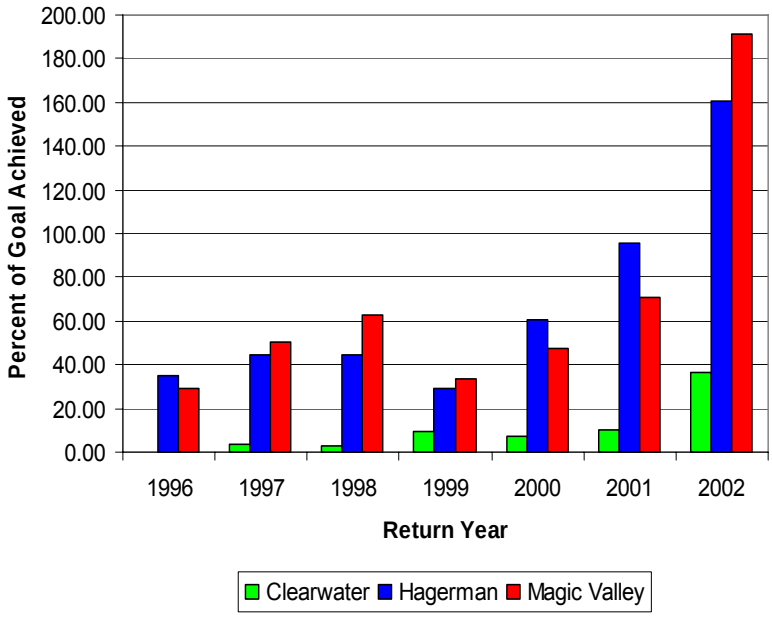
FISHERY RESEARCH

STEELHEAD FISH HATCHERY EVALUATIONS—IDAHO

Project Progress Report

October 1, 2001 to September 30, 2002



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Steelhead Fish Hatchery Evaluations—Idaho

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October 1, 2001 to September 30, 2002

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

Page

LIST OF APPENDICES

List of Appendices (Continued.)

Page

List of Appendices (Continued.)

ABSTRACT

This annual report summarizes activities associated with Idaho-Lower Snake River Compensation Plan (LSRCP) hatcheries' activities from October 1, 2001 through September 30, 2002. Included in this report are all fall 2001 and spring 2002 adult steelhead *Oncorhynchus mykiss* returns and all releases of juvenile steelhead made within the reporting period for LSRCP facilities. Information presented in this report supersedes that included in previous reports.

An estimated minimum of 49,276 adult LSRCP steelhead returned to Idaho in the fall of 2001 and spring of 2002. This return total consisted of 21,860 estimated to have returned from Hagerman National Fish Hatchery releases, 22,283 estimated to have returned from Magic Valley Fish Hatchery releases, and 5,133 estimated to have returned from Clearwater Fish Hatchery releases. Totals do not include returns of non-adipose-clipped adults which could not be evaluated. Even without adding in returns from unmarked steelhead, this total adult return greatly exceeded the LSRCP goal of 39,260 for Idaho steelhead facilities.

In April and May 2002, the Idaho-LSRCP hatcheries released 3,863,407 steelhead smolts of brood year 2001. Clearwater Fish Hatchery released 639,028 Dworshak B-stock smolts. Hagerman National Fish Hatchery released 1,318,660 smolts that were a mixture of Sawtooth A, Pahsimeroi A, and Dworshak B-stocks. Magic Valley Fish Hatchery released 1,905,719 smolts that were a mixture of Sawtooth A, Pahsimeroi A, Dworshak B, Upper Salmon B, and East Fork Natural Stocks.

The out-migration conditions in 2002 were above average. Total flow and spill at Lower Granite Dam during the entire migration window were well above average. However, estimated survival to Lower Granite Dam, based on PIT tag detections, was not elevated. This suggests that survival to Lower Granite Dam was about average, though survival through the rest of the migration corridor might have been a bit above average.

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INTRODUCTION

The completion of the four hydroelectric dams on the lower section of the Snake River in Washington reduced the returns of anadromous salmonids to the Snake River drainage. The Water Resources Development Act of 1976 authorized the Lower Snake River Compensation Plan (LSRCP) to mitigate for the loss of fisheries and wild runs to the Upper Snake River basin in Idaho, Washington, and Oregon. Mitigation for anadromous fishery losses included improvements in smolt passage at the dams, as well as the construction and operation of fish hatcheries for stock augmentation in the affected region. The United States Fish and Wildlife Service (USFWS) was authorized to administer the operation and maintenance of 12 hatcheries and 11 satellite facilities in the region.

The LSRCP includes a Hatchery Evaluation Studies (HES) component to monitor and determine the best practices for the operation of LSRCP hatcheries in each state. In Idaho, the Idaho Department of Fish and Game (IDFG) operates McCall Fish Hatchery and the Sawtooth Fish Hatchery for producing Chinook salmon *Oncorhynchus tshawytscha*, the Magic Valley Fish Hatchery for producing steelhead trout *O. mykiss*, and the Clearwater Fish Hatchery for producing both Chinook and steelhead. In addition, the USFWS operates the Hagerman National Fish Hatchery for producing steelhead trout and Dworshak National Fish Hatchery for producing Chinook salmon as part of the LSRCP mitigation program. The purpose of this report is to summarize HES activities and hatchery accomplishments for the LSRCP steelhead facilities in Idaho from October 1, 2001 through September 30, 2002.

