	10	15.63%	11	17.19%	0	0.00%	37	57.81%
04/26/02	32	7	21.88%	7	21.88%	5	15.63%	0	0.00%	19	59.38%
04/27/02	290	56	19.31%	34	11.72%	49	16.90%	0	0.00%	139	47.93%
04/28/02	73	3	4.11%	12	16.44%	15	20.55%	0	0.00%	30	41.10%
04/29/02	111	6	5.41%	12	10.81%	19	17.12%	0	0.00%	37	33.33%
04/30/02	200	2	1.00%	34	17.00%	42	21.00%	0	0.00%	78	39.00%
05/01/02	50	1	2.00%	5	10.00%	9	18.00%	0	0.00%	15	30.00%
05/02/02	60	11	18.33%	3	5.00%	12	20.00%	0	0.00%	26	43.33%
05/03/02	25	5	20.00%	0	0.00%	3	12.00%	0	0.00%	8	32.00%
05/04/02	74	20	27.03%	3	4.05%	15	20.27%	0	0.00%	38	51.35%
05/05/02	36	11	30.56%	3	8.33%	10	27.78%	0	0.00%	24	66.67%
05/06/02	202	20	9.90%	29	14.36%	51	25.25%	0	0.00%	100	49.50%
05/07/02	158	11	6.96%	16	10.13%	38	24.05%	0	0.00%	65	41.14%
05/08/02	195	9	4.62%	30	15.38%	55	28.21%	0	0.00%	94	48.21%
05/09/02	31	8	25.81%	3	9.68%	5	16.13%	0	0.00%	16	51.61%
05/10/02	13	1	7.69%	1	7.69%	3	23.08%	0	0.00%	5	38.46%
05/12/02	200	43	21.50%	41	20.50%	36	18.00%	0	0.00%	120	60.00%
05/13/02	171	14	8.19%	29	16.96%	51	29.82%	0	0.00%	94	54.97%
05/14/02	62	2	3.23%	14	22.58%	12	19.35%	0	0.00%	28	45.16%
05/15/02	67	14	20.90%	17	25.37%	16	23.88%	0	0.00%	47	70.15%
05/16/02	63	9	14.29%	20	31.75%	13	20.63%	0	0.00%	42	66.67%
05/17/02	36	6	16.67%	6	16.67%	6	16.67%	0	0.00%	18	50.00%
05/19/02	107	32	29.91%	19	17.76%	18	16.82%	0	0.00%	69	64.49%
05/20/02	93	38	40.86%	20	21.51%	18	19.35%	1	1.08%	77	82.80%
05/21/02	100	32	32.00%	18	18.00%	27	27.00%	0	0.00%	77	77.00%
05/22/02	104	34	32.69%	25	24.04%	17	16.35%	0	0.00%	76	73.08%
05/23/02	96	43	44.79%	17	17.71%	11	11.46%	1	1.04%	72	75.00%
05/24/02	100	30	30.00%	28	28.00%	7	7.00%	0	0.00%	65	65.00%
05/26/02	25	8	32.00%	10	40.00%	1	4.00%	0	0.00%	19	76.00%
05/27/02	48	14	29.17%	15	31.25%	6	12.50%	0	0.00%	35	72.92%
05/28/02	21	7	33.33%	9	42.86%	0	0.00%	0	0.00%	16	76.19%
05/29/02	101	23	22.77%	21	20.79%	18	17.82%	0	0.00%	62	61.39%
05/30/02	191	19	9.95%	47	24.61%	30	15.71%	0	0.00%	96	50.26%
05/31/02	27	4	14.81%	7	25.93%	2	7.41%	0	0.00%	13	48.15%
06/01/02	43	12	27.91%	8	18.60%	9	20.93%	0	0.00%	29	67.44%
06/02/02	80	21	26.25%	5	6.25%	14	17.50%	0	0.00%	40	50.00%
06/03/02	67	13	19.40%	3	4.48%	18	26.87%	0	0.00%	34	50.75%
06/04/02	48	6	12.50%	13	27.08%	6	12.50%	0	0.00%	25	52.08%
06/05/02	35	2	5.71%	7	20.00%	6	17.14%	0	0.00%	15	42.86%

Appendix B. Table 3. Continued.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
06/06/02	14	3	21.43%	1	7.14%		0.00%	0	0.00%	4	28.57%
06/07/02	3		0.00%	0	0.00%	1	33.33%	0	0.00%	1	33.33%
