



CHINOOK SALMON FISH HATCHERY EVALUATIONS—IDAHO

Project Progress Report

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Brian Leth
Fisheries Research Biologist

Tracy Petering
Technical Records Specialist

Dmitri Vidergar
Senior Fisheries Research Biologist

Paul Kline
Principal Fisheries Research Biologist

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LSRCP Hatchery Evaluation Studies in Idaho Part 1: Chinook Salmon

**2001 Annual Report
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By

**Brian Leth
Tracy Petering
Dmitri Vidergar
Paul Kline**

**Idaho Department of Fish and Game
600 South Walnut Street
P.O. Box 25
Boise, ID 83707**

To

**U.S. Fish and Wildlife Service
Lower Snake River Compensation Plan Office
1387 S. Vinnell Way, Suite 343
Boise, ID 83709**

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ABSTRACT

This annual report summarizes Idaho-Lower Snake River Compensation Plan (LSRCP) Hatchery Evaluation monitoring studies from October 1, 2000 through September 30, 2001. Included in this report are all 2001 adult Chinook salmon *Oncorhynchus tshawytscha* returns and all releases of juvenile spring and summer Chinook salmon made within the reporting period. Release information includes data from 2000 parr and presmolt releases as well as smolt release data from spring 2001. Information presented in this report supersedes that included in previous reports.

Total adult and jack returns of spring and summer Chinook salmon to the upper Snake River drainage in 2001 were above the most recent 10-year average and above the LSRCP return goal of 58,700 Chinook salmon above Lower Granite Dam (LGR). Lower Granite Dam counts included 175,093 spring Chinook salmon and 17,539 summer Chinook salmon of wild, natural, or hatchery origin, of which 3,135 and 3,804, respectively, were jacks. Total LGR counts were 397% and 228% of the respective 2000 spring and summer Chinook salmon counts. The 2001 LGR counts included an estimated 28,951 wild- or natural-origin spring and summer Chinook salmon. Wild- or natural-origin spring and summer Chinook salmon were 395% of the respective 2000 count.

Adult and jack Chinook salmon returns to Idaho hatchery racks (LSRCP, Idaho Power Company, and U.S. Fish and Wildlife Service) totaled 27,241 spring run and 12,019 summer run fish. These numbers include fish of wild, natural, and hatchery origin. The 2001 hatchery rack totals were 184% and 165% greater than the 2000 spring and summer Chinook salmon total hatchery rack returns, respectively. Returns to LSRCP Chinook salmon hatcheries in Idaho totaled 11,811 spring and 10,922 summer Chinook salmon. These numbers include fish of wild, natural, and hatchery origin and represent an increase of 163% and 160% over the 2000 returns, respectively.

Total adult and jack spring Chinook salmon returns in 2001 to specific LSRCP trapping locations included Sawtooth Fish Hatchery—2,103, Red River satellite—1,333, Crooked River satellite—2,013, Powell satellite—2,344, and Dworshak National Fish Hatchery—4,018. A total of 10,922 summer Chinook salmon returned to the South Fork Salmon River trap, the collection site for McCall Fish Hatchery. These numbers may include a small proportion of naturally produced fish, as some subjectivity is introduced in determining if a fish is truly unmarked (natural) or has a poor quality fin clip.

Chinook salmon returns to non-LSRCP Idaho hatcheries included 15,430 spring Chinook salmon (Kooskia National Fish Hatchery—2,261 and Rapid River Fish Hatchery—13,169) and 1,097 summer Chinook salmon (Pahsimeroi Fish Hatchery). These numbers may also include a small proportion of naturally produced fish, as mentioned above.

Smolt-to-adult return (SAR) rates (from juvenile release to return at hatchery weirs) for brood year 1996 LSRCP spring and summer Chinook salmon ranged from 0.38% for Red and Crooked River releases to 0.98% at Pahsimeroi Hatchery. These SARs are minimum estimates and do not include harvest or straying between LGR and the hatchery weirs.

Idaho-LSRCP hatcheries operated by the Idaho Department of Fish and Game released 1,165,231 summer Chinook salmon smolts, 46,981 summer Chinook salmon parr, 664,766 spring Chinook salmon smolts, 993,474 presmolts, and 433,497 spring Chinook salmon parr

during the 2001 fiscal year (October 1, 2000—September 30, 2001). Smolts released during the 2001 reporting period were the progeny of brood year 1999 adult returns and emigrated in 2001. Parr and presmolts released in 2001 were the progeny of brood year 2000 adult returns and emigrated to the ocean in the spring of 2002.

Representative groups of brood year 1999 Chinook salmon from LSRCP and Idaho Power Company hatchery facilities were tagged with passive integrated transponder (PIT) tags. Detection rates at Lower Snake River dam detection facilities ranged from 7.50% for presmolts released from the Stolle Pond acclimation site on the South Fork Salmon River in 2000, to 67.03% for smolts released from Rapid River Fish Hatchery in 2001.

Sport fisheries targeting hatchery-origin (adipose-clipped) Chinook salmon were held on sections of the Snake River, Clearwater River, Salmon River, Little Salmon River, and South Fork Salmon River in 2001. Sport anglers harvested an estimated 21,833 salmon in the Clearwater subbasin and 21,631 salmon in the Salmon River subbasin. Nez Perce and Shoshone-Bannock Tribal members harvested an estimated 817 Chinook salmon in the Clearwater subbasin and 9,262 in the Salmon River subbasin.

Authors:

Brian Leth
Fisheries Research Biologist

Tracy Petering
Technical Records Specialist I

Dmitri Vidergar
Senior Fisheries Research Biologist

Paul Kline
Principal Fisheries Research Biologist

INTRODUCTION

The U.S. Army Corps of Engineers constructed four hydroelectric dams (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite) on the lower Snake River between 1962 and 1975. Fishery managers and biologists expected the survival of downstream migrating smolts and upstream migrating adults to be reduced by dam construction and operation and the alteration of the river ecosystem. The Lower Snake River Compensation Plan (LSRCP) was authorized by the Water Resources Development Act of 1976 (90 Stat. 2917) to compensate for the reduced survival and anadromous fish losses caused by dam construction and operation. The primary compensation tool specified in the LSRCP was a hatchery mitigation program. In 1977, the U.S. Fish and Wildlife Service (USFWS) was given budgeting and administrative responsibility for operation and maintenance funding of LSRCP fish hatchery programs through an interagency agreement among the U.S. Army Corps of Engineers, National Marine Fisheries Service (NMFS), and the USFWS.

The LSRCP hatchery program specifies the use of fish hatcheries to produce and release large numbers of juvenile anadromous salmonids to meet adult return goals. Adult return goals established by the LSRCP are 8,000 summer run Chinook salmon *Oncorhynchus tshawytscha*, 50,700 spring run Chinook salmon, and 18,300 fall run Chinook salmon to the Snake River basin. At the present time, only Oxbow Fish Hatchery, an Idaho Power Company (IPC) facility on the Snake River bordering Idaho and Oregon, raises fall Chinook salmon. To achieve these goals, the Idaho Department of Fish and Game (IDFG) and the USFWS currently operate five hatcheries and five satellite facilities in Idaho: McCall Fish Hatchery and the South Fork Salmon River trap; Dworshak National Fish Hatchery; Kooskia National Fish Hatchery; Clearwater Fish Hatchery and the Red River, Crooked River, and Powell satellite facilities; and Sawtooth Fish Hatchery and the East Fork Salmon River satellite facility (Figure 1). Clearwater Fish Hatchery, the final hatchery authorized under the LSRCP, became operational in 1992. The IPC owns and maintains three additional Chinook salmon hatcheries in Idaho that are operated by IDFG staff (Rapid River, Oxbow, and Pahsimeroi fish hatcheries; Figure 1).

Specific information pertaining to the LSRCP program at Dworshak National Fish Hatchery and IPC facilities are reported in separate reports, although we include selective information in this report for comparative purposes.

The LSRCP includes a Hatchery Evaluation Study (HES) component to monitor and evaluate the mitigation hatchery program. The primary goal of the HES is to determine the best hatchery management practices that allow the mitigation hatcheries to meet LSRCP and IDFG anadromous fisheries goals. Objectives to address the goal are: 1) to monitor and document hatcheries' ability to meet mitigation goals and 2) to conduct small-scale manipulative studies involving modified or alternative hatchery practices that show potential for increasing adult returns and achieving LSRCP and IDFG goals. These small-scale studies may be printed and bound as independent reports. This report summarizes Chinook salmon HES activities carried out from October 1, 2000 through September 30, 2001.

METHODS

Adult Return and Juvenile Release Summary Documentation

For comparative purposes and to evaluate the success of IDFG operated hatcheries in the LSRCP program, we summarize juvenile releases and adult returns for the reporting period October 2000 through September 2001 for both LSRCP and non-LSRCP hatcheries in Idaho operated by IDFG or the U.S. Fish and Wildlife Service (USFWS).

When comparing the number of juveniles released to individual hatchery release goals, it was necessary to convert parr and presmolts to smolt equivalents to make comparisons between hatcheries and across years. Parr and presmolts were converted using the multipliers 0.75 and 0.90, respectively (Hassemer et al. 2000). Parr and presmolt multipliers represent the average survival expected during hatchery rearing between the parr or presmolt to smolt stage. Juvenile releases included LSRCP fish as well as fish released for other purposes (e.g. IDFG and other supplementation efforts).

We report the smolt-to-adult-return rate (SAR) of the brood year represented by the three-ocean returning adults (five-year generation length). For this reporting period (October 2000 through September 2001), we provide SARs for brood year 1996 hatchery returns.

Hatchery Operations Documentation

Information on selected hatchery operations, including juvenile rearing and release, weir management, and spawning protocols, was obtained from written and oral communication with hatchery personnel. Written documents from which we extracted relevant information included "Run" and "Brood Year" reports from Clearwater, McCall, Rapid River, Oxbow, Pahsimeroi, and Sawtooth fish hatcheries, monthly hatchery rearing summaries, stocking slips, the Idaho release and recovery database, and memoranda pertinent to trapping, spawning, rearing, and release operations. Personal communications through formal and informal meetings provided additional information. We attempted to avoid duplication of hatchery documents while highlighting information (e.g., fish health) that may have affected adult return characteristics. Documentation includes number of eggs taken; strain, tagging or marking of experimental groups; number of fish released; and release locations.

Composition of Brood Year 2001 Adult Returns

Age Determinations—Age composition of returning jack and adult Chinook salmon was determined using length frequency distributions specific to each hatchery facility (Table 1).

The age notations we use throughout the text and tables for adults that returned in 2001 refer to the total age of the fish and assume all juvenile smolts are yearlings. Three-year-old fish (jacks) originated from releases of brood year 1998 juveniles; four-year-olds originated from releases of brood year 1997 juveniles, and five-year-olds originated from releases of brood year 1996 juveniles.

Sex Composition—Hatchery personnel provide the sex composition data we report. Sex ratios were calculated for total adult returns, including and excluding jacks (three-year-old males), and for specific age groups where appropriate. In some locations, sex composition data

was based on a subsample of gender identified adults. In other locations, sex composition data were not available, and only total adult numbers were reported.

Fish Origin—We classified any Chinook salmon bearing an external mark, typically an adipose or ventral fin clip, as a hatchery-origin fish. However, some hatchery-origin fish have no external mark but do have a coded-wire tag (CWT) inserted in their snout. All externally unmarked fish with a CWT were also classified as hatchery-origin. We refer to some hatchery-origin fish as reserve or production fish; the terms reserve and production are used in reference to a hatchery-origin Chinook salmon with an adipose (AD) fin clip that can be legally harvested in a sport fishery. We refer to other hatchery-origin fish as supplementation fish; supplementation fish refer to Chinook salmon that are part of the Idaho Supplementation Study (ISS) and are not intended to contribute to sport fisheries. Supplementation fish are typically marked with a right ventral (RV) or left ventral (LV) fin clip or a CWT and no external mark. For a more detailed explanation of the ISS program, refer to Lutch et al. 2003.

Fish Health Monitoring—Adult Chinook salmon held for spawning are typically spawned within two months of arrival. Fish health monitoring at spawning includes sampling for viral, bacterial, and parasitic disease agents. Ovarian fluid is sampled from females and used in viral assays. Kidney samples are taken from all females spawned and used in bacterial assays. Head wedges are taken from a representative number of fish spawned and used to assay for presence/absence of the parasite responsible for whirling disease. All Chinook salmon ponded for possible spawning receive an injection of erythromycin 200 (Gallimycin) at the following dose: 20 mg/kg. Adult Chinook salmon in holding ponds receive a minimum of three formalin treatments (120-170 ppm) per week to control the spread of fungus and ectoparasites. Tissue samples collected from adult female Chinook salmon spawned at IDFG hatcheries were assayed at the Eagle Fish Health Laboratory, Eagle, Idaho. The IDFG standards required that all eggs from all females tested for bacterial kidney disease (BKD) by Enzyme-Linked Immunosorbent Assay (ELISA) methods with optical density values exceeding 0.249 be culled in 2001. However, eggs from females with optical densities between 0.25 and 0.399, in some cases, were kept but incubated and reared separately as High-BKD segregation groups. Additionally, due to the elevated prevalence of BKD at the Clearwater Fish Hatchery satellites (Powell, Red River and Crooked River) in 2001, the maximum allowable optical density (OD) value was raised to 0.399 for those facilities (D. Munson, IDFG, personal communication).

Fish Disposition

In 2001, adult returns exceeded holding capacity at some hatchery facilities, requiring releases of excess fish. Some hatchery-origin fish were recycled back through fisheries to allow anglers additional harvest opportunity. Others were out-planted in other streams where escapements of naturally produced fish were extremely low. All recycled fish released downstream were opercle punched to identify them as previously trapped fish. Some hatchery-origin jacks were killed for consumptive uses and distributed to the Nez Perce Tribe, the Shoshone-Bannock Tribe, and various local health and welfare organizations.

Brood Year 1996 Smolt-to-Adult Return Rates

Within the text, we identify juvenile releases as parr, presmolts, or smolts and provide juvenile release-to-adult return estimates based on this terminology. The terms fry, parr, and presmolts refer to Chinook salmon in their first spring, summer, or fall of life, respectively.

Smolts are juveniles released in their second spring of life. Most hatchery-reared spring and summer Chinook salmon in Idaho and throughout the Columbia Basin are released as smolts. For some hatchery release groups, large numbers of smolts are marked with Passive Integrated Transponders (PIT) tags, which are uniquely identifiable tags that are detectable at several of the Snake and Columbia River hydroelectric projects, including Lower Granite Dam. Therefore, the SAR of marked fish (the number of marked fish returning divided by the number of marked fish released) is a commonly used estimator of survival and is assumed to represent overall smolt-to-adult survival for the entire release group. Smolt-to-adult return rates in this report represent a minimum estimate of survival from tagging to adult detections at LGR or to individual hatchery weirs and are not expanded to include fish harvested or detected downstream of LGR. In addition, because not all hatchery-origin release groups include sufficient numbers of PIT-tagged individuals to estimate SAR to Lower Granite Dam, we also estimate SAR back to individual hatchery weirs. Weir SARs are based on ratios of returning jack and adult Chinook salmon from a given brood year and the number of corresponding smolts released from the same brood year. Survival rates back to hatchery weirs should be considered minimum return rates, because harvest and stray rate estimates between LGR and the hatchery weir are not included. Smolt-to-adult survival rates estimated in this report are for brood year 1996 release groups. With a typical five-year generation length, the five-year-old (three-ocean) component of brood year 1996 releases returned in 2001. It should be noted that returning six-year-old (four-ocean) Snake River spring/summer Chinook have been documented but generally account for a very small segment of the brood year return. The limited ability to identify four-ocean returns based on length frequency data precludes us from determining that portion of the return, and they are not included in the SAR.

Juvenile Out-migration Conditions

Snake River water flow during smolt out-migration is a significant factor affecting survival of Idaho's anadromous fishes (Berggren and Filardo 1993). River flows during emigration periods for brood year returns completed in 2001 are of particular interest for this reporting period. Flow conditions during the 1998 emigration period of brood year 1996 Chinook salmon are reported in Figure 2. Flow conditions for the 2001 emigration period for brood year 1999 Chinook salmon are reported in Figure 3. We obtained river flow data from the Fish Passage Center (FPC) (http://www.fpc.org/adult_history/YTD-LGR) and the Columbia River Data Access in Real Time (DART) (<http://www.cqs.washington.edu/dart/dart.html>) databases.

Two periods were defined to summarize juvenile out-migration flows at LGR. The "peak" period, April 15 to May 5, is defined as the period of time during which 50% of the emigration of yearling Chinook salmon occurs. The "extended" period, April 20 to May 30, includes most of the known out-migration of wild- and natural-origin yearling Chinook salmon. For further explanation of emigration periods identified in this report, refer to Petrosky 1991.

Out-migration Timing and Juvenile Survival

We retrieved PIT tagging and interrogation data from the PIT Tag Information System (PTAGIS) (<http://www.psmfc.org/pittag/>) database maintained by the Pacific States Marine Fisheries Commission in Gladstone, Oregon. These data pertain to hatchery-origin fish PIT tagged by various entities for numerous purposes and used to assess migration survival and timing.

The detection (interrogation) rates among PIT-tagged juvenile salmonids migrating past three Lower Snake River dams and one Columbia River dam serve as relative or minimum survival indices. These indices are considered relative or minimum because: 1) an unknown (but we believe small) number of PIT-tagged fish that die in the hatchery may go undetected, although all juvenile mortalities recovered in the hatcheries are scanned; 2) not all fish pass through PIT tag detectors at the dams; 3) approximately 0.30% of PIT tags fail (Kiefer and Lockhart 1994) or are lost between tagging and arrival at detection sites; 4) some fish arrive while detection gear is not being operated; and 5) mortality occurs between dams.

We compared the relative survival between fish from various groups of hatchery-origin juveniles arriving at dams with PIT tag interrogation capabilities. Detection rates reflect the total number of unique detections of individual fish at any of the Lower Granite, Little Goose, Lower Monumental, or McNary detection sites. We present arrival-timing graphs for various PIT tag groups for comparative purposes. These graphs are constructed from detections at LGR only. For releases that occurred over an extended period, such as volitional releases, we used the middle date of the release period as the date from which to calculate travel times.

We used graphic interpretation to examine the relationship between release date and travel time to LGR. Graphical interpretation included an estimate of the coefficient of determination (R^2). The coefficient of determination was used to make inferences about the variability in the dependant variable (median travel time to LGR) that was explained by the independent variable (release date) in a general linear model (Ott 1993:589-591).

Female Progeny:Female Parent Ratios

The female progeny:female parent ratio is the number of adult females that returned to their hatchery of origin for each female spawned in a given brood year's spawning. A small amount of error is introduced into the ratio estimate because of inaccurate sexing of adults at the time of trapping. In addition, only fish of known hatchery-origin are compiled to estimate progeny:parent ratios; although assumed a minor problem, misidentification of a fish's origin would also bias the ratios.

Return Year 2001 Weir Management Protocols

McCall Fish Hatchery

Following the guidelines established by National Oceanic and Atmospheric Administration (NOAA) Fisheries in the application for the Section 10 permit for McCall Fish Hatchery trapping and spawning activities, IDFG defined the following weir management plan:

1. Maintain a minimum of 20 pairs of spawners in the natural environment above the weir with a preferred target of at least 35 pairs by releasing 67% of the wild- or natural-origin (listed) adults, then supplementation and reserve adults, in that order of preference.
2. Maintain the composition of adults released to spawn naturally above the weir at 50% wild or natural origin and 50% hatchery produced where the number of supplementation adults released does not exceed the number of natural adults, except where this is necessary to maintain the 20 pair minimum. That is, if the

number of natural + supplementation pairs of adults released is approximately 18, then the 35 pair goal could be met by releasing reserve fish only (i.e. 17 pairs). If there are less than 10 pairs of natural fish released, then any combination of supplementation + reserve fish will be used to bring the total number of pairs released to 20 (approximately 11 pairs). In this situation, the number of reserve fish could exceed the number of natural fish released; i.e., genetic criteria will be subordinated to demographic concerns in order to maintain 20 pairs of spawners in the natural environment.

Sawtooth Fish Hatchery

Following the guidelines established by NOAA Fisheries in the application for the Section 10 permit for Sawtooth Fish Hatchery trapping and spawning activities, IDFG defined the following weir management plan:

1. Maintain a minimum of 20 pairs of spawners in the natural environment above the weir with a preferred target of at least 35 pairs by releasing 67% of the wild- or natural-origin (listed) adults, then supplementation and reserve adults, in that order of preference.
2. Maintain the composition of adults released to spawn naturally above the weir at 50% wild or natural origin and 50% hatchery produced where the number of supplementation adults released does not exceed the number of natural adults, except where this is necessary to maintain the 20 pair minimum. That is, if the number of natural + supplementation pairs of adults released is approximately 18, then the 35 pair goal could be met by releasing reserve fish only (i.e., 17 pairs). If there are less than 10 pairs of natural fish released, then any combination of supplementation + reserve fish will be used to bring the total number of pairs released to 20 (approximately 11 pairs). In this situation, the number of reserve fish could exceed the number of natural fish released; i.e., genetic criteria will be subordinated to demographic concerns in order to maintain 20 pairs of spawners in the natural environment.

In addition, Sawtooth Fish Hatchery is presently required by Permit #919 not to retain any unmarked fish for supplementation broodstock if the predicted return is less than 100 adults.

Clearwater Fish Hatchery

None of the natural or hatchery origin Chinook salmon populations in the Clearwater River drainage is listed under the Endangered Species Act. Therefore, the Clearwater Fish Hatchery and satellite facilities are not required to adhere to the requirements outlined in the IDFG application to NMFS for a Section 10 permit. IDFG management, research, and hatchery staff establish weir management plans for the Red River, Crooked River, and Powell satellite facilities.

Red River and Crooked River Satellite Facilities (Clearwater Hatchery)

In 1997, Red River and Crooked River Chinook salmon were combined to make the South Fork Clearwater River stock.