Hatchery evaluation consists of two major components as laid out in the Cooperative Work Agreement established annually between the USFWS and the IDFG. The first of these components is to document the accomplishments of the IDFG-LSRCP program towards meeting specific smolt production and adult return goals. The second component is to identify factors limiting hatchery success at meeting return goals and to recommend possible improvements as they become apparent. Much of this latter task consists of performing specific experiments related to hatchery success. Results of experiments such as out-migration timing and recoveries of tagged groups are presented in this report.

METHODS

IDFG LSRCP Program Success Documentation

The success of the LSRCP mitigation goals was measured by comparing the estimated adult steelhead returns over Lower Granite Dam to the LSRCP goal of 39,260 adults. In addition to this, the individual contributions of Magic Valley, Clearwater, and Hagerman National fish hatcheries towards the overall mitigation goal was estimated using coded-wire tag recovery data supplied by the Harvest Monitoring Project (HMP). Results for the mitigation objective are reported under *Results, Adult Returns*.

Hatchery Operations Documentation

Hatchery operations between October 1, 2001 and September 30, 2002 are documented in this report. Any information relevant to the quality of the brood year 2001 smolts released in 2001, or relevant to the early rearing success of brood year 2002, is discussed. Information concerning size at release, health, and dietary considerations was obtained through the

Hatchery Brood Year and Run reports from each hatchery. Information on final numbers and mark information was obtained through the Release database maintained by the Idaho Coded-Wire Tag (CWT) Recovery Lab in Lewiston, Idaho.

Fish Marking

All production steelhead, which are steelhead available for angler harvest upon return to Idaho, released from LSRCP facilities in 2004 had their adipose fin removed. Coded-wire tags were put in representative groups of each stock being released in each Idaho river section to allow for the comparative evaluation of different release groups to harvest. Since there were several releases into each IDFG river section in the upper Salmon River, and all releases within each section were expected to perform equivalently, coded-wire tags were not included in each individual release but were included in one release per section. In addition to these marks, all production steelhead that received a coded-wire tag also had their left ventral fin removed to indicate the presence of the tag.

In addition to these production fish, 330,607 steelhead from Clearwater Fish Hatchery, 398,078 steelhead from Hagerman National Fish Hatchery, and 76,242 steelhead from Magic Valley Fish Hatchery were released without adipose clips as parts of negotiated supplementation releases. Supplementation releases are unmarked steelhead which are not available for angler harvest and which are intended to supplement or establish a local population. The 3,800 supplementation steelhead released from Magic Valley Fish Hatchery at the East Fork Weir were the progeny of naturally produced steelhead trapped at the East Fork Satellite Facility, while all of the other supplementation steelhead were the progeny of established hatchery stocks.

Representative groups of steelhead from both production and supplementation groups received PIT tags to track juvenile survival and mean travel time to Lower Granite Dam. The numbers of PIT-tagged smolts released were insufficient to allow for meaningful evaluation of adult returns.

Migration Conditions

One of the important factors found to influence survival to adult of Idaho anadromous salmonids is the condition of the river corridor during the out-migration (Raymond, 1979). Of primary importance for this consideration is the level of flow in the lower reaches of the Snake River, which directly affects the amount of spill at the four lower Snake River dams and the length of time taken by smolts during the migration through the river corridor (Berggren and Filardo 1993). This reporting period covers the adults that return as three-, four-, or five-year-olds during the fall of 2001 and the spring of 2002. These adults were from the out-migrations in the springs of 1998, 1999, or 2000. Therefore, the flow conditions during the emigration period for these three years, as well as the flow conditions during the emigration period of 2002, are reported. Water flow data for these periods was obtained through the Columbia River Data Access in Real Time (DART) web site.

Petrosky (1991) defined two time periods that accounted for most of the Chinook salmon migration past Lower Granite Dam. The peak period of emigration for Chinook smolts is from April 15 to May 5 and is the time period when approximately 50% of the yearling Chinook salmon reach Lower Granite Dam. The extended period is from April 20 to May 30, and encompasses the time when most of the wild and natural yearling Chinook salmon reach the

dam. Hatchery raised steelhead in Idaho are generally released beginning in early to mid April, and all releases are finished by early May. Hatchery steelhead emigration generally mimics Chinook in timing, so flows and spill during the peak and extended period are reported as an indicator of flow conditions encountered by steelhead smolts migrating through the lower Snake River.

Juvenile Migration Timing and Survival

Juvenile out-migration timing and survival was estimated using passive integrated transponder (PIT) tags. Idaho Department of Fish and Game fish marking and HES personnel tagged hatchery steelhead about one month prior to release to give the fish a chance to recover and to allow any tagging-induced mortality to occur. Size and mark information was collected at the time of marking and submitted to PTAGIS, a computerized database managed by Pacific States Marine Fisheries Commission (PSMFC). Release information for tag groups was obtained from hatcheries and was submitted to PTAGIS by the HES tag coordinator.

PIT tags were interrogated at four dams on the Snake and Columbia rivers: Lower Granite, Little Goose, Lower Monumental, and McNary. Arrival timing and tag number data were collected for each interrogation site and linked to the release information found in the PTAGIS database. From this information, smolt migration timing to Lower Granite Dam and a smolt survival index through the system was obtained. The survival estimate was determined using the Survival Under Proportional Hazards (SURPH) program (Lady et al. 2001). This program is a platform that uses the Cormack-Jolly-Sever model for single release and multiple recapture events (Cormack 1964; Jolly 1965; Seber 1965). Mean travel time to Lower Granite Dam was calculated for each group using the PitPro v4.0 program, which converts data from PTAGIS into formats that are compatible with the SURPH program.