Totals	**5031**	**1200**	**23.85%**	**875**	**17.39%**	**818**	**16.26%**	**2**	**0.04%**	**2895**	**57.54%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/26/02	4	1	25.00%	0	0.00%	0	0.00%	0	0.00%	1	25.00%
04/01/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
04/02/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
04/03/02	3		0.00%	1	33.33%	1	33.33%	0	0.00%	2	66.67%
04/04/02	2	1	50.00%	1	50.00%	0	0.00%	0	0.00%	2	100.00%
04/05/02	3	1	33.33%	1	33.33%	0	0.00%	0	0.00%	2	66.67%
04/06/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
04/07/02	5	0	0.00%	2	40.00%	0	0.00%	0	0.00%	2	40.00%
04/08/02	8	0	0.00%	1	12.50%	0	0.00%	0	0.00%	1	12.50%
04/09/02	2	0	0.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%
04/10/02	12	1	8.33%	5	41.67%	0	0.00%	0	0.00%	6	50.00%
04/11/02	27	12	44.44%	4	14.81%	0	0.00%	0	0.00%	16	59.26%
04/12/02	25	13	52.00%	3	12.00%	0	0.00%	0	0.00%	16	64.00%
04/13/02	26	9	34.62%	4	15.38%	1	3.85%	0	0.00%	14	53.85%
04/14/02	46	26	56.52%	9	19.57%	0	0.00%	0	0.00%	35	76.09%
04/15/02	58	29	50.00%	10	17.24%	1	1.72%	0	0.00%	40	68.97%
04/16/02	62	21	33.87%	13	20.97%	4	6.45%	0	0.00%	38	61.29%
04/17/02	77	34	44.16%	11	14.29%	2	2.60%	0	0.00%	47	61.04%
04/18/02	138	38	27.54%	37	26.81%	7	5.07%	0	0.00%	82	59.42%
04/19/02	25	8	32.00%	4	16.00%	3	12.00%	0	0.00%	15	60.00%
04/20/02	22	9	40.91%	0	0.00%	2	9.09%	0	0.00%	11	50.00%
04/21/02	32	10	31.25%	5	15.63%	2	6.25%	0	0.00%	17	53.13%
04/22/02	5	1	20.00%	0	0.00%	0	0.00%	0	0.00%	1	20.00%
04/23/02	8	1	12.50%	2	25.00%	0	0.00%	0	0.00%	3	37.50%
04/24/02	13	7	53.85%	2	15.38%	2	15.38%	0	0.00%	11	84.62%
04/25/02	8	0	0.00%	1	12.50%	3	37.50%	0	0.00%	4	50.00%
04/26/02	10	2	20.00%	3	30.00%	2	20.00%	0	0.00%	7	70.00%
04/27/02	73	10	13.70%	17	23.29%	17	23.29%	0	0.00%	44	60.27%
04/28/02	23	1	4.35%	9	39.13%	4	17.39%	0	0.00%	14	60.87%
04/29/02	25	1	4.00%	8	32.00%	4	16.00%	0	0.00%	13	52.00%
04/30/02	59	3	5.08%	12	20.34%	17	28.81%	0	0.00%	32	54.24%
05/01/02	27	0	0.00%	3	11.11%	7	25.93%	0	0.00%	10	37.04%
05/02/02	47	14	29.79%	5	10.64%	6	12.77%	0	0.00%	25	53.19%
05/03/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
05/04/02	77	12	15.58%	2	2.60%	22	28.57%	0	0.00%	36	46.75%
05/05/02	24	5	20.83%	0	0.00%	10	41.67%	0	0.00%	15	62.50%
05/06/02	73	8	10.96%	8	10.96%	24	32.88%	0	0.00%	40	54.79%
05/07/02	99	18	18.18%	11	11.11%	24	24.24%	0	0.00%	53	53.54%
05/08/02	95	23	24.21%	10	10.53%	23	24.21%	0	0.00%	56	58.95%
05/09/02	110	21	19.09%	13	11.82%	25	22.73%	0	0.00%	59	53.64%
05/10/02	81	9	11.11%	15	18.52%	24	29.63%	0	0.00%	48	59.26%
05/11/02	25	4	16.00%	2	8.00%	7	28.00%	0	0.00%	13	52.00%
05/12/02	47	9	19.15%	4	8.51%	14	29.79%	0	0.00%	27	57.45%
