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

Annual Report
2005 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 07-64
2006

TABLE OF CONTENTS

Page

LIST OF FIGURES

List of Tables, continued.

Page

LIST OF TABLES

LIST OF APPENDICES

Page

ABSTRACT

This project monitored the daily passage of Chinook salmon *Oncorhynchus tshawytscha*, steelhead trout *O. mykiss,* and sockeye salmon *O. nerka* smolts during the 2005 spring out-migration at migrant traps on the Snake River and Salmon River.

In 2005 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, the age-1 and older fish were distinguishable from wild fish by the occurrence of fin erosion. Age-0 Chinook salmon are more difficult to distinguish between wild and non-adclipped hatchery fish and therefore classified as unknown rearing.

The total annual hatchery spring/summer Chinook salmon catch at the Snake River trap was 0.34 times greater in 2005 than in 2004. The wild spring/summer Chinook catch was 0.34 times less than the previous year. Hatchery steelhead trout catch was 0.67 times less than in 2004. Wild steelhead trout catch was 0.72 times less than the previous year. The Snake River trap collected 1,152 age-0 Chinook salmon of unknown rearing. During 2005, the Snake River trap captured 219 hatchery and 44 wild/natural sockeye salmon and 110 coho salmon *O. kisutch* of unknown rearing. Differences in trap catch between years are due to fluctuations not only in smolt production, but also differences in trap efficiency and duration of trap operation associated with flow. Trap operations began on March 6 and were terminated on June 3. The trap was out of operation for a total of one day due to heavy debris. FPC requested that the trap be restarted on June 15 through June 22 to collect and PIT tag age-0 Chinook salmon.

Hatchery Chinook salmon catch at the Salmon River trap was 1.06 times greater and wild Chinook salmon catch was 1.26 times greater than in 2004. The hatchery steelhead trout collection in 2005 was 1.41 times greater and wild steelhead trout collection was 1.27 times greater than the previous year. Trap operations began on March 6 and were terminated on May 17 due to high flows. There were two days when the trap was taken out of service because of mechanical failure.

Travel time (d) and migration rate (km/d) through Lower Granite Reservoir for passive integrated transponder (PIT) tagged Chinook salmon and steelhead trout marked at the Snake River trap were affected by discharge. Statistical analysis of 2005 data detected a relation between migration rate and discharge for hatchery Chinook but was unable to detect a relation for wild Chinook. The inability to detect a migration rate discharge relation for wild Chinook salmon was caused by a lack of data. For hatchery Chinook salmon there was a 1.8-fold increase in migration rate 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 2.2-fold and a 2.2-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 2005 data detected a significant relation between migration rate and Lower Granite Reservoir inflow discharge for hatchery Chinook salmon, wild Chinook salmon, hatchery steelhead trout, and wild steelhead trout. Migration rate increased 4.2-fold for hatchery Chinook salmon, 2.9-fold for wild Chinook salmon and 2.5-fold for hatchery steelhead, and 1.7-fold for wild steelhead as discharge increased between 50 kcfs and 100 kcfs.

Fish tagged with PIT tags at the Snake River and Salmon River traps were interrogated at four dams with PIT tag detection systems (Lower Granite, Little Goose, Lower Monumental and McNary dams). Because of the addition of the fourth interrogation site (Lower Monumental) in 1993 and the installation of the Removable Spillway Weir at Lower Granite Dam in 2001, caution must be used in comparing cumulative interrogation data. Cumulative interrogations at the four dams for fish marked at the Snake River trap were 84% for hatchery Chinook, 89% for wild Chinook, 94% for hatchery steelhead, and 93% for wild steelhead. Cumulative interrogations at the four dams for fish marked at the Salmon River trap were 71% for hatchery Chinook, 78% for wild Chinook salmon, 80% for hatchery steelhead trout, and 81% for wild steelhead trout.

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

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

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

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

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

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

OBJECTIVES

1. Provide daily trap catch data at the head of Lower Granite Reservoir for TMT's use in implementing the NMFS Biological Opinion.

2. Provide an interrogation site for PIT-tagged smolts, marked by other projects, at the end of their migration in a riverine environment and the beginning of their migration in a reservoir environment.

3. Determine riverine travel time from the point of release to the smolt traps (index sites) at the upper end of Lower Granite Reservoir for PIT-tagged smolts.

4. Determine reservoir travel time from the head of lower Granite Reservoir to Lower Granite Dam using PIT-tagged smolts marked at the traps and PIT-tagged smolts passing the traps from upriver hatchery releases and rearing areas.

5. Determine cumulative interrogation rate at Lower Granite, Little Goose, Lower Monumental, and McNary dams during the spring out-migration period for PIT-tagged hatchery and wild spring/summer Chinook salmon, and hatchery and wild steelhead trout.

6. Correlate smolt migration rate with river flow for fish moving in riverine and reservoir environments.

7. Determine trap efficiency for each species at each trap over a range of discharges.

8. Evaluate timing of returning adult wild and natural steelhead crossing Lower Granite Dam.

METHODS

Releases of Hatchery-Produced Smolts

Anadromous hatchery release information was reported for hatchery smolts, which contributed to the 2005 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 2005.

SMOLT MONITORING TRAPS

During the 2005 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. Because no brand groups were released upstream, 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 2005, 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. Tag quotas for wild Chinook were increased at the Snake River trap by 2,000 and by 5,000 at the Salmon River trap. The Clearwater River trap was operated to increase CSS wild numbers and tag quotas of 3,250 wild Chinook and 1,400 wild steelhead were established at that trap.

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

Snake River Trap

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

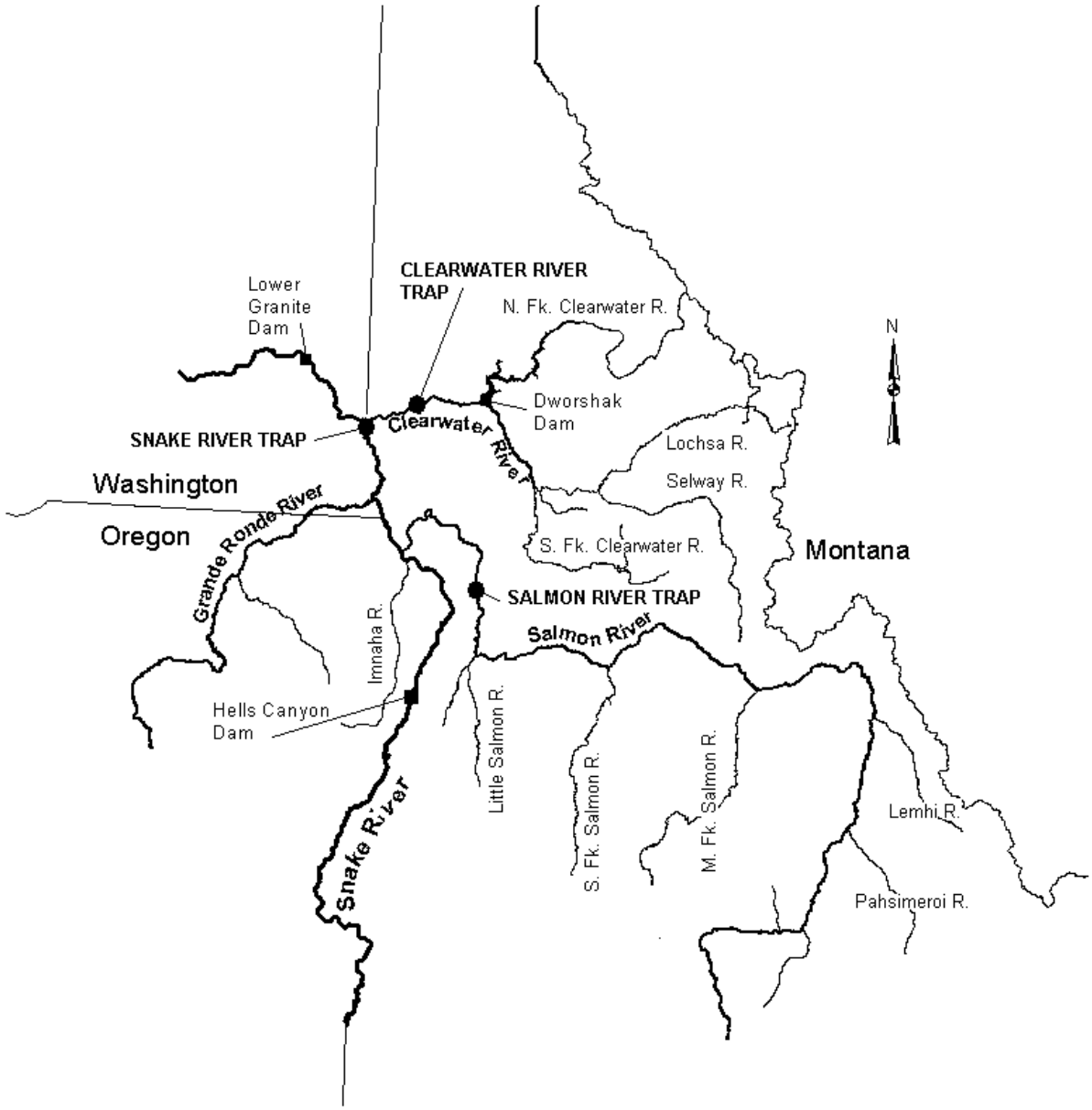

Figure 1. Map of study area

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

Snake River trap operations began on March 6 and continued through June 3. The Snake River trap was out of operation for a total of one day during the 2005 season. The trap was restarted on June 15 and operated until June 22. Subyearling Chinook salmon were PIT-tagged to evaluate the summer spill that was required by court order. 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. Test tags were sent through the system. Reader efficiency ranged between 90% and 100% for both readers 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 6 and continued through May 17 when operations were terminated for the season. The Salmon River trap was out of operation for two days during the 2005 season due to mechanical problems. 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 2005. 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. Trap efficiencies are no longer calculated for either of the smolt traps due to extremely large confidence intervals (C.I. = 50-100% of the mean). 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 2005 for the Snake River trap, 1989 to 1995 for the Clearwater River trap, and 1993 to 2005 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.

Drainage / Release Site	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
Clearwater River Drainage												
American River	601	967	277	445	169	272	—	—	131	211	—	—
Big Canyon Creek ACC[a] Facility	499	803	175	281	67	108	—	—	29	47	—	—
Clear Creek	541	870	216	348	109	175	—	—	71	114	—	—
Clearwater River	464	746	139	224	32	51	—	—	-6	-10	—	—
Clearwater River Smolt Trap	470	756	145	234	38	61	—	—	—	—	—	—
Crooked River	597	960	272	438	165	265	—	—	127	204	—	—
Dworshak National Fish Hatchery	504	811	180	289	72	116	—	—	34	55	—	—
Kooskia National Fish Hatchery	541	871	217	349	109	176	—	—	71	115	—	—
Lapwai Creek	475	765	151	243	43	70	—	—	6	9	—	—
Lochsa River	561	903	237	381	129	208	—	—	91	147	—	—
Lolo Creek	518	833	193	311	86	138	—	—	48	77	—	—
Meadow Creek, Selway River	580	934	256	412	149	239	—	—	111	178	—	—
Meadow Creek, SF Clearwater	571	919	247	397	139	224	—	—	101	163	—	—
Mill Creek, SF Clearwater	570	918	246	396	139	223	—	—	101	162	—	—
Newsome Creek	590	950	266	428	158	255	—	—	121	194	—	—
Nez Perce Tribal Hatchery	487	784	163	262	55	89	—	—	17	28	—	—
N Lapwai Valley ACC[a] Pond	476	766	152	244	44	71	—	—	6	10	—	—
Papoose Creek	626	1008	302	486	194	313	—	—	157	252	—	—
Potlatch River	478	770	154	248	47	75	—	—	9	14	—	—
Powell Rearing Pond/Walton Creek	631	1016	307	494	199	321	—	—	162	260	—	—
Red River	601	967	277	445	169	272	—	—	131	211	—	—
Red River Rearing Pond	618	994	293	472	186	299	—	—	148	238	—	—
Selway River	561	903	237	381	129	208	—	—	91	147	—	—
Salmon River Drainage												
Alturas Lake	913	1469	588	947	481	774	449	722	—	—	336	541
Bear Valley Creek	816	1314	492	792	385	619	352	567	—	—	240	386
East Fork Salmon River	856	1377	531	855	424	682	391	630	—	—	279	449
East Fork Salmon River Trap	874	1406	549	884	442	711	409	659	—	—	297	478
East Fork Salmon River Weir	874	1407	550	885	442	712	410	660	—	—	298	479
East Fork South Fork Salmon River	684	1100	359	578	252	405	219	353	—	—	107	172
Hazard Creek	619	996	295	474	187	301	155	249	—	—	42	68
Johnson Creek	698	1124	374	602	267	429	234	377	—	—	122	196
Johnson Creek Trap	703	1131	378	609	271	436	239	384	—	—	126	203
Knox Bridge	716	1152	391	630	284	457	252	405	—	—	139	224
Lemhi River	771	1241	447	719	339	546	307	494	—	—	194	313
Lemhi River Weir	802	1290	477	768	370	595	337	543	—	—	225	362

Table 1. Continued.

Drainage / Release Site	Mouth of Columbia River mi	Mouth of Columbia River km	Mouth of Snake River mi	Mouth of Snake River km	Lower Granite Dam mi	Lower Granite Dam km	Snake River trap site mi	Snake River trap site km	Clearwater River trap site mi	Clearwater River trap site km	Salmon River trap site mi	Salmon River trap site km
Salmon River Drainage Continued												
Little Salmon River	600	965	275	443	168	270	135	218	—	—	23	37
Lower S Fork Salmon River Trap	646	1040	322	518	214	345	182	293	—	—	70	112
Marsh Creek Trap	823	1325	499	803	391	630	359	578	—	—	247	397
Middle Fork Salmon River	711	1144	386	622	279	449	247	397	—	—	134	216
North Fork Salmon River	749	1206	425	684	318	511	285	459	—	—	173	278
Pahsimeroi Pond	823	1325	499	803	391	630	359	578	—	—	247	397
Pahsimeroi River	816	1314	492	792	385	619	352	567	—	—	240	386
Pahsimeroi River Trap	818	1316	493	794	386	621	354	569	—	—	241	388
Pettit Lake	908	1462	584	940	477	767	444	715	—	—	332	534
Pettit Lake Creek	907	1460	583	938	475	765	443	713	—	—	331	532
Rapid River Hatchery	608	978	283	456	176	283	144	231	—	—	31	50
Rapid River Trap	608	979	284	457	176	284	144	232	—	—	32	51
Rapid River, Little Salmon River	604	972	280	450	172	277	140	225	—	—	27	44
Redfish Lake	898	1445	574	923	466	750	434	698	—	—	321	517
Redfish Lake Creek	895	1440	570	918	463	745	431	693	—	—	318	512
Redfish Lake Creek Trap	897	1443	572	921	465	748	432	696	—	—	320	515
Salmon River	513	825	188	303	81	130	48	78	—	—	-64	-103
Salmon River Smolt Trap	577	928	252	406	145	233	112	181	—	—	—	—
Sawtooth Hatchery	896	1442	572	920	464	747	432	695	—	—	319	514
Sawtooth Trap	896	1442	572	920	464	747	432	695	—	—	319	514
Secesh River	683	1099	359	577	251	404	219	352	—	—	106	171
Slate Creek	578	931	254	409	147	236	114	184	—	—	2	3
South Fork Salmon River	646	1040	322	518	214	345	182	293	—	—	70	112
South Fork Salmon River Trap	718	1155	393	633	286	460	254	408	—	—	141	227
South Fork Salmon River Weir	715	1151	391	629	283	456	251	404	—	—	139	223
Squaw Creek Acclimation Pond	864	1390	539	868	432	695	400	643	—	—	287	462
Squaw Creek, Salmon River	863	1389	539	867	431	694	399	642	—	—	286	461
Stolle Pond	724	1165	400	643	292	470	260	418	—	—	147	237
Valley Creek	891	1434	567	912	459	739	427	687	—	—	314	506
White Bird Creek	566	911	242	389	134	216	102	164	—	—	—	—
Yankee Fork Salmon River	880	1416	556	894	448	721	416	669	—	—	303	488
Snake River Drainage												
Asotin Creek	470	756	145	234	38	61	6	9	—	—	—	—
Big Sheep Creek	552	889	228	367	121	194	88	142	—	—	—	—
Captain John Rapid ACC[a] Pond	506	815	163	263	56	90	24	38	—	—	—	—
Catherine Creek ACC[a] Pond	667	1073	342	551	235	378	203	326	—	—	—	—
Cottonwood ACC[a] Pond	521	839	197	317	89	144	57	92	—	—	—	—
Deer Creek / Big Canyon Facility	586	943	262	421	154	248	122	196	—	—	—	—
Grande Ronde River	493	793	168	271	61	98	29	46	—	—	—	—
Grande Ronde River ACC[a] Pond	692	1113	367	591	260	418	227	366	—	—	—	—

Table 1. Continued.

Drainage / Release Site	Mouth of Columbia River mi	Mouth of Columbia River km	Mouth of Snake River mi	Mouth of Snake River km	Lower Granite Dam mi	Lower Granite Dam km	Snake River trap site mi	Snake River trap site km	Clearwater River trap site mi	Clearwater River trap site km	Salmon River trap site mi	Salmon River trap site km
Snake River Drainage Continued												
Hells Canyon Dam	571	919	247	397	139	224	107	172	—	—	—	—
Imnaha River	516	830	191	308	84	135	52	83	—	—	—	—
Imnaha Trap	520	837	196	315	88	142	56	90	—	—	—	—
Imnaha River ACC[a] Pond	562	904	237	382	130	209	98	157	—	—	—	—
Little Sheep Creek Facility	544	875	219	353	112	180	80	128	—	—	—	—
Lookingglass Creek	580	933	255	411	148	238	116	186	—	—	—	—
Lostine River	600	966	276	444	168	271	136	219	—	—	—	—
Lostine River ACC[a] Pond	613	987	289	465	181	292	149	240	—	—	—	—
Lower Granite Dam	432	695	107	173	—	—	-32	-52	—	—	—	—
Pittsburg landing ACC[a] Facility	539	868	215	346	107	173	75	121	—	—	—	—
Snake River	324	522	—	—	-107	-173	-140	-225	—	—	—	—
Snake River Smolt Trap	464	747	140	225	32	52	—	—	—	—	—	—
Wallowa Hatchery	614	988	290	466	182	293	150	241	—	—	—	—
Wallowa River	574	924	250	402	142	229	110	177	—	—	—	—

[a] Acclimation

RESULTS AND DISCUSSION

Hatchery Releases

Chinook Salmon

Spring Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at five locations in Idaho and one in Oregon (Table 2). A total of 6,594,224 spring Chinook salmon smolts were released at nine locations in Idaho, and 992,977 were released at six locations in Oregon during 2005.

Summer Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at two locations in Idaho (Table 2). A total of 2,128,012 summer Chinook salmon were released at three locations in Idaho during 2005.

Fall Chinook salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at two locations in Idaho, one location in Oregon, and one location in Washington during 2005 (Table 2). A total of 290,215 age-1 fall Chinook salmon were released at two locations in Idaho. A total of 1,832,230 age-0 fall Chinook salmon were released at three locations in Idaho. A total of 589,119 age-0 fall Chinook salmon were released at one location in Oregon. A total of 1,542,768 age-0 fall Chinook salmon were released at two locations in Washington.

Steelhead Trout

Steelhead trout released into the Snake River drainage upstream of Lower Granite Dam were reared at five locations in Idaho, one in Oregon, and one in Washington (Table 3). A total of 6,983,534 steelhead trout smolts were released at 23 locations in Idaho, and 1,527,515 were released at five locations in Oregon during 2005. A total of 150,442 steelhead trout smolts were released at one location in Washington during 2005. Fall releases of steelhead trout were not included in this report.

Coho and Sockeye Salmon

Hatchery coho salmon released into the Snake River drainage upstream of Lower Granite Dam were reared at one location in Idaho and one location in Washington (Table 4). A total of 816,300 coho smolts were released at three locations in Idaho during 2005. Summer and fall releases of coho salmon have not been included in this report.

Hatchery sockeye salmon that contributed to the 2005 out-migration were reared at one location in Idaho (Table 4). A total of 209,046 sockeye salmon were released at five locations for migration year 2005.