Adult Returns

The IDFG Harvest Monitoring Project estimated the number of LSRCP steelhead that returned to Idaho in the 2001-2002 return year (Hansen In Press). This estimate includes steelhead caught in the sport harvest and at hatchery racks and in-river escapement for off-site released groups. Hansen's (In Press) estimate should be considered a minimum estimate since it does not include prespawning mortality or tributary strays. The number of smolts released versus the number of estimated returning adults enumerated in Idaho was used to determine an estimated smolt-to-adult return (SAR) rate for each group.

The success of the LSRCP mitigation goals was measured by comparing the estimated adult steelhead returns to the LSRCP goal of 39,260 adults. The adult return goal for Clearwater Fish Hatchery was reduced from 14,000 to 4,000 in 1997 by IDFG to comply with a hatchery steelhead production cap imposed by the National Oceanographic and Atmospheric Administration (NOAA) fisheries service; however, this does not reduce the mandated LSRCP mitigation goals. It should also be noted that the adult return goal for Hagerman National Fish Hatchery remains at 13,600, even though production targets have been reduced from 2.4 million smolts down to 1.3 million smolts. The individual contributions of Magic Valley, Clearwater, and Hagerman National fish hatcheries toward the overall mitigation goal was estimated using coded-wire tag recovery data supplied by the HMP.

Out of State Contribution

In addition to the estimated returns to the state of Idaho, an estimate of out-of-state contribution of adult steelhead was made for all marked steelhead released from LSRCP facilities. Since these steelhead did not return to Idaho, the count of out-of-state contribution was not included in calculating performance relative to the LSRCP adult return goals.

Coded-wire tag recovery information for out-of-state recoveries was obtained from the Regional Mark Information System (RMIS) database maintained by PSMFC. The data used in this report for out of state recoveries was obtained in January 2007 from the RMIS and does not reflect changes made to the database after that date.

Since coded-wire tags were not included in every release group, and because the total number of recoveries reported to the RMIS were small, for the purpose of evaluation all releases which had fish returning to spawn in the spring of 2002 were lumped by IDFG river section (Figure 1) and stock in the Salmon River drainage. Similarly, all production releases from Clearwater Fish Hatchery were pooled, because there was no reason to assume that the various releases would have different return characteristics or susceptibility to downstream harvest. This consolidation of individual releases became the release section used for estimation.

The age of the fish was calculated by subtracting the brood year from the expected year of spawning. Since most recoveries outside of Idaho take place the year prior to when the fish would actually spawn, it was assumed that any adult steelhead recovered in the migration corridor from June through December would actually have spawned the following year. The age for ocean recoveries was determined using the same formula, even though fish recovered in the ocean were not necessarily returning to spawn. This was done to maintain consistency between the two categories.

Tag recoveries reported to the RMIS were expanded using the estimated number reported in the database. The estimated number is the number of un-sampled fish represented by a single sampled coded-wire tag. If the estimated number was either zero or had been left blank, an estimated number of one fish was used for that record. The estimated number was summed for all release sections for all ages that contributed to the 2002 return. A tagged to untagged ratio was also calculated for each release section by summing the total number of coded-wire-tagged steelhead released in the section, and dividing that number by the total number of untagged steelhead plus the number of tagged steelhead that had shed their tags. The number of steelhead that shed their tags was estimated by sampling approximately 300 tagged steelhead prior to release to determine whether they had retained their tags for a minimum of three months. The total number of untagged recoveries for the section was determined by dividing the total estimated tag recoveries in each section by the tagged to untagged ratio for the section. The total recoveries of all steelhead for the section were then the sum of the estimated tagged recoveries and the estimated untagged recoveries for the section.

Recoveries outside of Idaho were broken into several categories. The main migration corridor consists of the Columbia and Snake rivers. Recoveries in the Columbia River were divided into sport fishery, tribal harvest, and hatchery weir recoveries. Since there is no significant tribal harvest reported to RMIS, recoveries in the Snake River were only divided into sport fishery and hatchery weir categories. In addition to these categories, recoveries in the Deschutes River were divided into sport fishery, hatchery weir, and tribal ceremonial and

subsistence recoveries. The Deschutes River was separated from the other categories because hatchery steelhead straying into the river are a problem of interest and represent a substantial number of steelhead which are removed from the population.

The final categories used for adult recoveries were the ocean harvest and other recoveries. Both of these categories cover very large areas, including all ocean zones and all tributaries to the Snake and Columbia Rivers with the exception of the Deschutes. However, neither of these categories had sufficient recoveries to warrant further division.

Idaho Fisheries Contribution

Snouts from coded-wire-tagged steelhead recovered by creel clerks from angler harvested steelhead, and were sent to the CWT Lab for processing. The HMP derived a harvest estimate by river section for the fishery through a phone survey of angler success (Hansen In Press). A sample rate was then calculated by river section by month for creel recoveries by dividing the number of harvested fish checked by the estimated harvest in that section (Hansen In Press). Contribution to the fishery for each LSRCP group was calculated by dividing the number of tags of each code recovered by the sample rate for the river section and month where the tag was recovered.