05/13/02	31	3	9.68%	6	19.35%	5	16.13%	0	0.00%	14	45.16%
05/14/02	55	6	10.91%	6	10.91%	15	27.27%	0	0.00%	27	49.09%
05/15/02	80	26	32.50%	18	22.50%	18	22.50%	0	0.00%	62	77.50%
05/16/02	38	9	23.68%	12	31.58%	7	18.42%	0	0.00%	28	73.68%
05/17/02	26	2	7.69%	7	26.92%	3	11.54%	0	0.00%	12	46.15%
05/18/02	41	9	21.95%	10	24.39%	8	19.51%	0	0.00%	27	65.85%
05/19/02	62	16	25.81%	12	19.35%	13	20.97%	1	1.61%	42	67.74%
05/20/02	44	17	38.64%	4	9.09%	14	31.82%	0	0.00%	35	79.55%
05/21/02	222	73	32.88%	46	20.72%	45	20.27%	0	0.00%	164	73.87%
05/22/02	116	34	29.31%	34	29.31%	15	12.93%	0	0.00%	83	71.55%
05/23/02	100	37	37.00%	27	27.00%	14	14.00%	0	0.00%	78	78.00%
05/24/02	26	5	19.23%	9	34.62%	5	19.23%	0	0.00%	19	73.08%
05/25/02	8	0	0.00%	6	75.00%	1	12.50%	0	0.00%	7	87.50%
05/26/02	2	0	0.00%	2	100.00%	0	0.00%	0	0.00%	2	100.00%
05/27/02	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/28/02	4	3	75.00%	1	25.00%	0	0.00%	0	0.00%	4	100.00%
05/29/02	10	4	40.00%	2	20.00%	1	10.00%	0	0.00%	7	70.00%
05/30/02	44	8	18.18%	10	22.73%	8	18.18%	0	0.00%	26	59.09%
05/31/02	9	2	22.22%	1	11.11%	2	22.22%	0	0.00%	5	55.56%

Appendix B. Table 4. Continued.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
06/01/02	15	2	13.33%	6	40.00%	1	6.67%	0	0.00%	9	60.00%
06/02/02	19	5	26.32%	1	5.26%	4	21.05%	0	0.00%	10	52.63%
06/03/02	19	5	26.32%	3	15.79%	2	10.53%	0	0.00%	10	52.63%
06/04/02	17	3	17.65%	2	11.76%	0	0.00%	0	0.00%	5	29.41%
06/05/02	8	3	37.50%	4	50.00%	0	0.00%	0	0.00%	7	87.50%
06/06/02	4	1	25.00%	3	75.00%	0	0.00%	0	0.00%	4	100.00%
06/07/02	3	1	33.33%	0	0.00%	0	0.00%	0	0.00%	1	33.33%
Totals	**2518**	**639**	**25.38%**	**472**	**18.75%**	**439**	**17.43%**	**1**	**0.04%**	**1551**	**61.60%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/14/02	149	29	19.46%	18	12.08%	22	14.77%	1	0.67%	70	46.98%
03/15/02	74	7	9.46%	10	13.51%	9	12.16%	0	0.00%	26	35.14%
03/16/02	377	46	12.20%	63	16.71%	64	16.98%	0	0.00%	173	45.89%
03/18/02	121	16	13.22%	23	19.01%	15	12.40%	0	0.00%	54	44.63%
03/19/02	121	16	13.22%	15	12.40%	19	15.70%	0	0.00%	50	41.32%
03/20/02	118	23	19.49%	13	11.02%	15	12.71%	0	0.00%	51	43.22%
03/21/02	120	18	15.00%	21	17.50%	21	17.50%	0	0.00%	60	50.00%
03/22/02	121	22	18.18%	16	13.22%	15	12.40%	0	0.00%	53	43.80%
03/25/02	121	18	14.88%	18	14.88%	21	17.36%	0	0.00%	57	47.11%
03/26/02	120	18	15.00%	18	15.00%	20	16.67%	0	0.00%	56	46.67%
03/27/02	120	23	19.17%	20	16.67%	23	19.17%	0	0.00%	66	55.00%
03/28/02	120	12	10.00%	27	22.50%	22	18.33%	0	0.00%	61	50.83%
03/29/02	117	18	15.38%	17	14.53%	17	14.53%	1	0.85%	53	45.30%