Table 2. Hatchery Chinook salmon released into the Snake River system upriver from Lower Granite Dam contributing to the 2005 out-migration.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Red River Acclimation Pond	Clearwater	Spring	03/21/05	401,362 (300)
Powell Acclimation Pond	Clearwater	Spring	03/24/05	403,917 (300)
Crooked River Acclimation Pond	Clearwater	Spring	03/29/05	700,387 (300)
Kooskia Nat'l Fish Hatchery	Kooskia NFH	Spring	04/01/05	620,000 (1,500)
Dworshak Hatchery	Dworshak NFH	Spring	04/04/05	1,072,359 (52,000)
			Drainage Total	**3,198,025** **(54,400)**
Nez Perce Tribal Hatchery	Nez Perce TH	Fall 0+	05/07/05	869,300
Big Canyon	Lyons Ferry	Fall 0+	05/30/05	510,226 (2,500)
Big Canyon	Lyons Ferry	Fall 0+	06/21/05	55,000 (50,000)
Big Canyon Acclimation Pond	Lyons Ferry	Fall 1+	04/04/05	139,509 (5,000)
			Drainage Total	**1,574,035** **(57,500)**
Salmon River				
Hazard Creek	Rapid River	Spring	03/11/05	200,000
Rapid River Hatchery	Rapid River	Spring	03/15/05	2,761,430 (52,000)
Sawtooth Hatchery	Sawtooth	Spring	03/31/05	134,769 (500)
South Fork Salmon River @ Johnson Creek	McCall	Summer	03/14/05	105,230 (12,000)
Knox Bridge	McCall	Summer	03/18/05	1,047,530 (75,000)
Pahsimeroi Hatchery	Pahsimeroi	Summer	03/22/05	975,252 (500)
			Drainage Total	**5,224,211** **(140,000)**
Snake River				
Snake River @ Hells Canyon Dam	Rapid River	Spring	03/08/05	300,000
Grande Ronde Acclimation Pond	Lookingglass	Spring	03/08/05	105,369
Lostine Acclimation Pond	Lookingglass	Spring	03/11/05	95,541 (5,000)
Catherine Creek Acclimation Pond	Lookingglass	Spring	03/14/05	130,544

Table 2. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Snake River, continued.				
Lookingglass Hatchery	Lookingglass	Spring	03/18/05	98,023 (5,000)
Lostine Acclimation Pond	Lookingglass	Spring	03/28/05	69,278 (5,000)
Imnaha Acclimation Pond	Lookingglass	Spring	03/29/05	435,186 (21,000)
Catherine Creek Acclimation Pond	Lookingglass	Spring	04/04/05	59,036
			Drainage Total	**1,292,977 (36,000)**
Pittsburg Landing Acclimation Pond	Lyons Ferry	Fall 1+	04/14/05	150,706 (5,000)
			Drainage Total	**150,706 (5,000)**
Snake River @ Hells Canyon Dam	Oxbow	Fall 0+	04/28/05	189,119 (10,000)
Snake River @ Hells Canyon Dam	Umatilla	Fall 0+	05/09/05	400,000
Captain John Acclimation Pond	Lyons Ferry	Fall 0+	05/16/05	121,000 (121,000)
Captain John Acclimation Pond	Lyons Ferry	Fall 0+	05/23/05	234,030
Pittsburg Landing Acclimation Pond	Umatilla	Fall 0+	05/23/05	397,704 (2,500)
Captain John Acclimation Pond	Lyons Ferry	Fall 0+	05/23/05	505,087 (3,500)
Grande Ronde River	Lyons Ferry	Fall 0+	05/24/05	482,460
Captain John Acclimation Pond	Lyons Ferry	Fall 0+	05/26/05	200,191 (3,500)
			Drainage Total	**2,529,591 (140,500)**
			Grand Total	**13,969,545 (433,400)**

Table 3. Hatchery steelhead trout released into the Snake River system upriver from Lower Granite Dam contributing to the 2005 out-migration.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Red River Acclimation Pond	Clearwater	B	04/09/05	248,729 (7,500)
Crooked River Acclimation Pond	Clearwater	B	04/11/05	232,026 (600)
Kooskia Hatchery	Dworshak	B	04/11/05	282,362
S. Fork Clearwater River @ Red House Hole	Dworshak	B	04/11/05	317,032
Newsome Creek	Dworshak	B	4/12/05	72,406
American River	Dworshak	B	04/13/05	79,320
S. Fork Clearwater River @ Red House Hole	Clearwater	B	04/13/05	267,414 (300)
Meadow Creek	Clearwater	B	04/18/05	22,757 (1,200)
Mill Creek Bridge	Clearwater	B	04/18/05	22,757 (1,200)
Dworshak Hatchery	Clearwater	B	04/18/05	1,122,064 (1,500)
Lolo Creek	Clearwater	B	04/20/05	53,046 (300) (1,504)
			Drainage Total	**2,719,913** **(12,600)**
Salmon River				
Little Salmon River	Magic Valley	A	03/15/05	84,828 (300)
Little Salmon River	Magic Valley	B	03/17/05	214,443 (300)
Little Salmon River @ Hazard Creek	Niagara Springs	A	03/24/05	358,387 (600)
Little Salmon River @ Hazard Creek	Hagerman	A	03/28/05	156,219 (300)
Pahsimeroi Hatchery	Niagara Springs	A	04/02/05	820,667 (300)
Squaw Creek Acclimation Pond	Magic Valley	B	04/04/05	87,108 (1,800)
Little Salmon River	Hagerman	B	04/06/05	91,263 (300)
Little Salmon River @ Hazard Creek	Hagerman	A	04/07/05	44,795
Salmon River	Magic Valley	A	04/07/05	125,873 (300)
Lemhi River	Magic Valley	A	04/08/05	132,793 (600)
Salmon River	Magic Valley	A	04/11/05	236,487 (300)
Sawtooth Hatchery	Hagerman	A	04/11/05	747,462 (300)
Pahsimeroi River	Magic Valley	A	04/12/05	27,342

Table 3. Continued.

Drainage Release Site	Hatchery	Stock	Release Date	No. Released (No. PIT Tagged)
Salmon River, continued.				
Salmon River @ McNabb Point	Magic Valley	A	04/13/05	183,698 (300)
East Fork Salmon River	Magic Valley	B	04/15/05	236,818
Squaw Creek	Magic Valley	B	04/18/05	244,237 (500)
East Fork Salmon River	Magic Valley	B	04/22/05	11,116
Valley Creek	Magic Valley	A	04/26/05	30,100 (300)
Salmon River @ Yankee Fork	Magic Valley	A	04/26/05	190,451 (300)
East Fork Salmon River	Hagerman	B	05/02/05	100,150 (300)
Salmon River @ Yankee Fork	Hagerman	A	05/04/05	139,384 (300)
			Drainage Total	**4,263,621 (7,400)**
Snake River				
Snake River @ Hells Canyon Dam	Niagara Springs	A	03/14/05	526,024 (300)
Cottonwood Acclimation Pond	Lyons Ferry	A	03/25/05	150,442
Little Sheep Acclimation Pond	Irrigon	A	04/11/05	152,048
Wallowa Acclimation Pond	Irrigon	A	04/11/05	396,943
Big Sheep Creek	Irrigon	A	04/11/05	136,553
Big Canyon Acclimation Pond @ Grande Ronde	Irrigon	A	04/11/05	87,924
Wallowa Acclimation Pond	Irrigon	A	04/30/05	145,818
Big Canyon Acclimation Pond @ Grande Ronde	Irrigon	A	05/02/05	82,205
			Drainage Total	**1,677,957 (300)**
			Grand Total	**8,661,491 (20,300)**

Table 4. Hatchery coho and sockeye salmon released into the Snake River system upstream from Lower Granite Dam contributing to the 2005 out-migration.

Drainage Release Site	Species	Hatchery	Release Date	No. Released (No. PIT Tagged)
Clearwater River				
Potlatch River	Coho	Eagle Creek	03/07/05	287,793 (1,000)
Clearwater River	Coho	Eagle Creek	03/09/05	193,732 (1,000)
Clear Creek	Coho	Eagle Creek	03/09/06	46,912
Clear Creek	Coho	Dworshak	04/27/05	287,863 (2,000)
			Drainage Total	**816,300** **(4,000)**
Salmon River				
Redfish Lake	Sockeye	Sawtooth	10/05/04	79,887 (1,000)
Alturas Lake	Sockeye	Sawtooth	10/06/04	21,129 (1,000)
Pettit Lake	Sockeye	Sawtooth	10/06/04	29,700 (1,000)
			Drainage Total	**130,716** **(3,000)**
Redfish Lake Creek	Sockeye	Sawtooth	05/10/05	39,269 (2,000)
Salmon River	Sockeye	Sawtooth	05/10/05	39,061
			Drainage Total	**78,330** **(2,000)**
			Grand Total	**209,046** **(5,000)**

Smolt Monitoring Traps

Snake River Trap Operation

The Snake River trap captured 1,307 hatchery and 501 wild age-1 Chinook salmon, 1,152 age-0 Chinook salmon of unknown rearing, 5,846 hatchery and 1,416 wild steelhead trout, 219 hatchery and 44 unknown rearing sockeye salmon, and 110 coho salmon of unknown rearing in 2005 (Table 5).

Hatchery Chinook salmon first arrived at the trap on March 22 (one fish). Significant numbers of fish were not trapped until April 19 (122 fish). The daily catch fluctuated between zero and 297 fish per day (Figure 2). One percent (15) of the total season catch was collected in March, 23% (296) in April, 74% (964) in May, and 2% (32) in June.

Wild Chinook salmon first arrived at the trap on March 14 (one fish). Significant numbers of fish were not trapped until May 18 (166 fish). The daily catch fluctuated between zero and

166 fish per day (Figure 2). One percent (4) of the total season catch was collected in March, 17% (84) in April, 64% (321) in May, and 18% (92) in June.

Physical characteristics were used to differentiate between age-0 Chinook salmon and older salmon. This year, 1,152 age-0 Chinook salmon were captured. Seven percent (80) of the total season catch was collected in March, 10% (114) in April, 38% (443) in May, and 45% (515) in June.

Hatchery steelhead trout first arrived at the trap on March 18 (one fish). Significant numbers of fish were not trapped until April 21 (138 fish). The daily catch fluctuated between zero and 785 fish per day (Figure 3). Two percent (134) of the total season catch was collected in March, 35% (2,017) in April, 63% (3,685) in May, and less than 1% (10) in June.

Wild steelhead trout first arrived at the trap on March 13 (one fish). Significant numbers of fish were not trapped until May 8 (319 fish). The daily catch fluctuated between zero and 319 fish per day (Figure 3). Two percent (28) of the total season catch was collected in March, 25% (349) in April, 73% (1,035) in May, and less than 1% (4) in June.

Hatchery sockeye salmon first arrived at the trap on May 11 (three fish). The daily catch fluctuated between zero and 74 fish per day. Ninety-five percent (209) of the total season catch was collected in May and 5% (10) in June.

Sockeye salmon of unknown origin first arrived at the trap on March 29 (one fish). The daily trap catch fluctuated between zero and 11 fish per day. Two percent (1) of the total season catch was collected in March, 93% (41) in May, and 5% (2) in June.

Coho salmon of unknown rearing first arrived at the trap on March 21 (one fish). The daily trap catch fluctuated between zero and 22 fish per day. Thirty-one percent (34) of the total season catch was collected in March, 26% (29) in April, and 43% (47) in May.

Snake River discharge measured at the Anatone gauge ranged between 13.6 kcfs and 98.9 kcfs (Table 6). Water temperature at the Snake River trap ranged between 6.6°C and 18.8°C (Figure 4). Secchi disk transparency at the Snake River trap ranged between 0.3 m and 2.6 m (Figure 4).

Salmon River Trap Operations

The Salmon River scoop trap captured 34,107 hatchery and 9,534 wild age-1 Chinook salmon, 3,440 hatchery and 314 wild steelhead trout, 108 hatchery sockeye salmon, and seven sockeye salmon of unknown rearing in 2005 (Table 5).

Hatchery Chinook salmon first appeared on March 12 (11 fish). Significant numbers of fish were not trapped until March 13 (421 fish). The daily catch fluctuated between zero and 2,992 fish per day (Figure 5). About 44% (14,860) of the season total was captured in March, 52% (17,856) in April, and four percent (1,391) in May.

Wild Chinook salmon first appeared on March 7 (two fish). Significant numbers of fish were not trapped until March 13 (228 fish). The daily catch fluctuated between zero and 752 fish per day (Figure 5). About 24% (2,260) of the season total was captured in March, 63% (6,022) in April, and 13% (1,252) in May.

Hatchery steelhead trout first appeared at the trap on March 21 (one fish). Significant numbers of fish were not trapped until April 26 (173 fish). The daily catch fluctuated between zero and 275 fish per day (Figure 6). About one percent (46) of the season total was captured in March, 45% in April (1,534), and 54% (1,860) in May.

Wild steelhead trout first appeared on March 31 (one fish). The daily trap catch remained below 100 fish throughout the trapping season. Daily catch fluctuated between zero and 40 fish per day (Figure 6). Less than one percent (1) of the season total was captured in March, 48% (150) in April, and 52% (163) in May.

Hatchery sockeye salmon first appeared at the trap on May 10 (one fish). The daily catch fluctuated between zero and 57 fish per day. One hundred percent (108) of the season total was captured in May.

Sockeye salmon of unknown rearing first appeared at the trap an May 12 (one fish). The daily catch fluctuated between zero and three fish per day. One hundred percent (7) of the season total was captured in May.

Salmon River discharge measured at the White Bird gauge ranged between 3.6 kcfs and 46.9 kcfs (Table 7). Water temperature at the Salmon River trap ranged between 4.0°C to 10.0°C (Figure 7). Secchi disk transparency at the Salmon River trap ranged between 0.1 m and 2.4 m (Figure 7).

The trap was operated at a position approximately 10 meters from the north shoreline from March 7 through May 6. The trap position was changed to approximately 30 meters from the north shoreline on May 7 to avoid large amounts of woody debris. The trap remained at 30 meters until May 14 when it was moved back to 10 meters. On May 17, the trap was moved to 35 meters from the north shore to avoid large amounts of woody debris and high discharge. Trapping was suspended for the season on May 17.

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 1996 through 2005.

Year	Species / Run	Snake River Trap	Clearwater River Trap	Salmon River Trap
2005	HC	1,307	16,388	34,107
	WC	501	2,016	9,534
	HS	5,846	11,341	3,440
	WS	1,416	1,456	314
2004	HC	3,849	29,694	32,038
	WC	1,473	1,290	7,567
	HS	8,698	7,930	2,480
	WS	1,972	1,035	248
2003	HC	3,395	21,342	35,897
	WC	1,386	1,005	9,339
	HS	7,319	9,257	3,101
	WS	1,252	464	319
2002	HC	7,252	4,985	43,168
	WC	1,458	627	5,548
	HS	12,578	5,652	3,284
	WS	2,591	524	395
2001	HC	636	No Data	10,388
	WC	94		2,274
	HS	4,300		4,079
	WS	926		488
2000	HC	5,566	No Data	22,175
	WC	2,214		3,373
	HS	8,777		2,290
	WS	1,364		336
1999	HC	15,327	No Data	23,180
	WC	6,411		5,079
	HS	7,271		2,554
	WS	1,050		228
1998	HC	3,487	No Data	10,852
	WC	1,063		1,459
	HS	8,001		1,218
	WS	1,116		112
1997	HC	1,543	No Data	2,280
	WC	898		1,065
	HS	1,600		1,267
	WS	196		66
1996	HC	3,163	No Data	6,205
	WC	1,140		1,776
	HS	8,921		9,566
	WS	896		304

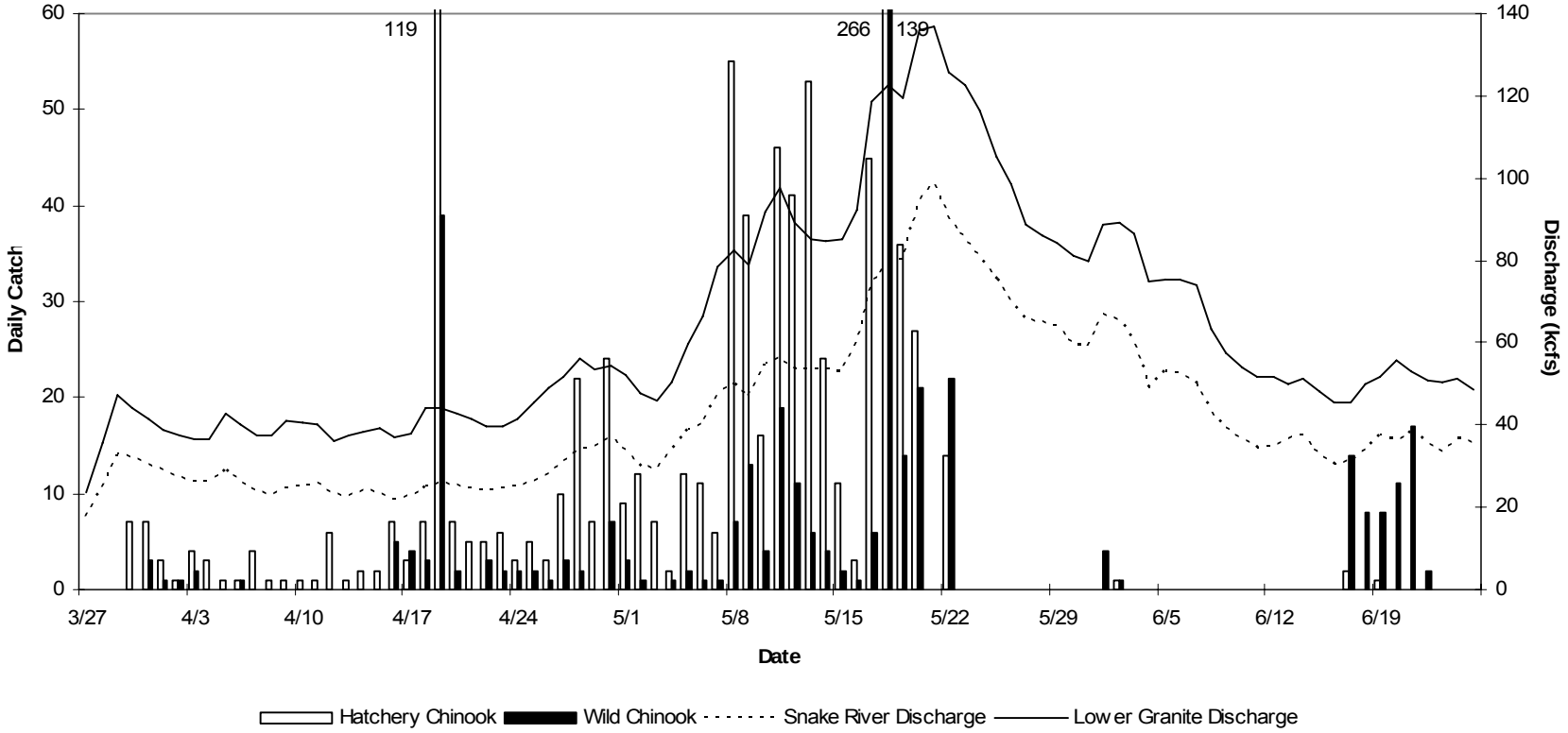

Figure 2. Snake River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Snake River and Lower Granite discharge, 2005.