Hatchery Weirs

Hatchery personnel documented the number of steelhead that returned to the East Fork Salmon River weir, Sawtooth Fish Hatchery weir, and two weirs operated by Clearwater Fish Hatchery. The Clearwater Fish Hatchery weirs are located on Crooked River and Red River, which are tributaries to the South Fork of the Clearwater River. In addition to these weirs, HES personnel and Sawtooth Fish Hatchery personnel operated a steelhead trap on Squaw Creek just south of the town of Clayton, Idaho. All adult steelhead recovered at all traps were measured for length and sex and were scanned for the presence of coded-wire tags. No subsampling of recovered adults took place at any of these weirs during the spring of 2002, so no expansion needed to be done on the tag group contribution. Snouts from steelhead containing a coded-wire tag were removed and sent to the Idaho CWT Lab for processing. The HMP used these data to estimate the total number of LSRCP-reared steelhead that returned to hatchery racks or escaped above the weir to spawn naturally.

Experimentation

Squaw Pond

The Squaw Pond acclimation facility was put into operation for the first time in 1998. The facility was designed to reduce residualism and increase migration success for steelhead smolts in the upper Salmon River drainage. A secondary objective was to provide further angling opportunity on B-stock steelhead in the Salmon River. A study of smolt migration and adult return characteristics of the releases from the Squaw Pond facility was initiated in 1998 to determine whether the facility was attaining the intended objectives. Release year 2002 marked the fourth year of operations in Squaw Pond.

Steelhead smolts from Magic Valley Hatchery were released into the Squaw Pond acclimation facility at the earliest practical opportunity in the spring, depending upon climate

conditions. This allowed the smolts a minimum of two weeks to imprint on the pond and Squaw Creek. After the acclimation period, two fish counters were installed in series in the outlet to the pond, and the dam boards were removed from the outlet according to a prearranged schedule. The goal of board removal was to steadily lower the water level in the pond to encourage the smolts to emigrate freely without forcing them to leave. Representative groups from the early migrants, late migrants, and nonmigrants were PIT tagged to measure out-migration survival and timing. The nonmigrant group was taken from the fish remaining in the pond after all boards have been removed, and the fish counters indicated that the rate of emigration had been reduced to a very low level.

A sample was taken of steelhead released into Squaw Creek in conjunction with the start of releases from the pond. These steelhead were sampled for length, gender, and maturity characteristics. Sex and precocity of the smolts in the sample were determined by dissecting fish until 100 males had been examined.

Complete information about the design and operation of the Squaw Pond study can be found in Osborne and Rhine (1999) and Newman (2002).

RESULTS AND DISCUSSION

Hatchery Operations Documentation

Clearwater Fish Hatchery

Brood Year 2001—A total of 1,039,672 Dworshak B-stock eyed steelhead eggs were received from Dworshak National Fish Hatchery (George and Shockman 2002). These eggs were all from the middle or later egg takes and did not represent the entire run. This is common practice for Clearwater Fish Hatchery steelhead since the fish will be released off-site and will not be part of a broodstock program.

Heavy losses of steelhead were reported by George and Shockman (2002) during incubation and swim-up, which contributed to a survival from eyed-egg to smolt of 55.3%, which is unusually low survival for steelhead raised at Clearwater Fish Hatchery. The elevated losses were attributed to mechanical damage caused by incorrect cleaning techniques, and losses were reduced by changing techniques.

All marking and enumeration of steelhead occurred in August as the juvenile steelhead were moved from interior vats to outside raceway. This was done to minimize the total stress on the steelhead, which was expected to improve survival and growth during the critical summer months. Complete information on marks applied, release timing, and release locations can be found in Appendix A, Table 1.

Survival to the dams ranged from 78% to 50% with an atypical pattern of survival showing greatly increased survival the further down the South Fork Clearwater that the smolts were released (Table 1). Lower survival of groups released in the upper reaches of the South Fork Clearwater River used to be a common phenomena (Harrington 2002), though it had not been seen in recent years (Harrington 2003). Mean travel time was not very different among groups (Table 1).

Brood Year 2002—Between March 22 and March 29, Clearwater Fish Hatchery received 1,065,391 eyed Dworshak B-stock steelhead eggs from the middle takes at Dworshak National Fish Hatchery (McGehee and Hutzenbiler, 2003). One adult female tested positive for IHN, and the eggs from that female were culled.

Hagerman National Fish Hatchery

Brood Year 2001—A total of 1,177,436 eyed steelhead eggs were received from Sawtooth Fish Hatchery, and a further 217,400 eyed steelhead eggs were received from Clearwater Fish Hatchery to comprise the total releases in 2002 (Hagerman National Fish Hatchery 2002). The eggs from Sawtooth Fish Hatchery consisted of two stocks: 965,031 Sawtooth A-stock and 212,405 Pahsimeroi A-stock, while all of the eggs from Clearwater Fish Hatchery were Dworshak B-stock (Hagerman National Fish Hatchery 2002). Survival from egg to release was 79.1% for the Sawtooth A-stock and 87.3% for the Pahsimeroi A-stock. Hatching success for all three stocks was very similar and averaged 98.2%. Survival of the two A-strain steelhead stocks was about 95%, while survival of the Dworshak B-stock was 82.8%. The actual survival of Pahsimeroi stock could not be accurately determined, as an accounting error resulted in a larger number of smolts being reported to have been released than there were eggs received. This error could have originated at several points during the rearing process; however, survival of the two A-strain stocks is generally quite similar.