The South Fork weir management plan included either holding AD-clipped fish as broodstock to be spawned, holding them in a separate pond to be released back into a sport fishery, or releasing them to spawn naturally (adult outplant). Only AD-clipped fish that were to be ponded for broodstock were injected with erythromycin 200 (Gallimycin) at trapping. All LV and RV clipped fish were released above the weir to spawn naturally without an erythromycin 200 (Gallimycin) injection. Chinook salmon with no mark or CWTs were released above the weir to spawn naturally without an erythromycin 200 (Gallimycin) injection. Chinook salmon with no external mark but having a CWT were released below the weir to spawn naturally with no erythromycin 200 (Gallimycin) injection. All South Fork fish released through the sport fishery or released to spawn naturally were given a right opercle punch designation. Due to the low return of jacks to the South Fork, all were retained for spawning except unmarked, untagged fish. Red River satellite facility adult holding ponds were used to hold Nez Perce Tribe broodstock; therefore, all Clearwater Fish Hatchery broodstock were transported, held, and spawned at Clearwater Fish Hatchery.

Powell Satellite Facility

The Powell weir management plan included treating AD-clipped fish both with CWT or without as either broodstock (ponded), held in a separate pond to be recycled back into the sport fishery, or released to spawn naturally (adult outplant). Only AD-clipped fish that were to be ponded for broodstock were injected with erythromycin 200 (Gallimycin) at trapping. Stray South Fork Chinook salmon that were trapped at Powell and either LV or RV clipped were recycled back through the sport fishery or released to spawn naturally (adult outplant). Chinook salmon captured that were either unmarked or had only a CWT were given a left opercle punch and released back into the Lochsa River without an erythromycin 200 (Gallimycin) injection. Unmarked Chinook salmon trapped a second time were ponded as broodstock. Powell fish that were either recycled through the sport fishery or released to spawn naturally were given a left opercle punch designation. Due to the low return of jacks to Powell, all jacks trapped were retained for spawning except unmarked, untagged fish. A temporary adult fish weir was operated in Crooked Fork Creek approximately 1.5 km upstream from the Powell satellite facility to intercept hatchery-origin stray Chinook salmon. Crooked Fork Creek is a control stream within the ISS study design, and IDFG researchers attempted to intercept as many of the hatchery-origin strays as possible to avoid confounding effects of having hatchery-origin fish contribute to natural production.

Trapping protocol for the Crooked Fork Creek trap included transporting hatchery-origin Chinook salmon to the Powell satellite holding ponds where they would either be ponded as broodstock, temporarily held until they could be loaded in trucks and recycled through the sport fishery, or released to spawn naturally (adult outplant). All fish that were recycled through the sport fishery or released to spawn naturally (adult outplant) were left opercle punched at trapping. To differentiate between trapping locations, research trap tenders on the Crooked Fork Creek weir opercle punched their Chinook salmon low on the left opercle.

Harvest

In 2001, sport fisheries for adipose-clipped (hatchery-origin) spring and summer Chinook salmon were held on sections of the Snake River, Clearwater River, Little Salmon River, Lower Salmon River, and South Fork Salmon River. Regional fishery management biologists from IDFG monitored angler effort and estimated harvest using a combination of fixed site, roving creel, telephone surveys, and voluntary angler survey drop-off boxes. We present summaries of estimated harvest from each fishery. Detailed information from individual fisheries is available from IDFG regional reports (Barrett 2001; Janssen and Kiefer in progress; Apperson 2003).

RESULTS

Summary of Juvenile Releases

Spring run juvenile Chinook salmon releases during the 2001 fiscal year at Idaho-LSRCP hatchery facilities, operated by IDFG, consisted of 664,766 smolts, 433,497 parr, and 993,474 presmolts. Summer Chinook salmon juvenile releases included 1,165,231 smolts and 46,981 parr (Table 2). Specific purpose and release location for all hatchery release groups are listed in Appendix A, Tables 1-5. While most Chinook salmon released in 2001 were adipose-fin clipped allowing the potential for harvest, 630,997 hatchery-reared smolts and 616,792 hatchery-reared parr were released with adipose fins intact (Nez Perce Tribe and Idaho Supplementation Studies releases; Appendix A). These supplementation and Nez Perce tribal releases were distinguishable from wild-origin fish by the presence of CWTs or ventral fin clips. Other marks or tags may have been applied to a portion of some releases from each hatchery for ongoing experiments.

A more comprehensive review of juvenile rearing and marking can be found in brood year reports from individual hatcheries. To clarify individual brood year releases during the 2001 reporting period, brood year 1999 and brood year 2000 releases are described below.

Brood Year 1999

Brood year 1999 releases during reporting year 2001 include only smolts. Parr and presmolt releases from brood year 1999 are reported in the 2000 annual report.

Idaho-LSRCP hatchery facilities operated by IDFG released 664,766 spring Chinook salmon smolts and 1,165,231 summer Chinook salmon smolts from brood year 1999 (Table 2).

Brood Year 2000

Brood year 2000 releases during reporting year 2001 include only parr and presmolts. Smolt releases from brood year 2000 will be reported in the 2002 annual report.

Idaho-LSRCP hatchery facilities operated by IDFG released 1,426,971 spring Chinook salmon parr and presmolts and 46,981 summer Chinook salmon parr from brood year 2000 (Table 2).

Summary of Adult Returns

Spring and Summer Run Chinook Salmon

Adult salmon returning to the Snake River basin are comprised of both spring and summer run components. Adult counting facilities operated by the FPC at Lower Snake and Columbia River hydroelectric projects categorize spring and summer runs based on the arrival timing at individual projects. For example, Chinook salmon arriving at LGR between March 1 and June 17 are classified as spring run, while Chinook salmon arriving between June 18 and August 17 are classified as summer run. In addition, the FPC does not discriminate Chinook salmon return numbers by their respective origins (wild/natural or hatchery). Many hatchery-origin Chinook salmon have no external mark, and a visual determination of origin is not possible.

PIT tag data have shown that some spring run Chinook salmon arrive at LGR after June 17 and summer run Chinook salmon arrive prior to June 17. Therefore, arrival timing alone may not be sufficient to accurately determine the numbers of spring and summer Chinook salmon returns. In order to reduce the discrepancy created by this observed overlap in arrival timing at LGR, the U.S. v. Oregon Technical Advisory Committee (TAC) estimates the proportion of Chinook salmon crossing LGR that are spring or summer run and also hatchery or wild origin by using data collected at hatcheries and from fisheries (Table 4). Therefore, while the total reported number of adult Chinook salmon arriving at LGR is the same for both methods, proportions of the total return that are composed of wild and hatchery or spring and summer run adults are different (Table 3 and Table 4). It should be noted that TAC estimates do not include jacks. We present Chinook salmon return data derived from both methods (FPC and TAC).

Spring Run Chinook Salmon

The total count of spring Chinook salmon (wild, natural, or hatchery origin) crossing LGR in 2001 based on FPC data was 175,093, of which 3,135 were jacks (Table 3). The TAC estimated 147,131 adult spring run Chinook salmon (jacks not included) arrived at LGR, including 130,654 hatchery-origin and 16,477 wild- or natural-origin adults (Table 4). The total 2001 LGR spring Chinook salmon count based on FPC data was 397% greater than the respective 2000 count.

Returns to all Idaho hatchery racks, including fish of wild, natural, or hatchery origin, totaled 27,241 spring Chinook salmon (Table 5); this return was 184% greater than the 2000 return of 14,816 fish. Returns to Idaho-LSRCP hatchery racks totaled 11,811 spring Chinook salmon; this return was 163% greater than the 2000 LSRCP rack return of 7,262 fish. A total of 15,430 spring Chinook salmon returned to non-LSRCP Idaho hatcheries (Kooskia National Fish Hatchery and Rapid River Fish Hatchery). This return was 204% greater than the 2000 non-LSRCP rack return of 7,554 fish. It should be noted that the Oxbow hatchery adult trap was not operated in 2001 due to the large return of adult Chinook salmon to Idaho in 2001.

Hatchery Origin Returns—Returns to all Idaho hatchery racks of hatchery origin only spring Chinook salmon totaled 23,246 (Table 6); this return was 252% greater than the 2000 return of 9,213 hatchery-origin fish. Returns to Idaho-LSRCP hatchery racks totaled 10,476 hatchery-origin spring Chinook salmon; this return was 312% greater than the 2000 LSRCP rack return of 3,361 fish. A total of 12,770 hatchery-origin spring Chinook salmon returned to

non-LSRCP Idaho hatcheries (Kooskia National Fish Hatchery and Rapid River Fish Hatchery). This return was 272% greater than the 2000 non-LSRCP hatchery origin rack return of 4,693 fish.

Summer Chinook Salmon

The total count of summer Chinook salmon (wild, natural, or hatchery origin) crossing LGR in 2001 based on FPC data was 17,539 (Table 3). Included in this total were 3,804 jacks. The TAC estimated that 38,562 adult summer run Chinook salmon arrived at Lower Granite Dam, 26,088 of which were hatchery origin, and the remaining 12,475 were of wild or natural origin (Table 4). The total LGR summer run Chinook salmon count based on FPC data was 228% greater than the respective 2000 count.

Returns to all Idaho hatchery racks, including fish of wild, natural, or hatchery origin, totaled 12,019 summer Chinook salmon (Table 7); this return was 165% greater than the 2000 rack return of 7,271 fish. Returns to the Idaho-LSRCP hatchery rack (South Fork Salmon River) totaled 10,922 summer Chinook salmon; this return was 160% greater than the 2000 LSRCP rack return of 6,812 fish. A total of 1,097 summer Chinook salmon returned to the non-LSRCP Idaho hatchery (Pahsimeroi Fish Hatchery). This return was 239% greater than the 2000 non-LSRCP rack return of 459 fish.

Hatchery Origin Returns—Returns to all Idaho hatchery racks of hatchery-origin summer Chinook salmon totaled 9,995 (Table 7); this return was 157% greater than the 2000 return of 6,384 hatchery-origin fish. Returns to the Idaho-LSRCP hatchery rack (South Fork Salmon River) totaled 9,144 hatchery-origin summer Chinook salmon; this return was 150% greater than the 2000 LSRCP rack return of 6,093 fish. A total of 851 hatchery-origin summer Chinook salmon returned to the non-LSRCP Idaho hatchery (Pahsimeroi Fish Hatchery). This return was 294% greater than the 2000 non-LSRCP hatchery-origin rack of 291 fish.

Hatchery Operations

McCall Fish Hatchery

2001 Juvenile Releases—McCall Fish Hatchery released 1,212,212 summer run juvenile Chinook salmon during the 2001 reporting period. A total of 1,165,231 brood year 1999 smolts (88,154 ISS fish and 1,077,078 reserve fish) were released at Knox Bridge on the South Fork Salmon River. In addition, 46,981 brood year 2000 parr were released into the Stolle Meadow acclimation pond as part of the ISS study (Table 2; Appendix A, Table 2). Green-egg-to-eyed survival of brood year 1999 summer Chinook salmon reared at McCall Fish Hatchery averaged 78.2% (Table 8).

2001 Adult Return—In 2001, 10,922 summer run Chinook salmon were trapped at the South Fork Salmon River weir, which included 4,204 females, 5,626 adult males, and 1,092 jacks (Tables 10a and 10b). Included in this total were 9,144 hatchery-origin fish consisting of 3,573 females, 4,580 adult males, and 991 jacks. The remaining 1,778 fish were wild- or natural-origin fish consisting of 631 females, 1,046 adult males, and 101 jacks (IDFG 2001).

Adult Releases—Of the 10,922 Chinook salmon captured at the South Fork Salmon River weir, 2,432 natural and supplementation origin fish were released upstream of the weir to

spawn naturally, including 882 females and 1,550 males. In addition, 1,976 adipose clipped reserve fish were released downstream of the weir at three different sites (Dollar Cr. Bridge [654 fish], Dollar Cr. Mouth [137 fish], and Goat Cr. [1,185 fish]) in an effort to recycle surplus adults back through the sport fishery. Additionally, in an effort to increase natural production in areas with depressed populations, 1,241 adipose clipped adults were released into three streams to spawn naturally. Of these, 83 were stocked into the East Fork of the South Fork Salmon River (EFSFSR), 105 were stocked into Meadow Creek (a tributary of the EFSFSR), and 1,053 were stocked into Panther Creek (a tributary of the Salmon River) (IDFG 2001).

Adult releases met the guidelines defined by NOAA Fisheries in IDFG's application for a Section 10 permit. Of the 2,432 fish released above the weir, 1,674 were of wild or natural origin, 758 were supplementation origin, and one was hatchery origin.

1. Ninety-four percent of the naturally produced, ESA-listed, summer Chinook salmon trapped were released above the weir to spawn naturally,
2. Eight hundred eighty-two pairs of spawners were released above the weir to spawn naturally, and
3. Sixty-nine percent of the total fish released above the weir were wild or natural origin.

Brood Year 2001 Spawning Protocols—At ponding, adult Chinook salmon larger than 66 cm fork length were injected with erythromycin 200 (Gallimycin) into the peritoneal cavity posterior to the pelvic fins at a rate of 20 mg/kg body weight as a preventive measure for BKD.

There were 1,393 prespawning mortalities, including 598 females, 795 adult males, and no jacks. Of the 417 females spawned (407 marked and 10 unmarked), 396 adipose clipped females were used to create a reserve group, and 21 (10 wild and 11 supplementation) were used to create the supplementation broodstock (Table 9). Reserve fish were spawned with reserve fish, supplementation with supplementation, supplementation with unmarked, and unmarked with unmarked. Each female's eggs were split into two groups. Each group was fertilized with the sperm of one male. A total of 809 adult males and 25 jacks were used to fertilize the different groups (Table 9). The two groups of eggs were then recombined, rinsed with well water, and water hardened in a 100 ppm solution of Argentyne. Eggs from reserve females were double loaded into hatchery egg trays. Eggs from supplementation and unmarked fish were single loaded to allow listed fish to be culled individually if necessary (IDFG 2001).

The green egg take was 1,793,667 (Table 9). Of these, 270,015 eggs from 39 females, including one listed female, were culled due to BKD ELISA values exceeding brood year 2001 spawn management criteria (optical density ≥ 0.25). The remaining 1,523,652 green eggs yielded 1,139,385 eyed-eggs for a 74.8% eye-up survival rate. Average fecundity based on the green egg count was 4,301 eggs per female (Table 9).

Johnson Creek Stock—Nez Perce Tribe fisheries staff held 166 Johnson Creek fish (57 female, 77 male, and 32 jacks) on site at the South Fork Trap; 28 females were spawned producing 80,753 eyed eggs (IDFG 2001).

Mark/Tag Recovery—Personnel from IDFG recovered 1,107 CWTs in 2001 from Chinook salmon reared at McCall Fish Hatchery. Among these recoveries, 347 were from the South Fork Salmon River weir, 677 from sport fisheries, and 82 from spawning ground surveys

in 2001. Juvenile releases that contributed to these recoveries included 130,110 from brood year 1996, 567,024 from brood year 1997, and 400,212 from brood year 1998. Coded-wire tag recoveries included 12 fish from brood year 1996, 1,028 from brood year 1997, and 67 from brood year 1998 (Appendix B, C, D; Table 2).

Of the 1,107 CWTs recovered, lengths were taken from 1,071 fish. Three-year-old fish ranged from 48 to 82 cm fork length with a median of 56 cm (n = 66). Four-year-old fish ranged from 54 to 95 cm with a median of 78 cm (n = 993). Five-year-old fish ranged from 81 to 109 cm with a median of 91 cm (n = 12).

Brood Year 1996 Smolt-to-Adult Return Rate—Over the return years 1999, 2000, and 2001, 3,958 hatchery-origin Chinook salmon returned to the South Fork Salmon River weir from a release of 393,872 smolts and 24,990 parr resulting in a 0.96% survival rate (from release to returns at the weir) (Table 11). Adult PIT tag detections at LGR from the brood year 1996 PIT tag release of 47,340 full-term smolts included 539 summer Chinook salmon of hatchery-origin, yielding an SAR of 1.14% (from smolt release to adult detection at LGR; Appendix D, Table 2). Of these detections, 108 were detected in 1999 as one-ocean, 394 were detected in 2000 as two-ocean, and 37 were detected in 2001 as three-ocean fish.

Consumptive Releases—Adult returns to the South Fork weir were in excess of broodstock needs, so some fish were distributed to various organizations for consumptive use. Organizations included Nez Perce Tribe (527), Shoshone-Bannock Tribe (374), Cascade WICAP (589), ICAN (100), McCall Health and Welfare (319), and Calvary Christian Church (100) (IDFG 2001).

Sawtooth Fish Hatchery and East Fork Salmon River Satellite

2001 Juvenile Releases—Sawtooth Fish Hatchery released 57,134 spring Chinook salmon smolts into the Salmon River immediately below the hatchery weir in 2001 (Table 2; Appendix A, Table 5). Green-egg-to-eyed survival of brood year 1999 spring Chinook salmon reared at Sawtooth Fish Hatchery was 93.3% (Table 8).

2001 Adult Return—In 2001, 2,103 adult spring Chinook salmon were trapped at the Sawtooth Fish Hatchery, which included 1,427 of hatchery origin and 676 of wild or natural origin (Tables 10a and 10b). Hatchery-origin returns included 657 adult males, 594 females, and 176 jacks. Natural-origin returns included 343 adult males, 282 females, and 51 jacks.

Adult Releases—In 2001, 1,231 Chinook salmon were released above the weir to spawn naturally. Of these, 619 were unmarked natural origin (255 females, 317 adult males, and 47 jacks), and the remaining 612 were hatchery origin (202 females, 244 adult males, and 166 jacks). Hatchery-origin fish were part of the ISS study. No downstream releases occurred in 2001 (Schilling 2001).

Adult releases met the guidelines defined by NOAA Fisheries in the IDFG application for a Section 10 permit. Of the 457 females released above the weir, 255 were of wild or natural origin and 202 were hatchery origin. Of the 774 males released, 317 were unmarked adult males, and 47 were unmarked jacks; 244 hatchery-origin males and 166 hatchery-origin jacks were released above the weir in 2001 (Schilling 2001).

1. Ninety-two percent of the unmarked, ESA-listed, naturally-produced spring Chinook salmon trapped were released above the weir to spawn naturally.
2. Four hundred fifty-seven pairs of spawners were released above the weir to spawn naturally.
3. Fifty percent of the total fish released above the weir were of wild or natural origin.

Brood Year 2001 Spawning Protocols—At ponding, adult Chinook salmon were injected with erythromycin 200 (Gallimycin) into the peritoneal cavity posterior to the pelvic fins at a rate of 20 mg/kg body weight as a preventive measure for BKD. Additionally, all ponded fish were treated three times per week in a one-hour 170 ppm formalin flush.

There were 66 prespawning mortalities, including 36 females, 30 males, and no jacks. A total of 382 females spawned (Table 9). Of these, 340 were used to create reserve groups and 42 were used to create ISS groups. Each female's eggs were split into two groups. Each group was fertilized with the sperm of one male. Mark and age class was used to determine the preferred male to female crosses. A total of 375 adult males and 7 jacks were used to fertilize the different groups. The two groups of eggs were then recombined, rinsed with well water, and water hardened in a 100 ppm solution of Argentyne. Eggs from each female were incubated separately and isolated based on BKD designation.

The green egg take was 1,890,845. These green eggs yielded 1,732,927 eyed-eggs for a 91.6% eye-up survival. Average fecundity based on the green egg count was 4,950 eggs per female (Table 9; Schilling 2001). Eggs from 85 females were culled due to having ELISA based optical densities of 0.40 or greater.

Mark/Tag Recovery—Personnel from IDFG recovered 850 CWTs in 2001 from Chinook salmon reared at Sawtooth Fish Hatchery. Of these recoveries, 765 were recovered at the Sawtooth weir, and the remaining 85 were recovered during spawning ground surveys above the Sawtooth weir. Juvenile releases with CWTs that contributed to the 2001 adult return included 216,065 from brood year 1997 and 119,891 from brood year 1998. All brood year 1996 juveniles were marked with an adipose clip only (no CWTs used). There were no CWT recoveries from sport fisheries for brood years 1996, 1997, or 1998. (Appendices B, C, D; Table 5).

Three-year-old fish ranged from 41 to 84 cm fork length with a median of 58 cm (n = 53). Four-year-old fish ranged from 55 to 89 cm fork length with a median of 75 cm (n = 797). Since no brood year 1996 Chinook salmon were released with CWTs, no length at age information was developed for age-5 adults.

Brood Year 1996 Smolt-to-Adult Return Rate—Over the return years 1999, 2000, and 2001, 227 hatchery-origin Chinook salmon returned to Sawtooth Fish Hatchery weir from a release of 43,161 smolts resulting in a 0.53% SAR (from release at the hatchery to returns at the weir) (Table 11). Only three brood year 1996 PIT-tagged fish returned to Sawtooth weir, so we did not report an SAR based on PIT tag recoveries for this group. Adult PIT tag detections consisted of two 2-ocean adults and one 3-ocean adult.

Consumptive Releases—No fish were distributed for consumptive use.

East Fork Salmon River Satellite (Sawtooth Fish Hatchery)—The East Fork Salmon River satellite weir was not operated for the collection of Chinook salmon in 2001.

Red River/Crooked River Satellites (Clearwater Fish Hatchery)

2001 Juvenile Releases—Clearwater Fish Hatchery released 279,068 juvenile Chinook salmon in Red River and Crooked River during the 2001 contract year. Of those, 38,943 brood year 1999 smolts and 155,887 brood year 2000 presmolts were released in Crooked River, and 84,238 brood year 2000 presmolts were released in Red River (Appendix A. Table 1). Green-egg-to-eyed survival of brood year 1999 spring Chinook salmon (South Fork Clearwater stock) reared at Clearwater Fish Hatchery was 85.60% (Table 8). Green-egg-to-eyed survival of brood year 2000 spring Chinook salmon reared at Clearwater Fish Hatchery was 82.3% (George and Shockman 2002).

2001 Adult Return—A total of 3,346 spring Chinook salmon of natural and hatchery origin were trapped at the South Fork satellites (Red and Crooked River) in 2001, which included 2,760 hatchery-origin and 586 natural-origin fish (Tables 10a and 10b). Hatchery-origin male returns included 42 three-year-olds, 1,121 four-year-olds, and 93 five-year-olds. Hatchery-origin female returns included 14 three-year-olds, 1,467 four-year-olds, and 23 five-year-olds (Table 10a). Natural-origin male returns included 1 three-year-old, 231 four-year-olds, and 41 five-year-olds. Natural-origin female returns included zero three-year-olds, 303 four-year-olds, and 10 five-year-olds (Table 10b). Sex composition of the South Fork return is based on a subsample of 2,496 fish.