03/30/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
04/01/02	120	14	11.67%	27	22.50%	15	12.50%	0	0.00%	56	46.67%
04/02/02	120	28	23.33%	12	10.00%	22	18.33%	0	0.00%	62	51.67%
04/03/02	119	25	21.01%	18	15.13%	19	15.97%	0	0.00%	62	52.10%
04/04/02	119	21	17.65%	14	11.76%	26	21.85%	0	0.00%	61	51.26%
04/05/02	121	18	14.88%	20	16.53%	19	15.70%	0	0.00%	57	47.11%
04/06/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/08/02	121	19	15.70%	19	15.70%	28	23.14%	0	0.00%	66	54.55%
04/09/02	120	22	18.33%	14	11.67%	32	26.67%	1	0.83%	69	57.50%
04/10/02	124	21	16.94%	21	16.94%	20	16.13%	1	0.81%	63	50.81%
04/11/02	121	16	13.22%	15	12.40%	25	20.66%	0	0.00%	56	46.28%
04/12/02	118	20	16.95%	19	16.10%	26	22.03%	0	0.00%	65	55.08%
04/15/02	121	24	19.83%	20	16.53%	25	20.66%	0	0.00%	69	57.02%
04/16/02	121	18	14.88%	20	16.53%	18	14.88%	0	0.00%	56	46.28%
04/17/02	121	29	23.97%	21	17.36%	21	17.36%	0	0.00%	71	58.68%
04/18/02	191	31	16.23%	31	16.23%	39	20.42%	0	0.00%	101	52.88%
04/19/02	47	10	21.28%	8	17.02%	7	14.89%	0	0.00%	25	53.19%
04/22/02	120	21	17.50%	19	15.83%	15	12.50%	0	0.00%	55	45.83%
04/23/02	120	26	21.67%	23	19.17%	19	15.83%	0	0.00%	68	56.67%
04/24/02	119	26	21.85%	17	14.29%	27	22.69%	0	0.00%	70	58.82%
04/25/02	135	28	20.74%	17	12.59%	31	22.96%	0	0.00%	76	56.30%
04/26/02	110	14	12.73%	14	12.73%	21	19.09%	0	0.00%	49	44.55%
04/29/02	121	28	23.14%	17	14.05%	20	16.53%	0	0.00%	65	53.72%
04/30/02	120	15	12.50%	20	16.67%	23	19.17%	0	0.00%	58	48.33%
05/01/02	123	22	17.89%	23	18.70%	26	21.14%	0	0.00%	71	57.72%
05/02/02	83	17	20.48%	15	18.07%	16	19.28%	0	0.00%	48	57.83%
05/03/02	36	5	13.89%	5	13.89%	7	19.44%	0	0.00%	17	47.22%
05/04/02	32	6	18.75%	8	25.00%	8	25.00%	0	0.00%	22	68.75%
05/05/02	80	17	21.25%	12	15.00%	12	15.00%	1	1.25%	42	52.50%
05/06/02	30	4	13.33%	6	20.00%	10	33.33%	0	0.00%	20	66.67%
05/07/02	76	11	14.47%	24	31.58%	12	15.79%	0	0.00%	47	61.84%
05/08/02	46	9	19.57%	15	32.61%	5	10.87%	0	0.00%	29	63.04%
05/09/02	28	7	25.00%	8	28.57%	2	7.14%	0	0.00%	17	60.71%
05/10/02	6	3	50.00%	0	0.00%	1	16.67%	0	0.00%	4	66.67%
05/11/02	16	5	31.25%	6	37.50%	1	6.25%	0	0.00%	12	75.00%
05/12/02	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/13/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
05/14/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/15/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
05/16/02	22	3	13.64%	8	36.36%	5	22.73%	0	0.00%	16	72.73%
05/17/02	5	1	20.00%	1	20.00%	1	20.00%	0	0.00%	3	60.00%
05/18/02	3	0	0.00%	0	0.00%	2	66.67%	0	0.00%	2	66.67%