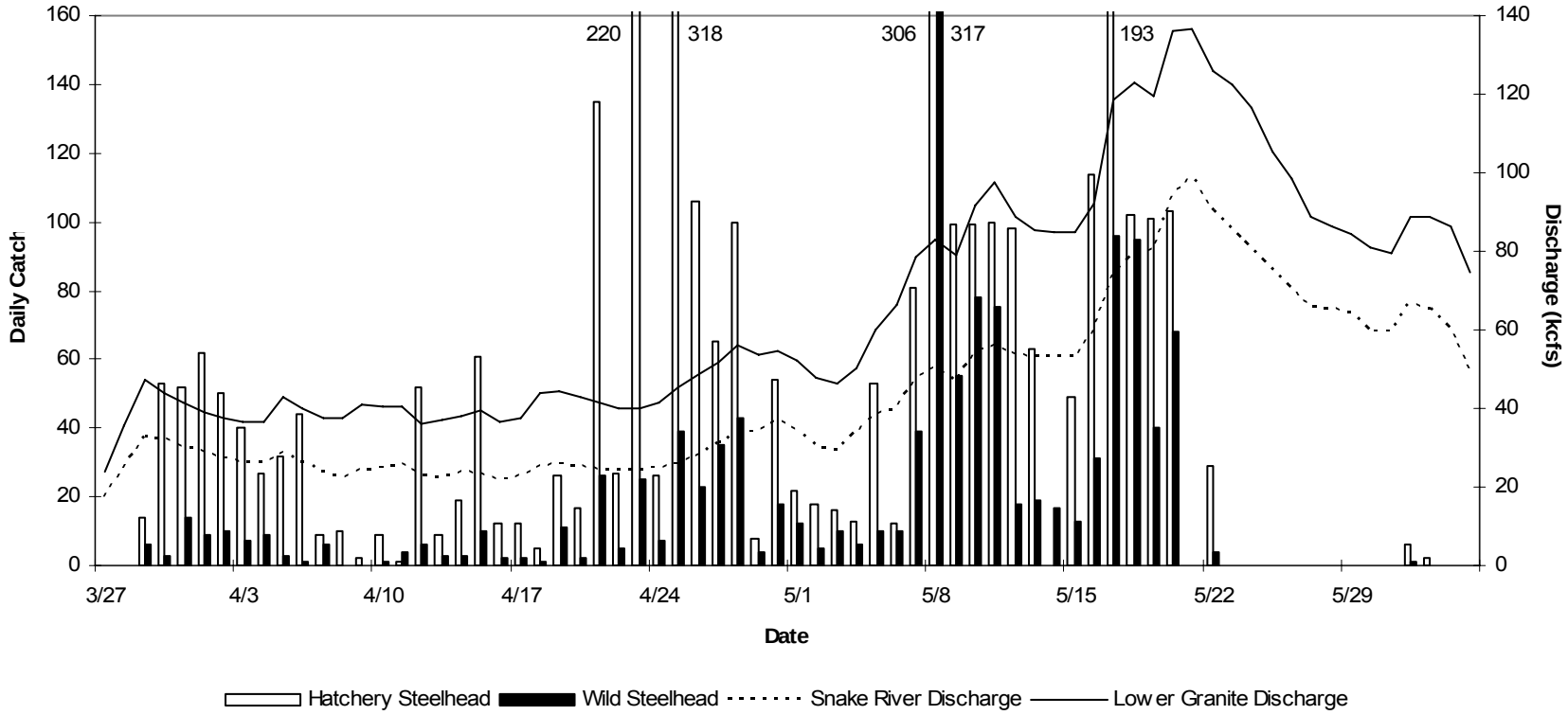

Figure 3. Snake River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Snake River and Lower Granite discharge, 2005.

Table 6. Monthly Snake River discharge at Anatone, Washington, and 2005 comparison with previous three years. Comparison data is reported as 2005 discharge minus annual interval discharge.

		2005	2002		2003		2004	
		Discharge (cfs)	Discharge (cfs)	2005 Comparison (kcfs)	Discharge (cfs)	2005 Comparison (kcfs)	Discharge (cfs)	2005 Comparison (kcfs)
March	Min	13,609	14,630	-1.0	15,408	-1.8	20,907	-7.3
	Max	32,910	41,260	-8.4	37,936	-5.0	43,392	-10.5
	Average	18,174	24,046	-5.9	28,250	-10.1	31,141	-13.0
April	Min	21,688	25,339	-3.7	30,722	-9.0	23,597	-1.9
	Max	36,842	60,143	-23.3	43,349	-6.5	41,914	-5.1
	Average	26,282	39,457	-13.2	36,830	-10.5	29,607	-3.3
May	Min	29,332	26,963	2.4	31,274	-1.9	29,108	0.2
	Max	98,915	84,175	14.7	146,719	-47.8	71,257	27.7
	Average	60,560	44,887	15.7	55,989	4.6	48,553	12.0
June	Min	30,450	35,306	-4.9	27,280	3.2	27,279	3.2
	Max	66,950	83,131	-16.2	131,563	-64.6	66,920	0.0
	Average	40,896	53,175	-12.3	62,639	-21.7	45,472	-4.6

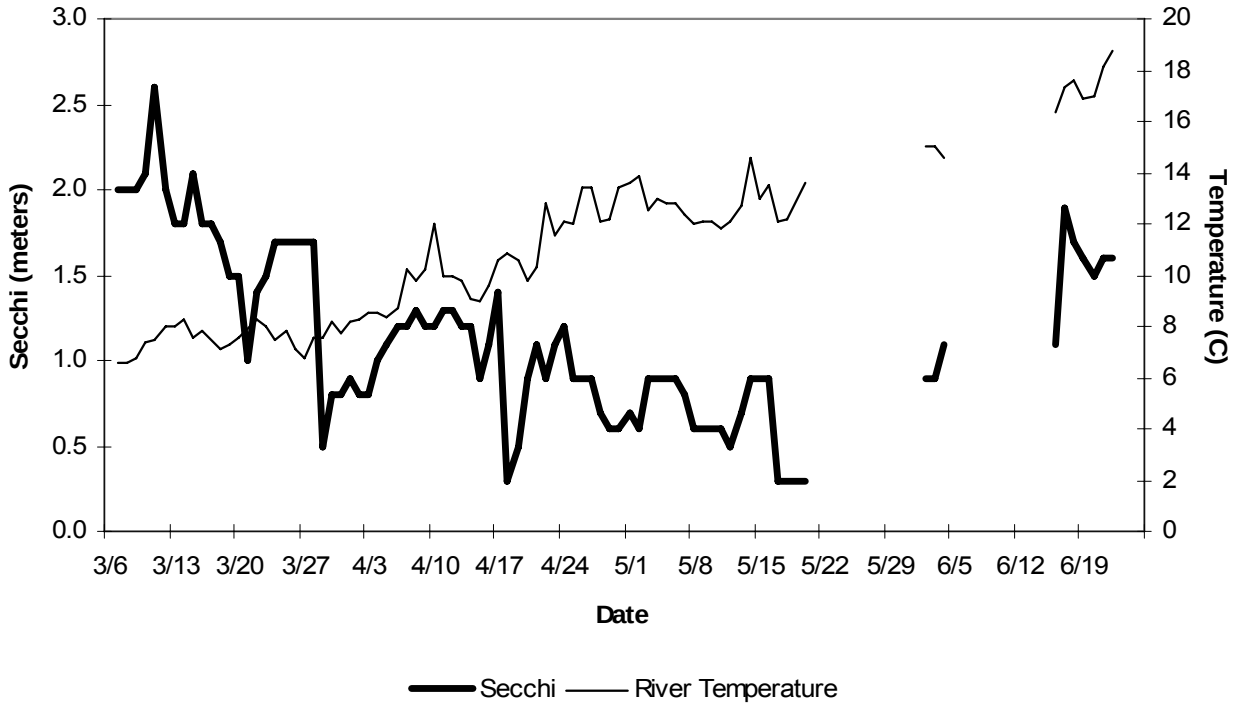

Figure 4. Daily river water temperature and Secchi disk transparency at the Snake River trap, 2005.

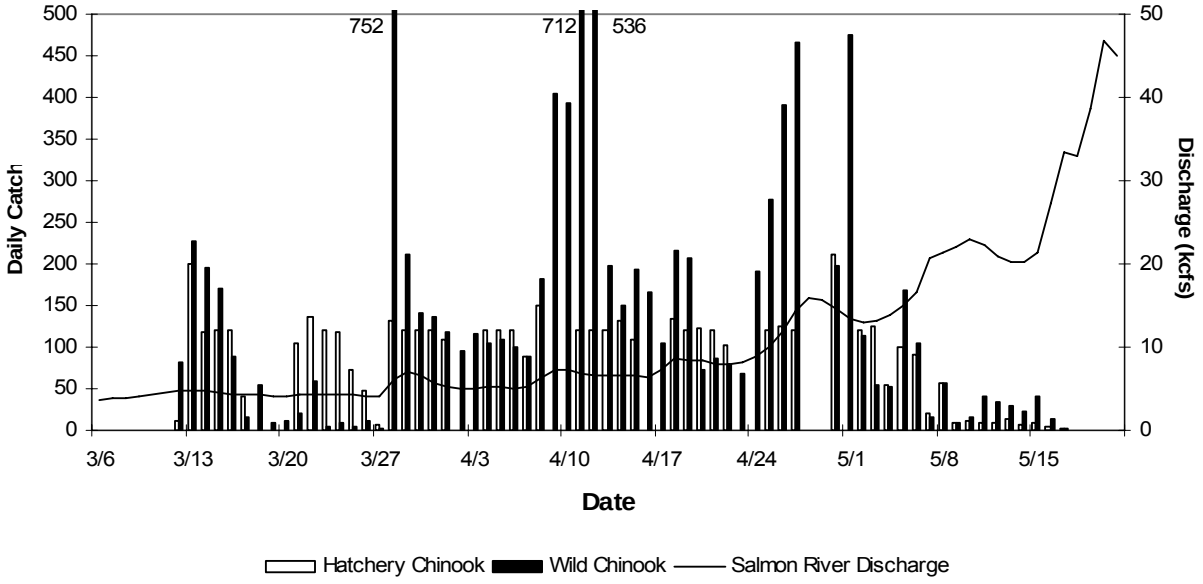

Figure 5. Salmon River trap daily catch of hatchery Chinook salmon and wild Chinook salmon overlaid by Salmon River discharge, 2005.

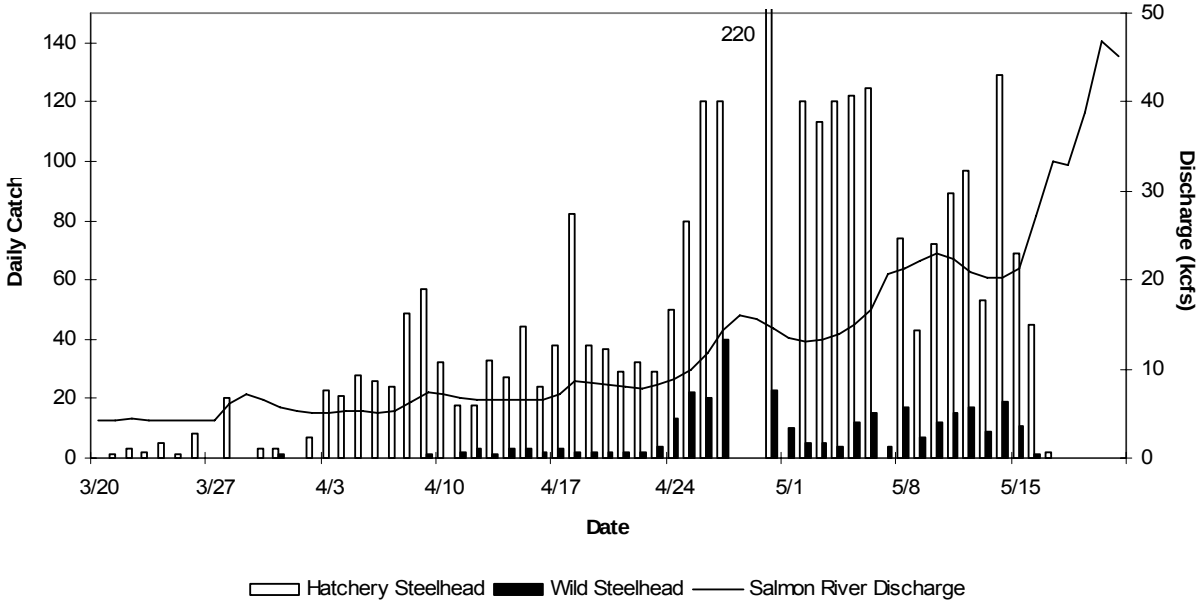

Figure 6. Salmon River trap daily catch of hatchery steelhead trout and wild steelhead trout overlaid by Salmon River discharge, 2005.

Table 7. Monthly Salmon River discharge at White Bird, Idaho, and 2005 comparison with previous three years. Comparison data is reported as 2005 discharge minus annual interval discharge.

		2005	2002		2003		2004	
		Discharge (cfs)	Discharge (cfs)	2005 Comparison (kcfs)	Discharge (cfs)	2005 Comparison (kcfs)	Discharge (cfs)	2005 Comparison (kcfs)
March	Min	3,596	3,169	0.4	3,765	-0.2	3,554	0.0
	Max	7,100	5,514	1.6	9,433	-2.3	10,632	-3.5
	Average	4,457	4,137	0.3	6,286	-1.8	6,071	-1.6
April	Min	4,985	5,962	-1.0	7,255	-2.3	8,632	-3.6
	Max	15,953	23,423	-7.5	18,041	-2.1	14,932	1.0
	Average	8,140	12,357	-4.2	12,173	-4.0	11,688	-3.5
May	Min	13,043	12,543	0.5	12,588	0.5	13,980	-0.9
	Max	46,867	52,568	-5.7	90,290	-43.4	36,523	10.3
	Average	27,653	25,006	2.6	30,156	-2.5	24,558	3.1

Travel Time and Migration Rates

Release Sites to Snake River Trap

Hatchery Spring Chinook Salmon—In 2005, five PIT-tagged hatchery spring Chinook salmon were interrogated at the Snake River trap (Table 8). One was from the Catherine Creek Pond (travel time 68.0 d), one was from the Imnaha River weir (travel time 26.2 d), one was from the Lookingglass Hatchery (travel time 30.2 d), and two were from the Rapid River Hatchery (median 40.2 d).

Wild Spring Chinook Salmon—In 2005, five PIT-tagged wild spring Chinook salmon were interrogated at the Snake River trap (Table 8). Two were from Camas Creek (median travel time 283.5 d), one was from the Grande Ronde River trap (travel time 0.9 d), one was from the Marsh Creek trap (travel time 39.3 d), and one was from the Sawtooth trap (travel time 11.1 d).

Hatchery Summer Chinook Salmon—In 2005, 15 PIT-tagged hatchery summer Chinook salmon were interrogated at the Snake River trap (Table 8). Five were from Johnson Creek (median travel time 64.1 d) and ten were from Knox Bridge (median 60.2 d).

Wild Summer Chinook Salmon—In 2005, four PIT-tagged wild summer Chinook salmon were interrogated at the Snake River trap (Table 8). Two were from the Johnson Creek trap (median travel time 167.0 d), one was from Lake Creek (travel time 6.4 d), and one was from the South Fork Salmon River trap (median 66.1 d).

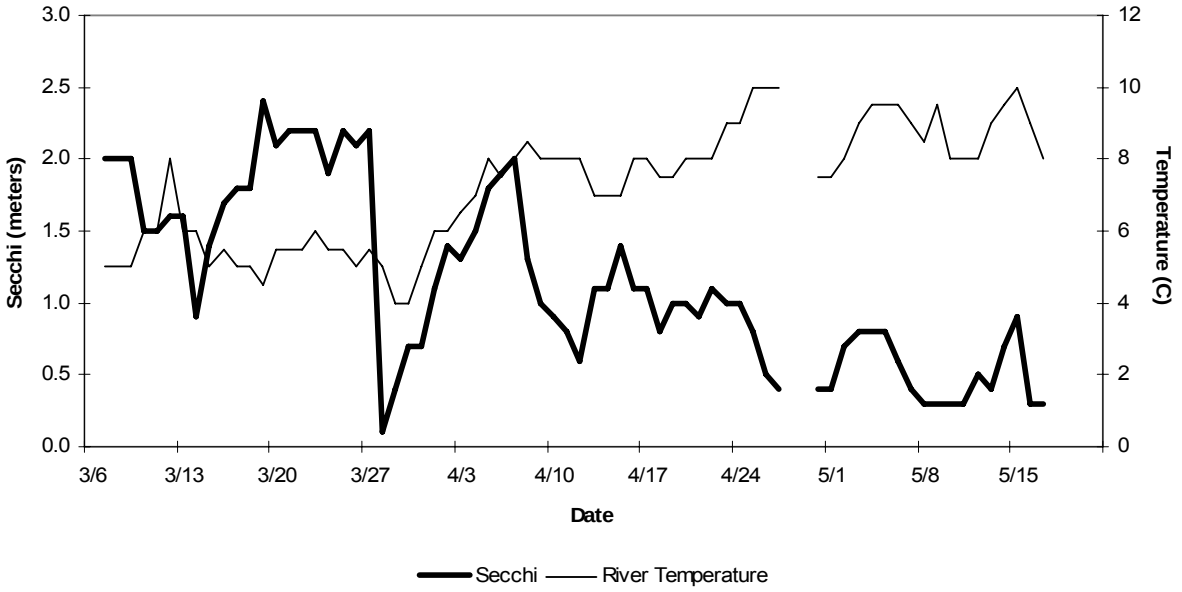

Figure 7. Daily river water temperature and Secchi disk transparency at the Salmon River trap, 2005.

Hatchery Fall Chinook Salmon—In 2005, 121 PIT-tagged hatchery fall Chinook salmon were interrogated at the Snake River trap (Table 8). One-hundred thirteen were from the Snake River (Section 3) (median travel time 0.9 d) and eight were from the Snake River (Section 4) (median 19.2 d).

Wild Unknown Run Chinook Salmon—In 2005, eight PIT-tagged wild unknown run Chinook salmon were interrogated at the Snake River trap (Table 8). Three were from the Salmon River trap (median travel time 6.8 d), four were from the Snake River (section 3) (median 1.1 d), and one was from the Snake River (section 4) (travel time 14.4 d).

Hatchery Summer Steelhead Trout—In 2005, 25 hatchery summer steelhead trout were interrogated at the Snake River trap (Table 8). One was from the Big Sheep Creek Facility (travel time 34.0 d), four were from the Imnaha River trap (median 1.3 d), three were from the Little Salmon River (median 42.0 d), one was from the Salmon River trap (travel time 2.5 d), one was from the Sawtooth Hatchery (travel time 11.6 d), one was from Squaw Creek (travel time 28.0 d), one was from Squaw Creek Acclimation Pond (travel time 6.3 d), and seven were from the Wallowa Hatchery (median 8.9 d).

Wild Summer Steelhead Trout—In 2005, 15 wild summer steelhead trout were interrogated at the Snake River trap (Table 8). Two were from Asotin Creek (median travel time 2.0 d), one was from the Grande Ronde River (section 2) (travel time 18.7 d), one was from the Grande Ronde River trap (travel time 2.1 d), six were from the Imnaha River trap (median 3.3 d), one was from the Lemhi River (travel time 5.0 d), one was from Lookingglass Creek (travel time 10.0 d), two were from the Minam River (median 18.9 d), and one was from the Sawtooth trap (travel time 8.7 d).

Unknown Summer Steelhead Trout—In 2005, one hatchery summer steelhead trout of unknown rearing was interrogated at the Snake River trap (Table 8). It was from the Imnaha River trap (travel time 4.7 d).

Hatchery Sockeye Salmon—In 2005, 11 hatchery sockeye salmon were interrogated at the Snake River trap (Table 8). One was from Alturas Lake (travel time 217.0 d), one was from Pettit Lake (travel time 225.4 d), one was from Pettit Lake Creek (travel time 5.8 d), one was from Redfish Lake (travel time 226.1 d), and seven were from the Redfish Lake Creek trap (median 6.9 d).

Wild Sockeye Salmon—In 2005, three wild sockeye salmon were interrogated at the Snake River trap (Table 8). One was from Alturas Lake Creek (travel time 5.1 d) and two were from the Redfish Lake Creek trap (median 8.2 d).

Hatchery Coho Salmon—In 2005, two hatchery coho salmon were interrogated at the Snake River trap (Table 8). One was from the Clearwater River (travel time 69.4 d) and one was from the Potlatch River (travel time 24.7 d).

Release Sites to Salmon River Trap

Hatchery Spring Chinook Salmon—In 2005, 396 hatchery spring Chinook salmon were interrogated at the Salmon River trap (Table 9). They were from the Rapid River Hatchery (median travel time 15.9 d).

Wild Spring Chinook Salmon—In 2005, eight wild spring Chinook salmon were interrogated at the Salmon River trap (Table 9). Two were from the Lemhi River weir (median travel time 123.4 d), one was from the Marsh Creek trap (travel time 17.0 d), and five were from the Sawtooth trap (median 16.5 d).

Hatchery Summer Chinook Salmon—In 2005, 328 hatchery summer Chinook salmon were interrogated at the Salmon River Trap (Table 9). Twenty-eight were from Johnson Creek (median travel time 43.8 d), 300 were from Knox Bridge (median 97.7 d), and one was from the Pahsimeroi Pond (travel time 17.8 d).

Wild Summer Chinook Salmon—In 2005, 21 wild summer Chinook salmon were interrogated at the Salmon River trap (Table 9). Ten were from the Johnson Creek trap (median travel time 52.1 d), seven were from the Pahsimeroi River trap (median 24.0 d), and four were from the South Fork Salmon River trap (median 25.9 d).

Hatchery Summer Steelhead Trout—In 2005, three hatchery summer steelhead trout were interrogated at the Salmon River trap (Table 9). One was from the Little Salmon River (travel time 33.9 d) and two were from the Squaw Creek Acclimation Pond (median 7.4 d).