Adult Releases—794 natural- and hatchery-origin Chinook salmon were released in the South Fork Clearwater River for natural spawning. Of these, 253 (140 males, 110 females and 3 unknown) were released above the weir in Red River, and 377 (181 males, 193 females and 3 unknowns) were released above the weir in Crooked River. A total of 123 adults (66 males and 57 females) were released in Meadow Creek of the South Fork, and 41 (24 males, 17 females) were released in Mill Creek for natural spawning. An additional 1,177 fish were transported to four release sites to recycle fish through the sport fishery (Tighe and Hedrick 2001).

Brood Year 2001 Spawning Protocol—At ponding, adult Chinook salmon were injected with erythromycin 200 (Gallimycin) into the peritoneal cavity posterior to the pelvic fins at a rate of 20 mg/kg body weight as a preventive measure for BKD. Additionally, all ponded fish were treated three times per week in a one-hour 150 ppm formalin flush.

There were 184 prespawning mortalities, including 99 females, 80 males, and 5 of unknown sex. There were 676 females and 483 males spawned (which included 186 females spawned by Nez Perce Tribal Fisheries) in 2001. Eggs from each female were fertilized with milt from two males (Table 9). Approximately one minute after milt from the first male had been in contact with the eggs, milt from a second male was introduced as a safety measure to offset the possibility of the first male being nonviable. Eggs were water hardened in a 100 ppm Argentyne solution for one hour, rinsed, chilled, and placed in egg trays (Tighe and Hedrick 2001).

To create the South Fork production broodstock, 490 females were spawned. Eggs from 128 of these females were culled, leaving 1,484,173 green eggs. These green eggs yielded 1,435,499 eyed eggs. Additionally, 186 females were spawned as part of the Nez Perce tribal fisheries program. Eggs from 95 of these females were culled, leaving 356,336 green eggs. These eggs yielded 249,763 eyed eggs. In total, 1,840,509 green eggs taken from 453 females

yielded 1,685,262 eyed eggs for a 91.6% eye-up survival. Average fecundity based on the green egg count was 4,063 eggs per female (Table 9).

Eggs from 199 females were culled because BKD ELISA values exceeded brood year 2001 spawn management criteria (>0.39 OD). Eggs from the other 24 females were culled due to full mortality in the trays (Tighe and Hedrick 2001).

Mark/Tag Recovery—Personnel from IDFG submitted snouts to the CWT laboratory from 13 Chinook salmon captured at the Red River and Crooked River satellite weirs (Tighe and Hedrick 2001). Seven of the snouts submitted did not have CWTs, and data from the other six snouts are not available. The 2001 Clearwater Fish Hatchery run report indicated that all 13 fish from which snouts were removed fell into the length criteria of two-ocean adults (brood year 1997). Because neither brood year 1996 or 1997 fish were released at either facility with CWTs, it is likely that if the remaining six snouts did have CWTs, they were strays from other releases. In fact, the four snouts collected during spawning ground surveys in Red River were from Newsome Creek and Walton Creek releases. Brood year 1998 releases at Crooked River and Red River included 21,568 and 21,209 CWTs, respectively (Appendix B, Table 1). No CWTs from either of the brood year 1998 releases were recovered in 2001.

Other tags detected at Crooked River Satellite included 14 PIT tags and one radio tag.

Brood Year 1996 Smolt-to-Adult Return Rate—Over the return years 1999, 2000, and 2001, 971 hatchery-origin Chinook salmon returned to the Crooked River and Red River hatchery weirs from a release of 257,114 smolts, resulting in a 0.38% SAR (from release to returns at the weir) (Table 11). Adult PIT tag detections at LGR from the brood year 1996 PIT tag release of 1,499 full-term smolts included only one fish, so we did not report an SAR based on PIT tag recoveries for this group.

Powell Satellite (Clearwater Fish Hatchery)

2001 Juvenile Releases—Clearwater Fish Hatchery released 212,648 brood year 1999 spring Chinook salmon smolts and 559,652 brood year 2000 presmolts into Walton Creek at the Powell satellite facility in 2001 (Appendix A, Table 1). Green-egg-to-eyed survival of brood year 1999 spring Chinook salmon (Powell stock) reared at Clearwater Fish Hatchery was 82.6% (Table 8). Green-egg-to-eyed survival of brood year 2000 spring Chinook salmon reared at Clearwater Fish Hatchery was 82.3% (George and Shockman 2002).

2001 Adult Return—In 2001, 2,344 spring Chinook salmon of natural- and hatchery-origin were trapped at the Powell satellite facility, which included 2,271 hatchery-origin and 73 natural-origin fish (Table 10a and 10b). Hatchery-origin male returns included 60 three-year-olds, 797 four-year-olds, and 40 five-year-olds. Hatchery-origin female returns included 17 three-year-olds, 1,342 four-year-olds, and 15 five-year-olds (Table 10a). Natural-origin male returns included 1 three-year-old, 27 four-year-olds, and 1 five-year-old. Natural-origin female returns included zero three-year-olds, 44 four-year-olds, and zero five-year-olds (Table 10b). Sex composition of the Powell return is based on a subsample of 1,749 fish.

Adult Releases—A total of 219 hatchery-origin adult Chinook salmon were released into Colt Killed Creek (White Sands) for natural spawning. In addition, 611 hatchery-origin adults were transported and released in the Clearwater and Lochsa Rivers to provide additional harvest opportunity for anglers (Tighe and Hedrick 2001).

Brood Year 2001 Spawning Protocol—At ponding, adult Chinook salmon were injected with erythromycin 200 (Gallimycin) into the peritoneal cavity posterior to the pelvic fins at a rate of 20 mg/kg body weight as a preventive measure for BKD. Additionally, all ponded fish were treated three times per week in a one-hour 120 ppm formalin flush.

There were 182 prespawning mortalities, including 106 females and 76 males; 795 females were spawned (Table 9). The eggs from each female were fertilized with milt from one male. Approximately one minute after milt from the first male had been in contact with the eggs, milt from a second male was introduced as a safety measure to offset the possibility of the first male being nonviable. A total of 482 males including jacks were used. Eggs were water hardened in a 100 ppm Argentyne solution for one hour, rinsed, chilled, and placed in egg trays.

The green egg take was 2,737,281. These green eggs yielded 2,496,154 eyed-eggs for a 91.2% eye-up survival (Tighe and Hedrick 2001). Average fecundity based on the green egg count was 3,443 eggs per female (Table 9).

Disease sampling included collecting kidney samples from all females, 60 ovarian fluid, and 20 head wedge samples. Eggs from 84 females were culled, because BKD ELISA values exceeded brood year 2001 spawn management criteria (>0.39) (Tighe and Hedrick 2001).

Mark/Tag Recovery—in 2001, CWTs from 993 Chinook salmon were extracted from snouts sampled at the Powell satellite facility. Of the CWTs collected, 959 were from the brood year 1997 Powell pond releases (presmolt release = 18, smolt release = 941), 28 were from the brood year 1998 Powell pond smolt release, two were from the brood year 1996 Powell pond smolt release, three were strays from the brood year 1997 Boulder Creek release, and one was a stray from the brood year 1997 Papoose Creek release. Boulder and Papoose Creeks are tributaries of the Lochsa River located approximately 71 and eight kilometers downstream of the Powell facility, respectively. Numbers of Chinook salmon released with CWTs that contributed to recoveries in 2001 included 216,691 smolts from brood year 1996, 102,801 presmolts and 316,650 smolts from brood year 1997, and 187,566 smolts from brood year 1998 (Appendices B, C, D; Table 1). Coded-wire tag recoveries from Idaho sport fisheries included 26 from the brood year 1997 Powell smolt release.

Three-year-old fish ranged from 43 to 67 cm fork length with a median of 53 cm ($n = 28$). Four-year-old fish ranged from 50 to 90 cm with a median of 73 cm ($n = 985$). Only two five-year-old fish were collected with CWTs, so no descriptive statistics are reported.

Other tags detected at the weir included 19 PIT tags and two radio tags.

Brood Year 1996 Smolt-to-Adult Return Rate—Over the return years 1999, 2000, and 2001, 1,050 hatchery-origin Chinook salmon returned to the Powell satellite facility from a release of 244,847 smolts, resulting in a 0.43% smolt-to-adult survival rate (from release to returns at the hatchery weir) (Table 11). Adult PIT tag detections at LGR from the brood year 1996 PIT tag release of 2,010 full-term smolts included 11 fish yielding an SAR of 0.55% (release to adult detection at LGR) (Appendix D, Table 1).

Dworshak National Fish Hatchery

Information pertaining to the LSRCP program at Dworshak National Fish Hatchery is reported under a separate cover by the U.S. Fish and Wildlife Service. Selected information is included in this report for comparative purposes.

2001 Juvenile Releases—Dworshak National Fish Hatchery released 330,120 brood year 1999 spring Chinook salmon smolts into the North Fork of the Clearwater River in 2001.

2001 Adult Return—In 2001, 4,018 spring Chinook salmon of hatchery-origin were trapped at the Dworshak National Fish Hatchery, which included 36 jacks, 3,235 four-year-olds, and 747 five-year-olds (Table 10a).

Brood Year 1996 Smolt-to-Adult Return Rate—Staff from Dworshak National Fish Hatchery enumerated 4,244 brood year 1996 spring Chinook salmon of hatchery origin at the Dworshak adult trap over the return years 1999, 2000, and 2001 from a release of 973,400 smolts, resulting in a 0.44% SAR (from release at the hatchery to returns at the hatchery trap) (Table 11).

Brood Year 1996 Female Progeny:Female Parent Ratios

Female progeny:female parent ratios for brood year 1996 LSRCP hatchery Chinook salmon ranged from 5.76 for South Fork Clearwater (Clearwater Fish Hatchery) to 15.61 for the Pahsimeroi Fish Hatchery indicating that all facilities were above replacement for brood year 1996 returns (Table 11). In other words, each female spawner from brood year 1996 produced on average from 5.76 to 15.61 returning females in the years 2000 and 2001.

Juvenile Out-migration Conditions

Mean daily flows at LGR in 2001 (emigration year for brood year 1999 Chinook salmon) averaged 42.5 kcfs during the "peak" (April 15 to May 5) and 57.8 kcfs during the "extended" (April 20 to May 30) out-migration periods (Table 12). Peak and extended flows in 2001 were 49.5% and 57.0% of the previous 10-year average (1991-2000) and 52% and 46% of the flow in 1998 (emigration year for brood year 1996 Chinook salmon), respectively. Daily flows throughout the 1998 and 2001 emigration periods are shown in Figures 2 and 3. While spill occurred during most of the 1998 emigration period at Lower Granite Dam, no spill occurred at Lower Granite Dam during the 2001 emigration period (Figures 2 and 3).

Out-migration Timing and Juvenile Survival for 2001 Emigration

General

The following discussion of PIT tag interrogation data refers to groups of Idaho-LSRCP and IPC hatchery-reared Chinook salmon smolts that migrated in 2001, including fish released both as subyearling parr or presmolts and those released as yearling smolts. PIT tag detection rates at three Lower Snake River dams (Lower Granite, Little Goose, Lower Monumental) and one Columbia River dam (McNary) for brood year 1999 Chinook salmon tagged as yearling

smolts in 2001 ranged from 47.31% for fish released into Newsome Creek to 67.03% for fish released from Rapid River Fish Hatchery. Detection rates at Lower Snake River dams for brood year 1999 Chinook salmon tagged as parr or presmolts in 2000 ranged from 7.50% for parr released into Stolle Pond on the South Fork of the Salmon River to 14.77% for presmolts released into the South Fork of the Salmon River (Appendix E).

Median travel times from release site to LGR for brood year 1999 hatchery-reared Chinook salmon tagged as smolts in 2001 (excluding Dworshak/Kooskia fish) ranged from 21 days from Pahsimeroi Fish Hatchery to 49 days from Knox Bridge on the South Fork Salmon River (Appendix E). Median travel times to LGR for brood year 1999 hatchery-reared Chinook salmon tagged and released as parr or presmolts in 2000 are listed in Appendix E but are not directly comparable to detection rates of Chinook salmon tagged and released as smolts, because parr and presmolts are subject to significant overwinter mortality in freshwater before their seaward migration and detection at Lower Snake River and Columbia River interrogation sites the following spring. Median arrival dates at LGR for all groups of brood year 1999 Chinook salmon PIT tagged and released in 2001 as smolts ranged from April 29, 2001 to May 14, 2001 (Figures 4-9). First and last dates of arrival for fish released as smolts varied from March 28, 2001 to May 1, 2001 and from June 1, 2001 to July 19, 2001, respectively. Median arrival dates for fish released as parr or presmolts in 2000 ranged from May 6 to May 19. First and last arrival dates for fish released as parr or presmolts ranged from April 7, 2001 to April 28, 2001 and from July 3, 2001 to August 1, 2001, respectively.

We examined the relationship between travel time to Lower Granite Dam and release date for 2001 smolt release groups from Clearwater, McCall, Sawtooth, Pahsimeroi, and Kooskia hatcheries. There appears to be a strong relationship ($R^2=.904$, Figure 10) resulting in reduced travel times for groups released in April compared to those released in March. It is suspected that groups released in mid- to late March are lingering for some period before actively migrating, thus giving the appearance of a longer travel time than groups released later. However, the two groups, from Rapid River and McCall hatcheries, with the longest travel times have the highest PIT tag detection rates. To this point, it is unclear if earlier release dates have an effect on smolt survival.

McCall Fish Hatchery

Chinook salmon reared at McCall Fish Hatchery that were PIT tagged and released as smolts into the South Fork Salmon River at Knox Bridge survived at a minimum of 63.02% to LGR (based on cumulative unique PIT tag detections). The median arrival date at LGR for these fish was May 13, 2001 (Figure 4; Appendix E, Table 2). The first fish arrived on March 28, 2001 and the last on July 19, 2001. Presmolts released below the South Fork Salmon River adult weir in September of 2000 survived at a minimum of 14.77% to LGR (based on cumulative unique PIT tag detections). The median arrival date at LGR for these fish was May 18, 2001 (Appendix E, Table 2). The first fish arrived on April 26, 2001 and the last on July 3, 2001. Parr released at Stolle Ponds in August of 2000 survived at a minimum of 7.50% to LGR (based on cumulative unique PIT tag detections). Median arrival date at LGR for these fish was May 19, 2001 (Appendix E, Table 2). The first fish arrived on April 28, 2001 and the last on July 12, 2001.

Red River Satellite

Chinook salmon reared at the Clearwater Fish Hatchery and released from the Red River Satellite rearing pond as presmolts in 2000 survived at a minimum of 8.80% to LGR (based on cumulative unique PIT tag detections; Appendix E, Table 1). Median arrival date at LGR for these fish was May 10, 2001. The first fish arrived on April 7, 2001 and the last on July 6, 2001.

Crooked River Satellite

Chinook salmon reared at the Clearwater Fish Hatchery and released from the Crooked River Satellite facility as smolts in March of 2001 survived at a minimum of 50.33% to LGR (based on cumulative unique PIT tag detections; Appendix E, Table 1). Median arrival date at LGR for these fish was May 7, 2001 (Figure 5). The first fish arrived on April 18, 2001 and the last on June 11, 2001. Chinook salmon released as presmolts in September of 2000 survived at a minimum of 7.82%. Median arrival date at LGR was May 6, 2001. The first fish arrived on April 14, 2001, and the last fish arrived on August 1, 2001.

Powell Satellite

Chinook salmon reared at the Clearwater Fish Hatchery and released as smolts in April 2001 from the Powell satellite facility survived at a minimum of 63.09% to LGR (based on cumulative unique PIT tag detections; Appendix E, Table 1). The median arrival date at LGR for these fish was May 12, 2001 (Figure 6). The first fish arrived on April 26, 2001 and the last on June 13, 2001.

Rapid River Hatchery

Chinook salmon reared at Rapid River Fish Hatchery (IPC) and released as smolts in March of 2001 survived at a minimum of 67.03% to LGR (based on cumulative unique PIT tag detections; Appendix E, Table 4). Median arrival date at LGR for these fish was April 30, 2001 (Figure 8). The first fish arrived on March 31, 2001 and the last on July 3, 2001.

Pahsimeroi Fish Hatchery

Chinook salmon reared and released as smolts in April of 2001 at Pahsimeroi Fish Hatchery (IPC) survived at a minimum of 60.00% to LGR (based on cumulative unique PIT tag detections; Appendix E, Table 3). Median arrival date at LGR for these fish was May 10, 2001 (Figure 9). The first fish arrived on April 27, 2001 and the last on June 18, 2001.

Sawtooth Fish Hatchery

Chinook salmon smolts reared at the Sawtooth Fish Hatchery and released in April 2001 survived at a minimum of 51.20% to LGR (based on cumulative unique interrogations of PIT tag detections; Appendix E, Table 5). The median arrival date for these fish was May 13, 2001. The first fish arrived on May 1, 2001 and the last on May 26, 2001 (Figure 7).

Harvest

Snake River

A fifty mile section of the Snake River from Dug Bar boat ramp (river mile 197) to Hells Canyon Dam (river mile 247) was open to harvest of AD-clipped Chinook salmon. Due to budgetary and logistical constraints, Snake River creel survey consisted of voluntary angler survey drop boxes. Because of this, the catch data was not expanded to estimate total harvest in the Snake River reach. Summary of the drop box survey data showed 342 anglers fishing 2,263 hours to harvest 178 salmon. Catch rate of fish harvested was 12.7 hours per fish kept and 8.9 hours per fish caught (Barrett 2001).

Clearwater River Subbasin

Chinook salmon fisheries in the Clearwater River subbasin included sections of the mainstem Clearwater, Middle Fork Clearwater, North Fork Clearwater, and South Fork Clearwater rivers and were open from April 21 to August 4. Additionally, a fishery on the Lochsa River was open from May 27 through August 5.

IDFG regional fisheries management staff estimated ($\pm 95\%$ CI) that 307,713 hours of angling effort resulted in a harvest of 21,883 (1,918) spring Chinook salmon in the Clearwater subbasin. Average catch rate over all sections was 10.5 hours per fish caught and 14.1 hours per fish kept. Of the fish harvested, it was estimated that 8,355 fish originated from Dworshak National Fish Hatchery, 6,397 were from Kooskia National Fish Hatchery, and the remaining 7,131 were from Clearwater hatchery (5,031 South Fork stock, 2,100 Powell stock) (Barrett 2001). In addition, tribal fisheries managers estimated 817 hatchery-origin Chinook salmon were harvested from the North Fork Clearwater River and Clear Creek (tributary of the Middle Fork Clearwater River) as part of the treaty fishery (Scott Marshall, IDFG, personal communication).

Salmon River Subbasin

Fisheries in the Salmon River subbasin included a 34 mile section on the mainstem Salmon River from Hammer Creek to the mouth of Little Salmon River opened from April 21 to June 10 (Barrett 2001), a 23 mile section of Little Salmon River from its mouth to Little Salmon River bridge near Smokey Boulder road from April 21 to August 5 (Janssen and Kiefer, in progress) and a six mile section on South Fork Salmon River from Goat Creek to 100 yards below the South Fork adult weir opened from June 10 to July 2 (Apperson 2003).

It was estimated that 62,831 hours of angling effort on the mainstem Salmon River fishery resulted in a harvest of 6,091 (± 988 [95% CI]) salmon. The average catch rate was 10.3 hours per fish kept and 8.3 hours per fish caught (Barrett 2001). Based on CWT recoveries, of the 6,091 fish harvested, 6,028 were estimated to have originated from Rapid River hatchery and the remaining 63 from McCall Hatchery.

In the Little Salmon River, IDFG fisheries management staff estimated 9,458 hatchery-origin Chinook salmon were harvested in the sport fishery from 117,579 hours of angling effort. Average catch rate over the entire season was 9.8 hours per fish caught (Janssen and Kiefer, in progress).

In the South Fork Salmon River, fisheries management staff estimated 6,082 Chinook salmon were harvested in the sport fishery from 53,377 hours of angling effort. Average catch rate was 8.8 hours per fish kept and 5.4 hours per fish caught (Apperson 2003).

Tribal fisheries managers estimated 9,262 hatchery-origin Chinook salmon were harvested in the Salmon River subbasin as part of the treaty fisheries, including 1,795 in the South Fork Salmon River and 7,467 in the Little Salmon River and Rapid River (Scott Marshall, IDFG, personal communication).

SUMMARY

General

We evaluated the IDFG-LSRCP program by comparing the return of adults in 2001 to the program escapement goal at Lower Granite Dam. In addition, to identify possible limiting factors, we evaluated individual hatchery programs in meeting their facility goals as well as determining relative survival rates of juvenile releases that contributed to the 2001 return. When comparing the number of juveniles released to individual hatchery release goals, it was necessary to convert parr and presmolts to smolt equivalents to make comparisons between hatcheries and across years. Parr and presmolts were converted using the multipliers 0.75 and 0.90, respectively (Hassemer et al. 2000). Parr and presmolt multipliers represent the average survival expected during hatchery rearing between the parr or presmolt to smolt stage. Juvenile releases included LSRCP fish as well as fish released for other purposes (e.g., IDFG and other supplementation efforts). We also compared SARs and the number of returning female progeny produced per female parent between hatchery facilities for brood year 1996. SARs were based on adult PIT tag detections at Lower Granite Dam or from hatchery weir counts.

LSRCP Adult Returns to Lower Granite Dam

Returns of LSRCP hatchery-origin adult Chinook salmon to Idaho in 2001 exceeded the LSRCP escapement goal of 8,000 summer run and 50,700 spring run Chinook salmon above Lower Granite Dam. In 2001, an estimated 26,088 summer run and 130,654 spring run Chinook salmon of hatchery-origin passed over Lower Granite Dam (Table 4).

Individual Hatchery Success

Idaho-LSRCP return goals for hatcheries managed by IDFG are 11,915 spring Chinook salmon for Clearwater Fish Hatchery, 19,445 spring run Chinook salmon for Sawtooth Fish Hatchery, and 8,000 summer run Chinook salmon for McCall Fish Hatchery (Table 13).