Dworshak B-stock steelhead were observed to have higher mortalities than the other two stocks during rearing (Hagerman National Fish Hatchery 2002). There were a couple of organisms identified as contributing to this elevated mortality; however, the same mortality was not observed in either of the other two stocks, despite their being exposed to the same organisms. As smolts were moved off station for stocking in the spring, the mortality was seen to decline in the Dworshak stock, which led to a speculation that reduced water quality as a result of increased rearing densities was a significant contributing factor to the observed mortality. Why this disproportionately impacted the Dworshak stock was unexplained.

All marking of juvenile steelhead was performed in the fall as fish were being disbursed from their initial rearing raceways to the final rearing raceways. Juvenile steelhead at Hagerman National Fish Hatchery are initially loaded into a few raceways at high numbers and then disbursed out to an average number of about 20,000 fish per raceway. By marking juveniles at the time they would be distributed, the total amount of handling and associated stress is minimized. The complete accounting of marks and tags by release site and stock can be found in Appendix A, Table 2.

Survival of the PIT-tagged fish to the dams was 66.1% (Table 1), which is near the average for steelhead groups in the state of Idaho. The mean travel time to Lower Granite Dam was considerably different between Sawtooth Fish Hatchery (29.5 days) and the Yankee Fork release (19.4 days). This is a fairly large difference considering that the two groups were released only one week apart, and the distance traveled is very similar between those two points.

Brood Year 2002—During late May and early June of 2002, a total of 1,394,836 eyed steelhead eggs were received from Sawtooth Fish Hatchery and Clearwater Fish Hatchery (Hagerman National Fish Hatchery 2002). The eggs received from Sawtooth Fish Hatchery consisted of 965,031 Sawtooth A-stock and 212,405 Pahsimeroi A-stock, while the eggs received from Clearwater Fish Hatchery consisted of 217,400 Dworshak B-stock. Hatching

success for the two A-strain stocks was about 98.5% (Hagerman National Fish Hatchery 2003), while the hatching success for the Dworshak B-stock was 97.3%. This indicates that all three stocks of eggs were of good quality.

Magic Valley Fish Hatchery

Brood Year 2001—During the latter part of April, all of May, and the first part of June, Magic Valley Fish Hatchery received five stocks of eyed steelhead eggs consisting of: 1,131,772 Dworshak B, 77,822 Upper Salmon B, 906,282 Pahsimeroi A, 399,000 Sawtooth A, and 3,800 East Fork Natural eggs (Lowell et al. 2003a). Survival to release for the East Fork B, Pahsimeroi A, and Sawtooth A stocks was 77%, 95%, and 82%, respectively. However, survival to release for the Dworshak B-stock fish was only 57%. Lower survival from egg to smolt for Dworshak B-stock steelhead raised in the Hagerman Valley is typical. However, for brood year 2001, the hatching success of the Dworshak B-stock eggs was only 87% compared with about 98% for all of the other stocks (Lowell et al. 2003a), which is earlier mortality than normal.

All fin clipping and coded-wire tagging took place during August, September, and October, after the juvenile steelhead had already been moved to outside raceways. All PIT tagging, with the exception of the two PIT tag groups put into Squaw Pond fish as part of the Squaw Pond study, was performed during late February, which allowed the smolts a full month to recover from the tagging and exhibit any tagging induced mortality. Complete information on marks applied, release locations, and release timing, can be found in Appendix A, Table 3.

An outbreak of Cold Water Disease Flavobacterium psychrophilus was noted by the hatchery during the summer (Lowell et al. 2003a), along with an infection of Infectious Hematopoietic Necrosis Virus. The resulting mortality contributed to the overall survival of the stocks, though it did not appear to be the major cause for the comparatively lower survival of the Dworshak B-stock.

Survival to Lower Granite Dam of the PIT-tagged fish was generally good, with no overall pattern to the various releases (Table 1). It is interesting to note the very high survival of the early group released at the St. Charles Bridge on the Lemhi (92.6%) when compared to the later release (67.0%), even though the two releases were only three days apart. This most likely reflects the rapidly changing conditions that smolts can experience during spring migration caused by precipitation and snow melt events. The lower survival of the two Squaw Pond releases may reflect decreased quality of smolts that have acclimated in the pond and suggests that a lower adult return of these fish could be expected.

Mean travel time of the PIT-tagged groups of fish varied from 16 days to 27 days (Table 1). Migration is usually highly influenced by flow levels and distance of travel. For brood year 2001 smolts, the fish released in the Little Salmon at Stinky Springs, which had the shortest migration distance, also had the longest migration time and the lowest survival estimate.

Brood Year 2002—From April to June of 2002, Magic Valley Fish Hatchery received 2,442,305 eyed steelhead eggs comprised of five stocks: 1,019,468 Dworshak B, 81,206 Upper Salmon B, 910,249 Pahsimeroi A, 399,000 Sawtooth A, and 32,382 East Fork Natural (Lowell et al. 2003b). Hatching percentages were estimated as being near 100% for all stocks except the Dworshak B-stock. The Dworshak B-stock early survival was estimated to be somewhat lower than the other stocks, but still around 90% (Rick Lowell, Idaho Department of Fish and Game, personal communication).

Migration Conditions

Flows during the spring of 2002 were high enough to allow for elevated amounts of water to be routed over the spillways (Table 2). Overall flows were only slightly above average, but the increased amount of water being passed over the spillways at Lower Granite Dam is likely to have a positive impact on smolt survival. While flows were not as good as those seen a few years earlier, they were probably not low enough to cause higher than normal mortality in the migration corridor.