Table 8. Travel time, separated by species, run, and rearing type, from the point of release to the Snake River trap, 2005.

Species/Run/Rearing	Release Site	Distance From Release Site To Trap (km)	Number Of Receptors	Minimum Travel Time (days)	Maximum Travel Time (days)	Median Travel Time (days)
Chinook / Spring / Hatchery	Catherine Creek Pond	326	1	67.99	67.99	67.99
	Imnaha River Weir	157	1	26.20	26.20	26.20
	Lookingglass Hatchery	186	1	30.21	30.21	30.21
	Rapid River Hatchery	231	2	34.62	45.67	40.15
Chinook / Spring / Wild	Camas Creek	454	2	282.71	284.18	283.45
	Grande Ronde River Trap	48	1	0.92	0.92	0.92
	Marsh Creek Trap	578	1	39.32	39.32	39.32
	Sawtooth Trap	695	1	11.10	11.10	11.10
Chinook / Summer / Hatchery	Johnson Creek	377	5	58.25	64.24	64.13
	Knox Bridge	405	10	39.64	64.18	60.20
Chinook / Summer / Wild	Johnson Creek Trap	384	2	66.90	267.08	166.99
	Lake Creek	397	1	6.40	6.40	6.40
	South Fork Salmon River Trap	408	1	66.11	66.11	66.11
Chinook / Fall / Hatchery	Snake River (Section 3)	1	113	0.16	30.23	0.85
	Snake River (Section 4)	78	8	8.49	21.14	19.22
Chinook / Unknown / Wild	Salmon Trap	181	3	3.85	14.21	6.76
	Snake River (Section 3)	1	4	0.48	19.32	1.12
	Snake River (Section 4)	78	1	14.44	14.44	14.44
Coho/Unknown/Hatchery	Clearwater River	1	1	69.39	69.39	69.39
	Potlatch River	25	1	24.65	24.65	24.65
Steelhead / Summer / Hatchery	Big Sheep Creek	115	1	34.00	34.00	34.00
	Imnaha River Trap	90	4	-7.10	15.97	1.28
	Little Salmon River	218	3	35.97	55.60	42.04
	Salmon Trap	181	7	1.51	4.31	2.53
	Sawtooth Hatchery	695	1	11.58	11.58	11.58
	Squaw Creek	642	1	27.98	27.98	27.98
	Squaw Creek ACC[a] Pond	643	1	6.32	6.32	6.32
	Wallowa Hatchery	241	7	7.32	34.37	8.87
Steelhead/Summer/Wild	Asotin Creek	9	2	1.89	2.14	2.02
	Grande Ronde River (Section 2)	177	1	18.66	18.66	18.66
	Grande Ronde River Trap	48	1	2.05	2.05	2.05
	Imnaha River Trap	90	6	0.96	7.97	3.34
	Lemhi River	494	1	4.98	4.98	4.98
	Lookingglass Creek	183	1	9.99	9.99	9.99
	Minam River	193	2	3.32	34.52	18.82
	Sawtooth Trap	695	1	8.72	8.72	8.72

Table 8. Continued.

Species/Run/Rearing	Release Site	Distance From Release Site To Trap (km)	Number Of Receptors	Minimum Travel Time (days)	Maximum Travel Time (days)	Median Travel Time (days)
Steelhead/Summer/Unknown	Imnaha Trap	90	1	4.65	4.65	4.65
Sockeye / Summer / Hatchery	Alturas Lake	722	1	216.95	216.95	216.95
	Pettit Lake	715	1	225.39	225.39	225.39
	Pettit Lake Creek	713	1	5.75	5.75	5.75
	Redfish Lake	698	1	226.12	226.12	226.12
	Redfish Lake Creek Trap	696	7	3.97	8.82	6.87
Sockeye / Summer / Wild	Alturas Lake Creek	711	1	5.11	5.11	5.11
	Redfish Lake Creek Trap	696	2	7.98	8.32	8.15

[a] Fish were released prior to reported date of release.

Table 9. Travel time, separated by species, run, and rearing type, from the point of release to the Salmon River trap, 2005.

Species/Run/Rearing	Release Site	Distance From Release Site To Trap (km)	Number Of Receptors	Minimum Travel Time (days)	Maximum Travel Time (days)	Median Travel Time (days)
Chinook / Spring / Hatchery	Rapid River Hatchery	50	396	1.90	47.83	15.89
Chinook / Spring / Wild	Lemhi River Weir	362	2	113.98	132.78	123.38
	Marsh Creek Trap	397	1	16.97	16.97	16.97
	Sawtooth Trap	514	5	10.47	22.48	16.47
Chinook / Summer / Hatchery	Johnson Creek	196	28	17.88	57.80	43.84
	Knox Bridge	224	300	11.90	54.80	97.70
	Pahsimeroi Pond	397	1	17.82	17.82	17.82
Chinook / Summer / Wild	Johnson Creek Trap	203	10	31.48	177.63	52.08
	Pahsimeroi River Trap	388	7	8.51	745.13	23.95
	South Fork Salmon River Trap	227	4	13.99	181.87	25.86
Steelhead / Summer / Hatchery	Little Salmon River	37	1	33.90	33.90	33.90
	Squaw Creek Acclimation Pond	462	2	6.87	7.84	7.36

Snake River Trap to Lower Granite Dam

A removable spillway weir (RSW) was installed at Lower Granite Dam in 2001. When the RSW is operated, there is a significant increase in the number of smolts that pass the facility by spill thus reducing the number of smolts passing via the collection facility or through the turbines. Therefore, when the RSW is in operation there are fewer PIT tag interrogations at Lower Granite Dam. The RSW was operated for fish passage during the spring to coincide with periods of spill, which was provided when flows exceeded 85 kcfs (spill provided sporadically between April 29-June 10).

Hatchery Chinook Salmon PIT Tag Groups—Sufficient numbers of hatchery spring/summer Chinook salmon (609 individual fish) were PIT tagged daily at the Snake River trap to provide 10 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 19 through May 20 (Appendix A, Table 1). Median travel time ranged from 8.0 to 2.7 d (6.4 km/d to 18.9 km/d migration rate).

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 Snake River trap to Lower Granite Dam and average Lower Granite inflow for PIT-tagged hatchery Chinook salmon groups (Table 11). The equation shows that as discharge increases, migration rate increases.

Wild Chinook Salmon PIT-Tag Groups—Sufficient numbers of wild Chinook salmon (329 individual fish) were PIT tagged daily at the Snake River trap to provide six daily release groups for median migration rate calculations through Lower Granite Reservoir from April 19 through May 22 (Appendix A, Table 2). Median travel time ranged from 7.9 to 2.9 d (6.9 km/d to 18.0 km/d migration rate).

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 Snake River trap to Lower Granite Dam and average Lower Granite inflow for PIT-tagged wild Chinook salmon groups (Table 11). The inability to detect a relation is probably due to lack of sufficient data.

Hatchery Steelhead Trout PIT Tag Groups—Sufficient numbers of hatchery steelhead trout (3,356 individual fish) were PIT tagged daily at the Snake River trap to provide 49 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 29 through May 22 (Appendix A, Table 3). Median travel time ranged from 15.2 to 1.5 d (3.4 km/d to 34.0 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 10). 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 11). The equation shows that as discharge increases, migration rate increases.

Wild Steelhead Trout PIT-Tag Groups—Sufficient numbers of wild steelhead trout (1,355 individual fish) were PIT tagged daily at the Snake River trap to provide 33 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 31

through May 20 (Appendix A, Table 4). Median travel time ranged from 11.5 to 1.5 d (4.5 km/d to 34.7 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 10). 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 11). The equation shows that as discharge increases, migration rate increases.

Salmon River Trap to Lower Granite Dam

Hatchery Chinook Salmon PIT Tag Groups—Sufficient numbers of hatchery Chinook salmon (4,835 individual fish) were PIT tagged daily at the Salmon River trap to provide 42 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 13 through May 8 (Appendix A, Table 5). Median travel time ranged from 39.2 to 6.3 d (5.9 km/d to 37.2 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 12). 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 hatchery Chinook salmon groups (Table 11). The equation shows that as discharge increases, migration rate increases.

Wild Chinook Salmon PIT-Tag Groups—Sufficient numbers of wild Chinook salmon (9,476 individual fish) were PIT tagged daily at the Salmon River trap to provide 57 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 12 through May 15 (Appendix A, Table 6). Median travel time ranged from 44.4 to 4.6 d (5.3 km/d to 50.7 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 12). 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 11). The equation shows that as discharge increases, migration rate increases.

Hatchery Steelhead Trout PIT Tag Groups—Sufficient numbers of hatchery steelhead trout (2,624 individual fish) were PIT tagged daily at the Salmon River trap to provide 43 daily release groups for median migration rate calculations through Lower Granite Reservoir from March 26 through May 16 (Appendix A, Table 7). Median travel time ranged from 28.1 to 3.1 d (8.3 km/d to 75.0 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 12). 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 11). The equation shows that as discharge increases, migration rate increases.

Wild Steelhead Trout PIT-Tag Groups—Sufficient numbers (312 individual fish) of wild steelhead trout were PIT tagged daily at the Salmon River trap to provide 14 daily release groups for median migration rate calculations through Lower Granite Reservoir from April 24

through May 14 (Appendix A, Table 8). Median travel time ranged from 6.4 to 3.1 d (36.4 km/d to 74.4 km/d migration rate).

Data stratified by 5 kcfs groups were used in the regression analysis (Table 12). 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 11). The equation shows that as discharge increases, migration rate increases.

Interrogation of PIT-Tagged Fish

Cumulative interrogation data generally are not directly comparable between years. Changes in the amount, duration, and timing of spill results in changes in fish collection efficiency at the dams and therefore PIT tag interrogation rate. A fourth collection facility in the system, Lower Monumental Dam became operational in 1993, and total interrogations are likely to be greater beginning in 1993 than in previous years under similar spill conditions. A removable spillway weir (RSW) was installed at Lower Granite Dam in 2001, tested in 2002, and was operational for a portion of the 2005 outmigration. The RSW increased spillway passage efficiency and, therefore, reduced the number of fish collected and detected at a given spill level. Any comparison in trends of cumulative detection at dams must be done cautiously, in a manner that incorporates changes in collection efficiency.

After combining to remove groups with small sample size, mean percent interrogation of Snake River trap hatchery Chinook salmon daily PIT tag release groups at Lower Granite Dam was 51.4% and ranged between 18.0% and 91.7% for hatchery fish (Appendix B, Table 1). The mean for wild Chinook salmon was 49.0% and ranged from 32.3% to 100% (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 72.7% and 100%, and averaged 88.1% and wild Chinook salmon ranged from 72.7% to 100% and averaged 87.1% (Table 13).

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 30.4% to 65.3% and averaged 51.5% (Appendix B, Table 5). Wild Chinook salmon ranged from 23.3% to 100% and averaged 65.4% (Appendix B, Table 6). Seasonal cumulative interrogation rate of PIT-tagged hatchery Chinook salmon to Lower Granite, Little Goose, Lower Monumental, and McNary dams ranged between 50.0% and 86.0% and averaged 71.2% (Table 13). Wild Chinook salmon cumulative interrogation rates ranged between 46.7% and 100% and averaged 76.3% (Table 13).

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 22.8% to 100% for hatchery fish and averaged 67.7% (Appendix B, Table 3). Wild steelhead trout ranged from 0% to 100% and averaged 67.1% (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 85.2% and 100% and averaged 93.3% (Table 13). Wild steelhead trout cumulative interrogation rates ranged between 72.7% and 100% and averaged 92.4% (Table 13).

Percent interrogation of Salmon River trap hatchery steelhead trout daily PIT tag release groups at Lower Granite Dam, after combining to remove groups with small sample size, ranged

from 24.6% to 85.7% and averaged 57.6% (Appendix B, Table 7). Wild steelhead trout ranged from 0% to 100% and averaged 61.5% (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 35% and 100% and averaged 56.4% (Table 13). Wild steelhead trout ranged from 50.0% to 100% and averaged 83.6% (Table 13).

Table 10. Migration rates (km/day) stratified by 5 kcfs intervals from the Snake River trap to Lower Granite Dam, 2005.

	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
35-40					7.68	344	6.90	39
40-45	6.42	84	6.92	33	9.10	222	9.32	37
45-50					12.18	203	12.25	26
50-55	8.70	41	10.26	7	12.41	453	14.87	133
55-60								
60-65					15.93	18	14.16	6
65-70								
70-75					15.20	35	17.92	8
75-80	11.23	11			20.37	11	20.74	8
80-85					24.66	339	24.38	278
85-90	14.26	67	18.04	7	23.84	208	23.81	76
90-95					26.88	163	24.75	120
95-100					29.95	32	25.10	8
100-105								
105-110			8.83	9				
110-115					32.74	35	34.10	7
115-120								
120-125			9.58	8	31.54	89	33.82	77
125-130	16.65	20	15.98	42	31.33	36		
130-135	18.89	9			33.25	69	32.07	39

Table 11. Linear regression statistics for migration rate/discharge relations by species rearing type and trap using data stratifies by 5-kcfs intervals, 2005.

Species	Trap	N	Intercept	Slope	r^2	P
Hatchery	Snake	6	0.849	-1.212	0.972	<0.001
Chinook	Salmon	10	2.069	-5.364	0.922	<0.001
Wild	Snake	6	0.381	0.725	0.247	0.316
Chinook	Salmon	14	1.528	-3.115	0.757	<0.001
Hatchery	Snake	15	1.137	-1.920	0.957	<0.001
Steelhead	Salmon	14	1.308	-1.779	0.916	<0.001
Wild	Snake	14	1.156	-1.997	0.955	<0.001
Steelhead	Salmon	6	0.772	0.703	0.854	0.008

Table 12. Migration rates (km/day) stratified by 5 kcfs intervals from the Salmon River trap to Lower Granite Dam, 2005.

	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
30-35			5.40	183				
35-40	5.55	472	5.70	410	15.23	98		
40-45	8.79	939	11.81	3260	17.74	215		
45-50	13.29	410	17.39	691	22.38	124		
50-55	19.55	139	28.14	868	33.85	175	42.63	66
55-60	22.06	151	29.23	122	32.80	153	42.01	10
60-65	24.45	104	31.73	358	37.70	79		
65-70	30.54	124	33.93	25	45.92	136		
70-75			39.35	112	54.33	90	58.71	7
75-80	36.79	71			57.92	95	56.69	10
80-85	35.04	38	41.48	61				
85-90	35.95	24	41.61	38	60.27	176	55.18	44
90-95					52.57	79		
95-100			32.34	21			72.40	8
100-105					60.87	47		
105-110			30.78	7	63.07	17		
110-115			50.72	14	74.74	16		

Table 13. Interrogations of PIT-tagged fish from the Snake River trap, 1987-2005; Clearwater River trap, 1989-1995; and Salmon River trap 1993-2005, 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	2005	CH	622	320	51.4%	178	28.6%	14	2.3%	12	1.9%	524	84.2%
	2004	CH	2,127	1,077	50.6%	522	24.5%	94	4.4%	53	2.5%	1,746	82.1%
	2003	CH	2,047	557	27.2%	470	23.0%	123	6.0%	173	8.5%	1,323	64.6%
	2002	CH	1,901	391	20.6%	428	22.5%	346	18.2%	2	0.1%	1,167	61.4%
	2001	CH	413	291	70.5%	51	12.3%	8	1.9%	4	1.0%	354	85.7%
	2000	CH	3,963	1,179	29.8%	677	17.1%	188	4.7%	195	4.9%	2,239	56.5%
	1999	CH	4,268	997	23.4%	1,515	35.5%	516	12.1%	206	4.8%	3,234	75.8%
	1998	CH	2,303	1,077	46.8%	510	22.2%	192	8.3%	71	3.1%	1,850	80.3%
	1997	CH	—	—	—	—	—	—	—	—	—	—	—
	1996	CH	1,450	497	34.3%	259	17.9%	189	13.0%	40	2.8%	985	67.9%
	1995	CH	3,927	1,646	41.9%	643	16.4%	430	11.0%	153	3.9%	2,872	73.1%
	1994	CH	2,844	885	31.1%	332	11.7%	223	7.8%	329	11.6%	1,769	62.2%
	1993	CH	3,203	1,336	41.7%	494	15.4%	246	7.7%	134	4.2%	2,210	69.0%
	1992	CH	410	166	40.5%	83	20.2%	—	0.0%	48	11.7%	297	72.4%
Snake	2005	CW	339	166	49.0%	124	36.6%	7	2.1%	3	0.9%	300	88.5%
	2004	CW	1,389	757	54.5%	277	19.9%	27	1.9%	8	0.6%	1,069	76.9%
	2003	CW	1,311	399	30.4%	327	24.9%	125	9.5%	90	6.9%	941	71.8%
	2002	CW	1,393	294	21.1%	448	32.2%	207	14.9%	1	0.1%	950	68.2%
	2001	CW	43	26	60.5%	3	7.0%	—	0.0%	1	2.3%	30	69.8%
	2000	CW	1,989	550	27.7%	480	24.1%	144	7.2%	112	5.6%	1,286	64.7%
	1999	CW	3,624	804	22.2%	1,515	41.8%	567	15.6%	121	3.3%	3,007	83.0%
	1998	CW	961	442	46.0%	190	19.8%	89	9.3%	42	4.4%	763	79.4%
	1997	CW	—	—	—	—	—	—	—	—	—	—	—
	1996	CW	842	269	31.9%	190	22.6%	119	14.1%	40	4.8%	618	73.4%
	1995	CW	2,067	1,023	49.5%	366	17.7%	216	10.5%	68	3.3%	1,673	80.9%
	1994	CW	934	354	37.9%	95	10.2%	82	8.8%	83	8.9%	614	65.7%
	1993	CW	1,125	576	51.2%	150	13.3%	57	5.1%	46	4.1%	829	73.7%
Snake	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	2005	SH	3,356	2,273	67.7%	803	23.9%	67	2.0%	7	0.2%	3,150	93.9%
	2004	SH	4,843	3,497	72.2%	767	15.8%	101	2.1%	14	0.3%	4,379	90.4%
	2003	SH	4,177	1,282	30.7%	881	21.1%	508	12.2%	86	2.1%	2,757	66.0%
	2002	SH	5,031	1,200	23.9%	875	17.4%	818	16.3%	2	0.0%	2,895	57.5%
	2001	SH	3,156	2,082	66.0%	115	3.6%	24	0.8%	6	0.2%	2,227	70.6%
	2000	SH	3,717	2,122	57.1%	342	9.2%	203	5.5%	41	1.1%	2,708	72.9%
	1999	SH	3,990	1,185	29.7%	1,175	29.4%	537	13.5%	89	2.2%	2,986	74.8%
	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	2005	SW	1,357	911	67.1%	325	23.9%	22	1.6%	1	0.1%	1,259	92.8%
	2004	SW	1,923	1,457	75.8%	253	13.2%	19	1.0%	2	0.1%	1,731	90.0%
	2003	SW	1,208	397	32.9%	300	24.8%	77	6.4%	32	2.6%	806	66.7%

Table 13. Continued.

Site	Year	Species[a]	No. Tagged	Number Interrogated / Site: 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, continued	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%
	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	2005	CH	4,837	2,490	51.5%	821	17.0%	89	1.8%	56	1.2%	3,456	71.4%
	2004	CH	4,187	2,033	48.6%	641	15.3%	87	2.1%	67	1.6%	2,828	67.5%
	2003	CH	4,492	1,120	24.9%	576	12.8%	97	2.2%	365	8.1%	2,158	48.0%
	2002	CH	5,049	853	16.9%	818	16.2%	892	17.7%	5	0.1%	2,568	50.9%
	2001	CH	4,564	2,740	60.0%	519	11.4%	99	2.2%	37	0.8%	3,395	74.4%
	2000	CH	4,804	1,486	30.9%	708	14.7%	214	4.5%	230	4.8%	2,638	54.9%
	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	2005	CW	9,478	6,195	65.4%	1,108	11.7%	87	0.9%	36	0.4%	7,426	78.3%
	2004	CW	7,291	3,334	45.7%	1,225	16.8%	331	4.5%	182	2.5%	5,072	69.6%
	2003	CW	9,242	3,130	33.9%	1,459	15.8%	276	3.0%	799	8.6%	5,664	61.3%
	2002	CW	5,467	1,082	19.8%	1,358	24.8%	773	14.1%	1	0.0%	3,214	58.8%

Table 13. Continued.