Clearwater Fish Hatchery

Three satellite adult trapping facilities (Red River, Crooked River, and Powell) of Clearwater Fish Hatchery trapped 5,031 adult and jack Chinook salmon in 2001. An estimated 7,131 Chinook salmon destined for one of the three facilities were harvested in the 2001 sport fishery, bringing the total estimated adult and jack return of Chinook salmon from Clearwater

Fish Hatchery to 12,162, which exceeded the return goal of 11,915 (Table 13). It is likely this return estimate is low, because approximately 35% of juvenile releases that contributed to the 2001 return were at offsite locations. While some returning adults from offsite releases were likely harvested in sport fisheries, the majority of fish from offsite release were unaccounted for, because these locations do not have adult trapping facilities. Additionally, since the escapement at the Powell satellite facility was beyond holding capacity in 2001, the adult trap was not operated for several intervals, allowing fish additional opportunity to stray. Furthermore, while tribal harvest on Clearwater River origin Chinook salmon was estimated at 817, it is unknown what proportions were from Dworshak and Kooskia National fish hatcheries, so tribal harvest was not included.

When comparing juvenile release targets to the percent of adult and jack return goals achieved, it appears the juvenile survival rate used to calculate numbers of juveniles needed to achieve return goals was reasonable under current hatchery and environmental conditions. For Clearwater Fish Hatchery, releases that contributed to the 2001 return averaged 124% of the juvenile release goal, which resulted in returns that were 101% of the return goal.

Survival of brood year 1996 juveniles released from the three satellite facilities averaged 0.41%, and the number of female progeny produced per female parent averaged 7.75, indicating that brood year 1996 returning adults were above replacement.

Sawtooth Fish Hatchery

In 2001, staff at Sawtooth Fish Hatchery trapped 1,427 adult and jack Chinook salmon that were captured at the Sawtooth adult weir. While some unintentional harvest of Sawtooth Chinook salmon may have occurred in 2001, no sport fisheries were intended to target Sawtooth hatchery fish. Adult and jack returns to Sawtooth Fish Hatchery in 2001 fell well short of the 19,445 return goal (Table 13). However, the survival rate used to calculate numbers of juveniles needed to reach returns goals seemed reasonable for this period. Juvenile releases that contributed to the 2001 return averaged 5.7% of the juvenile release goal, which resulted in a return that was 7.3% of the return goal. Meeting juvenile release goals has been limited by chronically reduced adult returns and, to a lesser extent, the incorporation of hatchery produced Chinook salmon into the ISS program. The direct result of incorporating fish into the ISS program is that a portion of hatchery-origin adults are passed upstream of the weir to spawn naturally instead of being incorporated into hatchery broodstock. It should also be noted that the original adult return goal of 19,445 included the East Fork Salmon River (6,090 adults) and Valley Creek (2,610 adults) as spawn and or release locations for Sawtooth Fish Hatchery. Adult Chinook salmon trapping and spawning at East Fork Salmon River satellite facility was discontinued in 1998 due to low adult returns and other management concerns. The Valley Creek component of the upper Salmon River Chinook salmon program was never implemented due to low numbers of returning adults to the Sawtooth Fish Hatchery.

Survival of brood year 1996 juveniles released from Sawtooth Fish Hatchery was 0.53%, and the number of female progeny produced per female parent averaged 12.7, indicating that brood year 1996 returning adults were above replacement.

McCall Hatchery

In 2001, staff from McCall Fish Hatchery trapped 9,144 Chinook salmon at the South Fork Salmon River adult trap. An estimated 6,082 Chinook salmon destined for the South Fork trap were harvested in the sport fishery on South Fork Salmon River, and an additional 1,795 were harvested as part of a tribal treaty fishery, bringing the total estimated return to 17,021, which more than doubled the return goal of 8,000 (Table 13). We included estimated harvest from the tribal treaty fishery because the South Fork is a terminal fishery; we assumed that all hatchery-origin Chinook salmon harvested on the South Fork Salmon River were from McCall Fish Hatchery releases. It is likely that the adult and jack return is underestimated, because an average of 8.5% of releases that contributed to the 2001 return were at offsite locations. With the exception of those harvested in fisheries, fish returning to offsite locations are unaccounted for in the return. On average, juvenile releases contributing to the 2001 return were 97.4% of release goals but resulted in a return that was 218% of the return goal, indicating that juveniles survived at a higher rate than was initially modeled to meet escapement objectives.

Survival of brood year 1996 juveniles released from McCall Fish Hatchery was 0.96%, and the number of female progeny produced per female parent averaged 15.97, indicating that brood year 1996 returning adults were above replacement.

Table 1. Length criteria (fork length in centimeters) used by Lower Snake River Compensation Plan Hatchery Evaluation Studies personnel and by hatchery personnel to age returning adult Chinook salmon in 2001.

	Age (years)		
	3	4	5
McCall Fish Hatchery	<67	67—89	≥90 ^a
Clearwater Fish Hatchery			
Powell	<64	64—82	≥83 ^b
Red River	<64	64—82	≥83 ^b
Crooked River	<64	64—82	≥83 ^b
Dworshak National Fish Hatchery	≤56	57—81	>81 ^c
Sawtooth Fish Hatchery	≤64	64—82	>82 ^d

^a As noted in 2001 McCall Fish Hatchery Run Year Report.

^b As noted in 2001 Clearwater Fish Hatchery Run Year Report.

^c As noted in Annual Report Fiscal Year 2000 Idaho Fishery Resource Office, Ahsahka, Idaho.

^d As noted in 2000 Sawtooth Fish Hatchery Brood Year Report.

Table 2. Hatchery-reared spring and summer Chinook salmon juveniles released from Lower Snake River Compensation Plan (LSRCP) hatcheries operated by the Idaho Department of Fish and Game between October 1, 2000 and September 30, 2001. All smolt releases are from brood year 1999, and all parr and presmolt releases are from brood year 2000. Specific release location and numbers released are included in Appendix A. Total numbers include all fish reared at LSRCP facilities.

Hatchery	Summer Chinook			Spring Chinook			Total
	Smolt	Presmolt	Parr	Smolt	Presmolt	Parr	
McCall	1,165,231		46,981				1,212,212
Clearwater ^a							
Rapid River				475,248	234,279	103,811	813,338
South Fork (Red River/Crooked River)					84,238		84,238
Powell				132,384	674,957	329,686	1,137,027
Sawtooth				57,134			57,134
Total	1,165,231	0	46,981	664,766	993,474	433,497	3,303,949

^a Clearwater releases include several offsite locations.

Table 3. Adult and jack spring and summer Chinook salmon from wild, natural, or hatchery origin counted at Lower Granite Dam (LGR). Spring Chinook salmon are defined as crossing LGR March 1 to June 17 and summer Chinook salmon as crossing June 18 to August 17. Data obtained from Fish Passage Center (<http://www.fpc.org>).

Return Year	Lower Granite Dam Count						Spring and Summer Combined
	Spring Adult	Spring Jack	Spring Total	Summer Adult	Summer Jack	Summer Total	
2001	171,958	3,135	175,093	13,735	3,804	17,539	192,632
2000	33,822	10,318	44,140	3,939	3,756	7,695	51,835
1999	3,296	2,507	5,803	3,260	1,584	4,844	10,647
1998	9,854	109	9,963	4,355	328	4,683	14,646
1997	33,855	81	33,936	10,709	127	10,836	44,772
1996	4,207	1,639	5,846	2,607	944	3,551	9,397
1995	1,105	373	1,478	692	157	849	2,327
1994	3,120	43	3,163	795	73	868	4,031
1993	21,035	183	21,218	7,889	130	8,019	29,237
1992	21,391	533	21,924	3,014	298	3,312	25,236
1991	6,623	980	7,603	3,809	1,179	4,988	12,591
1990	17,315	244	17,559	5,093	128	5,221	22,780
1989	12,955	1,549	14,504	3,169	902	4,071	18,575
1988	29,495	924	30,419	6,145	362	6,507	36,926
1987	28,835	946	29,781	5,891	660	6,551	36,332
1986	31,576	1,307	32,883	6,154	1,255	7,409	40,292
1985	25,207	2,530	27,737	4,938	1,568	6,506	34,243
1984	6,511	1,410	7,921	5,429	1,815	7,244	15,165
1983	9,517	509	10,026	3,895	767	4,662	14,688
1982	12,367	379	12,746	4,210	318	4,528	17,274
1981	13,115	527	13,642	3,326	479	3,805	17,447
1980	5,461	1,298	6,759	2,688	759	3,447	10,206
1979	6,753	786	7,539	2,714	858	3,572	11,111

Table 4. Lower Granite Dam adult spring and summer Chinook salmon run reconstruction. Table taken from the U.S. v. Oregon Technical Advisory Committee, January 9, 2003. Counts of returning jacks are not included.

Year	Spring			Summer			Total Run		
	Wild	Hatchery	Total	Wild	Hatchery	Total	Wild	Hatchery	Total
2001	16,477	130,654	147,131	12,475	26,088	38,562	28,951	156,742	185,693
2000	3,266	26,131	29,397	4,067	4,291	8,358	7,333	30,422	37,755
1999	1,104	2,192	3,296	1,584	1,676	3,260	2,688	3,868	6,556
1998	5,089	4,765	9,854	2,913	1,442	4,355	8,002	6,207	14,209
1997	2,126	31,729	33,855	5,137	5,572	10,709	7,263	37,301	44,564
1996	1,358	2,857	4,215	1,916	691	2,607	3,274	3,548	6,822
1995	745	360	1,105	343	349	692	1,088	709	1,797
1994	1,416	1,704	3,120	183	612	795	1,599	2,316	3,915
1993	5,871	15,164	21,035	4,082	3,807	7,889	9,953	18,971	28,924
1992	11,134	10,258	21,392	441	2,573	3,014	11,575	12,831	24,406
1991	2,206	4,418	6,624	2,967	842	3,809	5,173	5,260	10,433
1990	3,216	14,099	17,315	3,342	1,751	5,093	6,558	15,850	22,408
1989	3,029	9,926	12,955	2,299	870	3,169	5,328	10,796	16,124
1988	8,581	20,914	29,495	1,807	4,338	6,145	10,388	25,252	35,640
1987	7,883	20,953	28,836	1,855	4,036	5,891	9,738	24,989	34,727
1986	6,895	24,828	31,723	2,684	3,470	6,154	9,579	28,298	37,877
1985	5,245	19,963	25,208	2,696	2,366	5,062	7,941	22,329	30,270
1984	3,199	3,313	6,512	4,229	1,200	5,429	7,428	4,513	11,941
1983	6,181	3,336	9,517	3,219	676	3,895	9,400	4,012	13,412
1982	7,117	5,250	12,367	3,531	679	4,210	10,648	5,929	16,577
1981	7,941	5,174	13,115	2,739	567	3,306	10,680	5,741	16,421
1980	3,478	1,983	5,461	2,404	284	2,688	5,882	2,267	8,149
1979	2,573	4,266	6,839	2,714	0	2,714	5,287	4,266	9,553

Table 5. Hatchery-, natural-, or wild-origin spring Chinook salmon returns to Idaho hatcheries, 1984-2001. (DNFH = Dworshak National Fish Hatchery, IPC = Idaho Power Company, EFSR = Sawtooth Fish Hatchery satellite facility on East Fork Salmon River, USFWS = United States Fish and Wildlife Service, LSRCP = Lower Snake River Compensation Plan). Powell, Red River, and Crooked River are satellite facilities of Clearwater Fish Hatchery.

Year	Hatchery and Wild Origin											Grand Total
	LSRCP Facilities						Total LSRCP	USFWS Kooskia	IPC		Total Other	
	DNFH	Powell	Red R.	Crooked R.	Sawtooth	EFSR			Rapid R.	Oxbow		
2001	4,018	2,344	1,333	2,013	2,103	0 ^e	11,811	2,261	13,169	0 ^e	15,430	27,241
2000	3,202	1,602	ND	1,472	986	0 ^a	7,262	1,581	4,799	1,174	7,554	14,816
1999	800	188	ND	156	196	0 ^a	1,340	157	885	79	1,121	2,461
1998	915	541	ND	367	153	0 ^a	1,976	408	1,644	74	2,126	4,102
1997	3150	718	ND	1,314	254	7	5,443	1,657	10,520	944	13,121	18,564
1996	963	186	62 ^b	299	156	10	1,676	202	1,412	78	1,692	3,368
1995	125	14	4	6 ^c	37	0 ^a	186	40	129		169	355
1994	74	86	31	26	96	15	328	232	265	29	526	854
1993	823	500	139	402	587	90	2,541	1,180	4,468	431	6,079	8,620
1992	370	270	39	228	387	65	1,359	312	2,466	934	3,712	5,071
1991	165	33	18	20	566	62	864	467	1,913	69	2,449	3,313
1990	2,042	179	53 ^d	29	1,488	145	3,936	1,141	2,606	30	3,777	7,713
1989	1,700	154	104 ^d				1,958	973	2,800		3,773	5,731
1988	1,972		394 ^d				2,366	595	3,780		4,375	6,741
1987	2,017		519				2,536	687	3,807		4,494	7,030
1986	516						516	283	6,900		7,183	7,699
1985	334						334	529			529	863
1984	82						82	341			341	423

- ^a EFSR trap was not operated in 1995 or 1998 to 2001.
- ^b Represents data from 3- and 4-year-old returns only.
- ^c Represents data from 3-year-old returns only.
- ^d Includes returns from fall releases.
- ^e The Oxbow and EFSR adult traps were not operated in 2001.

Table 6. Hatchery-origin adult and jack spring Chinook salmon returns to Idaho hatcheries, 1984-2001. (DNFH = Dworshak National Fish Hatchery, IPC = Idaho Power Company, EFSR = Sawtooth Fish Hatchery Satellite facility on East Fork Salmon River, USFWS = U.S. Fish and Wildlife Service, LSRCP = Lower Snake River Compensation Plan). Blank spaces indicate years when origin of adult fish was not documented.

HATCHERY-ORIGIN FISH												
Year	LSRCP Facilities						Total LSRCP	USFWS Kooskia	IPC		Total Other	Grand Total
	DNFH	Powell	Red R.	Crooked R.	Sawtooth	EFSR			Rapid R.	Oxbow		
2001	4,018	2,272	2,759 ^a		1,427	0 ^b	10,476		12,770	0 ^b	12,770	23,246
2000		1,543	284	1,083	451	0	3,361		4,693	1,159	5,852	9,213
1999		180	ND	149	75	0	404		877	70	947	1,351
1998		519	ND	303	26	0	848		1,552	66	1,618	2,466
1997		713	ND	1,204	99	1	2,017		10,267	911	11,178	13,195
1996		181	46	254	51	1	533		1,323	60	1,383	1,916
1995									125			
1994									240			
1993									3,774			
1992									2,156			
1991									1,760			
1990									2,468	4	2,472	
1989									2,718			
1988												
1987												
1986												
1985												
1984												

^a Included in this number are Red River and Crooked River numbers.

^b The Oxbow and EFSR adult traps were not operated in 2001.

Table 7. Adult and jack summer Chinook salmon returns to McCall (South Fork Salmon River, Lower Snake River Compensation Plan) and Pahsimeroi (Idaho Power Company) fish hatcheries, including total returns and hatchery-origin only returns, 1986-2001. Blank spaces indicated years when origin of adult fish was not documented.

Return Year	McCall Fish Hatchery		Pahsimeroi Fish Hatchery		Total	Total Hatchery-origin
	Total	Hatchery-origin	Total	Hatchery-origin		
2001	10,922	9,144	1,097	851	12,019	9,995
2000	6,812	6,093	459	291	7,271	6,384
1999	1,961	1,670	377	296	2,338	1,966
1998	974	822	147	76	1,121	898
1997	3,659	3,371	127	39	3,786	3,410
1996	1,199	1,042	89	40	1,288	1,082
1995	307	269	80 ^a	19	387	288
1994	519	222	36	28	555	250
1993	2,703	1,122	169		2,872	
1992	2,848		131		2,979	
1991	1,212		238		1,450	
1990	969		470		1,439	
1989	938		347		1,285	
1988	2,393		838		3,231	
1987	2,705		2,175		4,880	
1986	2,690		6,518		9,208	

^a Represents data from 3- and 4-year-old returns only.

Table 8. Selected spawning and hatchery production data and in-hatchery survival estimates for brood year 1999 Idaho hatchery spring and summer Chinook salmon.

Facility	Females Spawned	Males Spawned	Green Eggs Taken	Eyed Eggs	% Survival to Eyed ^a
Summer Chinook					
McCall Hatchery SF Salmon R.	427	420	1,892,572	1,480,273	78.2
Spring Chinook					
Clearwater Hatchery					
Powell	27	87	126,815	104,731	82.6
South Fork ^b	6	21	21,739	18,605	85.6
Sawtooth Hatchery	12	56	63,642	59,373	93.3

^a Culled eggs are included in eggs taken and used to calculate survival to eye-up.

^b South Fork Clearwater represents both Red River and Crooked River production combined.

Table 9. Return and disposition of hatchery-origin spring and summer Chinook salmon to Idaho hatchery racks in 2001. Jacks were not used to calculate sex ratio. Released fish include those recycled through fisheries, released upstream or downstream, outplanted in other streams, or distributed for consumptive use. ND = Data not available.

Facility	Returns					Spawned					Released			
	Adult		Jack	Total	Adult Sex Ratio M:F	Adult			Egg take	Fecundity	Adult			Total
	Female	Male				Female	Male	Jack			Female	Male	Jack	
Summer Chinook														
McCall	3,573	4,580	991	9,144	1.28 :1	417 ^j	809	25	1,793,667	4,301	2,478	2,965	478	5,921
Pahsimeroi	468	355	28	851	0.76 :1	340 ^k	ND	ND	1,699,097	4,997	77	61	5	143
Total Summer Chinook				9,995					3,492,764					6,064
Spring Chinook														
Rapid River	7,471	5,171	128	12,770 ^a	0.69 :1	878 ^b	ND	ND	3,333,314	3,796	ND	ND	ND	8,697
Oxbow ^c	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dworshak	ND	ND	36	4,018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kooskia	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
South Fork Clearwater R. ^d	1,504	1,214	42	2,760	0.81 :1	453 ^m	483	0	1,840,509 ^l	4,063	1,005	950	16	1,971 ^e
Powell	1,357	837	77	2,271 ^f	0.62 :1	795	482	0	2,737,281	3,443	411	347	0	830
Sawtooth	594	657	176	1,427	1.11 :1	382 ^g	375 ^h	7	1,890,845	4,950	202	244	166	612
East Fork ⁱ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Spring Chinook				23,246					9,801,949					12,110

^a Sex composition of the return is based on a subsample of 3,965 fish.

^b Does not include 425 females spawned whose eggs were culled for BKD prevention.

^c The Oxbow adult trap was not operated in 2001.

^d Sex composition of the return is based on a subsample of 2496 fish. Crooked River and Red River adult numbers are combined.

^e Approximately 500 of the fish released were natural origin.

^f Includes 379 Powell strays captured at Crooked Fork Creek weir and transferred to the Powell facility.

^g Includes 21 natural-origin females used to create supplementation broodstock.

^h Includes 21 natural-origin males used to create supplementation broodstock.

ⁱ East Fork adult Chinook trap was not operated in 2001.

^j Includes 10 natural-origin females used to create supplementation broodstock.

^k Includes 35 natural-origin females used to create supplementation broodstock.

^l Includes 356,336 eggs from 91 females for Nez Perce tribal production.

^m Does not include 223 females spawned whose eggs were culled.

Table 10a. Age and sex composition of 2001 hatchery-origin spring and summer run Chinook salmon returns to Idaho hatchery racks. Summaries are from individual hatchery annual reports. ND = Data not available.

	Males				Females				Males and Females			
	Age-3 No.	Age-4 No.	Age-5 No.	Total Males	Age-3 No.	Age-4 No.	Age-5 No.	Total Females	Age-3 No.	Age-4 No.	Age-5 No.	Total Return
Summer Chinook												
McCall FH	991	4,421	159	5,571	2	3,508	63	3,573	993	7,929	222	9,144
Pahsimeroi FH	28	165	190	383	0	271	197	468	28	436	387	851
Spring Chinook												
Rapid River FH ^a	128	5,129	41	5,298	0	7,412	60	7,472	128	12,541	101	12,770
Oxbow FH ^b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dworshak NFH	ND	ND	ND	ND	ND	ND	ND	ND	36	3,235	747	4,018
Kooskia NFH	ND	ND	ND	ND	ND	ND	ND	ND	28	2,137	96	2,261^c
Clearwater FH												
Powell ^d	60	797	40	897	17	1,342	15	1,374	77	2,139	55	2,271^g
SF Clearwater ^{e,f}	42	1,121	93	1,256	14	1,467	23	1,504	56	2,588	116	2,760
Sawtooth FH	176	649	8	833	0	570	24	594	176	1,219	32	1,427

^a Age and sex composition is based on a subsample of 3,965 fish.

^b The Oxbow adult Chinook salmon trap was not operated in 2001.

^c Includes an unknown proportion of wild- or natural-origin adults.

^d Sex composition is based on a subsample of 1749 fish.

^e Sex composition is based on a subsample of 2496 fish.

^f SF Clearwater represents combined Red River and Crooked River numbers.

^g Includes 379 Powell strays captured at Crooked Fork Creek weir and subsequently transferred to the Powell facility.

Table 10b. Age and sex composition of 2001 wild- and natural-origin spring and summer run Chinook salmon returns to Idaho hatchery racks. Summaries are from individual hatchery reports. ND = Data not available.

	Males				Females				Males and Females			
	Age-3 No.	Age-4 No.	Age-5 No.	Total Males	Age-3 No.	Age-4 No.	Age-5 No.	Total Females	Age-3 No.	Age-4 No.	Age-5 No.	Total Return
Summer Chinook												
McCall FH	101	1,018	28	1,147	0	618	13	631	101	1,636	41	1,778
Pahsimeroi FH	7	59	63	129	0	73	44	117	7	132	107	246
Spring Chinook												
Rapid River FH	9	204	2	215	0	183	1	184	9	387	3	399
Oxbow FH ^a	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dworshak NFH	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kooskia NFH	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Clearwater FH												
Powell FH	1	27	1	29	0	44	0	44	1	71	1	73
SF Clearwater ^b	1	231	41	273	0	303	10	313	1	534	51	586
Sawtooth FH	51	275	68	394	0	170	112	282	51	445	180	676

^a The oxbow adult Chinook salmon trap was not operated in 2001.