05/19/02	4	0	0.00%	1	25.00%	2	50.00%	0	0.00%	3	75.00%
05/25/02	2	1	50.00%	0	0.00%	1	50.00%	0	0.00%	2	100.00%
Totals	**5049**	**853**	**16.89%**	**818**	**16.20%**	**892**	**17.67%**	**5**	**0.10%**	**2568**	**50.86%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/12/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
03/13/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
03/14/02	2	1	50.00%	0	0.00%	0	0.00%	0	0.00%	1	50.00%
03/15/02	4	0	0.00%	1	25.00%	0	0.00%	0	0.00%	1	25.00%
03/16/02	12	2	16.67%	0	0.00%	2	16.67%	0	0.00%	4	33.33%
03/17/02	6	0	0.00%	2	33.33%	0	0.00%	0	0.00%	2	33.33%
03/18/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
03/19/02	3	2	66.67%	0	0.00%	1	33.33%	0	0.00%	3	100.00%
03/20/02	10	1	10.00%	0	0.00%	1	10.00%	0	0.00%	2	20.00%
03/21/02	5	2	40.00%	2	40.00%	0	0.00%	0	0.00%	4	80.00%
03/22/02	7	2	28.57%	1	14.29%	2	28.57%	0	0.00%	5	71.43%
03/23/02	10	1	10.00%	3	30.00%	2	20.00%	0	0.00%	6	60.00%
03/24/02	9	1	11.11%	3	33.33%	1	11.11%	0	0.00%	5	55.56%
03/25/02	19	6	31.58%	4	21.05%	2	10.53%	0	0.00%	12	63.16%
03/26/02	21	1	4.76%	5	23.81%	1	4.76%	0	0.00%	7	33.33%
03/27/02	23	6	26.09%	6	26.09%	2	8.70%	0	0.00%	14	60.87%
03/28/02	26	8	30.77%	3	11.54%	3	11.54%	0	0.00%	14	53.85%
03/29/02	41	10	24.39%	9	21.95%	3	7.32%	0	0.00%	22	53.66%
03/30/02	45	10	22.22%	4	8.89%	6	13.33%	0	0.00%	20	44.44%
03/31/02	80	17	21.25%	19	23.75%	13	16.25%	0	0.00%	49	61.25%
04/01/02	68	21	30.88%	15	22.06%	5	7.35%	0	0.00%	41	60.29%
04/02/02	126	25	19.84%	30	23.81%	17	13.49%	0	0.00%	72	57.14%
04/03/02	93	17	18.28%	14	15.05%	15	16.13%	0	0.00%	46	49.46%
04/04/02	171	41	23.98%	41	23.98%	24	14.04%	0	0.00%	106	61.99%
04/05/02	283	63	22.26%	72	25.44%	30	10.60%	0	0.00%	165	58.30%
04/06/02	521	99	19.00%	119	22.84%	78	14.97%	0	0.00%	296	56.81%
04/07/02	264	56	21.21%	70	26.52%	23	8.71%	0	0.00%	149	56.44%
04/08/02	390	70	17.95%	103	26.41%	58	14.87%	0	0.00%	231	59.23%
04/09/02	422	86	20.38%	87	20.62%	54	12.80%	0	0.00%	227	53.79%
04/10/02	581	104	17.90%	154	26.51%	90	15.49%	1	0.17%	349	60.07%
04/11/02	378	77	20.37%	79	20.90%	60	15.87%	0	0.00%	216	57.14%
04/12/02	143	32	22.38%	42	29.37%	17	11.89%	0	0.00%	91	63.64%
04/13/02	257	54	21.01%	87	33.85%	31	12.06%	0	0.00%	172	66.93%
04/14/02	161	29	18.01%	53	32.92%	20	12.42%	0	0.00%	102	63.35%
04/15/02	173	39	22.54%	43	24.86%	28	16.18%	0	0.00%	110	63.58%
04/16/02	136	31	22.79%	33	24.26%	23	16.91%	0	0.00%	87	63.97%
04/17/02	274	47	17.15%	68	24.82%	49	17.88%	0	0.00%	164	59.85%
04/18/02	112	17	15.18%	33	29.46%	17	15.18%	0	0.00%	67	59.82%
04/19/02	79	10	12.66%	26	32.91%	17	21.52%	0	0.00%	53	67.09%