Site	Year	Species[a]	No. Tagged	Number Interrogated / Site: 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.
Salmon, continued.	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	2005	SH	2,625	1,511	57.6%	541	20.6%	31	1.2%	6	0.2%	2,089	79.6%
	2004	SH	2,241	1,493	66.6%	261	11.6%	30	1.3%	9	0.4%	1,793	80.0%
	2003	SH	2,444	592	24.2%	442	18.1%	299	12.2%	58	2.4%	1,391	56.9%
	2002	SH	2,060	331	16.1%	272	13.2%	325	15.8%	1	0.0%	929	45.1%
	2001	SH	3,152	2,244	71.2%	81	2.6%	24	0.8%	2	0.1%	2,351	74.6%
	2000	SH	2,130	1,209	56.8%	153	7.2%	70	3.3%	21	1.0%	1,453	68.2%
	1999	SH	2,266	718	31.7%	614	27.1%	214	9.4%	32	1.4%	1,578	69.6%
	1998	SH	1,117	608	54.4%	158	14.2%	76	6.8%	7	0.6%	849	76.0%
	1997	SH	1,252	627	50.1%	213	17.0%	118	9.4%	1	0.1%	960	76.6%
	1996	SH	1,410	598	42.4%	205	14.5%	140	9.9%	24	1.7%	967	68.6%
	1995	SH	1,556	937	60.2%	190	12.2%	118	7.6%	14	0.9%	1,259	80.9%
	1994	SH	2,596	1,001	38.6%	164	6.3%	70	2.7%	36	1.4%	1,271	49.0%
	1993	SH	1,641	1,203	73.3%	112	6.8%	44	2.7%	13	0.8%	1,372	83.6%
Salmon	2005	SW	314	177	56.4%	72	22.9%	5	1.6%	1	0.3%	255	81.2%
	2004	SW	239	147	61.5%	39	16.3%	3	1.3%	0	0.0%	189	79.1%
	2003	SW	312	101	32.4%	45	14.4%	16	5.1%	12	3.8%	174	55.8%
	2002	SW	390	97	24.9%	71	18.2%	43	11.0%	0	0.0%	211	54.1%
	2001	SW	485	366	75.5%	19	3.9%	4	0.8%	5	1.0%	394	81.2%
	2000	SW	336	141	42.0%	56	16.7%	18	5.4%	5	1.5%	220	65.5%
	1999	SW	227	56	24.7%	75	33.0%	27	11.9%	5	2.2%	163	71.8%
	1998	SW	112	56	50.0%	13	11.6%	10	8.9%	1	0.9%	80	71.4%
	1997	SW	59	38	64.4%	6	10.2%	5	8.5%	0	0.0%	49	83.1%
	1996	SW	251	112	44.6%	49	19.5%	21	8.4%	1	0.4%	183	72.9%
	1995	SW	435	251	57.7%	59	13.6%	32	7.4%	1	0.2%	343	78.9%
	1994	SW	532	260	48.9%	44	8.3%	32	6.0%	10	1.9%	346	65.0%
	1993	SW	902	575	63.7%	73	8.1%	36	4.0%	5	0.6%	689	76.4%

[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 2005 were 92% of the previous year's release. Hatchery fall Chinook salmon releases were 216% of the previous year. Hatchery steelhead trout releases were 94% of 2004 numbers. Hatchery sockeye releases were 272% of 2004 numbers. Hatchery coho releases were 86% of last year's. Hatchery production of spring/summer Chinook salmon in the Clearwater River drainage was 99%, the Snake River and non-Idaho tributaries 86%, and the Salmon River drainage 84% of 2004 production. Hatchery production of steelhead trout in the Clearwater River drainage was 97%, the Snake River and non-Idaho tributaries was 89%, and the Salmon River was 95% of last year's total. Hatchery production of Chinook salmon and steelhead trout released above Lower Granite Dam was 13,969,545 and 8,661,491, respectively, in 2005. Significant numbers of hatchery sockeye salmon (209,046) and hatchery coho salmon (816,300) were released for migration year 2005.

The Snake River trap was operated on the east side of the river from March 6 through June 3, 2005 and was out of operation for one day during this period due to high flow and debris. FPC requested that the trap be restarted on June 15 and it was operated until June 22 to collect and PIT tag fall chinook. The Snake River trap captured 1,307 age-1 hatchery and 501 wild Chinook salmon, 1,152 age-0 Chinook salmon of unknown rearing, 5,846 hatchery and 1,416 wild steelhead trout, 219 hatchery sockeye, 44 sockeye/kokanee of unknown rearing, and 110 coho of unknown rearing.

The Salmon River trap was operated on the east side of the river from March 6 through May 17, 2005 and was out of operation for two days during this period due to mechanical problems. The Salmon River trap captured 34,107 age-1 hatchery and 9,534 wild Chinook salmon, 3,490 hatchery and 314 wild steelhead trout, 108 hatchery sockeye salmon, and seven sockeye salmon of unknown rearing.

Significant migration rate/discharge relations were detected for hatchery Chinook salmon, hatchery steelhead, and wild steelhead released from the Snake River trap to Lower Granite Dam. Statistical analysis could not detect a significant relation between migration rate and discharge for wild Chinook salmon due to a lack of data.

A significant migration rate/discharge relation was detected for hatchery Chinook salmon, wild Chinook salmon, hatchery steelhead trout, and wild steelhead trout released from the Salmon River trap to Lower Granite Dam.

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 2005 must be compared with caution due to the addition of a new collection facility at Lower Monumental Dam in 1993 and the RSW at Lower Granite Dam in 2001. Since the installation and operation of the RSW at Lower Granite Dam, interrogation rates at Lower Granite Dam have decreased and interrogation rates at the other three collector dams have increased. The RSW was not operated in 2001 due to very low runoff.

LITERATURE CITED

Buettner, E. W. 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.

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.