^b SF Clearwater represents combined Red River and Crooked River trap numbers.

Table 11. Female progeny:female parent ratios (adult-to-adult survival) and hatchery production statistics for brood year 1996 hatchery-reared spring and summer Chinook salmon. Numbers of males and females returned may include some of natural origin. Return rates are minimum estimates as harvest and stray rates are not included. SAR = smolt-to-adult survival rate. Number of smolts released and number of brood year 1996 returns to the hatchery weir are used to calculate SAR.

Facility	Females spawned	Male spawned	BY 96 Smolts Released	Total BY96 Female Returns (99-01)	1999 Age-3 Returns ^a	2000 Age-4 Returns ^a	2001 Age-5 Returns ^a	Total Returns ^a	All Progeny: Female Parent	Female Progeny: Female Parent	Weir SAR (%)	% Return as Jacks
Summer Chinook												
McCall Hatchery												
SF Salmon River	111	125	412,615 ^b	1,686	693	3,043	222	3,958	35.66	15.19	0.96	17.51
Pahsimeroi Hatchery												
Pahsimeroi River	18	20	65,648	281	78	259	308	645	35.83	15.61	0.98	12.09
Spring Chinook												
Clearwater Hatchery												
Crooked & Red River	83	189	257,114	478	137	718	116	971	11.70	5.76	0.38	14.11
Powell	66	111	244,847	632	119	878	53	1,050	15.91	9.58	0.43	11.33
Rapid River Hatchery												
Rapid River	278 ^c	ND	896,170	1,638	639	2,846 ^d	89 ^e	3,574	12.86	5.89	0.40	17.88
Dworshak Hatchery												
NF Clearwater River	ND	ND	973,400	ND	670	2,827	747	4,244	ND	ND	0.44	15.79
Kooskia Hatchery												
Clear Creek	ND	ND	76,846	ND	72	604	96	772	ND	ND	1.00	9.33
Sawtooth Hatchery												
Upper Salmon River	10	32	43,161	127	60	135	32	227	22.70	12.70	0.53	26.43
EF Salmon River ^f	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

^a Return numbers include males and females. Data came from 1999, 2000, and 2001 hatchery Run and Brood Year reports.

^b Includes 18,743 smolt equivalents from a brood year 1996 parr release of 24,990.

^c From the 329 females spawned, 168k eggs from approximately 51 females were transferred to Clearwater Hatchery.

^d Age and sex composition of the adult return was estimated by measuring 3,705 of the 4,799 marked Chinook salmon that returned in 2000.

^e Age and sex composition of the adult return was estimated by measuring 3,965 of the 12,770 marked Chinook salmon that returned in 2001.

^f All 10 Chinook salmon captured at the East Fork trap in 1996 were released upstream to spawn naturally.

Table 12. Snake River mean daily flow (Kcfs) at Lower Granite Dam during the "peak" and "extended" Chinook salmon smolt migration periods, 1977-2001. Migration periods are defined by Petrosky (1991).

Year	Peak	Extended
	(04/15-05/05)	(04/20-05/30)
2001	42.5	57.8
2000	100.3	88.7
1999	109.1	113.5
1998	81.4	123.9
1997	149.3	169.9
1996	112.8	124.4
1995	72.9	74.1
1994	64.1	77.5
1993	69.8	114
1992	54.2	57.3
1991	44	70.5
1990	63.8	66.4
1989	93.6	87.2
1988	55.1	64.2
1987	59	62.4
1986	93.4	105.7
1985	86.9	87.2
1984	121.9	146.1
1983	85.6	111.3
1982	116.8	131.6
1981	76.2	86.7
1980	87.5	102.9
1979	64.8	89.9
1978	85.4	95.8
1977	39.1	40.2
1991-2000 Average	85.79	101.38

Table 13. LSRCP mitigation goals and hatchery production data for Idaho-LSRCP hatcheries including the 2001 hatchery-origin adult and jack returns and brood year (BY) 1996, 1997, and 1998 juvenile releases that contributed to the 2001 return.

	Adult Return ^a			Annual Target	Juvenile Releases ^b			
	2001				Contributing to 2001 Return			% of Target ^c
	Goal	Actual	% of Goal		BY 1996	BY 1997	BY 1998	
Summer Chinook								
McCall Fish Hatchery ^d	8,000	17,021	212.8%	1,000,000	412,615	1,389,472	1,118,881	97.4%
Spring Chinook								
Sawtooth Fish Hatchery	19,445	1,427	7.3%	2,300,000	43,161	223,393	123,425	5.7%
Clearwater Fish Hatchery ^e	11,915	12,162	102.1%	1,369,500	814,953	2,816,646	1,459,503	123.9%
TOTAL	39,360^f	30,610	77.8%	4,669,500	1,270,729	4,429,511	2,701,809	60.0%

^a Adult returns include weir returns and estimated sport harvest. Tribal harvest estimates are included for McCall hatchery only.

^b Release numbers represent combined smolt and smolt equivalents. Parr and presmolt releases were converted to smolt equivalents by multiplying by 0.75 and 0.90, respectively.

^c Percent of target achieved is averaged over three brood years (BY96, BY97, and BY98).

^d On average, 8.5% of juvenile releases from McCall hatchery were at offsite locations. The McCall, Sawtooth and Clearwater fish hatcheries' contribution toward the total goal = 39,445 adult Chinook salmon.

^e On average, 35% of juvenile releases from Clearwater hatchery were at offsite locations.

^f The LSRCP total mitigation goal = 58,700 hatchery-origin spring and summer Chinook salmon above Lower Granite Dam.

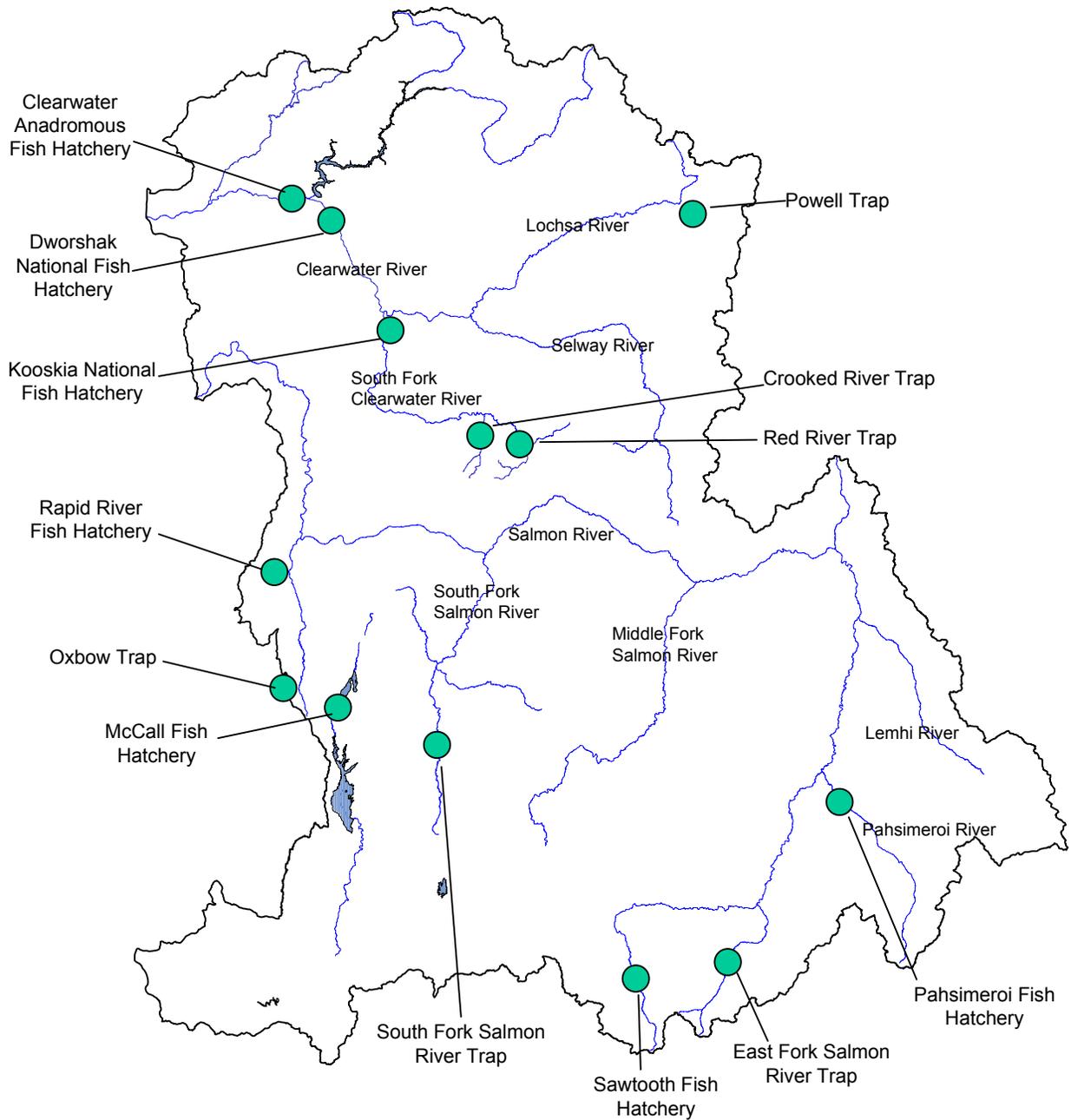


Figure 1. Locations of Chinook salmon hatcheries and trapping facilities in Idaho.

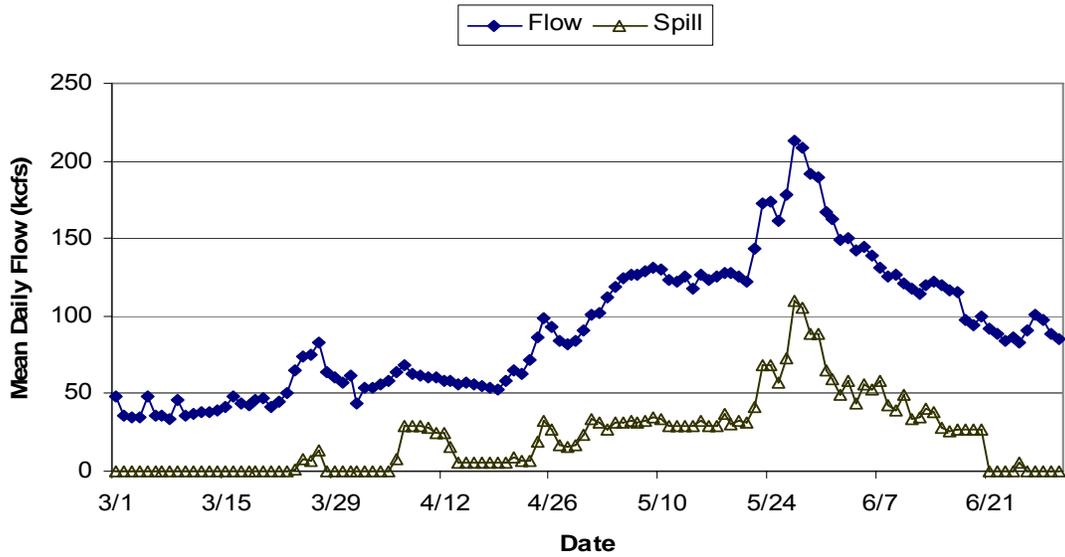


Figure 2. Daily flow and spill (kcfs) measured at Lower Granite Dam during the 1998 emigration period for brood year 1996 Chinook salmon, March 1—June 30, 1998.

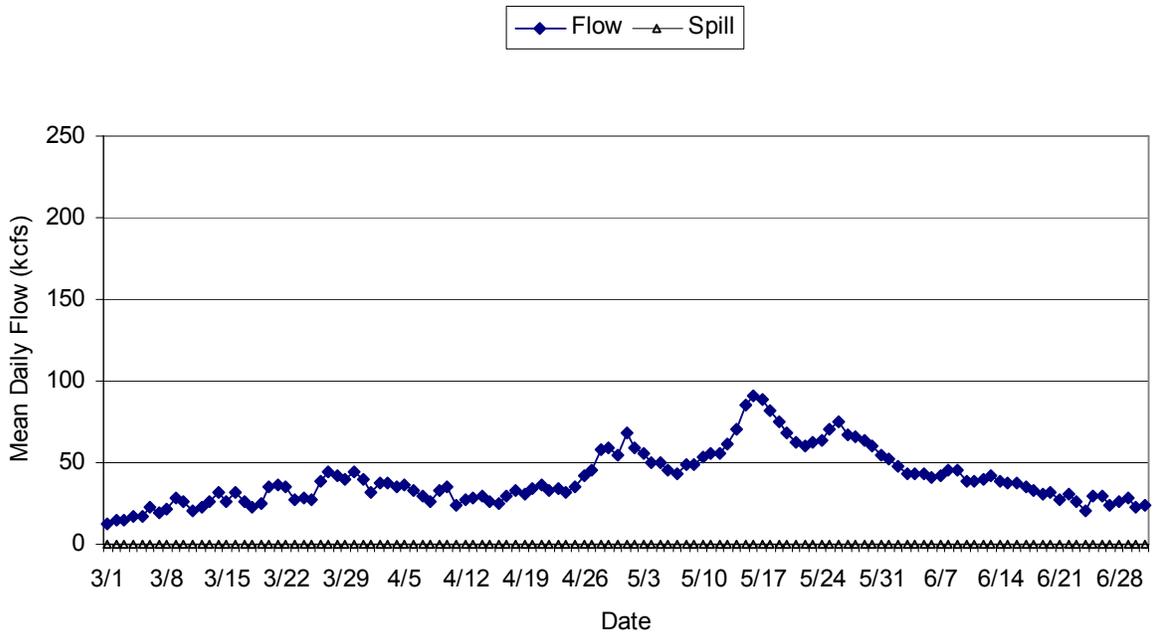


Figure 3. Daily flow and spill (kcfs) measured at Lower Granite Dam during the 2001 emigration period for brood year 1999 Chinook salmon. No spill occurred during the 2001 emigration period (March 1—June 29).

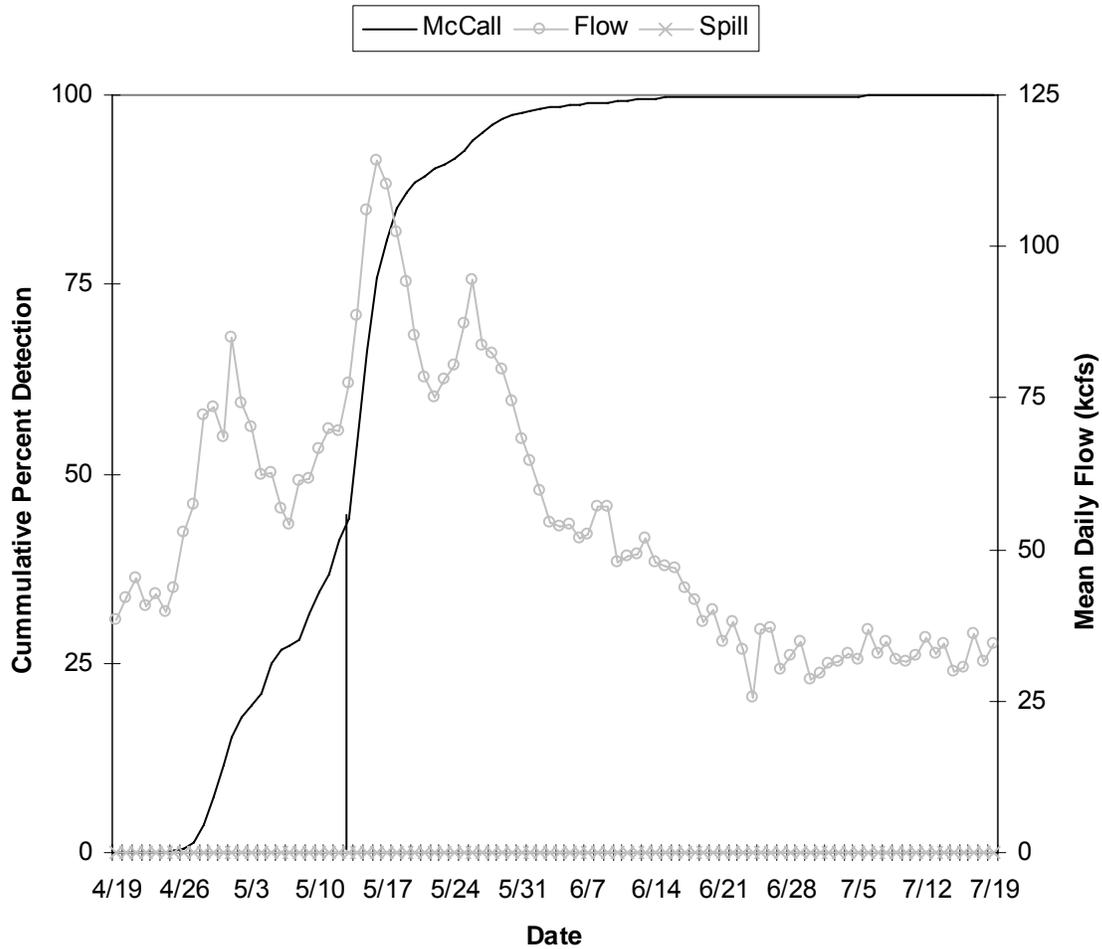


Figure 4. Migration year 2001 arrival timing and detection rates for PIT-tagged McCall Fish Hatchery juvenile summer Chinook salmon released (3/26 and 3/28/01) in the South Fork Salmon River. Vertical line indicates median arrival date (5/13). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

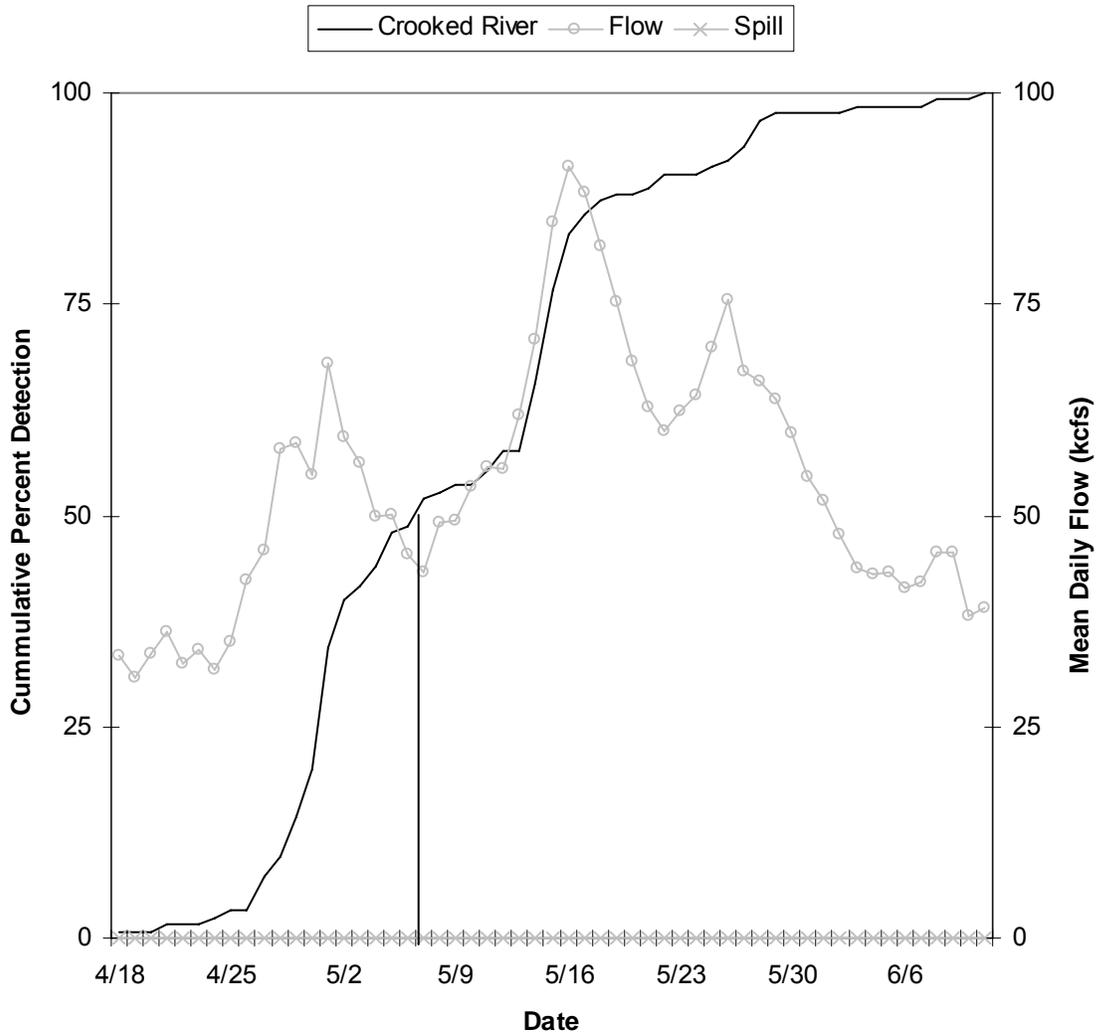


Figure 5. Migration year 2001 arrival timing and detection rates for PIT-tagged Clearwater Fish Hatchery juvenile summer Chinook salmon released (3/29/01) in the Crooked River at the hatchery. Vertical line indicates median arrival date (5/7). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