04/20/02	38	8	21.05%	12	31.58%	4	10.53%	0	0.00%	24	63.16%
04/21/02	36	7	19.44%	10	27.78%	3	8.33%	0	0.00%	20	55.56%
04/22/02	78	16	20.51%	13	16.67%	19	24.36%	0	0.00%	48	61.54%
04/23/02	41	9	21.95%	8	19.51%	5	12.20%	0	0.00%	22	53.66%
04/24/02	96	16	16.67%	30	31.25%	13	13.54%	0	0.00%	59	61.46%
04/25/02	10	2	20.00%	0	0.00%	2	20.00%	0	0.00%	4	40.00%
04/26/02	5	0	0.00%	3	60.00%	1	20.00%	0	0.00%	4	80.00%
04/27/02	7	4	57.14%	1	14.29%	1	14.29%	0	0.00%	6	85.71%
04/28/02	4	1	25.00%	0	0.00%	2	50.00%	0	0.00%	3	75.00%
04/29/02	7	0	0.00%	2	28.57%	3	42.86%	0	0.00%	5	71.43%
04/30/02	15	3	20.00%	2	13.33%	1	6.67%	0	0.00%	6	40.00%
05/01/02	14	0	0.00%	3	21.43%	1	7.14%	0	0.00%	4	28.57%
05/02/02	6	0	0.00%	1	16.67%	2	33.33%	0	0.00%	3	50.00%
05/03/02	2	0	0.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%
05/04/02	17	4	23.53%	3	17.65%	3	17.65%	0	0.00%	10	58.82%
05/05/02	20	3	15.00%	1	5.00%	2	10.00%	0	0.00%	6	30.00%
05/06/02	11	1	9.09%	3	27.27%	1	9.09%	0	0.00%	5	45.45%
05/07/02	17	0	0.00%	5	29.41%	4	23.53%	0	0.00%	9	52.94%
05/08/02	17	4	23.53%	6	35.29%	2	11.76%	0	0.00%	12	70.59%
05/09/02	19	7	36.84%	4	21.05%	2	10.53%	0	0.00%	13	68.42%
05/10/02	3	1	33.33%	1	33.33%	1	33.33%	0	0.00%	3	100.00%
05/11/02	10	2	20.00%	3	30.00%	1	10.00%	0	0.00%	6	60.00%
05/12/02	2	0	0.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%

Appendix B. Table 6. Continued.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
05/13/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
05/14/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
05/15/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
05/16/02	15	3	20.00%	3	20.00%	3	20.00%	0	0.00%	9	60.00%
05/17/02	6	1	16.67%	4	66.67%	0	0.00%	0	0.00%	5	83.33%
05/18/02	5	1	20.00%	1	20.00%	2	40.00%	0	0.00%	4	80.00%
05/19/02	4	0	0.00%	2	50.00%	0	0.00%	0	0.00%	2	50.00%
05/25/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
Totals	**5467**	**1082**	**19.79%**	**1358**	**24.84%**	**773**	**14.14%**	**1**	**0.02%**	**3214**	**58.79%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
04/01/02	2	0	0.00%	1	50.00%	0	0.00%	0	0.00%	1	50.00%
04/03/02	4	1	25.00%	2	50.00%	0	0.00%	0	0.00%	3	75.00%
04/04/02	5	0	0.00%	1	20.00%	0	0.00%	0	0.00%	1	20.00%
04/05/02	3	2	66.67%	0	0.00%	0	0.00%	0	0.00%	2	66.67%
04/06/02	1	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
04/07/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
04/08/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
04/09/02	3	0	0.00%	0	0.00%	0	0.00%	0	0.00%		0.00%
04/10/02	12	1	8.33%	2	16.67%	2	16.67%	0	0.00%	5	41.67%