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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/30/05[b]	24.85	0.00	0.00	10.27	32.31	4	7	57.14%	39.8	2.1
03/31/05[b]	9.66	0.00	0.00	9.66	9.66	1	7	14.29%	39.1	5.3
04/01/05[b]	8.74	0.00	0.00	6.12	11.37	2	3	66.67%	38.9	5.9
04/02/05[b]	12.92	0.00	0.00	12.92	12.92	1	1	100.00%	38.7	4.0
04/03/05[b]	17.23	0.00	0.00	10.31	24.15	2	4	50.00%	39.4	3.0
04/04/05[b]	23.13	0.00	0.00	23.13	23.13	1	3	33.33%	40.9	2.2
04/05/05[b]	10.76	0.00	0.00	10.76	10.76	1	1	100.00%	39.0	4.8
04/06/05[b]	21.48	0.00	0.00	21.48	21.48	1	1	100.00%	41.0	2.4
04/07/05[b]	12.78	0.00	0.00	11.57	13.99	2	4	50.00%	39.6	4.0
04/10/05[b]	18.71	0.00	0.00	18.71	18.71	1	1	100.00%	42.8	2.8
04/11/05[b]	17.13	0.00	0.00	17.13	17.13	1	1	100.00%	42.3	3.0
04/12/05[b]	13.56	0.00	0.00	7.79	26.30	4	6	66.67%	40.9	3.8
04/13/05[b]	15.76	0.00	0.00	15.76	15.76	1	1	100.00%	43.5	3.3
04/14/05[b]	12.51	0.00	0.00	4.32	20.70	2	2	100.00%	42.3	4.1
04/15/05[b]	9.05	0.00	0.00	5.05	13.05	2	2	100.00%	40.8	5.7
04/16/05[b]	13.12	0.00	0.00	4.56	13.64	4	7	57.14%	44.6	3.9
04/17/05[b]	13.48	0.00	0.00	12.75	14.21	2	3	66.67%	45.8	3.8
04/18/05[b]	10.04	0.00	0.00	6.71	13.61	3	7	42.86%	45.1	5.1
04/19/05	8.04	7.45	8.56	3.07	16.87	84	119	70.59%	44.0	6.4
04/20/05[b]	6.96	0.00	0.00	4.53	12.81	5	7	71.43%	44.0	7.4
04/21/05[b]	9.81	0.00	0.00	8.46	13.86	4	5	80.00%	47.7	5.3
04/22/05[b]	6.96	0.00	0.00	4.36	16.40	4	5	80.00%	47.1	7.4
04/23/05[b]	4.94	0.00	0.00	4.04	6.63	4	6	66.67%	47.3	10.4
04/24/05[b]	9.82	0.00	0.00	5.73	13.91	2	3	66.67%	49.8	5.3
04/25/05[b]	5.03	0.00	0.00	4.59	5.48	2	5	40.00%	51.7	10.3
04/26/05[b]	4.42	0.00	0.00	3.41	5.42	2	3	66.67%	53.0	11.7
04/27/05	4.10	2.56	8.05	2.56	8.05	7	10	70.00%	53.6	12.6
04/28/05	7.09	4.00	7.74	3.74	10.30	16	22	72.73%	52.6	7.3
04/29/05[b]	5.89	0.00	0.00	5.81	7.09	3	7	42.86%	52.0	8.8
04/30/05	6.10	5.22	7.46	4.76	9.81	18	24	75.00%	53.9	8.5
05/01/05[b]	4.28	0.00	0.00	4.07	4.49	2	4	50.00%	51.2	12.1
05/02/05[b]	4.87	0.00	0.00	4.40	6.12	5	9	55.56%	58.2	10.6
05/03/05[b]	3.72	0.00	0.00	3.72	3.72	1	4	25.00%	60.3	13.9
05/04/05[b]	4.61	0.00	0.00	4.61	4.61	1	1	100.00%	69.5	11.2
05/05/05	4.60	3.23	25.43	2.87	26.23	11	12	91.67%	76.4	11.2
05/06/05[b]	2.71	0.00	0.00	2.48	2.89	3	3	100.00%	76.7	19.0
05/07/05[b]	2.13	0.00	0.00	2.11	2.15	2	4	50.00%	80.1	24.2
05/08/05	3.02	2.68	3.36	2.19	10.99	30	43	69.77%	87.8	17.1
05/09/05	3.84	3.37	4.49	2.21	12.34	23	35	65.71%	88.5	13.4
05/10/05[b]	4.20	0.00	0.00	1.90	19.61	4	11	36.36%	89.7	12.3
05/11/05	5.39	3.50	18.78	2.47	22.03	14	29	48.28%	89.0	9.6
05/12/05[b]	5.31	0.00	0.00	3.71	6.90	4	21	19.05%	92.5	9.7
05/17/05[b]	1.81	0.00	0.00	1.81	1.81	1	9	11.11%	120.2	28.6
05/18/05	3.10	2.49	3.45	0.94	11.82	20	111	18.02%	128.7	16.7
05/20/05	2.73	1.57	4.73	1.55	5.47	9	21	42.86%	130.2	18.9
05/22/05[b]	4.80	0.00	0.00	3.71	5.79	3	14	21.43%	109.6	10.7
06/02/05[b]	3.45	0.00	0.00	3.45	3.45	1	1	100.00%	81.3	15.0
Totals				**0.94**	**26.23**	**232**	**426**	**54.46%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/31/05[b]	14.68	0.00	0.00	14.68	14.68	1	3	33.33%	38.9	3.5
04/02/05[b]	10.29	0.00	0.00	10.29	10.29	1	1	100.00%	38.8	5.0
04/03/05[b]	9.77	0.00	0.00	9.21	10.33	2	2	100.00%	38.7	5.3
04/06/05[b]	8.74	0.00	0.00	8.74	8.74	1	1	100.00%	38.8	5.9
04/16/05[b]	8.56	0.00	0.00	5.31	9.56	4	5	80.00%	41.4	6.0
04/17/05[b]	8.89	0.00	0.00	8.76	10.48	3	4	75.00%	42.6	5.8
04/18/05[b]	5.55	0.00	0.00	4.52	7.30	3	3	100.00%	42.0	9.3
04/19/05	7.46	7.07	8.06	4.44	9.92	33	39	84.62%	43.0	6.9
04/20/05[b]	6.57	0.00	0.00	6.57	6.57	1	2	50.00%	44.0	7.9
04/22/05[b]	5.06	0.00	0.00	3.91	6.75	3	3	100.00%	44.6	10.2
04/24/05[b]	4.12	0.00	0.00	3.58	4.66	2	2	100.00%	48.8	12.5
04/25/05[b]	4.25	0.00	0.00	4.12	4.38	2	2	100.00%	51.2	12.1
04/26/05[b]	5.42	0.00	0.00	5.42	5.42	1	1	100.00%	52.9	9.5
04/27/05[b]	5.15	0.00	0.00	4.02	6.88	3	3	100.00%	52.6	10.0
04/30/05	5.03	4.24	5.85	4.24	5.85	7	7	100.00%	51.8	10.3
05/01/05[b]	5.05	0.00	0.00	3.76	5.85	3	3	100.00%	53.8	10.2
05/02/05[b]	3.94	0.00	0.00	3.94	3.94	1	1	100.00%	54.1	13.1
05/05/05[b]	3.49	0.00	0.00	3.38	3.59	2	2	100.00%	71.9	14.8
05/06/05[b]	2.40	0.00	0.00	2.40	2.40	1	1	100.00%	75.9	21.5
05/08/05[b]	3.12	0.00	0.00	2.55	4.28	5	6	83.33%	87.8	16.5
05/09/05	2.86	2.05	10.64	2.05	10.64	7	11	63.64%	89.4	18.0
05/10/05[b]	8.19	0.00	0.00	5.48	10.90	2	4	50.00%	96.3	6.3
05/11/05[b]	5.45	0.00	0.00	2.91	10.43	3	11	27.27%	89.0	9.5
05/12/05[b]	4.54	0.00	0.00	3.74	8.49	4	11	36.36%	92.5	11.4
05/13/05[b]	7.98	0.00	0.00	6.51	9.46	2	5	40.00%	108.9	6.5
05/14/05[b]	7.70	0.00	0.00	7.70	7.70	1	3	33.33%	113.4	6.7
05/17/05[b]	3.26	0.00	0.00	2.82	3.70	2	5	40.00%	124.1	15.9
05/18/05	3.23	2.80	3.60	2.41	13.14	42	130	32.31%	128.7	16.0
05/19/05[b]	2.51	0.00	0.00	1.78	5.79	4	11	36.36%	129.4	20.5
05/20/05	5.38	2.47	11.57	2.47	11.57	8	20	40.00%	123.7	9.6
05/22/05	5.84	2.76	7.52	1.83	7.53	9	22	40.91%	106.2	8.8
06/01/05[b]	6.27	0.00	0.00	5.55	7.00	2	4	50.00%	80.5	8.2
06/02/05[b]	4.83	0.00	0.00	4.83	4.83	1	1	100.00%	79.1	10.7
Totals				**1.83**	**13.14**	**106**	**229**	**46.29%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/29/05	4.27	3.83	8.48	2.83	20.25	13	14	92.86%	41.8	12.1
03/30/05	5.85	5.20	6.49	3.61	32.12	42	53	79.25%	39.6	8.8
03/31/05	5.76	4.41	6.40	3.18	38.32	43	52	82.69%	39.1	9.0
04/01/05	5.96	5.17	8.89	3.11	34.46	43	62	69.35%	38.5	8.7
04/02/05	6.38	4.92	10.46	2.78	36.34	35	50	70.00%	38.3	8.1
04/03/05	15.18	7.41	23.03	3.83	36.48	32	40	80.00%	38.9	3.4
04/04/05	10.29	6.82	17.46	4.66	32.67	19	27	70.37%	38.9	5.0
04/05/05	8.89	6.81	14.25	3.80	22.18	25	32	78.13%	39.2	5.8
04/06/05	5.26	4.90	10.46	3.70	33.53	35	44	79.55%	39.5	9.8
04/07/05	8.01	3.77	23.68	3.77	23.68	8	9	88.89%	38.7	6.4
04/08/05	6.61	3.06	16.58	3.06	16.58	8	10	80.00%	38.8	7.8
04/09/05[b]	7.05	0.00	0.00	3.69	10.42	2	2	100.00%	38.7	7.3
04/10/05	12.78	7.72	16.89	7.17	17.28	9	9	100.00%	39.9	4.0
04/11/05[b]	5.90	0.00	0.00	5.90	5.90	1	1	100.00%	38.0	8.7
04/12/05	6.01	5.50	7.73	2.82	19.51	45	52	86.54%	38.5	8.6
04/13/05	8.87	4.01	17.13	4.01	17.13	6	9	66.67%	40.2	5.8
04/14/05	5.89	4.27	13.76	3.79	16.98	12	19	63.16%	40.5	8.8
04/15/05	6.22	5.61	7.54	2.78	37.02	46	61	75.41%	40.9	8.3
04/16/05	7.15	3.81	15.17	2.53	29.50	11	12	91.67%	40.8	7.2
04/17/05	3.83	2.63	12.76	1.74	15.28	10	12	83.33%	42.0	13.5
04/18/05[b]	3.64	0.00	0.00	2.92	13.89	5	5	100.00%	42.5	14.2
04/19/05	4.74	3.94	8.94	3.35	17.66	18	26	69.23%	41.6	10.9
04/20/05	6.58	3.95	14.26	3.51	18.20	14	17	82.35%	44.0	7.8
04/21/05	5.78	5.54	6.44	3.42	47.07	92	135	68.15%	44.1	8.9
04/22/05	5.66	4.79	7.51	3.71	9.59	20	27	74.07%	46.2	9.1
04/23/05	4.06	3.90	4.50	1.95	15.41	163	220	74.09%	45.5	12.7
04/24/05	4.74	3.65	6.57	1.84	15.40	20	26	76.92%	49.6	10.9
04/25/05	4.62	4.51	4.66	1.85	27.61	219	318	68.87%	51.7	11.2
04/26/05	3.74	3.57	4.41	2.51	14.29	60	106	56.60%	53.0	13.8
04/27/05	3.54	3.01	3.79	2.53	12.33	41	65	63.08%	53.6	14.6
04/28/05	2.97	2.75	3.60	1.76	10.29	57	100	57.00%	54.1	17.4
04/29/05[b]	5.50	0.00	0.00	2.73	7.70	5	8	62.50%	52.0	9.4
04/30/05	5.68	4.94	6.08	3.53	11.91	45	54	83.33%	53.9	9.1
05/01/05	4.70	3.88	5.73	3.48	8.02	17	22	77.27%	51.2	11.0
05/02/05	4.38	3.65	5.00	3.22	6.66	14	18	77.78%	54.1	11.8
05/03/05	3.80	3.59	5.15	3.57	5.43	10	16	62.50%	60.3	13.6
05/04/05	2.73	2.52	4.50	2.52	4.50	8	13	61.54%	63.8	18.9
05/05/05	3.39	2.70	3.52	1.71	4.43	35	53	66.04%	71.9	15.2
05/06/05	2.53	1.96	2.66	1.55	2.93	11	12	91.67%	76.7	20.4
05/07/05	2.32	2.24	2.46	1.84	9.68	61	81	75.31%	80.1	22.2
05/08/05	2.05	2.03	2.09	1.73	19.03	278	306	90.85%	84.5	25.2
05/09/05	1.91	1.84	1.97	1.50	6.21	69	99	69.70%	89.5	27.0
05/10/05	1.88	1.83	1.93	1.54	5.99	77	99	77.78%	92.8	27.5
05/11/05	1.96	1.88	2.12	1.54	18.52	86	100	86.00%	90.7	26.3
05/12/05	2.15	1.91	2.47	1.44	15.74	92	98	93.88%	86.3	23.9
05/13/05	2.72	2.60	2.81	2.07	9.64	47	63	74.60%	86.8	19.0
05/15/05	1.72	1.68	1.84	1.44	8.84	32	49	65.31%	98.6	29.9
05/16/05	1.58	1.48	1.68	1.40	9.15	35	114	30.70%	111.2	32.7
05/17/05	1.61	1.53	1.64	1.25	4.48	76	193	39.38%	120.2	32.1
05/18/05	1.65	1.59	1.79	1.26	10.93	36	102	35.29%	126.0	31.3
05/19/05	1.62	1.43	1.85	1.24	7.67	23	101	22.77%	130.6	31.8
05/20/05	1.52	1.39	1.61	1.14	6.93	46	103	44.66%	132.8	34.0
05/22/05	1.83	1.59	2.26	1.33	4.70	13	29	44.83%	121.5	28.2
06/01/05[b]	2.10	0.00	0.00	1.59	2.61	2	6	33.33%	88.0	24.5
06/02/05[b]	4.06	0.00	0.00	4.06	4.06	1	2	50.00%	80.2	12.7
Totals				**1.14**	**47.07**	**2257**	**3332**	**67.74%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/29/05[b]	4.14	0.00	0.00	3.27	5.40	4	6	66.67%	41.8	12.5
03/30/05[b]	8.66	0.00	0.00	7.46	10.48	3	3	100.00%	39.3	6.0
03/31/05	5.93	4.51	9.44	3.97	31.10	10	14	71.43%	39.1	8.7
04/01/05	5.75	4.64	8.48	4.64	8.48	8	9	88.89%	38.5	9.0
04/02/05	9.08	5.34	18.71	5.34	18.71	8	10	80.00%	39.0	5.7
04/03/05[b]	5.76	0.00	0.00	4.66	26.28	5	7	71.43%	38.8	9.0
04/04/05	9.50	7.20	49.69	7.20	49.69	7	9	77.78%	39.0	5.4
04/05/05[b]	6.68	0.00	0.00	4.88	6.84	3	3	100.00%	39.5	7.7
04/07/05	11.53	3.72	29.61	3.72	29.61	6	6	100.00%	39.3	4.5
04/10/05[b]	6.63	0.00	0.00	6.63	6.63	1	1	100.00%	38.3	7.8
04/11/05[b]	28.89	0.00	0.00	28.89	28.89	1	4	25.00%	50.8	1.8
04/12/05[b]	7.58	0.00	0.00	3.51	16.59	4	6	66.67%	39.6	6.8
04/13/05[b]	4.33	0.00	0.00	3.60	5.07	2	3	66.67%	37.9	11.9
04/14/05[b]	4.50	0.00	0.00	3.96	41.10	3	3	100.00%	40.1	11.5
04/15/05	4.81	4.31	5.86	4.31	5.86	8	10	80.00%	40.8	10.7
04/16/05[b]	3.73	0.00	0.00	3.71	3.75	2	2	100.00%	41.1	13.8
04/17/05[b]	4.10	0.00	0.00	3.65	4.54	2	2	100.00%	42.0	12.6
04/18/05[b]	3.14	0.00	0.00	3.14	3.14	1	1	100.00%	43.1	16.4
04/19/05	6.20	3.36	9.37	3.36	9.37	7	11	63.64%	42.2	8.3
04/20/05[b]	7.13	0.00	0.00	7.13	7.13	1	2	50.00%	44.0	7.2
04/21/05	5.66	4.62	6.47	3.54	7.96	22	26	84.62%	44.1	9.1
04/22/05[b]	5.17	0.00	0.00	3.77	5.20	4	5	80.00%	44.6	10.0
04/23/05	4.06	3.70	4.95	2.74	13.70	20	25	80.00%	45.5	12.7
04/24/05	4.81	3.22	5.50	3.22	5.50	6	7	85.71%	49.6	10.7
04/25/05	3.64	3.51	4.26	2.77	5.89	31	39	79.49%	51.2	14.2
04/26/05	3.63	3.38	4.40	2.35	5.40	20	23	86.96%	53.0	14.2
04/27/05	2.96	2.67	3.54	2.50	4.67	26	35	74.29%	54.0	17.4
04/28/05	3.14	3.02	3.50	2.45	13.88	31	43	72.09%	54.1	16.4
04/29/05[b]	5.10	0.00	0.00	3.54	6.66	2	4	50.00%	50.7	10.1
04/30/05	4.55	3.67	4.87	3.32	6.51	15	18	83.33%	51.8	11.3
05/01/05	4.26	3.61	6.20	3.47	6.62	10	12	83.33%	51.2	12.1
05/02/05[b]	3.57	0.00	0.00	2.76	4.59	5	5	100.00%	54.1	14.5
05/03/05	3.65	3.00	5.76	3.00	5.76	6	10	60.00%	60.3	14.2
05/04/05[b]	2.71	0.00	0.00	2.64	3.42	4	6	66.67%	63.8	19.1
05/05/05	2.88	2.37	3.74	2.37	3.74	8	10	80.00%	71.9	17.9
05/06/05	2.49	1.70	2.72	1.70	2.72	8	10	80.00%	75.9	20.7
05/07/05	2.31	2.12	2.43	1.90	5.40	25	39	64.10%	80.1	22.4
05/08/05	2.10	2.07	2.13	1.74	4.53	253	317	79.81%	84.5	24.6
05/09/05	1.96	1.88	2.10	1.67	2.56	40	55	72.73%	89.5	26.4
05/10/05	1.90	1.81	2.02	1.45	15.08	56	78	71.79%	92.8	27.2
05/11/05	2.28	2.11	2.42	1.73	11.21	64	75	85.33%	90.7	22.6
05/12/05	2.41	1.89	3.11	1.66	9.75	16	18	88.89%	86.3	21.4
05/13/05	2.55	2.46	2.80	2.44	4.48	12	19	63.16%	86.8	20.2
05/14/05	2.44	1.84	4.42	1.84	4.42	8	17	47.06%	87.4	21.2
05/15/05	2.06	1.54	2.45	1.54	2.45	8	13	61.54%	98.6	25.1
05/16/05	1.51	1.42	2.50	1.42	2.50	7	31	22.58%	111.2	34.1
05/17/05	1.57	1.49	1.66	1.31	3.62	39	96	40.63%	120.2	33.0
05/18/05	1.49	1.44	1.55	1.32	10.34	38	95	40.00%	121.0	34.7
05/19/05	1.66	1.44	3.12	1.44	6.16	9	40	22.50%	130.6	31.1
05/20/05	1.59	1.43	1.69	1.22	8.39	30	68	44.12%	132.8	32.4
05/22/05[b]	2.56	0.00	0.00	1.48	3.63	2	4	50.00%	117.5	20.2
Totals				**1.22**	**49.69**	**862**	**1288**	**66.93%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/12/05[b]	56.25	0.00	0.00	55.51	56.81	3	11	27.27%	38.5	4.2
03/13/05	47.42	45.76	48.57	24.19	58.30	83	199	41.71%	35.8	4.9
03/14/05	47.54	45.00	50.81	22.46	62.66	60	119	50.42%	36.5	4.9
03/15/05	47.94	45.36	51.90	28.57	58.76	51	120	42.50%	37.3	4.9
03/16/05	45.93	43.46	48.41	22.89	97.90	60	120	50.00%	37.4	5.1
03/17/05	42.10	36.55	45.56	23.12	51.39	15	42	35.71%	36.7	5.5
03/21/05	39.40	37.73	41.47	18.86	49.25	46	104	44.23%	38.4	5.9
03/22/05	36.87	35.13	38.58	13.33	46.02	55	137	40.15%	38.4	6.3
03/23/05	37.07	35.47	39.21	16.42	47.11	59	120	49.17%	39.2	6.3
03/24/05	35.38	33.13	36.57	18.42	43.46	43	118	36.44%	39.2	6.6
03/25/05	35.70	32.74	37.75	15.12	44.05	35	73	47.95%	40.5	6.5
03/26/05	34.00	31.61	36.83	13.19	41.47	25	48	52.08%	40.6	6.9
03/27/05[b]	29.10	0.00	0.00	25.77	32.43	2	6	33.33%	39.5	8.0
03/28/05	33.86	32.00	36.71	14.26	41.70	69	131	52.67%	42.3	6.9
03/29/05	33.43	32.40	36.95	14.12	42.50	73	120	60.83%	42.5	7.0
	34.52	32.52	36.14	20.19	41.12	63	120	52.50%	42.8	6.8
03/31/05	33.67	31.42	35.24	13.32	39.85	71	120	59.17%	42.8	6.9
04/01/05	33.87	30.66	34.91	18.37	39.36	62	109	56.88%	43.3	6.9
04/04/05	28.68	25.44	30.84	12.11	36.60	71	120	59.17%	43.1	8.1
04/05/05	25.71	24.38	29.93	17.65	35.13	67	121	55.37%	43.0	9.1
04/06/05	23.56	22.10	26.53	8.35	32.64	68	120	56.67%	42.7	9.9
04/07/05	24.12	22.17	27.32	12.66	32.84	41	89	46.07%	43.2	9.7
04/08/05	22.45	21.17	23.45	9.16	32.59	92	151	60.93%	43.0	10.4
04/11/05	20.77	19.97	23.58	9.19	29.25	64	121	52.89%	44.1	11.2
04/12/05	22.18	19.46	23.72	9.11	29.98	71	120	59.17%	44.6	10.5
04/13/05	18.78	18.02	22.25	9.46	28.33	67	120	55.83%	44.7	12.4
04/14/05	21.19	20.14	22.33	8.51	27.46	77	132	58.33%	46.0	11.0
04/15/05	20.02	16.80	20.66	8.91	27.71	66	108	61.11%	46.4	11.7
04/18/05	16.97	15.47	18.27	8.90	23.89	70	135	51.85%	47.8	13.8
04/19/05	17.15	16.11	17.55	12.04	20.69	59	120	49.17%	49.0	13.6
04/20/05	15.79	14.83	16.49	9.80	28.63	74	123	60.16%	49.3	14.8
04/21/05	15.45	14.53	15.54	9.17	20.95	64	120	53.33%	49.7	15.1
04/22/05	14.20	13.24	14.92	8.45	27.43	60	102	58.82%	50.3	16.5
04/25/05	10.67	10.30	11.22	4.51	17.84	79	121	65.29%	52.7	21.9
04/26/05	10.51	10.27	11.01	5.32	14.28	78	124	62.90%	55.5	22.2
04/27/05	10.68	10.03	11.18	7.60	19.54	73	120	60.83%	58.3	21.9
04/30/05	9.55	8.87	10.04	4.74	21.79	104	211	49.29%	64.5	24.5
05/02/05	8.37	7.87	9.44	6.15	20.11	63	120	52.50%	66.9	27.9
05/03/05	7.03	6.64	8.05	5.42	19.56	61	125	48.80%	69.3	33.2
05/04/05	6.70	5.84	8.68	4.83	19.39	23	55	41.82%	75.8	34.9
05/05/05	6.19	5.71	7.74	4.05	19.71	48	99	48.48%	79.4	37.7
05/06/05	6.67	5.57	7.89	3.64	22.55	38	92	41.30%	83.8	35.0
05/07/05	7.09	4.61	20.59	4.61	20.59	7	21	33.33%	86.1	32.9
05/08/05	6.28	5.52	9.29	3.08	17.57	17	56	30.36%	87.2	37.2
05/09/05[b]	7.80	0.00	0.00	7.80	7.80	1	8	12.50%	91.5	30.0
05/10/05[b]	9.14	0.00	0.00	8.43	22.02	4	12	33.33%	98.6	25.6
05/11/05[b]	7.76	0.00	0.00	5.50	10.02	2	10	20.00%	99.4	30.1
05/12/05[b]	16.59	0.00	0.00	16.59	16.59	1	10	10.00%	105.4	14.1
05/13/05[b]	6.11	0.00	0.00	6.11	6.11	1	13	7.69%	101.1	38.2
05/14/05[b]	7.29	0.00	0.00	6.83	7.76	2	6	33.33%	111.9	32.0
05/15/05[b]	14.62	0.00	0.00	14.62	14.62	1	9	11.11%	107.5	16.0
05/16/05[b]	7.09	0.00	0.00	7.09	7.09	1	4	25.00%	121.7	33.0
Totals				**3.08**	**97.90**	**2472**	**4746**	**52.09%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/12/05	43.19	39.43	45.87	24.46	54.19	51	81	62.96%	33.7	5.4
03/13/05	44.35	42.39	45.05	26.06	65.46	126	228	55.26%	34.6	5.3
03/14/05	43.83	43.00	44.06	23.22	62.26	128	195	65.64%	35.3	5.3
03/15/05	43.15	42.09	44.35	21.65	60.61	114	170	67.06%	35.6	5.4
03/16/05	41.82	41.02	42.44	21.83	54.71	61	89	68.54%	35.9	5.6
03/17/05	40.08	27.92	45.76	24.99	47.44	10	16	62.50%	35.8	5.8
03/18/05	39.94	32.50	44.36	21.45	51.67	33	54	61.11%	36.5	5.8
03/19/05	28.77	21.65	46.13	21.65	46.13	6	10	60.00%	34.4	8.1
03/20/05	38.24	26.01	47.62	26.01	47.62	6	11	54.55%	37.2	6.1
03/21/05	30.52	22.24	44.82	21.24	48.90	11	20	55.00%	36.2	7.7
03/22/05	35.99	31.63	37.96	16.57	54.63	38	58	65.52%	37.9	6.5
03/23/05[b]	28.65	0.00	0.00	23.09	39.68	4	5	80.00%	37.1	8.2
03/24/05	36.60	15.62	45.16	15.62	45.16	8	8	100.00%	40.0	6.4
03/25/05[b]	28.89	0.00	0.00	16.65	36.45	4	5	80.00%	38.2	8.1
03/26/05	26.60	20.43	36.04	12.33	44.69	9	12	75.00%	38.6	8.8
03/27/05[b]	28.38	0.00	0.00	23.99	32.77	2	2	100.00%	39.3	8.2
03/28/05	29.48	28.92	29.69	9.17	54.82	518	752	68.88%	40.4	7.9
03/29/05	29.02	28.61	30.06	14.73	43.74	154	211	72.99%	40.9	8.0
03/30/05	28.73	28.05	31.99	14.30	41.25	95	142	66.90%	41.2	8.1
03/31/05	27.20	26.65	29.84	12.72	50.72	97	137	70.80%	40.6	8.6
04/01/05	26.13	25.85	28.38	11.40	52.45	82	119	68.91%	40.5	8.9
04/02/05	25.15	23.44	28.89	12.71	43.65	56	96	58.33%	40.6	9.3
04/03/05	24.42	23.59	25.16	12.43	46.18	77	115	66.96%	40.7	9.6
04/04/05	22.48	19.98	24.23	14.37	37.54	66	105	62.86%	40.4	10.4
04/05/05	22.13	21.37	22.79	10.79	35.19	61	108	56.48%	41.1	10.6
04/06/05	20.87	17.51	21.47	11.80	34.24	66	99	66.67%	41.0	11.2
04/07/05	19.01	18.46	20.03	11.03	33.66	51	89	57.30%	40.5	12.3
04/08/05	18.73	18.07	19.22	11.77	43.53	125	182	68.68%	41.3	12.5
04/09/05	18.05	17.81	18.62	10.47	40.48	287	405	70.86%	41.4	12.9
04/10/05	17.22	16.99	17.84	9.85	40.45	282	393	71.76%	41.5	13.6
04/11/05	16.80	16.24	17.47	8.97	42.86	474	712	66.57%	42.3	13.9
04/12/05	17.04	16.15	18.11	8.16	43.39	388	536	72.39%	43.1	13.7
04/13/05	15.41	14.64	17.84	9.46	41.90	135	198	68.18%	42.8	15.2
04/14/05	15.64	14.53	17.81	8.63	41.53	109	149	73.15%	44.5	14.9
04/15/05	14.20	13.52	14.83	7.75	36.14	129	193	66.84%	44.2	16.5
04/16/05	13.90	12.65	15.69	7.80	38.88	121	165	73.33%	45.2	16.8
04/17/05	14.24	11.98	15.87	8.64	33.62	73	104	70.19%	46.3	16.4
04/18/05	14.70	13.48	16.42	7.48	30.85	143	215	66.51%	46.9	15.9
04/19/05	15.50	14.62	15.76	9.46	31.63	143	207	69.08%	48.0	15.1
04/20/05	14.46	11.81	15.86	9.67	29.55	44	72	61.11%	47.5	16.2
04/21/05	13.53	11.10	14.25	7.88	27.56	61	86	70.93%	48.6	17.3
04/22/05	10.41	9.49	11.92	6.90	17.13	55	80	68.75%	48.3	22.4
04/23/05	8.77	8.42	10.24	5.99	35.56	51	68	75.00%	49.2	26.6
04/24/05	8.30	7.64	9.10	5.53	14.03	128	191	67.02%	50.2	28.1
04/25/05	8.13	7.43	8.41	5.25	31.81	181	278	65.11%	50.7	28.7
04/26/05	8.56	8.47	8.69	4.90	29.72	259	391	66.24%	52.1	27.3
04/27/05	8.20	7.92	8.43	5.50	28.03	300	467	64.24%	52.5	28.5
04/30/05	7.99	7.67	8.48	5.75	29.17	122	197	61.93%	59.8	29.2
05/01/05	7.57	7.50	7.72	4.96	35.95	293	476	61.55%	62.5	30.9
05/02/05	6.56	6.48	6.94	5.03	26.55	65	114	57.02%	63.8	35.6
05/03/05	6.89	6.01	8.20	4.91	27.67	25	55	45.45%	69.3	33.9
05/04/05	6.16	5.67	7.32	4.76	17.58	23	53	43.40%	72.7	37.9
05/05/05	5.88	5.27	6.53	3.63	39.82	89	169	52.66%	79.4	39.7
05/06/05	5.63	5.09	6.00	3.52	24.55	61	105	58.10%	83.6	41.5
05/07/05	5.63	3.94	9.39	3.38	23.63	11	16	68.75%	86.3	41.5
05/08/05	5.61	4.68	7.51	3.48	17.75	27	56	48.21%	87.2	41.7
05/09/05[b]	5.65	0.00	0.00	3.48	8.61	4	8	50.00%	87.5	41.4
05/10/05[b]	7.02	0.00	0.00	5.70	8.45	4	15	26.67%	93.1	33.3
05/11/05	7.71	7.34	9.84	6.62	15.51	12	42	28.57%	99.4	30.3
05/12/05	6.66	6.52	7.90	5.40	9.19	9	34	26.47%	99.6	35.1
05/13/05	7.59	5.68	8.92	5.68	8.92	7	30	23.33%	108.9	30.8
05/14/05[b]	6.65	0.00	0.00	5.89	12.18	4	22	18.18%	111.9	35.1

Appendix A. Table 6. Continued

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
05/15/05	4.61	3.88	5.91	3.78	10.77	14	41	34.15%	112.3	50.7
05/16/05[b]	5.84	0.00	0.00	5.55	10.62	3	14	21.43%	121.6	40.0
Totals				**3.38**	**65.46**	**6170**	**9405**	**65.60%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
3/21/2005[b]	39.65	0.00	0.00	39.65	39.65	1	1	100.00%	38.8	5.9
3/22/2005[b]	19.71	0.00	0.00	19.71	19.71	1	3	33.33%	35.2	11.9
3/23/2005[b]	50.88	0.00	0.00	50.88	50.88	1	2	50.00%	47.5	4.6
3/24/2005[b]	45.60	0.00	0.00	37.59	47.07	3	5	60.00%	44.3	5.1
03/26/05	15.55	8.24	43.88	8.24	43.88	6	8	75.00%	37.9	15.0
03/28/05	19.42	7.98	34.64	6.30	42.55	12	20	60.00%	39.3	12.0
3/30/2005[b]	32.61	0.00	0.00	6.45	35.75	3	3	100.00%	42.5	7.2
3/31/2005[b]	34.80	0.00	0.00	34.80	34.80	1	3	33.33%	43.2	6.7
04/02/05	28.08	16.38	35.59	16.38	35.59	6	7	85.71%	42.1	8.3
04/03/05	19.81	10.83	23.81	8.13	27.75	13	23	56.52%	39.5	11.8
04/04/05	18.87	11.68	25.71	7.73	37.85	13	21	61.90%	39.7	12.4
04/05/05	16.95	12.52	20.00	6.11	39.66	17	28	60.71%	39.9	13.8
04/06/05	12.71	11.78	21.87	5.80	30.12	19	26	73.08%	39.3	18.4
04/07/05	11.66	8.21	22.66	4.81	31.62	18	24	75.00%	39.3	20.0
04/08/05	17.71	13.53	22.36	5.74	30.65	36	49	73.47%	40.7	13.2
04/09/05	16.78	12.15	22.56	5.47	37.70	40	57	70.18%	40.9	13.9
04/10/05	19.72	16.00	21.81	6.81	29.93	19	32	59.38%	43.4	11.8
04/11/05	19.79	10.98	25.66	10.43	28.62	13	18	72.22%	43.9	11.8
04/12/05	18.56	8.81	21.55	8.78	27.96	9	18	50.00%	44.1	12.6
04/13/05	13.77	9.75	24.74	7.56	27.19	16	33	48.48%	42.0	17.0
04/14/05	16.15	10.05	20.97	5.81	29.31	16	27	59.26%	44.5	14.5
04/15/05	13.74	9.82	21.57	5.87	36.05	21	44	47.73%	44.2	17.0
04/16/05	6.92	6.29	8.57	3.91	11.73	17	24	70.83%	40.8	33.7
04/17/05	6.37	5.71	10.13	3.89	21.99	22	38	57.89%	41.4	36.7
04/18/05	12.69	8.76	14.34	4.74	24.89	50	82	60.98%	46.9	18.4
04/19/05	10.66	7.79	15.79	5.65	39.79	19	38	50.00%	46.7	21.9
04/20/05	10.72	7.69	15.80	5.81	30.54	22	37	59.46%	47.3	21.8
04/21/05	10.72	6.21	15.76	5.80	17.76	11	29	37.93%	47.7	21.8
04/22/05	7.27	4.98	7.91	4.83	16.89	12	32	37.50%	47.1	32.1
04/23/05	7.00	5.74	7.69	4.60	12.83	10	29	34.48%	49.0	33.4
04/24/05	6.64	5.90	6.92	5.05	14.29	26	50	52.00%	50.5	35.2
04/25/05	6.54	5.67	7.02	4.43	15.55	38	80	47.50%	51.3	35.7
04/26/05	5.85	5.55	8.64	3.44	19.70	51	120	42.50%	52.1	39.9
04/27/05	8.67	7.82	9.40	4.51	16.64	60	120	50.00%	53.9	26.9
04/30/05	7.12	6.74	8.11	4.45	23.25	153	220	69.55%	57.0	32.8
05/02/05	6.20	5.65	6.77	4.39	18.49	79	120	65.83%	61.7	37.7
05/03/05	5.69	5.50	6.36	3.72	15.49	55	113	48.67%	66.1	41.0
05/04/05	4.74	4.64	4.90	3.02	17.02	81	120	67.50%	69.5	49.2
05/05/05	4.30	4.09	4.62	2.80	36.83	90	122	73.77%	73.3	54.3
05/06/05	4.03	3.92	4.28	2.98	12.51	95	125	76.00%	79.7	57.9
05/08/05	3.38	3.00	3.62	2.66	16.11	50	74	67.57%	87.8	69.1
05/09/05	3.11	2.93	3.84	2.67	10.01	33	43	76.74%	89.4	75.0
05/10/05	4.54	3.58	6.01	2.77	19.55	34	72	47.22%	88.9	51.4
05/11/05	4.71	4.31	5.07	2.66	16.70	59	89	66.29%	89.0	49.6
05/12/05	4.66	4.27	5.31	2.98	18.56	57	97	58.76%	92.5	50.1
05/13/05	3.96	3.70	5.58	2.86	10.77	22	53	41.51%	93.2	59.0
05/14/05	3.84	3.53	4.91	2.50	16.07	47	129	36.43%	100.7	60.9
05/15/05	3.70	3.47	4.14	2.18	8.79	17	69	24.64%	107.6	63.1
05/16/05	3.13	2.58	6.37	2.32	8.30	16	45	35.56%	113.2	74.7
05/17/05[b]	13.21	0.00	0.00	13.21	13.21	1	2	50.00%	110.2	17.7
Totals				**2.18**	**43.88**	**1500**	**2605**	**57.58%**		

[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, 2005.