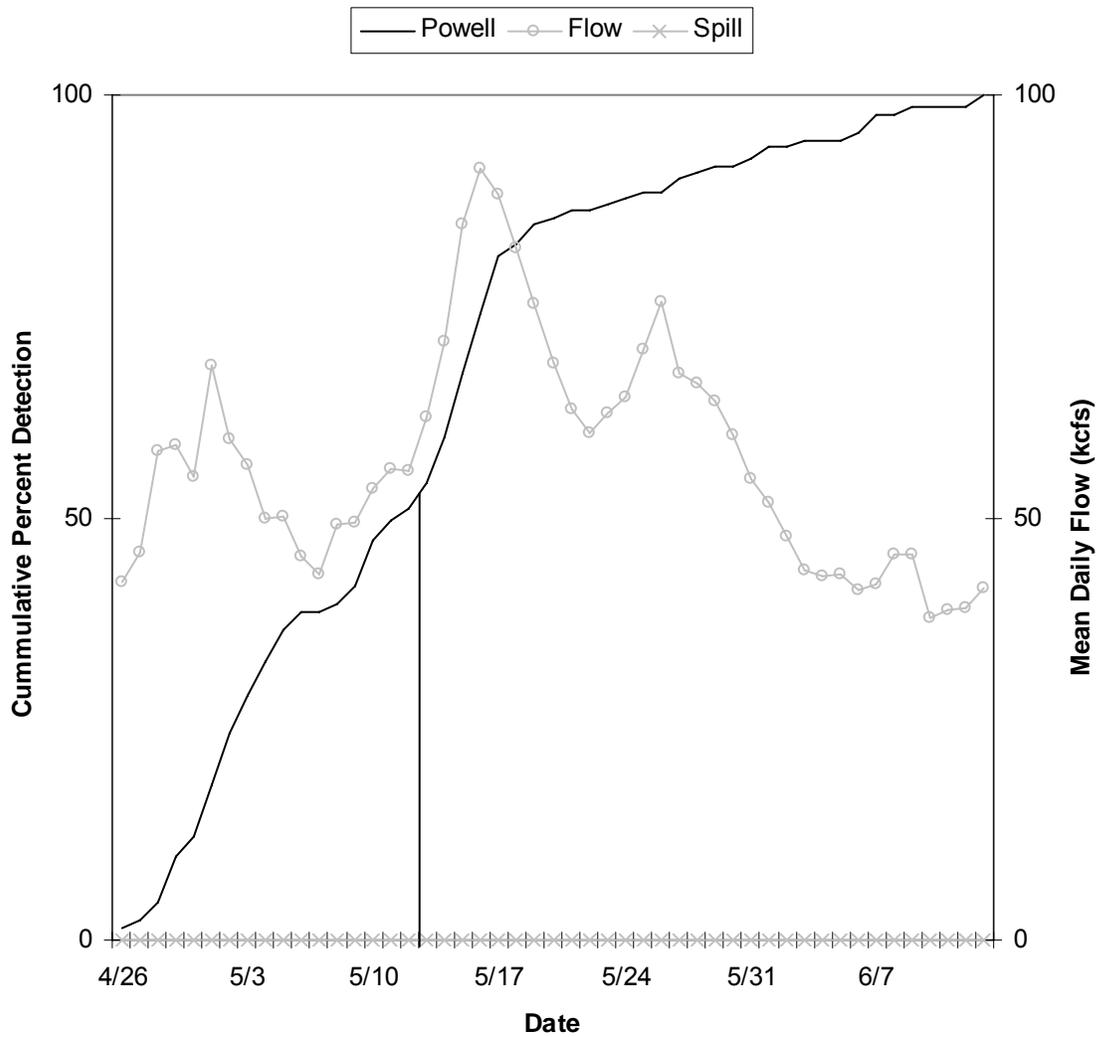


Figure 6. Migration year 2001 arrival timing and detection rates for PIT-tagged Clearwater Fish Hatchery juvenile summer Chinook salmon released (4/12/01) in the Crooked River at the hatchery. Vertical line indicates median arrival date (5/12). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

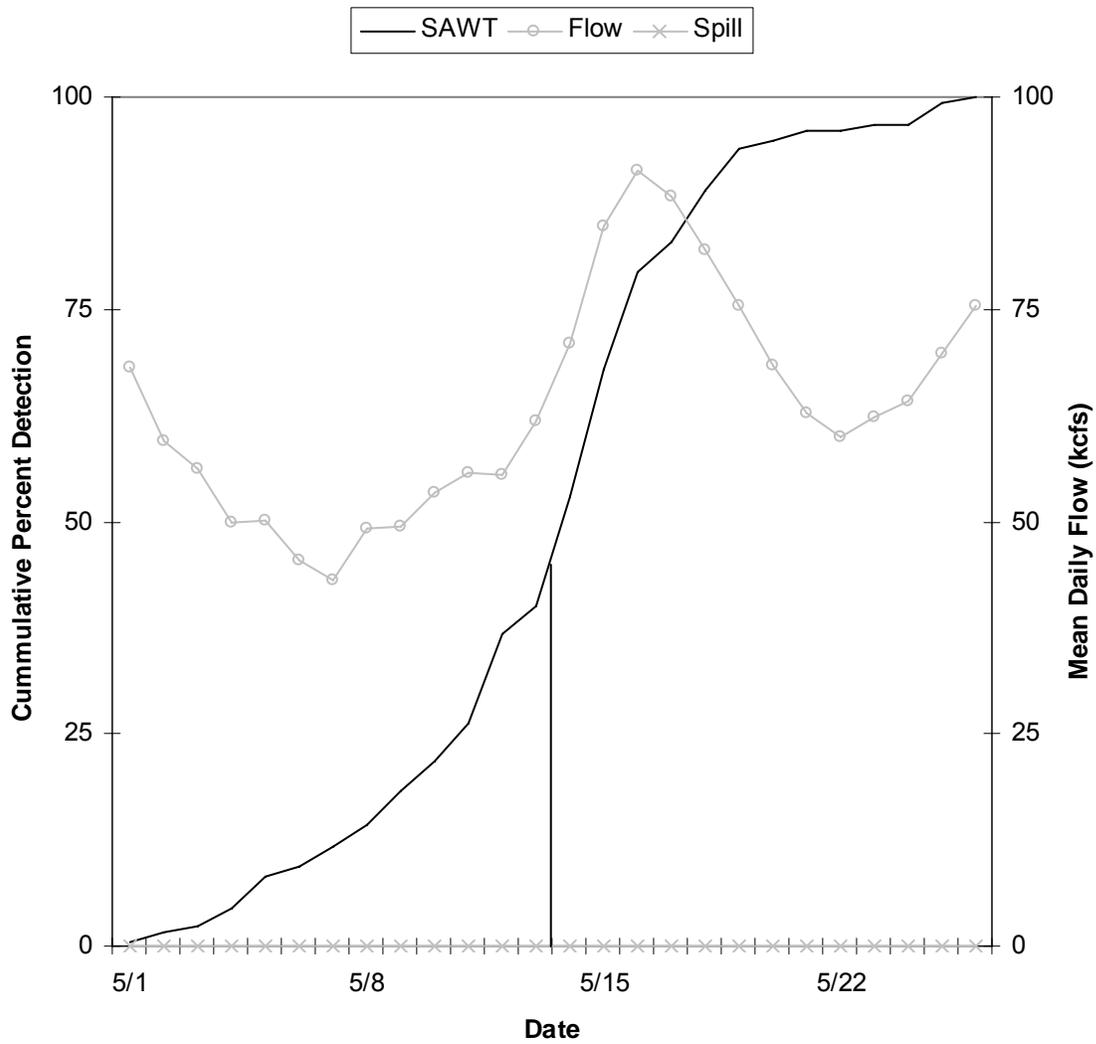


Figure 7. Migration year 2001 arrival timing and detection rates for PIT-tagged Sawtooth Fish Hatchery juvenile summer Chinook salmon released (4/20/01) in the upper Salmon River, Idaho. Vertical line indicates median arrival date (5/13). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

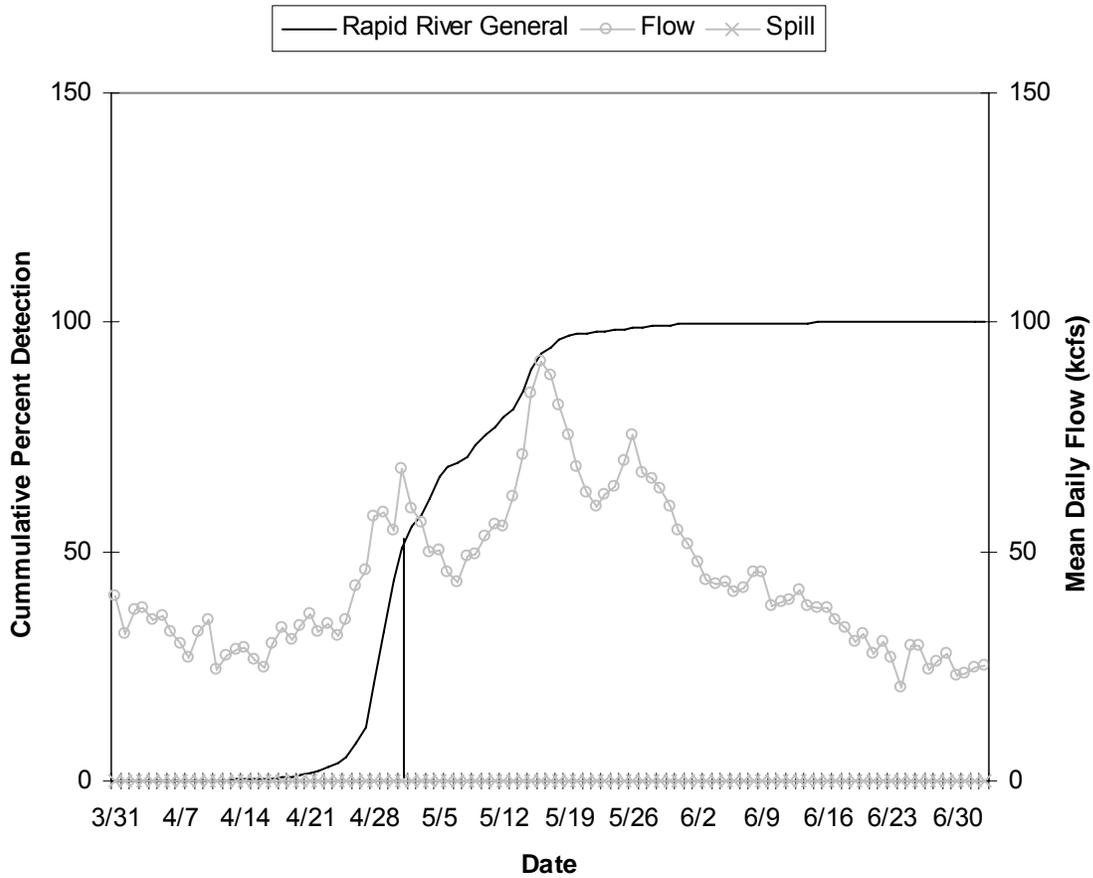


Figure 8. Migration year 2001 arrival timing and detection rates for PIT-tagged Rapid River Fish Hatchery juvenile summer Chinook salmon released (3/15/01) in Rapid River at the hatchery. Vertical line indicates median arrival date (4/30/01). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

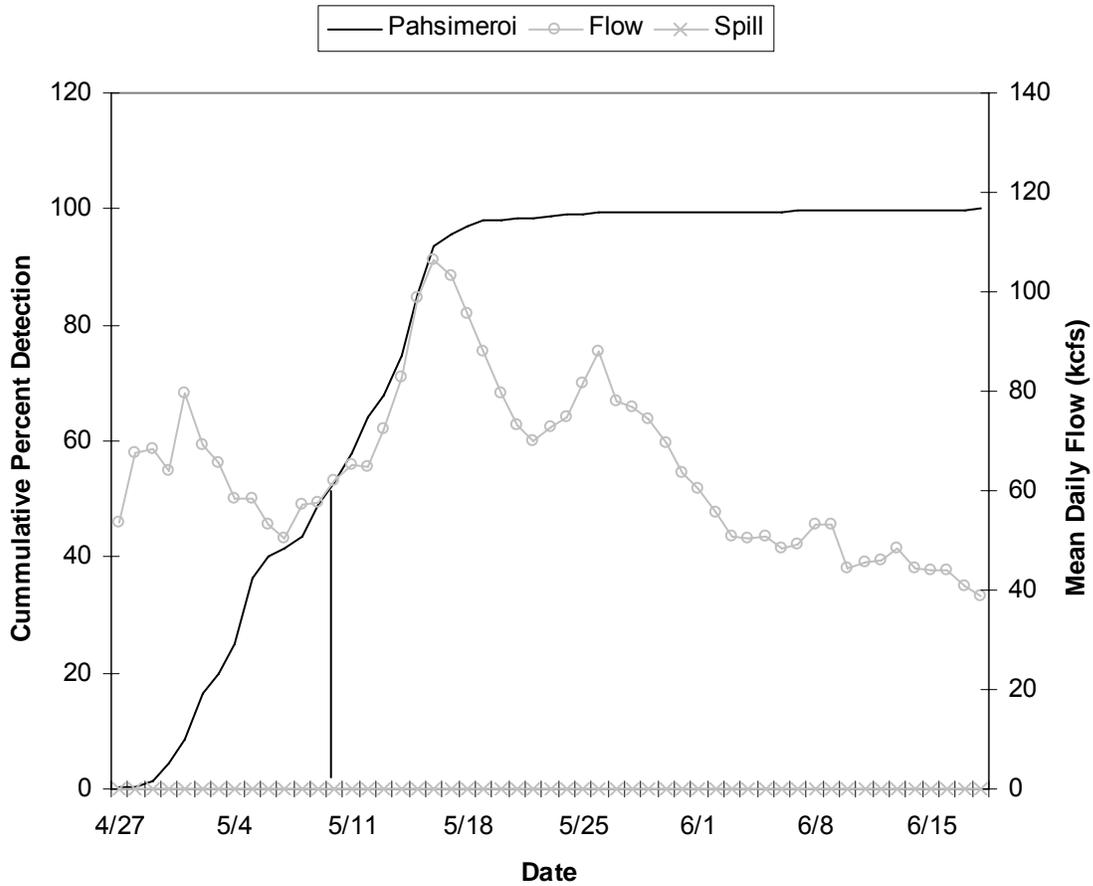
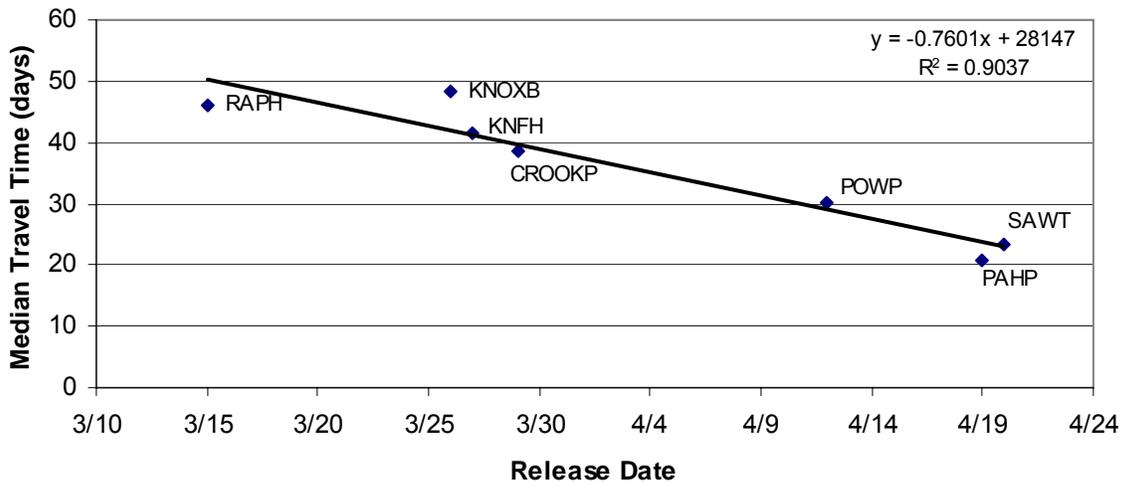


Figure 9. Migration year 2001 arrival timing and detection rates for PIT-tagged Pahsimeroi Fish Hatchery juvenile summer Chinook salmon released (4/19/01) in the Pahsimeroi River at the hatchery. Vertical line indicates median arrival date (5/10/01). Daily flows and spill (kcfs) measured at Lower Granite Dam during the 2001 smolt emigration period. Travel times and arrival dates are based on PIT tag detections at only Lower Granite Dam.

Median travel time vs. release date



Hatchery	Distance to LGR (km)
RAPH	283
KNOXB	457
KNFH	176
CROOKP	265
POWP	321
PAHP	619
SAWT	747

Figure 10. Median travel time (days) to Lower Granite Dam (LGR) versus release date for PIT-tagged spring and summer Chinook salmon smolts released from Idaho hatcheries that emigrated in 2001 ($R^2 = 0.9037$). Median travel times are based on unique PIT tag detections at only LGR. KNFH = Kooskia National Fish Hatchery, POWP = Powell Satellite (Clearwater), CROOKP = Crooked River Satellite (Clearwater), RAPH = Rapid River Fish Hatchery, KNOXB = Knox Bridge (McCall), PAHP = Pahsimeroi Fish Hatchery, SAWT = Sawtooth Fish Hatchery. KNOXB and PAHP releases are summer Chinook salmon; all others are spring Chinook salmon.

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APPENDICES

Appendix A. Table 1. Release data for Clearwater Fish Hatchery-reared spring Chinook salmon released in 2001. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Crooked Fk Cr Lochsa R 4/13/2001	Rapid River	CWT	104840	44,335	NPT Crooked Fork
			Untagged	1,371	NPT Crooked Fork
		PIT		None	
		Total:		45,706	
Lolo Cr 3/21/2001	Rapid River	CWT	610102	149,492	NPT Lolo Creek
			Untagged	4,657	NPT Lolo Creek
		PIT		1,046	
		Total:		155,195	
Newsome Cr S Fk Clwtr R 3/29/2001	Rapid River	CWT	610101	149,427	NPT Newsome Creek
			Untagged	4,654	NPT Newsome Creek
		PIT		1,059	
		Total:		155,140	
Crooked R Ponds 3/29/2001	Rapid River	CWT	104801	21,749	NPT Crooked River
			Untagged	673	NPT Crooked River
		PIT		None	
		Total:		22,422	
Walton Cr Trib to Lochsa 4/12/2001	Rapid River	CWT	104839	39,599	NPT Powell Release, Rapid River Stock
			Untagged	1,225	NPT Powell Release, Rapid River Stock
		PIT		None	
		Total:		40,824	
Crooked R Ponds 3/29/2001-3/29/2001	Powell	AD	Untagged	15,485	Crooked River LSRCP
		PIT		300	Crooked River LSRCP
		Total:		15,785	
Walton Cr Trib to Lochsa 4/12/2001	Powell	CWT	105427	20,955	NPT Powell Release, Powell Stock
			Untagged	648	NPT Powell Release, Powell Stock
		PIT		None	
		Total:		21,603	
Walton Cr Trib to Lochsa 4/12/2001-4/12/2001	Powell	AD	Untagged	94,996	LSRCP, Powell Release, Powell Stock
		PIT		None	
		Total:		94,996	
Crooked R Ponds 3/29/2001-3/29/2001	Rapid River	AD	Untagged	736	LSRCP Crooked River
		PIT		None	
		Total:		736	
Walton Cr Trib to Lochsa 4/12/2001-4/12/2001	Rapid River	BWT	Untagged	44,819	LSRCP Blank Wire
		PIT		None	
		Total:		44,819	
Walton Cr Trib to Lochsa 4/12/2001-4/12/2001	Rapid River	AD	Untagged	10,406	LSRCP Production
		PIT		None	
		Total:		10,406	
Lochsa R @ Pete King Creek 7/24/2001	Powell	CWT	109871	16,514	Pete King Parr
			Untagged	511	Pete King Parr
		PIT		None	
		Total:		17,025	

Appendix A. Table 1. Continued.