Migration Timing and Juvenile Survival

A total of 6,002 steelhead smolts were released with PIT tags in 2002. These included a mix of production and supplementation fish. The overall mean survival rate to Lower Granite Dam for all groups was 69.0% (Table 1). Mean time to Lower Granite Dam varied from 16.3 days to 29.5 days and showed no particular pattern. The fluctuations in mean time to Lower Granite Dam probably reflect short-term changes in flow conditions, time of release, distance traveled, and normal random variation.

Adult Returns

The HMP estimated that Hagerman National, Magic Valley, and Clearwater fish hatcheries returned a minimum of 49,276 adult steelhead to Idaho waters in the fall of 2001 and spring of 2002 (Table 3) (Hansen In Press). This estimate does not include in-stream prespawning mortalities, which includes those adults that failed to spawn successfully, nor does it include returns of those groups that were not marked and were therefore not accessible to either the fishery or a hatchery weir. Hansen (In Press) estimated that anglers harvested 23,537 steelhead, while 25,739 either returned to hatchery racks or escaped to spawn naturally.

The number of steelhead smolts released and the estimated number of adults that returned are compared to facility design production targets and projected adult return goals in Table 4. Figure 2 shows adult returns from steelhead released by each of the three LSRCP steelhead hatcheries as a percentage of their return goals for the last seven years. The 2001-2002 return year was the best return year for all three hatcheries. The figure for Clearwater Fish Hatchery may be somewhat low, since few of the steelhead released from this facility are expected to return to a hatchery rack, which means that the entire estimate is based on creel recoveries and the few strays to other hatchery racks in the system. Furthermore, there was no estimate determined for the large numbers of unmarked hatchery-origin steelhead released throughout the system. None of these fish contributed to angler harvest, nor did any of them return to hatchery racks except as strays, though it is reasonable to assume that they would return at a rate similar to other hatchery releases.

The total return of adult steelhead from each LSRCP facility for the last ten brood years is shown in Table 10. Each brood year will return across at least two, and often three different return years. The contribution from each of the LSRCP facilities for the last ten return years is found in Table 11, which is roughly the same information as found in Figure 2, except that the figure shows only the most recent return years to highlight recent trends more distinctly.

Out of State Recoveries

The total number of out-of-state recoveries was estimated to be 3,588 adult steelhead (Table 12). The majority of the recoveries were in the Columbia River (77.9%), with the Deschutes River accounting for a further 12.9%. Only a single piece of wire was reported to have been harvested in the ocean by a Japanese research vessel. This piece of wire expanded to an estimated seven fish, though the very low sample makes this number unreliable. The complete breakdown of out-of-state adult recoveries of steelhead by age and release section can be found in Table 12. A map of the river sections used in this breakdown can be found in Figure 1.

Fisheries Contribution

A phone survey was conducted by IDFG, which produced a total estimated angler harvest of 53,524 hatchery steelhead during the 2001-2002 steelhead season. Of these, 23,537 were produced by the three Idaho LSRCP facilities according to Hansen (In Press), while Dworshak National Fish Hatchery, Niagara Springs Fish Hatchery, and hatcheries in Oregon and Washington produced the remainder.

Weir Operation

Sawtooth Hatchery Weir—A total of 7,104 adult A-stock steelhead were trapped at the Sawtooth Fish Hatchery weir between March 20 and May 2, 2002 (Snider et al. 2003). This total consisted of 3,499 males (49.3%) and 3,605 females (50.7%) (Table 5). Of the 3,499 males, 3,443 were of hatchery-origin (98.4%), and 3,088 (89.8%) of those were 1-ocean fish. Of the 3,605 females, 3,566 were of hatchery-origin (98.9%) with 2,878 (80.7%) of those being 1-ocean fish.

All wild/natural fish were released directly above the weir for natural spawning (Snider et al. 2003). An additional 15 pairs of hatchery fish (15 males and 15 females) were released into weired off sections of both Frenchman and Beaver Creeks, and 70 pair were released into the main Salmon at the Vienna pullout for natural spawning as part of a supplementation study (Byrne 2003). In addition to these supplementation releases, a further 200 pairs of hatchery-origin steelhead were released into the Yankee Fork for the Shoshone-Bannock Tribe.

A total of 600 pairs of hatchery-origin steelhead were spawned at the Sawtooth trap in 2002, yielding 2,858,525 green eggs (Snider et al. 2003). Survival to eye-up for these eggs was 88.4%, which resulted in 2,526,935 eyed eggs for distribution to Magic Valley and Hagerman National fish hatcheries. The complete disposition of all fish trapped can be found in Table 5.

East Fork Salmon River Weir—Thirty-eight B-stock steelhead were recovered at the East Fork trap that operated between March 28 and May 21, 2002 (Snider et al. 2003). These fish were primarily returns from East Fork progeny that had been raised at Magic Valley Fish Hatchery. Of the 38 fish recovered, 19 (50.0%) were male and 19 (50.0%) were female. All of the fish recovered at the weir in 2002 were natural-origin with the exception of 11 hatchery-origin males. Since there were no hatchery-origin releases at the East Fork trap which could have contributed these males, it must be assumed that they were all strays from other release sites. The complete disposition of all fish trapped can be found in Table 6.

Crooked River Weir—Trapping at the Crooked River trap commenced on March 3, 2002 and continued through the Chinook salmon run later in the summer (Clearwater Fish Hatchery, unpublished data). During that time, seven natural-origin steelhead were collected, enumerated, and released above the weir. Of these seven, four were males (57.1%) and three were females (42.9%). No hatchery-origin adults were trapped. A complete breakdown of fish trapped and disposition can be found in Table 7.