Release Date	Median Travel Time	Lower Confidence Interval[a]	Upper Confidence Interval[a]	Minimum Travel Time	Maximum Travel Time	Number Recaptured	Number Tagged	Percent Recaptured	Mean Discharge	Migration Rate (km/day)
03/31/05[b]	9.40	0.00	0.00	9.40	9.40	1	1	100.00%	39.0	24.9
04/09/05[b]	11.72	0.00	0.00	11.72	11.72	1	1	100.00%	40.0	19.9
04/11/05[b]	8.47	0.00	0.00	8.47	8.47	1	2	50.00%	39.4	27.6
04/12/05[b]	9.22	0.00	0.00	8.92	9.52	2	3	66.67%	39.8	25.3
04/14/05[b]	10.84	0.00	0.00	8.52	13.15	2	3	66.67%	40.9	21.6
04/15/05[b]	16.07	0.00	0.00	14.60	19.88	3	3	100.00%	45.3	14.5
04/16/05[b]	13.21	0.00	0.00	13.21	13.21	1	2	50.00%	44.6	17.7
04/17/05[b]	8.60	0.00	0.00	6.58	10.62	2	3	66.67%	42.6	27.2
04/18/05[b]	7.40	0.00	0.00	7.40	7.40	1	2	50.00%	42.4	31.6
04/19/05[b]	7.57	0.00	0.00	7.57	7.57	1	2	50.00%	44.0	30.9
04/20/05[b]	7.10	0.00	0.00	7.10	7.10	1	2	50.00%	44.0	32.9
04/21/05[b]	8.02	0.00	0.00	8.02	8.02	1	2	50.00%	46.5	29.1
04/22/05[b]	8.78	0.00	0.00	8.78	8.78	1	2	50.00%	48.4	26.6
04/23/05[b]	8.32	0.00	0.00	5.61	12.76	3	4	75.00%	49.3	28.1
04/24/05	6.42	5.53	7.30	4.77	15.79	10	13	76.92%	50.3	36.4
04/25/05	5.53	4.54	6.47	4.38	14.05	13	22	59.09%	51.8	42.2
04/26/05	4.61	4.42	5.12	3.65	5.39	11	20	55.00%	52.9	50.7
04/27/05	4.77	4.59	7.87	4.37	11.46	14	40	35.00%	52.6	48.9
04/30/05	6.38	5.41	7.66	4.95	8.98	18	23	78.26%	53.9	36.6
05/01/05	5.56	5.19	6.68	5.08	7.14	10	10	100.00%	57.3	42.0
05/02/05[b]	4.60	0.00	0.00	4.55	6.59	3	5	60.00%	58.2	50.8
05/03/05[b]	5.31	0.00	0.00	4.49	6.71	4	5	80.00%	64.0	44.0
05/04/05[b]	4.55	0.00	0.00	4.55	4.55	1	4	25.00%	69.5	51.4
05/05/05	3.98	3.62	4.92	3.62	4.92	7	12	58.33%	73.3	58.7
05/06/05	4.12	3.77	4.45	3.48	4.67	10	15	66.67%	79.7	56.7
05/07/05[b]	2.98	0.00	0.00	2.98	2.98	1	4	25.00%	83.0	78.3
05/08/05	3.89	3.08	4.20	2.94	5.55	9	17	52.94%	88.0	60.1
05/09/05	3.14	2.87	7.54	2.87	7.54	6	7	85.71%	89.4	74.4
05/10/05	4.49	2.92	7.73	2.92	7.73	6	12	50.00%	89.7	52.0
05/11/05	5.17	4.19	6.40	3.39	6.55	12	15	80.00%	89.0	45.2
05/12/05	4.38	3.63	6.75	3.47	7.26	11	17	64.71%	87.3	53.3
05/13/05[b]	3.70	0.00	0.00	3.70	3.70	1	9	11.11%	93.2	63.1
05/14/05	3.23	2.70	6.04	2.70	6.04	8	19	42.11%	95.2	72.4
05/16/05[b]	3.18	0.00	0.00	3.18	3.18	1	11	9.09%	113.2	73.5
Totals				**2.70**	**15.79**	**145**	**242**	**59.92%**		

[a] Confidence intervals calculated with nonparametric statistics

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

Appendix B. Table 1. PIT-tagged hatchery Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2005.

Date	Number Released	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/30/05	7	4	57.14%	1	14.29%		0.00%		0.00%	5	71.43%
03/31/05	7	1	14.29%	5	71.43%		0.00%		0.00%	6	85.71%
04/01/05	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/02/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/03/05	4	2	50.00%	1	25.00%		0.00%		0.00%	3	75.00%
04/04/05	3	1	33.33%	1	33.33%		0.00%		0.00%	2	66.67%
04/05/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/06/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/07/05	4	2	50.00%		0.00%		0.00%		0.00%	2	50.00%
04/08/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/09/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/10/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/11/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/12/05	6	4	66.67%	2	33.33%		0.00%		0.00%	6	100.00%
04/13/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/14/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/15/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/16/05	7	4	57.14%	2	28.57%		0.00%		0.00%	6	85.71%
04/17/05	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/18/05	7	3	42.86%		0.00%		0.00%	1	14.29%	4	57.14%
04/19/05	119	84	70.59%	15	12.61%	2	1.68%		0.00%	101	84.87%
04/20/05	7	5	71.43%	1	14.29%	1	14.29%		0.00%	7	100.00%
04/21/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
04/22/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
04/23/05	6	4	66.67%	2	33.33%		0.00%		0.00%	6	100.00%
04/24/05	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/25/05	5	2	40.00%	3	60.00%		0.00%		0.00%	5	100.00%
04/26/05	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/27/05	10	7	70.00%	1	10.00%		0.00%	1	10.00%	9	90.00%
04/28/05	22	16	72.73%	4	18.18%		0.00%	1	4.55%	21	95.45%
04/29/05	7	3	42.86%	1	14.29%		0.00%		0.00%	4	57.14%
04/30/05	24	18	75.00%	4	16.67%		0.00%		0.00%	22	91.67%
05/01/05	4	2	50.00%	1	25.00%		0.00%		0.00%	3	75.00%
05/02/05	9	5	55.56%	2	22.22%		0.00%		0.00%	7	77.78%
05/03/05	4	1	25.00%	2	50.00%		0.00%		0.00%	3	75.00%
05/04/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/05/05	12	11	91.67%	1	8.33%		0.00%		0.00%	12	100.00%
05/06/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
05/07/05	4	2	50.00%	2	50.00%		0.00%		0.00%	4	100.00%
05/08/05	43	30	69.77%	8	18.60%	1	2.33%	2	4.65%	41	95.35%
05/09/05	35	23	65.71%	7	20.00%		0.00%	1	2.86%	31	88.57%
05/10/05	11	4	36.36%	4	36.36%		0.00%		0.00%	8	72.73%
05/11/05	29	14	48.28%	5	17.24%	3	10.34%		0.00%	22	75.86%
05/12/05	21	4	19.05%	12	57.14%	1	4.76%	1	4.76%	18	85.71%
05/13/05	3		0.00%	3	100.00%		0.00%		0.00%	3	100.00%
05/14/05	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
05/16/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/17/05	9	1	11.11%	7	77.78%		0.00%		0.00%	8	88.89%
05/18/05	111	20	18.02%	61	54.95%	5	4.50%	3	2.70%	89	80.18%
05/19/05	4		0.00%	1	25.00%	1	25.00%		0.00%	2	50.00%
05/20/05	21	9	42.86%	8	38.10%		0.00%	1	4.76%	18	85.71%
05/22/05	14	3	21.43%	7	50.00%		0.00%	1	7.14%	11	78.57%
06/02/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
06/17/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%

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, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/31/05	3	1	33.33%	2	66.67%		0.00%		0.00%	3	100.00%
04/01/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/02/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/03/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/06/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/16/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
04/17/05	4	3	75.00%	1	25.00%		0.00%		0.00%	4	100.00%
04/18/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/19/05	39	33	84.62%	5	12.82%		0.00%		0.00%	38	97.44%
04/20/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/22/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/23/05	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
04/24/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/25/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/26/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/27/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/28/05	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%
04/30/05	7	7	100.00%		0.00%		0.00%		0.00%	7	100.00%
05/01/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
05/02/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/04/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
05/05/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
05/06/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
05/07/05	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
05/08/05	6	5	83.33%		0.00%		0.00%		0.00%	5	83.33%
05/09/05	11	7	63.64%	3	27.27%		0.00%		0.00%	10	90.91%
05/10/05	4	2	50.00%	1	25.00%	1	25.00%		0.00%	4	100.00%
05/11/05	11	3	27.27%	4	36.36%		0.00%	1	9.09%	8	72.73%
05/12/05	11	4	36.36%	4	36.36%		0.00%		0.00%	8	72.73%
05/13/05	5	2	40.00%	3	60.00%		0.00%		0.00%	5	100.00%
05/14/05	3	1	33.33%	2	66.67%		0.00%		0.00%	3	100.00%
05/15/05	2		0.00%	2	100.00%		0.00%		0.00%	2	100.00%
05/16/05	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
05/17/05	5	2	40.00%	1	20.00%	2	40.00%		0.00%	5	100.00%
05/18/05	130	42	32.31%	66	50.77%	3	2.31%	2	1.54%	113	86.92%
05/19/05	11	4	36.36%	5	45.45%		0.00%		0.00%	9	81.82%
05/20/05	20	8	40.00%	10	50.00%	1	5.00%		0.00%	19	95.00%
05/22/05	22	9	40.91%	10	45.45%		0.00%		0.00%	19	86.36%
06/01/05	4	2	50.00%	1	25.00%		0.00%		0.00%	3	75.00%
06/02/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%

Appendix B. Table 3. PIT-tagged hatchery steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Snake River Trap, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/29/05	14	13	92.86%	1	7.14%		0.00%		0.00%	14	100.00%
03/30/05	53	42	79.25%	7	13.21%	1	1.89%		0.00%	50	94.34%
03/31/05	52	43	82.69%	4	7.69%		0.00%		0.00%	47	90.38%
04/01/05	62	43	69.35%	10	16.13%		0.00%	1	1.61%	54	87.10%
04/02/05	50	35	70.00%	9	18.00%		0.00%		0.00%	44	88.00%
04/03/05	40	32	80.00%	5	12.50%		0.00%		0.00%	37	92.50%
04/04/05	27	19	70.37%	4	14.81%		0.00%		0.00%	23	85.19%
04/05/05	32	25	78.13%	3	9.38%		0.00%		0.00%	28	87.50%
04/06/05	44	35	79.55%	5	11.36%	2	4.55%		0.00%	42	95.45%
04/07/05	9	8	88.89%	1	11.11%		0.00%		0.00%	9	100.00%
04/08/05	10	8	80.00%	1	10.00%		0.00%		0.00%	9	90.00%
04/09/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/10/05	9	9	100.00%		0.00%		0.00%		0.00%	9	100.00%
04/11/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/12/05	52	45	86.54%	2	3.85%		0.00%		0.00%	47	90.38%
04/13/05	9	6	66.67%	2	22.22%		0.00%		0.00%	8	88.89%
04/14/05	19	12	63.16%	6	31.58%		0.00%		0.00%	18	94.74%
04/15/05	61	46	75.41%	7	11.48%		0.00%	1	1.64%	54	88.52%
04/16/05	12	11	91.67%	1	8.33%		0.00%		0.00%	12	100.00%
04/17/05	12	10	83.33%	2	16.67%		0.00%		0.00%	12	100.00%
04/18/05	5	5	100.00%		0.00%		0.00%		0.00%	5	100.00%
04/19/05	26	18	69.23%	4	15.38%	1	3.85%		0.00%	23	88.46%
04/20/05	17	14	82.35%	1	5.88%	1	5.88%		0.00%	16	94.12%
04/21/05	135	92	68.15%	31	22.96%	2	1.48%		0.00%	125	92.59%
04/22/05	27	20	74.07%	5	18.52%		0.00%		0.00%	25	92.59%
04/23/05	220	163	74.09%	43	19.55%	4	1.82%		0.00%	210	95.45%
04/24/05	26	20	76.92%	4	15.38%		0.00%		0.00%	24	92.31%
04/25/05	318	219	68.87%	72	22.64%	5	1.57%	2	0.63%	298	93.71%
04/26/05	106	60	56.60%	33	31.13%	2	1.89%		0.00%	95	89.62%
04/27/05	65	41	63.08%	19	29.23%	2	3.08%		0.00%	62	95.38%
04/28/05	100	57	57.00%	32	32.00%	2	2.00%		0.00%	91	91.00%
04/29/05	8	5	62.50%	2	25.00%		0.00%		0.00%	7	87.50%
04/30/05	54	45	83.33%	6	11.11%		0.00%		0.00%	51	94.44%
05/01/05	22	17	77.27%	3	13.64%		0.00%		0.00%	20	90.91%
05/02/05	18	14	77.78%	3	16.67%		0.00%		0.00%	17	94.44%
05/03/05	16	10	62.50%	4	25.00%		0.00%		0.00%	14	87.50%
05/04/05	13	8	61.54%	4	30.77%		0.00%		0.00%	12	92.31%
05/05/05	53	35	66.04%	12	22.64%		0.00%	1	1.89%	48	90.57%
05/06/05	12	11	91.67%		0.00%		0.00%		0.00%	11	91.67%
05/07/05	81	61	75.31%	19	23.46%		0.00%		0.00%	80	98.77%
05/08/05	306	278	90.85%	21	6.86%	1	0.33%		0.00%	300	98.04%
05/09/05	99	69	69.70%	25	25.25%	1	1.01%		0.00%	95	95.96%
05/10/05	99	77	77.78%	20	20.20%	2	2.02%		0.00%	99	100.00%
05/11/05	100	86	86.00%	12	12.00%	1	1.00%		0.00%	99	99.00%
05/12/05	98	92	93.88%	4	4.08%		0.00%		0.00%	96	97.96%
05/13/05	63	47	74.60%	12	19.05%	3	4.76%		0.00%	62	98.41%
05/15/05	49	32	65.31%	12	24.49%	2	4.08%		0.00%	46	93.88%
05/16/05	114	35	30.70%	66	57.89%	6	5.26%		0.00%	107	93.86%
05/17/05	193	76	39.38%	100	51.81%	6	3.11%	1	0.52%	183	94.82%
05/18/05	102	36	35.29%	48	47.06%	8	7.84%	1	0.98%	93	91.18%
05/19/05	101	23	22.77%	56	55.45%	11	10.89%		0.00%	90	89.11%
05/20/05	103	46	44.66%	47	45.63%	2	1.94%		0.00%	95	92.23%
05/22/05	29	13	44.83%	12	41.38%	2	6.90%		0.00%	27	93.10%
06/01/05	6	2	33.33%	1	16.67%		0.00%		0.00%	3	50.00%
06/02/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%

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, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/29/05	6	4	66.67%		0.00%		0.00%		0.00%	4	66.67%
03/30/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
03/31/05	14	10	71.43%	2	14.29%		0.00%		0.00%	12	85.71%
04/01/05	9	8	88.89%	1	11.11%		0.00%		0.00%	9	100.00%
04/02/05	10	8	80.00%	1	10.00%		0.00%		0.00%	9	90.00%
04/03/05	7	5	71.43%	1	14.29%		0.00%		0.00%	6	85.71%
04/04/05	9	7	77.78%		0.00%		0.00%		0.00%	7	77.78%
04/05/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/06/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/07/05	6	6	100.00%		0.00%		0.00%		0.00%	6	100.00%
04/10/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/11/05	4	1	25.00%	1	25.00%	1	25.00%		0.00%	3	75.00%
04/12/05	6	4	66.67%	1	16.67%	1	16.67%		0.00%	6	100.00%
04/13/05	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/14/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/15/05	10	8	80.00%	2	20.00%		0.00%		0.00%	10	100.00%
04/16/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/17/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
04/18/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/19/05	11	7	63.64%	1	9.09%		0.00%		0.00%	8	72.73%
04/20/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/21/05	26	22	84.62%	4	15.38%		0.00%		0.00%	26	100.00%
04/22/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
04/23/05	25	20	80.00%	2	8.00%		0.00%		0.00%	22	88.00%
04/24/05	7	6	85.71%	1	14.29%		0.00%		0.00%	7	100.00%
04/25/05	39	31	79.49%	6	15.38%		0.00%		0.00%	37	94.87%
04/26/05	23	20	86.96%	1	4.35%		0.00%		0.00%	21	91.30%
04/27/05	35	26	74.29%	6	17.14%		0.00%	1	2.86%	33	94.29%
04/28/05	43	31	72.09%	9	20.93%		0.00%		0.00%	40	93.02%
04/29/05	4	2	50.00%	2	50.00%		0.00%		0.00%	4	100.00%
04/30/05	18	15	83.33%		0.00%		0.00%		0.00%	15	83.33%
05/01/05	12	10	83.33%	2	16.67%		0.00%		0.00%	12	100.00%
05/02/05	5	5	100.00%		0.00%		0.00%		0.00%	5	100.00%
05/03/05	10	6	60.00%	2	20.00%		0.00%		0.00%	8	80.00%
05/04/05	6	4	66.67%	2	33.33%		0.00%		0.00%	6	100.00%
05/05/05	10	8	80.00%	2	20.00%		0.00%		0.00%	10	100.00%
05/06/05	10	8	80.00%	1	10.00%		0.00%		0.00%	9	90.00%
05/07/05	39	25	64.10%	11	28.21%	1	2.56%		0.00%	37	94.87%
05/08/05	317	253	79.81%	53	16.72%	1	0.32%		0.00%	307	96.85%
05/09/05	55	40	72.73%	14	25.45%	1	1.82%		0.00%	55	100.00%
05/10/05	78	56	71.79%	20	25.64%		0.00%		0.00%	76	97.44%
05/11/05	75	64	85.33%	6	8.00%		0.00%		0.00%	70	93.33%
05/12/05	18	16	88.89%	2	11.11%		0.00%		0.00%	18	100.00%
05/13/05	19	12	63.16%	7	36.84%		0.00%		0.00%	19	100.00%
05/14/05	17	8	47.06%	6	35.29%	1	5.88%		0.00%	15	88.24%
05/15/05	13	8	61.54%	4	30.77%		0.00%		0.00%	12	92.31%
05/16/05	31	7	22.58%	19	61.29%	1	3.23%		0.00%	27	87.10%
05/17/05	96	39	40.63%	45	46.88%	2	2.08%		0.00%	86	89.58%
05/18/05	95	38	40.00%	33	34.74%	6	6.32%		0.00%	77	81.05%
05/19/05	40	9	22.50%	19	47.50%	5	12.50%		0.00%	33	82.50%
05/20/05	68	30	44.12%	34	50.00%	2	2.94%		0.00%	66	97.06%
05/22/05	4	2	50.00%	2	50.00%		0.00%		0.00%	4	100.00%
06/01/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%