Release Site/ Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Red River S Fk Clwtr 9/28/2001-9/28/2001	S Fk Clearwater	RV PIT Total:	Untagged	84,238 None 84,238	Supplementation Parr
Colt Killed Cr Trib to Lochsa 7/25/2001-7/25/2001	Powell	LV PIT Total:	Untagged	298,742 None 298,742	Colt Killed Parr
Crooked R Ponds 9/28/2001-9/28/2001	Powell	LV PIT Total:	Untagged	155,887 None 155,887	Supplementation
Magruder Corridor 7/17/2001-7/17/2001	Rapid River	AD PIT Total:	Untagged	103,811 None 103,811	NPT Selway Parr
Powell Rearing Ponds 10/1/2001-10/1/2001	Powell	AD PIT Total:	Untagged	519,070 None 519,070	Powell Pond Parr
Lochsa R @ Squaw Creek 7/24/2001-7/24/2001	Powell	BWT PIT Total:	Untagged	13,919 None 13,919	Squaw Cr Parr
Meadow Cr Selway R 10/11/2001-10/11/2001	Rapid River	AD PIT Total:	Untagged	89,490 None 89,490	Meadow Cr Parr
Lochsa R @ Boulder Cr 10/10/2001-10/10/2001	Rapid River	AD PIT Total:	Untagged	104,207 None 104,207	Parr
Powell Rearing Ponds 10/1/2001-10/1/2001	Rapid River	AD PIT Total:	Untagged	40,582 None 40,582	Powell Parr
Total Release For Clearwater In 2001				2,034,603	

Appendix A. Table 2. Release data for McCall Fish Hatchery-reared summer Chinook Salmon released in 2001. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Stock Name	LifeStage	Mark Type	CWT Code	Release Number	Marking Purpose
S Fk Salmon R@ Knox Bridge 3/26/2001-3/29/2001	S Fk Salmon	Smolt	CWT,AD	104370	57,188	Reserve
		Smolt	CWT,AD	104570	56,102	Reserve
		Smolt	CWT,AD	104470	57,224	Reserve
		Smolt	CWT,AD	104770	55,631	Reserve
		Smolt	CWT,AD	104670	56,087	Reserve
		Smolt	AD	Untagged	739,719	Reserve
		Smolt	PIT		55,127	Reserve
		Total:			1,077,077	Reserve
S Fk Salmon R@ Knox Bridge 3/27/2001-3/29/2001	S Fk Salmon	Smolt	LV	Untagged	87,554	ISS
		Smolt	PIT		600	ISS
		Smolt	Total:		88,154	ISS
S Fk Salmon R @ Stolle Meadows 7/20/2001-7/23/2001	S Fk Salmon	Parr	CWT	108370	22,900	ISS Stolle Pond
		Parr	CWT	108470	22,672	ISS Stolle Pond
		Parr		Untagged	1,409	ISS Stolle Pond
		Parr	PIT		None	ISS Stolle Pond
		Parr	Total:		46,981	ISS Stolle Pond
Total release for McCall in 2001				1,212,212		

Appendix A. Table 3. Release data for Pahsimeroi Fish Hatchery-reared summer Chinook salmon released in 2001. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Pahsimeroi Ponds 4/15/2001-4/26/2001	PAH CH-2	CWT	105113	24,001	ISS
		CWT	104870	58,860	ISS
			Untagged	2,578	ISS
		PIT		500	ISS
		Total:		85,939	ISS
Pahsimeroi Ponds 4/15/2001-4/26/2001	PAH CH-2	AD	Untagged	196,623	Reserve
		PIT		501	Reserve
		Total:		197,124	Reserve
Total Release For Pahsimeroi In 2001			283,063		

Appendix A. Table 4. Release data for Rapid River Fish Hatchery-reared spring Chinook salmon released in 2001. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Rapid River Hatchery 3/15/2001-4/25/2001	Rapid River	AD		347,736	U.S. Canada Group
		AD,PIT		54,986	U.S. Canada Group
		CWT,AD	103614	67,239	U.S. Canada Group
		CWT,AD	103613	68,125	U.S. Canada Group
		CWT,AD	103612	65,544	U.S. Canada Group
		CWT,AD	103611	64,654	U.S. Canada Group
		CWT,AD	103610	68,317	U.S. Canada Group
Total release for Rapid River in 2001			736,601		

Appendix A. Table 5. Release data for Sawtooth Fish Hatchery-reared spring Chinook salmon released in 2001. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Sawtooth Hatchery 4/18/2001	PAH CH-1	CWT	103607	55,100	ISS
		PIT		500	ISS
		Untagged		1,534	ISS
Total release for Sawtooth in 2001			57,134		

Appendix B. Table 1. Juvenile release and adult return data for brood year 1998 Chinook salmon reared at Clearwater Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Crooked R Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	104642 PIT	10,927 154	AD	Crooked R LSRCP	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Crooked R Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	104641 PIT	10,341 146	AD	Crooked R LSRCP	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Crooked R Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	Untagged	344,154	AD	Crooked R LSRCP	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
			Totals:	365,722			0	0	0		
Red River Rearing Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	104640 PIT	10,630 153	AD	Red River	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Red River Rearing Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	104639 PIT	10,279 147	AD	Red River	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Red River Rearing Ponds 4/10/00-4/14/00	1998	S Fk Clearwater	Untagged	58,279	AD	Red River	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
			Totals:	79,488			0	0	0		
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105418	37,524	AD	Powell Large	1	0	6	6	
							2	ND	ND	ND	
							3	ND	ND	ND	

Appendix B. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105407	56,248	AD	Powell Large	1	0	7	7	
							2	ND	ND	ND	
							3	ND	ND	ND	
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105412 PIT	47,532 150	AD	Powell Large	1	0	5	5	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	Untagged	4,658	AD	Powell Large	1	0	0	0	
							2	ND	ND	ND	
							3	ND	ND	ND	
			Totals:	146,112				0	18	18	
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105411	47,195	AD	Powell Small	1	0	2	2	
							2	ND	ND	ND	
							3	ND	ND	ND	
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105409	47,984	AD	Powell Small	1	0	2	2	
							2	ND	ND	ND	
							3	ND	ND	ND	
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	105410	47,807	AD	Powell Small	1	0	6	6	
							2	ND	ND	ND	
							3	ND	ND	ND	
Powell Rearing Ponds 4/10/00-4/13/00	1998	Powell	Untagged	4,424	None	Powell Small	1	0	0	0	
							2	ND	ND	ND	
							3	ND	ND	ND	
			Totals:	147,410				0	10	10	
Red River Rearing Ponds 4/10/00-4/14/00	1998	Powell	Untagged	79,563	AD	Red River Powell Stock	1	0	0	0	
							2	ND	ND	ND	
							3	ND	ND	ND	
			Totals:	79,563				0	0	0	

Appendix B. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam	
Crooked R Ponds 4/10/00-4/12/00	1998	Powell	Untagged	30,288	AD	Crooked R Powell Stock	1	0	0	0		
							2	ND	ND	ND		
							3	ND	ND	ND		
							Totals:		0	0	0	
Rapid River Hatchery 3/6/00-3/10/00	1998	Rapid River	Untagged	463,068	AD	Rapid R Release	1	0	0	0		
							2	ND	ND	ND		
							3	ND	ND	ND		
							Totals:		0	0	0	
Red River Rearing Ponds 9/27/1999	1998	Powell	Untagged	74,981	RV	LV Parr Release	1	0	0	0		
							2	ND	ND	ND		
							3	ND	ND	ND		
							Totals:		0	0	0	
54 Crooked R Ponds 9/28/1999	1998	Powell	Untagged	89,299	LV	RV Parr Release	1	0	0	0		
							2	ND	ND	ND		
							3	ND	ND	ND		
							Totals:		0	0	0	
				Harvest / Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam					
				Total 1-Ocean:	28			0				
				Total 2-Ocean:	ND			ND				
				Total 3-Ocean:	ND			ND				
				Total Harvest Recoveries:	0							
				Total Hatchery Recoveries:	28							
				Total PIT-Tag Detections:				0				
				Total PIT-Tag Releases:	901							
				Total Releases:	1,475,931							
				Total Recoveries:	28							

Appendix B. Table 2. Juvenile release and adult return data for brood year 1998 Chinook salmon reared at McCall Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
E Fk of S Fk Sal @ Johnson Ck 3/27/00-3/30/00	1998	S Fk Salmon	611710 PIT	68,539 8,043	Elas	NPT Johnson Cr.	1	0	0	0	14
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
E Fk Of S Fk Sal @ Johnson Ck 3/27/00-3/30/00	1998	S Fk Salmon	Untagged	2,368	None	NPT Johnson Cr.	1	0	0	0	
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				78,950			0	0	0		
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	105510	65,602	AD	US Canada	1	1	9	10	
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	105506	63,778	AD	US Canada	1	1	10	11	
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	105507	65,093	AD	US Canada	1	1	6	7	
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	105508	64,229	AD	US Canada	1	1	4	5	
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	105509	64,928	AD	US Canada	1	3	7	10	
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	Untagged PIT	473,906 47,705	AD	US Canada	1	0	0	0	144
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Totals:				845,245			7	36	43		

Appendix B. Table 2. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam	
S Fk Salmon R @ Knox Bridge 4/3/00-4/6/00	1998	S Fk Salmon	Untagged PIT	194,086 600	RV	ISS	1	0	0	0	1	
							2	ND	ND	ND	ND	
							3	ND	ND	ND	ND	
Totals:				194,686			0	0	0			
				Harvest / Hatchery Recoveries					Adult PIT Tag Detections at L. Granite Dam			
				Total 1-Ocean:	43					159		
				Total 2-Ocean:	ND					ND		
				Total 3-Ocean:	ND					ND		
				Total Harvest Recoveries:	7							
				Total Hatchery Recoveries:	36							
				Total PIT Tag Detections:						159		
				Total PIT Tag Releases:	56,348							
				Total Releases:	1,118,881							
				Total Recoveries:	43							

Appendix B. Table 3. Juvenile release and adult return data for brood year 1998 Chinook salmon reared at Pahsimeroi Fish. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag at detections L. Granite Dam
Pahsimeroi Ponds 4/13/00-4/17/00	1998	PAH CH-2	Untagged PIT	53,337	AD	ISS/IPC	1	0	0	0	0
				500			2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Totals:				53,837			0	0	0		
					Harvest / Hatchery Recoveries		Adult PIT Tag Detections at L. Granite Dam				
				Total 1-Ocean:	0		0				
				Total 2-Ocean:	ND		ND				
				Total 3-Ocean:	ND		ND				
				Total Harvest Recoveries:	0						
				Total Hatchery Recoveries:	0						
				Total PIT Tag Detections:			0				
				Total PIT Tag Releases:	500						
				Total Releases:	53,837						
				Total Recoveries:	0						

Appendix B. Table 4. Juvenile release and adult return data for brood year 1998 Chinook salmon reared at Rapid River Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam	
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	105505	65,088	AD	U.S. Canada	1	0	1	1		
							2	ND	ND	ND		
							3	ND	ND	ND		
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	105501	66,012	AD	U.S. Canada	1	0	1	1		
							2	ND	ND	ND		
							3	ND	ND	ND		
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	105502	65,537	AD	U.S. Canada	1	0	2	2		
							2	ND	ND	ND		
							3	ND	ND	ND		
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	105503	65,456	AD	U.S. Canada	1	1	2	3		
							2	ND	ND	ND		
							3	ND	ND	ND		
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	105504	66,200	AD	U.S. Canada	1	0	2	2		
							2	ND	ND	ND		
							3	ND	ND	ND		
Rapid River Hatchery 3/15/00-4/25/00	1998	Rapid River	Untagged PIT	2,086,583 47,748	AD	U.S. Canada	1	0	0	0	8	
							2	ND	ND	ND	ND	
							3	ND	ND	ND	ND	
Totals:				2,462,354				1	8	9		
				Harvest / Hatchery Recoveries					Adult PIT Tag Detections at L. Granite Dam			
				Total 1-Ocean:	9					9		
				Total 2-Ocean:	ND					ND		
				Total 3-Ocean:	ND					ND		

Appendix B. Table 4. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
				Total Harvest Recoveries:							
				1							
				Total Hatchery Recoveries:							
				8							
				Total PIT Tag Detections:		8					
				Total PIT Tag Releases:	47,748						
				Total Releases:	2,462,354						
				Total Recoveries:	9						

Appendix B. Table 5. Juvenile release and adult return data for brood year 1998 Chinook salmon reared at Sawtooth Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105429	7,833	None	ISS; Natural Rearing-Control	1	0	1	1	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105422	26,531	None	ISS; Natural Rearing-Control	1	0	3	3	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105423	26,804	None	ISS; Natural Rearing-Control	1	0	6	6	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105428	9,974	None	ISS; Natural Rearing-Control	1	0	0	0	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	Untagged PIT	1,631 511	None	ISS; Natural Rearing-Control	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Totals:				73,284			0	10	10		
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105421	21,963	None	ISS; Natural Rearing-Cammo	1	0	4	4	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	105420	26,786	None	ISS; Natural Rearing-Cammo	1	0	2	2	
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/12/2000	1998	Salmon R	Untagged PIT	891 496	None	ISS; Natural Rearing-Cammo	1	0	0	0	0
							2	ND	ND	ND	ND
							3	ND	ND	ND	ND
Totals:				50,136			0	6	6		

Appendix B. Table 5. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
				Harvest / Hatchery Recoveries		Adult PIT Tag Detections at L. Granite Dam					
				Total 1-Ocean:	16	0					
				Total 2-Ocean:	ND	ND					
				Total 3-Ocean:	ND	ND					
				Total Harvest Recoveries:	0						
				Total Hatchery Recoveries:	16						
				Total PIT Tag Detections:		0					
				Total PIT Tag Releases:	1,007						
				Total Releases:	123,425						
				Total Recoveries:	16						

Appendix C. Table 1. Juvenile release and adult return data for brood year 1997 Chinook salmon reared at Clearwater Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Lt Salmon R @ Warm Springs Br 7/8/1998	1997	Powell	105229	19,252	NONE	NPTH Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lt Salmon R @ Warm Springs Br 7/8/1998	1997	Powell	Untagged	595	NONE	NPTH Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
			Totals:	19,847				0	0	0	
Lochsa R @ Squaw Creek 7/29/1998	1997	Powell	100000	2,814	NONE	ISS Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lochsa R @ Squaw Creek 7/29/1998	1997	Powell	104616	9,628	NONE	ISS Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lochsa R @ Squaw Creek 7/29/1998	1997	Powell	Untagged	385	NONE	ISS Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
			Totals:	12,827				0	0	0	
Colt Killed Cr Trib To Lochsa 7/15/98-8/5/98	1997	Powell	Untagged PIT	299,079 1,906	AD	Contribution	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
			Totals:	299,079				0	0	0	
Lochsa R @ Boulder Cr 7/7/98-7/8/98	1997	Powell	Untagged	83,748	AD	Parr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
			Totals:	83,748				0	0	0	

Appendix C. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Walton Cr Trib to Lochsa 9/23/1998	1997	Powell	105136	51,397	AD	Contribution	1	0	2	2	
							2	0	7	7	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 9/23/1998	1997	Powell	105135	51,404	AD	Contribution	1	0	0	0	
							2	0	11	11	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 9/23/1998	1997	Powell	Untagged PIT	227,754 716	AD	Contribution	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
Totals:				330,555			0	20	20		
Magruder Corridor 9/29/1998	1997	Selway	Untagged PIT	5,712 596	NONE	Parr Release	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
Totals:				5,712			0	0	0		
Red River Rearing Ponds 10/5/1998	1997	S Fk Clearwater	Untagged PIT	66,114 704	LV	Parr Release	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
Totals:				66,114			0	0	0		
Crooked R S Fk Clwtr 9/24/1998	1997	S Fk Clearwater	Untagged PIT	162,119 697	RV	Parr Release	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
Totals:				162,119			0	0	0		
S Fk Clwtr R @ Mill Cr 3/19/1999	1997	S Fk Clearwater	105116	38,451	NONE	NPTH Mill Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
S Fk Clwtr R @ Mill Cr 3/19/1999	1997	S Fk Clearwater	Untagged	1,189	NONE	NPTH Mill Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Totals:				39,640			0	0	0		

Appendix C. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Lolo Cr 3/31/99-4/2/99	1997	S Fk Clearwater	105303	10,910	NONE	NPTH Lolo Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lolo Cr 3/31/99-4/2/99	1997	S Fk Clearwater	105112 PIT	24,657 1,007	NONE	NPTH Lolo Cr Release	1	0	0	0	2
							2	0	0	0	10
							3	ND	ND	ND	ND
Lolo Cr 3/31/99-4/2/99	1997	S Fk Clearwater	105131	53,487	NONE	NPTH Lolo Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lolo Cr 3/31/99-4/2/99	1997	S Fk Clearwater	105134	53,476	NONE	NPTH Lolo Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lolo Cr 3/31/99-4/2/99	1997	S Fk Clearwater	Untagged	4,438	NONE	NPTH Lolo Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
			Totals:	147,975				0	0	0	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105142 PIT	53,109 167	AD	LSRCP Powell Pond	1	0	30	30	
							2	4	209	213	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105137 PIT	52,079 166	AD	LSRCP Powell Pond	1	0	44	44	
							2	5	111	116	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105138 PIT	52,471 166	AD	LSRCP Powell Pond	1	0	40	40	
							2	1	171	172	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105139 PIT	52,706 167	AD	LSRCP Powell Pond	1	0	42	42	
							2	4	164	168	
							3	ND	ND	ND	

Appendix C. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105140 PIT	52,569 167	AD	LSRCP Powell Pond	1	0	41	41	
							2	7	147	154	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	105141 PIT	52,716 167	AD	LSRCP Powell Pond	1	0	52	52	
							2	5	140	145	
							3	ND	ND	ND	
Walton Cr Trib to Lochsa 4/12/99-4/15/99	1997	Rapid River	Untagged	17,827	AD	LSRCP Powell Pond	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Total PIT Tags				1,000			1				0
							2				8
							3				ND
Totals:				334,477				26	1191	1217	
65 Papoose Cr Lochsa R 4/7/1999	1997	Powell	103210 PIT	44,558 1,498	NONE	ISS Papoose Cr.	1	0	1	1	0
							2	0	1	1	6
							3	ND	ND	ND	ND
Papoose Cr Lochsa R 4/7/1999	1997	Powell	Untagged	1,894	AD	ISS Papoose Cr.	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Totals:				47,950				0	2	2	
Newsome Cr S Fk Clwtr R 3/19/1999	1997	Rapid River	105304	18,968	NONE	NPTH Newsome Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Newsome Cr S Fk Clwtr R 3/19/1999	1997	Rapid River	105132	52,917	NONE	NPTH Newsome Cr Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Newsome Cr S Fk Clwtr R 3/19/1999	1997	Rapid River	Untagged PIT	1,225 999	NONE	NPTH Newsome Cr Release	1	0	0	0	0
							2	0	0	0	11
							3	ND	ND	ND	ND
Totals:				74,109				0	0	0	

Appendix C. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Meadow Cr Selway R 3/22/99-3/29/99	1997	Rapid River	Untagged PIT	284,574 999	AD	NPTH Meadow Cr Release	1	0	0	0	1
							2	0	0	0	5
							3	ND	ND	ND	ND
Totals:				285,573			0	0	0		
Crooked R: S Fk Clwtr 4/12/99-4/15/99	1997	Rapid River	Untagged	246,478	AD	Contribution	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Totals:				246,978			0	0	0		
Red River: S Fk Clwtr 4/12/99-4/15/99	1997	S Fk Clearwater	Untagged PIT	360,483 500	AD	Contribution	1	0	0	0	0
							2	0	0	0	1
							3	ND	ND	ND	ND
Totals:				360,983			0	0	0		
Crooked R: S Fk Clwtr 4/12/99-4/15/99	1997	S Fk Clearwater	Untagged PIT	354,003 500	AD	Contribution	1	0	0	0	1
							2	0	0	0	4
							3	ND	ND	ND	ND
Totals:				354,003			0	0	0		
Lochsa R @ Pete King Creek 7/20/1998	1997	Powell	Untagged	12,889	BWT	Pete King Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Totals:				12,889			0	0	0		
Lochsa R @ Boulder Cr 4/5/99-4/7/99	1997	Powell	105117	38,536	NONE	Nez Perce Tribal release.	1	0	0	0	
							2	0	1	1	
							3	ND	ND	ND	
Lochsa R @ Boulder Cr 4/5/99-4/7/99	1997	Powell	105118	35,373	NONE	Nez Perce Tribal release.	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Lochsa R @ Boulder Cr 4/5/99-4/7/99	1997	Powell	105149	18,837	NONE	Nez Perce Tribal release.	1	0	1	1	
							2	0	2	2	
							3	ND	ND	ND	

Appendix C. Table 1. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Lochsa R @ Boulder Cr 4/5/99-4/7/99	1997	Powell	Untagged	2,869	NONE	Nez Perce	1	0	0	0	
						Tribal release.	2	0	0	0	
							3	ND	ND	ND	
Totals:				95,615			0	4	4		
				Harvest / Hatchery Recoveries	Adult PIT Tag Detections at L. Granite Dam						
				Total 1-Ocean:	253	4					
				Total 2-Ocean:	990	45					
				Total 3-Ocean:	ND	ND					
				Total Harvest Recoveries:	26						
				Total Hatchery Recoveries:	1217						
				Total PIT Tag Detections:		49					
				Total PIT Tag Releases:	11,122						
				Total Releases:	2,980,193						
				Total Recoveries:	1243						

Appendix C. Table 2. Juvenile release and adult return data for brood year 1997 Chinook salmon reared at McCall Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	105129	34,952	AD	Contribution	1	5	22	27	
							2	59	26	85	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	104944	53,744	AD	Contribution	1	10	20	30	
							2	115	20	135	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	104945	54,863	AD	Contribution	1	6	30	36	
							2	101	36	137	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	105119	42,440	AD	Contribution	1	14	27	41	
							2	115	52	167	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	105128	53,374	AD	Contribution	1	10	48	58	
							2	135	55	190	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	105130	51,027	AD	Contribution	1	8	49	57	
							2	137	65	202	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	Untagged PIT	678,571 47,983	AD	Contribution	1	0	0	0	119
							2	0	0	0	722
							3	ND	ND	ND	ND
Totals:				1,016,954				715	450	1165	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	105122	38,341	None	NPT Release	1	0	8	8	
							2	0	33	33	
							3	ND	ND	ND	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	Untagged	1,186	None	NPT Release	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	

Appendix C. Table. 2. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Totals:				39,527				0	41	41	
S Fk Salmon R @ Knox Bridge 4/5/99-4/8/99	1997	S Fk Salmon	Untagged PIT	126,344 593	LV	Supplementation	1	0	0	0	2
							2	0	0	0	4
							3	ND	ND	ND	ND
Totals:				126,937			0	0	0		
Total Knox Bridge PIT Tags				48,576			1				121
							2				726
							3				ND
Buckhorn Cr S Fk Salmon 10/7/98-10/8/98	1997	S Fk Salmon	105230	18,561	None	NPT Fall release SFSR	1	0	0	0	
							2	0	1	1	
							3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 10/7/98-10/8/98	1997	S Fk Salmon	105123	38,793	None	NPT Fall release SFSR	1	0	0	0	
							2	0	6	6	
							3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 10/7/98-10/8/98	1997	S Fk Salmon	105124	35,489	None	NPT Fall release SFSR	1	0	0	0	
							2	0	3	3	
							3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 10/7/98-10/8/98	1997	S Fk Salmon	105143	51,457	None	NPT Fall release SFSR	1	0	0	0	
							2	2	3	5	
							3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 10/7/98-10/8/98	1997	S Fk Salmon	Untagged PIT	4,524 1,991	None	NPT Fall release SFSR	1	0	0	0	0
							2	0	0	0	3
							3	ND	ND	ND	ND
Totals:				150,815			2	13	15		
S Fk Salmon R @ Stolle Meadows 8/3/98-8/19/98	1997	S Fk Salmon	105121	41,988	None	Research release Stolle Meadows	1	0	0	0	
							2	0	6	6	
							3	ND	ND	ND	
S Fk Salmon R @ Stolle Meadows 8/3/98-8/19/98	1997	S Fk Salmon	104617	6,388	None	Research release @ Stolle Meadows	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	