Red River Weir—The Red River trap began operation on March 6, 2002 and continued through Chinook season (Clearwater Fish Hatchery, unpublished data). No adult steelhead were trapped during this time, though the trap was operated continuously.

Smolt-to-Adult Return Rates

Clearwater Fish Hatchery

The 2002 return year completed the run of the brood year 1997 steelhead released from Clearwater Fish Hatchery in 1998. Only 333 3-ocean adult steelhead were recovered in the 2002 run year, which gave a total SAR for the brood year of 0.21% (Appendix D, Table 1). The 3-ocean adult returns in 2002 comprised 22.5% of the total adult returns of brood year 1997 steelhead.

A total of 4,246 2-ocean steelhead were estimated to have returned from the total brood year 1998 release of 595,997 (Appendix C, Table 1). Of the total release, 4,993 fish did not receive an adipose clip, and no return estimate was derived for this group. Therefore, the SAR for brood year 1998, after two years of adult returns, was 0.76%. Since approximately 20% of the adults produced from the Dworshak B-stock smolts released from Clearwater Fish Hatchery are expected to return as 3-ocean fish, the overall SAR for the brood year is likely going to rise considerably.

Only 554 1-ocean steelhead were estimated to have returned from a total brood year 1999 release of 735,266 (Appendix B, Table 1). However, this release number includes 239,993 smolts that were released without adipose clips and were not available to the fishery. If this number is removed from the SAR calculation, the SAR for the first year of returns of brood year 1999 is 0.11%, which is considerably better than it had been for the previous two brood years.

Hagerman National Fish Hatchery

Only six adult steelhead were recovered in 2002 from a total brood year 1997 release of 1,032,407 (Appendix D, Table 2). This was not unexpected, since the entire brood year 1997 release from Hagerman National Fish Hatchery consisted of A-strain stocks, which generally return as either 1- or 2-ocean adults. The total SAR for brood year 1997 was 0.90%.

A total of 3,273 2-ocean adult steelhead returned in 2002 from a brood year 1998 release of 1,133,825 (Appendix C, Table 2). Very few 3-ocean returns are expected in 2003, so the SAR for brood year 1998 is probably going to remain at 1.23%. This SAR makes brood year 1998 the first year in the last decade with an SAR above 1%, which probably reflects the improved conditions these smolts encountered.

The first year of returns for brood year 1999 fish looked promising. A total of 18,581 adult steelhead were recovered from a release of 1,174,883 (Appendix B, Table 2). Overall SAR

after the first year was 1.58%, which should get considerably higher when the 2-ocean adults are recovered in 2003. While the returns of brood year 1998 adults were the highest seen in the last decade, the SAR for the first year of returns from brood year 1999 were more than a quarter of a percent higher.

Magic Valley Fish Hatchery

No 3-ocean adult steelhead were recovered from brood year 1997 (Appendix D, Table 3). This left the SAR for brood year 1997 at 0.34% overall. This SAR was considerably reduced by the inclusion of Dworshak B-stock steelhead which made up 39.5% of the total release of brood year 1997 smolts from Magic Valley Fish Hatchery and which had an SAR of only 0.02%. The SAR for the East Fork B-stock smolts was 0.18%, and the SAR for the A-strain stocks was 0.71%.

A total of 4,736 adult 2-ocean steelhead from brood year 1998 contributed to the 2002 return (Appendix C, Table 3). This gave an overall SAR for brood year 1998 of 0.57%. The SAR for the Dworshak B-stock steelhead, which made up 54.7% of the total smolts released from brood year 1998, returned only 140 adult steelhead in 2001 and 2002 combined and had an SAR of only 0.01%. The SAR for the East Fork B-stock steelhead, which accounted for a further 18.2% of the total release, was 0.18%, and the remainder of the release, which consisted of A-strain steelhead stocks, had an SAR of 1.34%. The SAR for the A-strain steelhead stocks was comparable to the SAR for the same stocks included in the Hagerman National Fish Hatchery releases for the same brood year.

The first year of adult recoveries for brood year 1999 steelhead was 17,547, which gives an SAR of 0.98% overall even though 41.0% of the total ad clipped smolt release was Dworshak B-stock, which had an SAR of only 0.01% (Appendix B Table 3). The East Fork B-stock made up only 2.9% of the total ad clipped release and had an SAR of only 0.02%. The A-strain stocks made up the remainder of the release and had an SAR of 1.90%. Since about 20% of the total returns from brood year 1999 should arrive in 2003, the total SAR for this brood year will certainly exceed 2% for A-strain adults. The majority of both of the B-strain stocks should return in 2003 as well, which should improve the numbers for those stocks and boost the overall SAR for Magic Valley Fish Hatchery releases.

Experimentation

Squaw Pond—Both the early and the late groups that were PIT tagged as they left the pond showed slightly reduced survival compared to the group that was released directly into the creek (Table 1). There was no difference between the early (55.7%) and the late (53.1%) PIT tag group, as they had nearly identical survival. Overall, the creek released fish (84.5%) had an estimated survival rate that was above average for all groups released in 2002, while the two pond release groups had estimated survival that were below the average.