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, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/12/05	11	3	27.27%	2	18.18%		0.00%		0.00%	5	45.45%
03/13/05	199	83	41.71%	25	12.56%	3	1.51%	1	0.50%	112	56.28%
03/14/05	119	60	50.42%	16	13.45%	2	1.68%	2	1.68%	80	67.23%
03/15/05	120	51	42.50%	13	10.83%	2	1.67%		0.00%	66	55.00%
03/16/05	120	60	50.00%	14	11.67%	1	0.83%	1	0.83%	76	63.33%
03/17/05	42	15	35.71%	4	9.52%	2	4.76%	1	2.38%	22	52.38%
03/21/05	104	46	44.23%	11	10.58%	4	3.85%	1	0.96%	62	59.62%
03/22/05	137	55	40.15%	30	21.90%	2	1.46%		0.00%	87	63.50%
03/23/05	120	59	49.17%	17	14.17%	2	1.67%	1	0.83%	79	65.83%
03/24/05	118	43	36.44%	18	15.25%	3	2.54%	1	0.85%	65	55.08%
03/25/05	73	35	47.95%	14	19.18%		0.00%		0.00%	49	67.12%
03/26/05	48	25	52.08%	4	8.33%	3	6.25%	1	2.08%	33	68.75%
03/27/05	6	2	33.33%	1	16.67%		0.00%		0.00%	3	50.00%
03/28/05	131	69	52.67%	18	13.74%	3	2.29%	1	0.76%	91	69.47%
03/29/05	120	73	60.83%	18	15.00%	2	1.67%	3	2.50%	96	80.00%
03/30/05	120	63	52.50%	20	16.67%	1	0.83%	1	0.83%	85	70.83%
03/31/05	120	71	59.17%	15	12.50%	1	0.83%	1	0.83%	88	73.33%
04/01/05	109	62	56.88%	15	13.76%	3	2.75%		0.00%	80	73.39%
04/04/05	120	71	59.17%	15	12.50%	1	0.83%	3	2.50%	90	75.00%
04/05/05	121	67	55.37%	14	11.57%	1	0.83%	3	2.48%	85	70.25%
04/06/05	120	68	56.67%	12	10.00%	1	0.83%		0.00%	81	67.50%
04/07/05	89	41	46.07%	16	17.98%	3	3.37%	1	1.12%	61	68.54%
04/08/05	151	92	60.93%	25	16.56%	1	0.66%		0.00%	118	78.15%
04/11/05	121	64	52.89%	16	13.22%	2	1.65%		0.00%	82	67.77%
04/12/05	120	71	59.17%	21	17.50%		0.00%	2	1.67%	94	78.33%
04/13/05	120	67	55.83%	18	15.00%	3	2.50%	1	0.83%	89	74.17%
04/14/05	132	77	58.33%	22	16.67%	2	1.52%	1	0.76%	102	77.27%
04/15/05	108	66	61.11%	16	14.81%		0.00%	1	0.93%	83	76.85%
04/18/05	135	70	51.85%	32	23.70%	3	2.22%	1	0.74%	106	78.52%
04/19/05	120	59	49.17%	20	16.67%	2	1.67%	1	0.83%	82	68.33%
04/20/05	123	74	60.16%	23	18.70%	1	0.81%	1	0.81%	99	80.49%
04/21/05	120	64	53.33%	24	20.00%	3	2.50%	3	2.50%	94	78.33%
04/22/05	102	60	58.82%	19	18.63%		0.00%	3	2.94%	82	80.39%
04/25/05	121	79	65.29%	19	15.70%	3	2.48%	3	2.48%	104	85.95%
04/26/05	124	78	62.90%	16	12.90%	2	1.61%	3	2.42%	99	79.84%
04/27/05	120	73	60.83%	17	14.17%	2	1.67%	1	0.83%	93	77.50%
04/30/05	211	104	49.29%	49	23.22%	3	1.42%	1	0.47%	157	74.41%
05/02/05	120	63	52.50%	25	20.83%	3	2.50%	1	0.83%	92	76.67%
05/03/05	125	61	48.80%	33	26.40%	4	3.20%	1	0.80%	99	79.20%
05/04/05	55	23	41.82%	14	25.45%	1	1.82%	2	3.64%	40	72.73%
05/05/05	99	48	48.48%	20	20.20%	5	5.05%	1	1.01%	74	74.75%
05/06/05	92	38	41.30%	30	32.61%	4	4.35%	4	4.35%	76	82.61%
05/07/05	21	7	33.33%	5	23.81%	1	4.76%		0.00%	13	61.90%
05/08/05	56	17	30.36%	16	28.57%	4	7.14%	2	3.57%	39	69.64%
05/09/05	8	1	12.50%	4	50.00%		0.00%		0.00%	5	62.50%
05/10/05	12	4	33.33%	2	16.67%		0.00%		0.00%	6	50.00%
05/11/05	10	2	20.00%	2	20.00%		0.00%	1	10.00%	5	50.00%
05/12/05	10	1	10.00%	4	40.00%		0.00%		0.00%	5	50.00%
05/13/05	13	1	7.69%	10	76.92%		0.00%		0.00%	11	84.62%
05/14/05	6	2	33.33%	3	50.00%		0.00%		0.00%	5	83.33%
05/15/05	9	1	11.11%	4	44.44%		0.00%		0.00%	5	55.56%
05/16/05	4	1	25.00%		0.00%		0.00%		0.00%	1	25.00%
05/17/05	2		0.00%		0.00%		0.00%		0.00%	0	0.00%

Appendix B. Table 6. PIT-tagged wild Chinook salmon interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/12/05	81	51	62.96%	4	4.94%		0.00%		0.00%	55	67.90%
03/13/05	228	126	55.26%	24	10.53%	2	0.88%	1	0.44%	153	67.11%
03/14/05	195	128	65.64%	22	11.28%		0.00%	1	0.51%	151	77.44%
03/15/05	170	114	67.06%	17	10.00%		0.00%		0.00%	131	77.06%
03/16/05	89	61	68.54%	3	3.37%		0.00%		0.00%	64	71.91%
03/17/05	16	10	62.50%		0.00%		0.00%		0.00%	10	62.50%
03/18/05	54	33	61.11%	3	5.56%		0.00%		0.00%	36	66.67%
03/19/05	10	6	60.00%		0.00%		0.00%		0.00%	6	60.00%
03/20/05	11	6	54.55%	1	9.09%		0.00%		0.00%	7	63.64%
03/21/05	20	11	55.00%	2	10.00%		0.00%	1	5.00%	14	70.00%
03/22/05	58	38	65.52%	5	8.62%		0.00%		0.00%	43	74.14%
03/23/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
03/24/05	8	8	100.00%		0.00%		0.00%		0.00%	8	100.00%
03/25/05	5	4	80.00%		0.00%		0.00%		0.00%	4	80.00%
03/26/05	12	9	75.00%		0.00%		0.00%		0.00%	9	75.00%
03/27/05	2	2	100.00%		0.00%		0.00%		0.00%	2	100.00%
03/28/05	752	518	68.88%	65	8.64%	11	1.46%	3	0.40%	597	79.39%
03/29/05	211	154	72.99%	29	13.74%	1	0.47%	1	0.47%	185	87.68%
03/30/05	142	95	66.90%	17	11.97%		0.00%		0.00%	112	78.87%
03/31/05	137	97	70.80%	13	9.49%		0.00%	3	2.19%	113	82.48%
04/01/05	119	82	68.91%	14	11.76%		0.00%		0.00%	96	80.67%
04/02/05	96	56	58.33%	21	21.88%		0.00%		0.00%	77	80.21%
04/03/05	115	77	66.96%	12	10.43%	1	0.87%		0.00%	90	78.26%
04/04/05	105	66	62.86%	13	12.38%	1	0.95%	1	0.95%	81	77.14%
04/05/05	108	61	56.48%	11	10.19%		0.00%		0.00%	72	66.67%
04/06/05	99	66	66.67%	10	10.10%	2	2.02%		0.00%	78	78.79%
04/07/05	89	51	57.30%	6	6.74%		0.00%		0.00%	57	64.04%
04/08/05	182	125	68.68%	16	8.79%	3	1.65%		0.00%	144	79.12%
04/09/05	405	287	70.86%	39	9.63%	2	0.49%		0.00%	328	80.99%
04/10/05	393	282	71.76%	42	10.69%		0.00%	1	0.25%	325	82.70%
04/11/05	712	474	66.57%	63	8.85%	6	0.84%	1	0.14%	544	76.40%
04/12/05	536	388	72.39%	38	7.09%	6	1.12%	1	0.19%	433	80.78%
04/13/05	198	135	68.18%	21	10.61%	1	0.51%	1	0.51%	158	79.80%
04/14/05	149	109	73.15%	8	5.37%	1	0.67%	1	0.67%	119	79.87%
04/15/05	193	129	66.84%	21	10.88%	4	2.07%		0.00%	154	79.79%
04/16/05	165	121	73.33%	15	9.09%	1	0.61%	1	0.61%	138	83.64%
04/17/05	104	73	70.19%	7	6.73%	1	0.96%		0.00%	81	77.88%
04/18/05	215	143	66.51%	21	9.77%	2	0.93%		0.00%	166	77.21%
04/19/05	207	143	69.08%	26	12.56%	1	0.48%	3	1.45%	173	83.57%
04/20/05	72	44	61.11%	9	12.50%	2	2.78%		0.00%	55	76.39%
04/21/05	86	61	70.93%	6	6.98%		0.00%		0.00%	67	77.91%
04/22/05	80	55	68.75%	11	13.75%	1	1.25%		0.00%	67	83.75%
04/23/05	68	51	75.00%	6	8.82%		0.00%		0.00%	57	83.82%
04/24/05	191	128	67.02%	25	13.09%	3	1.57%	1	0.52%	157	82.20%
04/25/05	278	181	65.11%	33	11.87%		0.00%	1	0.36%	215	77.34%
04/26/05	391	259	66.24%	36	9.21%	3	0.77%		0.00%	298	76.21%
04/27/05	467	300	64.24%	36	7.71%	3	0.64%		0.00%	339	72.59%
04/30/05	197	122	61.93%	26	13.20%	3	1.52%	2	1.02%	153	77.66%
05/01/05	476	293	61.55%	91	19.12%	7	1.47%	3	0.63%	394	82.77%
05/02/05	114	65	57.02%	21	18.42%	1	0.88%	1	0.88%	88	77.19%
05/03/05	55	25	45.45%	17	30.91%	1	1.82%	1	1.82%	44	80.00%
05/04/05	53	23	43.40%	10	18.87%		0.00%	1	1.89%	34	64.15%
05/05/05	169	89	52.66%	47	27.81%	5	2.96%		0.00%	141	83.43%
05/06/05	105	61	58.10%	24	22.86%	1	0.95%		0.00%	86	81.90%
05/07/05	16	11	68.75%	1	6.25%		0.00%	1	6.25%	13	81.25%
05/08/05	56	27	48.21%	20	35.71%	2	3.57%	1	1.79%	50	89.29%
05/09/05	8	4	50.00%	1	12.50%	1	12.50%		0.00%	6	75.00%
05/10/05	15	4	26.67%	3	20.00%		0.00%		0.00%	7	46.67%
05/11/05	42	12	28.57%	14	33.33%		0.00%	1	2.38%	27	64.29%
05/12/05	34	9	26.47%	13	38.24%	2	5.88%		0.00%	24	70.59%
05/13/05	30	7	23.33%	15	50.00%	2	6.67%		0.00%	24	80.00%
05/14/05	22	4	18.18%	5	22.73%	2	9.09%	2	9.09%	13	59.09%
05/15/05	41	14	34.15%	23	56.10%	1	2.44%	1	2.44%	39	95.12%
05/16/05	14	3	21.43%	5	35.71%	1	7.14%		0.00%	9	64.29%
05/17/05	2		0.00%	1	50.00%		0.00%		0.00%	1	50.00%

Appendix B. Table 7. PIT-tagged hatchery steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/21/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
03/22/05	3	1	33.33%		0.00%		0.00%		0.00%	1	33.33%
03/23/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
03/24/05	5	3	60.00%		0.00%		0.00%		0.00%	3	60.00%
03/25/05	1		0.00%	1	100.00%		0.00%		0.00%	1	100.00%
03/26/05	8	6	75.00%		0.00%		0.00%		0.00%	6	75.00%
03/28/05	20	12	60.00%	2	10.00%		0.00%		0.00%	14	70.00%
03/30/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
03/31/05	3	1	33.33%	2	66.67%		0.00%		0.00%	3	100.00%
04/02/05	7	6	85.71%		0.00%		0.00%		0.00%	6	85.71%
04/03/05	23	13	56.52%	2	8.70%	1	4.35%	1	4.35%	17	73.91%
04/04/05	21	13	61.90%	5	23.81%	1	4.76%		0.00%	19	90.48%
04/05/05	28	17	60.71%	7	25.00%	1	3.57%		0.00%	25	89.29%
04/06/05	26	19	73.08%	3	11.54%		0.00%		0.00%	22	84.62%
04/07/05	24	18	75.00%	2	8.33%		0.00%		0.00%	20	83.33%
04/08/05	49	36	73.47%	6	12.24%	1	2.04%		0.00%	43	87.76%
04/09/05	57	40	70.18%	8	14.04%		0.00%		0.00%	48	84.21%
04/10/05	32	19	59.38%	7	21.88%		0.00%		0.00%	26	81.25%
04/11/05	18	13	72.22%	3	16.67%		0.00%	1	5.56%	17	94.44%
04/12/05	18	9	50.00%	6	33.33%		0.00%		0.00%	15	83.33%
04/13/05	33	16	48.48%	4	12.12%		0.00%		0.00%	20	60.61%
04/14/05	27	16	59.26%	3	11.11%	1	3.70%		0.00%	20	74.07%
04/15/05	44	21	47.73%	13	29.55%	2	4.55%		0.00%	36	81.82%
04/16/05	24	17	70.83%	5	20.83%		0.00%		0.00%	22	91.67%
04/17/05	38	22	57.89%	5	13.16%		0.00%		0.00%	27	71.05%
04/18/05	82	50	60.98%	16	19.51%	1	1.22%		0.00%	67	81.71%
04/19/05	38	19	50.00%	8	21.05%	1	2.63%		0.00%	28	73.68%
04/20/05	37	22	59.46%	5	13.51%		0.00%		0.00%	27	72.97%
04/21/05	29	11	37.93%	1	3.45%		0.00%		0.00%	12	41.38%
04/22/05	32	12	37.50%	8	25.00%	1	3.13%		0.00%	21	65.63%
04/23/05	29	10	34.48%	6	20.69%	1	3.45%		0.00%	17	58.62%
04/24/05	50	26	52.00%	9	18.00%		0.00%		0.00%	35	70.00%
04/25/05	80	38	47.50%	25	31.25%	1	1.25%	1	1.25%	65	81.25%
04/26/05	120	51	42.50%	35	29.17%	1	0.83%		0.00%	87	72.50%
04/27/05	120	60	50.00%	34	28.33%	4	3.33%		0.00%	98	81.67%
04/30/05	220	153	69.55%	24	10.91%	1	0.45%		0.00%	178	80.91%
05/02/05	120	79	65.83%	16	13.33%		0.00%		0.00%	95	79.17%
05/03/05	113	55	48.67%	15	13.27%		0.00%		0.00%	70	61.95%
05/04/05	120	81	67.50%	21	17.50%	3	2.50%		0.00%	105	87.50%
05/05/05	122	90	73.77%	13	10.66%		0.00%		0.00%	103	84.43%
05/06/05	125	95	76.00%	19	15.20%	1	0.80%		0.00%	115	92.00%
05/08/05	74	50	67.57%	18	24.32%		0.00%		0.00%	68	91.89%
05/09/05	43	33	76.74%	5	11.63%		0.00%		0.00%	38	88.37%
05/10/05	72	34	47.22%	5	6.94%		0.00%	1	1.39%	40	55.56%
05/11/05	89	59	66.29%	17	19.10%	2	2.25%		0.00%	78	87.64%
05/12/05	97	57	58.76%	31	31.96%		0.00%		0.00%	88	90.72%
05/13/05	53	22	41.51%	16	30.19%	1	1.89%		0.00%	39	73.58%
05/14/05	129	47	36.43%	59	45.74%	2	1.55%		0.00%	108	83.72%
05/15/05	69	17	24.64%	31	44.93%	3	4.35%	1	1.45%	52	75.36%
05/16/05	45	16	35.56%	19	42.22%	1	2.22%	1	2.22%	37	82.22%
05/17/05	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%

Appendix B. Table 8. PIT-tagged wild steelhead trout interrogations at Lower Granite (GRJ), Little Goose (GOJ), Lower Monumental (LMJ), and McNary (MCJ) dams from the Salmon River trap, 2005.

Date	Number Tagged	Ints GRJ	% GRJ	Ints GOJ	% GOJ	Ints LMJ	% LMJ	Ints MCJ	% MCJ	Grand Total Ints	Total % Obs.
03/31/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/09/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%
04/11/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/12/05	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/13/05	1		0.00%		0.00%		0.00%		0.00%	0	0.00%
04/14/05	3	2	66.67%		0.00%		0.00%		0.00%	2	66.67%
04/15/05	3	3	100.00%		0.00%		0.00%		0.00%	3	100.00%
04/16/05	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
04/17/05	3	2	66.67%	1	33.33%		0.00%		0.00%	3	100.00%
04/18/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/19/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/20/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/21/05	2	1	50.00%		0.00%		0.00%		0.00%	1	50.00%
04/22/05	2	1	50.00%	1	50.00%		0.00%		0.00%	2	100.00%
04/23/05	4	3	75.00%		0.00%		0.00%		0.00%	3	75.00%
04/24/05	13	10	76.92%	3	23.08%		0.00%		0.00%	13	100.00%
04/25/05	22	13	59.09%	4	18.18%		0.00%		0.00%	17	77.27%
04/26/05	20	11	55.00%	5	25.00%		0.00%		0.00%	16	80.00%
04/27/05	40	14	35.00%	18	45.00%	1	2.50%	1	2.50%	34	85.00%
04/30/05	23	18	78.26%		0.00%	1	4.35%		0.00%	19	82.61%
05/01/05	10	10	100.00%		0.00%		0.00%		0.00%	10	100.00%
05/02/05	5	3	60.00%		0.00%		0.00%		0.00%	3	60.00%
05/03/05	5	4	80.00%	1	20.00%		0.00%		0.00%	5	100.00%
05/04/05	4	1	25.00%	1	25.00%		0.00%		0.00%	2	50.00%
05/05/05	12	7	58.33%		0.00%		0.00%		0.00%	7	58.33%
05/06/05	15	10	66.67%	2	13.33%	1	6.67%		0.00%	13	86.67%
05/07/05	4	1	25.00%	1	25.00%		0.00%		0.00%	2	50.00%
05/08/05	17	9	52.94%	7	41.18%		0.00%		0.00%	16	94.12%
05/09/05	7	6	85.71%	1	14.29%		0.00%		0.00%	7	100.00%
05/10/05	12	6	50.00%		0.00%		0.00%		0.00%	6	50.00%
05/11/05	15	12	80.00%		0.00%	1	6.67%		0.00%	13	86.67%
05/12/05	17	11	64.71%	5	29.41%	1	5.88%		0.00%	17	100.00%
05/13/05	9	1	11.11%	8	88.89%		0.00%		0.00%	9	100.00%
05/14/05	19	8	42.11%	6	31.58%		0.00%		0.00%	14	73.68%
05/15/05	11		0.00%	7	63.64%		0.00%		0.00%	7	63.64%
05/16/05	1	1	100.00%		0.00%		0.00%		0.00%	1	100.00%

Prepared by:

Edwin W. Buettner
Senior Fisheries Research Biologist

Scott A. Putnam
Senior Fisheries Technician

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Steve P. Yundt, Chief
Bureau of Fisheries

Peter F. Hassemer
Anadromous Fish Manager