04/11/02	15	6	40.00%	2	13.33%	3	20.00%	0	0.00%	11	73.33%
04/12/02	4	1	25.00%	1	25.00%	0	0.00%	0	0.00%	2	50.00%
04/13/02	25	10	40.00%	5	20.00%	1	4.00%	0	0.00%	16	64.00%
04/14/02	31	7	22.58%	10	32.26%	4	12.90%	0	0.00%	21	67.74%
04/15/02	14	7	50.00%	1	7.14%	3	21.43%	0	0.00%	11	78.57%
04/16/02	36	12	33.33%	5	13.89%	6	16.67%	0	0.00%	23	63.89%
04/17/02	156	44	28.21%	25	16.03%	8	5.13%	0	0.00%	77	49.36%
04/18/02	29	7	24.14%	3	10.34%	2	6.90%	0	0.00%	12	41.38%
04/19/02	17	0	0.00%	1	5.88%	2	11.76%	0	0.00%	3	17.65%
04/22/02	28	5	17.86%	1	3.57%	1	3.57%	0	0.00%	7	25.00%
04/23/02	26	5	19.23%	5	19.23%	2	7.69%	0	0.00%	12	46.15%
04/24/02	54	4	7.41%	4	7.41%	12	22.22%	0	0.00%	20	37.04%
04/25/02	35	4	11.43%	3	8.57%	6	17.14%	0	0.00%	13	37.14%
04/26/02	53	2	3.77%	8	15.09%	7	13.21%	0	0.00%	17	32.08%
04/27/02	52	1	1.92%	6	11.54%	8	15.38%	0	0.00%	15	28.85%
04/28/02	70	6	8.57%	8	11.43%	19	27.14%	0	0.00%	33	47.14%
04/29/02	64	5	7.81%	8	12.50%	8	12.50%	0	0.00%	21	32.81%
04/30/02	84	10	11.90%	8	9.52%	18	21.43%	0	0.00%	36	42.86%
05/01/02	86	18	20.93%	3	3.49%	13	15.12%	0	0.00%	34	39.53%
05/02/02	96	22	22.92%	2	2.08%	19	19.79%	0	0.00%	43	44.79%
05/03/02	103	11	10.68%	7	6.80%	16	15.53%	0	0.00%	34	33.01%
05/04/02	57	6	10.53%	6	10.53%	10	17.54%	0	0.00%	22	38.60%
05/05/02	150	16	10.67%	16	10.67%	21	14.00%	0	0.00%	53	35.33%
05/06/02	121	9	7.44%	18	14.88%	29	23.97%	0	0.00%	56	46.28%
05/07/02	120	18	15.00%	14	11.67%	25	20.83%	0	0.00%	57	47.50%
05/08/02	87	10	11.49%	16	18.39%	18	20.69%	0	0.00%	44	50.57%
05/09/02	62	10	16.13%	12	19.35%	9	14.52%	0	0.00%	31	50.00%
05/10/02	59	6	10.17%	8	13.56%	12	20.34%	0	0.00%	26	44.07%
05/13/02	61	7	11.48%	13	21.31%	9	14.75%	0	0.00%	29	47.54%
05/14/02	64	18	28.13%	13	20.31%	6	9.38%	0	0.00%	37	57.81%
05/15/02	67	15	22.39%	11	16.42%	7	10.45%	0	0.00%	33	49.25%
05/16/02	74	17	22.97%	17	22.97%	14	18.92%	1	1.35%	49	66.22%
05/17/02	13	1	7.69%	3	23.08%	1	7.69%	0	0.00%	5	38.46%
05/18/02	10	2	20.00%	2	20.00%	3	30.00%	0	0.00%	7	70.00%
Totals	**2060**	**331**	**16.07%**	**272**	**13.20%**	**325**	**15.78%**	**1**	**0.05%**	**929**	**45.10%**

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, 2002.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
04/01/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/03/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
04/04/02	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
04/05/02	8	3	37.50%	3	37.50%	0	0.00%	0	0.00%	6	75.00%
04/06/02	4	1	25.00%	2	50.00%	0	0.00%	0	0.00%	3	75.00%
04/07/02	3	1	33.33%	0	0.00%	0	0.00%	0	0.00%	1	33.33%