Appendix C. Table. 2. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
S Fk Salmon R @ Stolle Meadows 8/3/98-8/19/98	1997	S Fk Salmon	Untagged PIT	1,496	None	Research	1	0	0	0	0
				933		release @	2	0	0	0	1
						Stolle Meadows	3	ND	ND	ND	ND
Totals:				50,805			0	6	6		
Buckhorn Cr S Fk Salmon 8/5/1998	1997	S Fk Salmon	105231	21,086	None	NPT Summer	1	0	0	0	
						release @	2	0	0	0	
						Buckhorn Cr.	3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 8/5/1998	1997	S Fk Salmon	105114	22,520	None	NPT Summer	1	0	0	0	
						release @	2	0	0	0	
						Buckhorn Cr.	3	ND	ND	ND	
Buckhorn Cr S Fk Salmon 8/5/1998	1997	S Fk Salmon	Untagged	1,349	None	NPT Summer	1	0	0	0	
						release @	2	0	0	0	
						Buckhorn Cr.	3	ND	ND	ND	
Totals:				44,955			0	0	0		
				Harvest / Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam				
				Total 1-Ocean:	257			121			
				Total 2-Ocean:	970			730			
				Total 3-Ocean:	ND			ND			
				Total Harvest Recoveries:	717						
				Total Hatchery Recoveries:	510						
				Total PIT Tag Detections:				851			
				Total PIT Tag Releases:	51,500						
				Total Releases:	1,428,261						
				Total CWT Recoveries:	1,227						

Appendix C. Table 3. Juvenile release and adult return data for brood year 1997 Chinook salmon reared at Pahsimeroi Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag detections at L. Granite Dam
Pahsimeroi Ponds 4/14/99-4/19/99	1997	PAH CH-2	Untagged PIT	135,169 500	AD	Pahsimeroi IPC	1	0	0	0	0
							2	0	0	0	0
							3	ND	ND	ND	ND
Totals:				135,669			0	0	0		
					Harvest / Hatchery Recoveries					Adult PIT Tag Detections at L. Granite Dam	
					Total 1-Ocean:	0				0	
					Total 2-Ocean:	0				0	
					Total 3-Ocean:	ND				ND	
					Total Harvest Recoveries:	0					
					Total Hatchery Recoveries:	0					
					Total PIT Tag Detections:					0	
					Total PIT Tag Releases:	500					
					Total Releases:	135,669					
					Total Recoveries:	0					

Appendix C. Table 4. Juvenile release and adult return data for brood year 1997 Chinook salmon reared at Rapid River Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag detections at L. Granite Dam
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	105133	52,439	AD	Contribution	1	2	21	23	
							2	33	28	61	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	103219	52,751	AD	Contribution	1	4	22	26	
							2	23	27	50	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	103522	54,067	AD	Contribution	1	1	19	20	
							2	34	24	58	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	103523	55,139	AD	Contribution	1	2	30	32	
							2	41	25	66	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	103524	53,916	AD	Contribution	1	4	14	18	
							2	31	21	52	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	103533	55,020	AD	Contribution	1	2	35	37	
							2	24	25	49	
							3	ND	ND	ND	
Rapid River Hatchery 3/18/99-4/26/99	1997	Rapid River	Untagged PIT	2,476,104 49,288	AD	Contribution	1	0	0	0	43
							2	0	0	0	809
							3	ND	ND	ND	ND
Totals:				2,847,284				201	291	492	
Snake R @ Hells Canyon Dam 3/18/99-3/19/99	1997	Rapid River	Untagged	300,000	AD	Contribution	1	0	0	0	
							2	0	0	0	
							3	ND	ND	ND	
Totals:				300,000				0	0	0	

Appendix C. Table 4. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag detections at L. Granite Dam	
Lt Salmon R @ Stinky Springs 3/17/1999	1997	Rapid River	Untagged	200,000	AD	Contribution	1	0	0	0		
							2	0	0	0		
							3	ND	ND	ND		
Totals:				200,000			0	0	0			
				Harvest / Hatchery Recoveries					Adult PIT Tag Detections at L. Granite Dam			
				Total 1-Ocean:	156					43		
				Total 2-Ocean:	336					809		
				Total 3-Ocean:	ND					ND		
				Total Harvest Recoveries:	201							
				Total Hatchery Recoveries:	291							
				Total PIT Tag Detections:						852		
				Total PIT Tag Releases:	49,288							
				Total Releases:	3,347,284							
				Total Recoveries:	492							

Appendix C. Table 5. Juvenile release and adult return data for brood year 1997 Chinook salmon reared at Sawtooth Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam
Sawtooth Hatchery 4/16/1999	1997	Salmon R	105262	21,193	None	Natures Treatment	1	0	29	29	
							2	0	11	11	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104618	10,855	None	Supplementation	1	0	4	4	
							2	0	2	2	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104620	6,439	None	Natures Treatment	1	0	3	3	
							2	0	4	4	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104631	9,844	None	Natures Treatment	1	0	9	9	
							2	0	3	3	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104632	7,885	None	Natures Treatment	1	0	9	9	
							2	0	3	3	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104633	4,518	None	Supplementation	1	0	2	2	
							2	0	5	5	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	105238	21,133	None	Supplementation	1	0	15	15	
							2	0	16	16	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	105240	21,964	None	Natures Treatment	1	0	7	7	
							2	0	9	9	
							3	ND	ND	ND	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	Untagged PIT	1,129 1,486	None	Supplementation	1	0	0	0	0
							2	0	0	0	3
							3	ND	ND	ND	ND
Totals:				106,446				0	131	131	

Appendix C. Table 5. Continued.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam	
Sawtooth Hatchery 4/16/1999	1997	Salmon R	105239	21,128	AD	Natures Control	1	0	30	30		
							2	0	148	148		
							3	ND	ND	ND		
Sawtooth Hatchery 4/16/1999	1997	Salmon R	102021	41,754	AD	Natures Control	1	0	60	60		
							2	0	256	256		
							3	ND	ND	ND		
Sawtooth Hatchery 4/16/1999	1997	Salmon R	104619	8,905	AD	Natures Control	1	0	11	11		
							2	0	60	60		
							3	ND	ND	ND		
Sawtooth Hatchery 4/16/1999	1997	Salmon R	105125	40,727	AD	Natures Control	1	0	71	71		
							2	0	232	232		
							3	ND	ND	ND		
Sawtooth Hatchery 4/16/1999	1997	Salmon R	Untagged PIT	4,928 1,480	AD	Natures Control	1	0	0	0	0	
							2	0	0	0	2	
							3	ND	ND	ND	ND	
Totals:				118,992				0	868	868		
				Harvest/ Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam					
				Total 1-Ocean:	250			0				
				Total 2-Ocean:	749			5				
				Total 3-Ocean:	ND			ND				
				Total Harvest Recoveries:	0							
				Total Hatchery Recoveries:	999							
				Total PIT Tag Detections:				5				
				Total PIT Tag Releases:	2,966							
				Total Releases:	223,393							
				Total Recoveries:	999							

Appendix D. Table 1. Juvenile release and adult return data for brood year 1996 Chinook salmon reared at Clearwater Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Smolt-to-adult return rates (SARs) are based on the number of juveniles released with PIT tags and the number of adult PIT tag interrogations at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Detections at Lower Granite Dam	SAR (%)
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	104627	54,568	AD	Powell	1	0	13	13		
						Contribution	2	1	198	199		
						Normal Size	3	0	1	1		
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	104626	53,546	AD	Powell	1	0	14	14		
						Contribution	2	2	218	220		
						Normal Size	3	0	0	0		
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	Untagged PIT	12,117 1005	AD	Powell	1	0	0	0	0	0.50
						Contribution	2	0	0	0	5	
						Normal Size	3	0	0	0	0	
Totals:				121,236			3	444	447			
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	104624	52,941	AD	Powell	1	0	13	13		
						Contribution	2	3	161	164		
						Large Size	3	0	1	1		
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	104625	53,626	AD	Powell	1	0	36	36		
						Contribution	2	1	241	242		
						Large Size	3	0	0	0		
Powell Rearing Ponds 4/6/98-4/8/98	1996	Powell	Untagged PIT	10,120 1005	AD	Powell	1	0	0	0	0	0.60
						Contribution	2	0	0	0	6	
						Large Size	3	0	0	0	0	
Totals:				117,692			4	452	456			
Crooked R: S Fk Clwtr 4/7/98-4/9/98	1996	Crooked R	Untagged PIT	205,407 499	AD	Contribution	1	0	0	0	0	0.20
							2	0	0	0	1	
							3	0	0	0	0	

Appendix D. Table 1. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Detections at Lower Granite Dam	SAR (%)
Totals:				205,906				0	0	0		
Snake R @ Hells Canyon Dam 3/16/98-3/18/98	1996	Rapid River	Untagged	304,100	AD	Contribution	1	0	0	0		
							2	0	0	0		
							3	0	0	0		
Totals:				304,100				0	0	0		
Red River Rearing Ponds 4/7/98-4/9/98	1996	Red River	Untagged PIT	21,123 500	LV	Red River LVs	1	0	0	0	0	
							2	0	0	0	0	0
							3	0	0	0	0	0
Totals:				21,623				0	0	0		
Red River Rearing Ponds 4/13/1998	1996	S Fk Clearwater	Untagged PIT	29,085 500	RV	Red River RVs	1	0	0	0	0	
							2	0	0	0	0	0
							3	0	0	0	0	0
Totals:				29,585				0	0	0		
Magruder Corridor 4/21/98-4/22/98	1996	Selway	Untagged PIT	8,592 300	AD	NPT Helicopter Smolt Plant	1	0	0	0	0	
							2	0	0	0	0	0
							3	0	0	0	0	0
Totals:				8,892				0	0	0		
Walton Cr Trib to Lochsa 4/6/98-4/9/98	1996	Powell	Untagged	5,919	AD	Walton Cr. Smolt Release	1	0	0	0		
							2	0	0	0		
							3	0	0	0		
Totals:				5,919				0	0	0		
				Harvest/ Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam					
Total 1-Ocean:				76			0					
Total 2-Ocean:				825			12					
Total 3-Ocean:				2			0					

Appendix D. Table 1. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Detections at Lower Granite Dam	SAR (%)
				Total Harvest Recoveries:								
				7								
				Total Hatchery Recoveries:								
				896								
				Total PIT Tag Detections:								
				Total PIT Tag Releases:								
				3,810								
				Total Releases:								
				814,953								
				Total Recoveries:								
				903								

Appendix D. Table 2. Juvenile release and adult return data for brood year 1996 Chinook salmon reared at McCall Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Smolt-to-adult return rates (SARs) are based on the number of juveniles released with PIT tags and the number of adult PIT tag interrogations at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag detections at L. Granite Dam	SAR (%)
1996	S Fk Salmon	105111	25,796	AD	U.S. Canada Release	1	0	25	25		
						2	14	11	25		
						3	3	1	4		
1996	S Fk Salmon	105126	51,931	AD	U.S. Canada Release	1	0	29	29		
						2	52	72	124		
						3	3	2	5		
1996	S Fk Salmon	105127	52,383	AD	U.S. Canada Release	1	0	59	59		
						2	33	64	97		
						3	0	1	1		
1996	S Fk Salmon	Untagged	240,780	AD	U.S. Canada Release	1	0	0	0		
						2	0	0	0		
						3	0	0	0		
		Totals:	370,890				105	264	369		
Total Knox Bridge PIT Tags			47,340			1				108	1.14
						2				394	
						3				37	
1996	S Fk Salmon	Untagged	24,990	RV	Supplementation	1	0	0	0		
						2	0	0	0		
						3	0	0	0		
		Totals:	24,990				0	0	0		
1996	S Fk Salmon	Untagged	22,982	Elas	Supplementation	1	0	0	0		
						2	0	0	0		
						3	0	0	0		
		Totals:	22,982				0	0	0		

Appendix D. Table 2. Continued.

Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag detections at L. Granite Dam	SAR (%)
			Harvest/ Hatchery Recoveries		Adult PIT Tag Detections at L. Granite Dam						
			Total 1-Ocean:		113		108				
			Total 2-Ocean:		246		394				
			Total 3-Ocean:		10		37				
			Total Harvest Recoveries:		105						
			Total Hatchery Recoveries:		264						
			Total PIT-Tag Detections:				539				
			Total PIT-Tag Releases:		47,340						
			Total Releases:		418,862						
			Total Recoveries:		369						

Appendix D. Table 3. Juvenile release and adult return data for brood year 1996 Chinook salmon reared at Pahsimeroi Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Smolt-to-adult return rates (SARs) are based on the number of juveniles released with PIT tags and the number of adult PIT tag interrogations at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag Detections at L. Granite Dam	SAR (%)
Pahsimeroi Ponds 4/15/98-4/18/98	1996	PAH CH-2	Untagged PIT	64,655 993	AD	Pahsimeroi Contribution	1	0	0	0	0	
							2	0	0	0	0	
							3	0	0	0	0	
Totals:				65,648			0	0	0			
						Harvest / Hatchery Recoveries	Adult PIT Tag Detections at L. Granite Dam					
						Total 1-Ocean:	0					
						Total 2-Ocean:	0					
						Total 3-Ocean:	0					
						Total Harvest Recoveries:	0					
						Total Hatchery Recoveries:	0					
						Total PIT Tag Detections:	0					
						Total PIT Tag Releases:	993					
						Total Releases:	65,648					
						Total Recoveries:	0					

Appendix D. Table 4. Juvenile release and adult return data for brood year 1996 Chinook salmon reared at Rapid River Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Smolt-to-adult return rates (SARs) are based on the number of juveniles released with PIT tags and the number of adult PIT tag interrogations at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag at detections L. Granite Dam	SAR (%)
Rapid River Hatchery 3/16/98-4/28/98	1996	Rapid River	104905 PIT	277,799 48,339	AD	US-Canada Contribution.	1	0	191	191	32	0.92
							2	104	687	791	390	
							3	2	1	3	23	
Rapid River Hatchery 3/16/98-4/28/98	1996	Rapid River	Untagged	570,014	AD	US-Canada Contribution.	1	0	0	0		
							2	0	0	0		
							3	0	0	0		
Totals:				896,170				106	879	985		
				Harvest/ Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam					
				Total 1-Ocean:	191			32				
				Total 2-Ocean:	791			390				
				Total 3-Ocean:	3			23				
				Total Harvest Recoveries:	106							
				Total Hatchery Recoveries:	879							
				Total PIT Tag Detections:				445				
				Total PIT Tag Releases:	48,339							
				Total Releases:	896,170							
				Total Recoveries:	985							

Appendix D. Table 5. Juvenile release and adult return data for brood year 1996 Chinook salmon reared at Sawtooth Fish Hatchery. Return data includes coded-wire tag (CWT) recoveries at the hatchery and in the fishery (when applicable) and PIT tag detections at Lower Granite Dam. Smolt-to-adult return rates (SARs) are based on the number of juveniles released with PIT tags and the number of adult PIT tag interrogations at Lower Granite Dam. Release data obtained from the IDFG fish marking database.

Release Site/ Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	Adult PIT Tag at detections L. Granite Dam	SAR (%)
Sawtooth Hatchery 4/21/1998	1996	Salmon R	Untagged PIT	42,662	AD	Sawtooth Contribution	1	0	0	0	0	0.60
				499			2	0	0	0	2	
							3	0	0	0	1	
Totals:				43,161			0	0	0			
				Harvest / Hatchery Recoveries			Adult PIT Tag Detections at L. Granite Dam					
				Total 1-Ocean:	0		0					
				Total 2-Ocean:	0		2					
				Total 3-Ocean:	0		1					
				Total Harvest Recoveries:	0							
				Total Hatchery Recoveries:	0							
				Total PIT Tag Detections:			3					
				Total PIT Tag Releases:	499							
				Total Releases:	43,161							
				Total Recoveries:	0							

Appendix E. Table 1. Interrogations of PIT-tagged juvenile Chinook salmon released from Idaho hatcheries and emigrating in spring 2001 from Clearwater Fish Hatchery (LGR = Lower Granite Dam, LGO = Little Goose Dam, LMN = Lower Monumental Dam, MCN = McNary, POWP = Powell, REDR = Red River, CROOKP = Crooked River).

File Name	Rel. Site	Rel Date	No. Tag	No. Rel.	No. / % Detected										Median Travel time (days)	Average Travel time (days)
					LGR No.	%	LGO No.	%	LMN No.	%	MCN No.	%	Total No.	%		
Clearwater Fish Hatchery					Spring Chinook											
Powell Satellite Hatchery DTV01066.R1A	POWP	04/12/01	298	298	131	43.96	48	16.11	7	2.35	2	0.67	188	63.09	30.08	29.97
Red River Satellite Hatchery JKB00264.RRP	REDP	09/28/00	500	500	31	6.20	9	1.80	4	0.80	0	0.00	44	8.80	224.27	229.31
Crooked River Satellite Hatchery DTV01066.R3B	CROOKP	03/29/01	300	300	125	41.67	17	5.67	8	2.67	1	0.33	151	50.33	38.60	41.04
JKB00263.CRP	CROOKP	09/28/00	499	499	33	6.61	5	1.00	0	0.00	1	0.20	39	7.82	220.23	229.20
Lolo Creek SCS01080.LC1	LOLOC	03/27/01	1,046	1,046	450	43.02	70	6.69	19	1.82	4	0.38	543	51.91	32.83	33.17
Newsome Creek SCS01080.NC1	NEWSOC	03/28/01	1,059	1,059	417	39.38	68	6.42	12	1.13	4	0.38	501	47.31	32.46	34.38

Appendix E. Table 2. Interrogations of PIT tagged juvenile Chinook salmon released from Idaho hatcheries and emigrating in spring 2001 from McCall Fish Hatchery. (LGR = Lower Granite Dam, LGO = Little Goose Dam, LMN = Lower Monumental Dam, MCN = McNary, KNOXB = Knox Bridge, SALRSF = South Fork Salmon River, STOLP = Stolle Ponds).

File Name	Rel. Site	Rel Date	No. Tag	No. Rel.	No. / % Detected								Median Travel time (days)	Average Travel time (days)		
					LGR No.	%	LGO No.	%	LMN No.	%	MCN No.	%			Total No.	%
McCall Fish Hatchery			Summer Chinook													
<i>Production Releases</i>																
LRB01043.11M																
LRB01043.21M																
LRB01043.31M																
LRB01043.41M																
LRB01044.11M																
LRB01044.21M																
LRB01044.31M																
LRB01044.41M																
LRB01045.11M																
LRB01045.21M																
LRB01045.31M																
LRB01045.42M																
Total	KNOXB	03/26/01	52,128	52,128	27,322	52.41	4,916	9.43	871	1.67	305	0.59	33,414	64.10	48.27	45.89
<i>Idaho Supplementation Studies</i>																
KAA00277.MCC	KNOXB	03/28/01	600	600	318	53.00	55	9.17	8	1.33	1	0.17	382	63.67	46.84	45.02
<i>University of Idaho Research</i>																
JLC01045.41M	KNOXB	03/26/01	2,999	2,999	1,580	52.68	237	7.90	52	1.73	21	0.70	1,890	63.02	48.93	46.30
JAH00258.MC3																
JAH00258.MC4																
JAH00258.MC5																
JAH00258.MC6																
Total	SALRSF	09/28/00	2,051	2,051	251	12.24	49	2.39	3	0.15	0	0.00	303	14.77	231.69	234.38
KAA00192.MCC	STOLP	08/02/00	600	600	43	7.17	1	0.17	1	0.17	0	0.00	45	7.50	290.37	294.14

All groups reared together and released on the same day, except where noted. Total includes all mark groups.

All groups reared together and released on the same day, except where noted. Total includes all mark groups.

Appendix E. Table 3. Interrogations of PIT tagged juvenile Chinook salmon released from Idaho hatcheries and emigrating in spring 2001 from Pahsimeroi Fish Hatchery. (LGR = Lower Granite Dam, LGO = Little Goose Dam, LMN = Lower Monumental Dam, MCN = McNary, PAHP = Pahsimeroi).

File Name	Rel. Site	Rel Date	No. Tag	No. Rel.	No./% Detected								Median Travel time (days)	Average Travel time (days)		
					LGR No.	%	LGO No.	%	LMN No.	%	MCN No.	%			Total No.	%
			Spring Chinook													
DTV01056.02P																
DTV01056.P01																
Total	PAHP	04/19/01	1,000	1,000	488	48.80	95	9.50	14	1.40	3	0.30	600	60.00	20.85	20.55

Appendix E. Table 4. Interrogations of PIT-tagged juvenile Chinook salmon released from Idaho hatcheries and emigrating in spring 2001 from Rapid River Fish Hatchery. (LGR = Lower Granite Dam, LGO = Little Goose Dam, LMN = Lower Monumental Dam, MCN = McNary, RAPH = Rapid River).

File Name	Rel. Site	Rel Date	No. Tag	No. Rel.	No./% Detected								Total No.	Total %	Median Travel time (days)	Average Travel time (days)
					LGR No.	%	LGO No.	%	LMN No.	%	MCN No.	%				
Rapid River Fish Hatchery																
<i>Production Releases</i>																
JLC01036.41R																
LRB01036.11R																
LRB01036.21R																
LRB01036.31R																
LRB01036.42R																
LRB01037.12R																
LRB01037.22R																
LRB01037.32R																
LRB01037.41R																
LRB01038.11R																
LRB01038.21R																
LRB01038.31R																
LRB01038.41R																
LRB01039.11R																
LRB01039.21R																
LRB01039.31R																
LRB01039.41R																
Total	RAPH	03/15/01	55,091	55,091	29,466	53.49	5,911	10.73	1,114	2.02	437	0.79	36,928	67.03	46.22	48.34

All groups reared together and released on the same day, except where noted. Total includes all mark groups.

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Appendix E. Table 5. Interrogations of PIT-tagged juvenile Chinook salmon released from Idaho hatcheries and emigrating in spring 2001 from Sawtooth Fish Hatchery. (LGR = Lower Granite Dam, LGO = Little Goose Dam, LMN = Lower Monumental Dam, MCN = McNary, SAWT = Sawtooth).

File Name	Rel. Site	Rel Date	No. Tag	No. Rel.	No./% Detected								Total No.	Total %	Median Travel time (days)	Average Travel time (days)
					LGR No.	%	LGO No.	%	LMN No.	%	MCN No.	%				
Sawtooth Fish Hatchery																
<i>Production Releases</i>																
DTV01055.S02	SAWT	04/20/01	500	500	197	39.40	54	10.80	5	1.00	0	0.00	256	51.20	23.31	22.20

Prepared by:

Brian Leth
Fisheries Research Biologist

Tracy Petering
Technical Records Specialist

Dmitri Videgar
Senior Fisheries Research Biologist

Paul Kline
Principal Fisheries Research Biologist

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Virgil K. Moore, Chief
Bureau of Fisheries

Daniel J. Schill
Fisheries Research Manager