04/08/02	2	0	0.00%	2	100.00%	0	0.00%	0	0.00%	2	100.00%
04/09/02	5	1	20.00%	2	40.00%	0	0.00%	0	0.00%	3	60.00%
04/10/02	14	3	21.43%	6	42.86%	0	0.00%	0	0.00%	9	64.29%
04/11/02	5	1	20.00%	0	0.00%	1	20.00%	0	0.00%	2	40.00%
04/12/02	4	0	0.00%	1	25.00%	0	0.00%	0	0.00%	1	25.00%
04/13/02	3	2	66.67%	0	0.00%	0	0.00%	0	0.00%	2	66.67%
04/14/02	4	1	25.00%	1	25.00%	0	0.00%	0	0.00%	2	50.00%
04/15/02	11	2	18.18%	0	0.00%	0	0.00%	0	0.00%	2	18.18%
04/16/02	63	23	36.51%	11	17.46%	3	4.76%	0	0.00%	37	58.73%
04/17/02	74	23	31.08%	8	10.81%	6	8.11%	0	0.00%	37	50.00%
04/18/02	7	3	42.86%	0	0.00%	1	14.29%	0	0.00%	4	57.14%
04/19/02	7	2	28.57%	1	14.29%	1	14.29%	0	0.00%	4	57.14%
04/20/02	1	1	100.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%
04/22/02	3	0	0.00%	1	33.33%	0	0.00%	0	0.00%	1	33.33%
04/23/02	5	0	0.00%	1	20.00%	1	20.00%	0	0.00%	2	40.00%
04/24/02	13	2	15.38%	2	15.38%	2	15.38%	0	0.00%	6	46.15%
04/25/02	4	1	25.00%	1	25.00%	0	0.00%	0	0.00%	2	50.00%
04/26/02	6	0	0.00%	1	16.67%	2	33.33%	0	0.00%	3	50.00%
04/27/02	5	0	0.00%	3	60.00%	1	20.00%	0	0.00%	4	80.00%
04/28/02	5	1	20.00%	0	0.00%	0	0.00%	0	0.00%	1	20.00%
04/29/02	2	0	0.00%	0	0.00%	1	50.00%	0	0.00%	1	50.00%
04/30/02	7	1	14.29%	1	14.29%	1	14.29%	0	0.00%	3	42.86%
05/01/02	7	3	42.86%	1	14.29%	1	14.29%	0	0.00%	5	71.43%
05/02/02	6	2	33.33%	0	0.00%	0	0.00%	0	0.00%	2	33.33%
05/03/02	7	2	28.57%	2	28.57%	0	0.00%	0	0.00%	4	57.14%
05/04/02	5	0	0.00%	0	0.00%	1	20.00%	0	0.00%	1	20.00%
05/05/02	8	2	25.00%	1	12.50%	1	12.50%	0	0.00%	4	50.00%
05/06/02	8	0	0.00%	2	25.00%	1	12.50%	0	0.00%	3	37.50%
05/07/02	22	4	18.18%	4	18.18%	5	22.73%	0	0.00%	13	59.09%
05/08/02	11	1	9.09%	2	18.18%	3	27.27%	0	0.00%	6	54.55%
05/09/02	5	2	40.00%	0	0.00%	2	40.00%	0	0.00%	4	80.00%
05/10/02	6	1	16.67%	3	50.00%	0	0.00%	0	0.00%	4	66.67%
05/11/02	7	0	0.00%	2	28.57%	1	14.29%	0	0.00%	3	42.86%
05/12/02	6	1	16.67%	0	0.00%	2	33.33%	0	0.00%	3	50.00%
05/13/02	4	0	0.00%	2	50.00%	2	50.00%	0	0.00%	4	100.00%
05/14/02	6	2	33.33%	2	33.33%	0	0.00%	0	0.00%	4	66.67%
05/15/02	3	1	33.33%	1	33.33%	0	0.00%	0	0.00%	2	66.67%
05/17/02	7	3	42.86%	0	0.00%	3	42.86%	0	0.00%	6	85.71%
05/18/02	3	0	0.00%	2	66.67%	0	0.00%	0	0.00%	2	66.67%
05/19/02	1	0	0.00%	0	0.00%	1	100.00%	0	0.00%	1	100.00%
Totals	**390**	**97**	**24.87%**	**71**	**18.21%**	**43**	**11.03%**		**0.00%**	**211**	**54.10%**

Prepared by:

Edwin W. Buettner
Senior Fisheries Research Biologist

Scott A. Putnam
Senior Fisheries Technician

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Steve Yundt, Chief
Bureau of Fisheries

Peter F. Hassemer
Anadromous Fish Manager