Of the 104 males sampled for precocity among the fish remaining in the pond at the end of the study, only eight (7.69%) were found to have any precocial development, compared to one male in 97 (1.03%) showing evidence of precocial development in the sample taken from smolts released directly into Squaw Creek. The mean length of the smolts in the pond sample (226 mm) was almost exactly the same as the mean length of the smolts measured in the creek sample (224 mm). However, male smolts comprised only 41.6% of the creek sample, whereas

male smolts comprised 61.2% of the pond sample. This elevated male component is expected if the pond is retaining nonmigrants.

The sample taken from the creek release consisted of a small number of smolts that died in transit when an obstruction removed oxygen to one section of the tank truck. It is possible that this selection of accidentally killed fish may not have been representative of the whole population.

Adult trapping was conducted near the mouth of the outlet creek from the pond and was moderately successful. However, over 100 adults were observed in the more than one kilometer stretch of Squaw Creek from the trap down to the confluence with the Salmon River, and these adults seemed to be forming redds rather than moving up into the trap. Therefore, an effort was made to seine adults out of the creek, which met with modest success. The numbers shown in Table 12 represent the total adults captured either at the trap or in the seining effort.

Throughout the trapping season, 165 adult steelhead were recovered in Squaw Creek. Of these adults, only 24 (1 natural-origin, 23 hatchery-origin) were large enough to meet the size criteria used for B-run fish. All of the hatchery-origin B-size adults were transported to the East Fork Trap facility to be held for spawning. A total of 17 adult females were spawned (Snider et al. 2003), though one of the females was just below the strict criteria to be considered a B-run fish according to trap data.

Spawning the 17 females yielded 98,302 green eggs (Snider et al. 2003), which makes an average fecundity of 5,782 eggs per female. The green egg total resulted in 81,206 surviving to eyed stage, for an eye-up percentage of 82.6%.

This was the first year of adult recoveries at Squaw Creek, and a few lessons were learned. The lightweight weir used early in the season proved inadequate to deal with the normal spring flows encountered in Squaw Creek, and it was replaced by a much heavier weir midway through the season. In addition to this, the large numbers of adults observed in the creek downstream of the weir indicated that the numbers trapped were far less than the numbers returning to the creek. Because of this, it was decided that a new location for the trap would be located closer to the mouth of the creek.

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Table 1. Survival estimate and 95% confidence interval to Lower Granite Dam for PIT tagged steelhead smolts for the 2002 migration period. All data was generated from the SURPH program using data obtained from the PTAGIS web site.

Coord. ID	Release Site	Rel. No.	Release Date	LGR % Survival	95% CI	Mean Travel Time (days)	95% CI
Clearwater Fish Hatchery							
Dworshak B-stock							
DTV	Red House Hole	302	4/19/02	78.0	7.8	22.4	11.2
DTV	Crooked River Ponds (Ad CWT)	300	4/26/02	67.0	4.9	29.5	9.4
DTV	Crooked River Ponds (Blank)	301	4/26/02	55.7	5.9	23.8	9.7
DTV	Red River Ponds	299	4/25/02	50.2	4.5	32.8	11.9
Hagerman National Fish Hatchery							
Sawtooth A							
DTV	Sawtooth Fish Hatchery	599	4/3/02*	58.4	6.7	29.5	15.6
DTV	Yankee Fork Dredge Ponds	300	5/2/02	73.8	6.7	19.4	7.5
DTV	Little Salmon River	300	4/10/02	63.7	7.5	21.1	9.3
Magic Valley Fish Hatchery							
Pahsimeroi A							
DTV	Lemhi R @ St Charles Br (Supp.)	300	5/3/02	92.6	8.5	19.8	6.9
DTV	Lemhi R @ St Charles Br (Ad Clip)	300	5/6/02	67.0	4.6	17.3	5.5
DTV	Salmon R @ Hammer Creek	300	4/10/02	85.5	6.3	17.5	13.2
DTV	Salmon R @ Shoup Bridge	300	4/18/02	72.8	8.9	25.4	9.3
DTV	Salmon River @ Lemhi Hole	300	4/19/02	77.8	8.5	21.3	8.3
Sawtooth A							
DTV	Yankee Fork	300	5/2/02	69.6	7.3	18.5	5.4
DTV	Salmon R @ Cottonwood CG	300	4/220/02	68.3	7.4	22.5	8.7
Dworshak B							
DTV	Little Salmon R @ Stinky Springs	300	4/8/02	58.7	6.5	27.2	17.0
DTV	Squaw Pond (early group)	301	5/6/02	55.7	5.0	19.6	4.9
DTV	Squaw Pond (late group)	300	5/9/02	53.1	5.9	16.3	5.0
DTV	Squaw Creek	300	4/25/02	78.7	11.7	23.4	9.7
East Fork B							
DTV	Squaw Creek	300	4/24/02	84.5	12.3	18.1	7.7

* Releases were spread over several days starting on this date.

Table 2. Snake River mean daily outflow and spill (thousand cubic feet per second) for the Lower Granite Dam fore bay in Washington from 1977-2002 during the Peak and Extended Chinook salmon smolt migration periods as defined by Petrosky (1991).

Year	Peak (4/15–5/5)	Extended (4/20–5/30)	Peak Spill (4/15–5/5)	Extended Spill (4/20–5/30)
1977	39.1	40.2	0	0
1978	85.4	95.8	10.3	7.7
1979	64.9	90.0	0	3.4
1980	89.9	103.1	0	0
1981	76.2	86.7	9.4	7.1
1982	116.7	131.6	24.2	32.4
1983	85.6	111.3	22.1	19.3
1984	122.8	146.1	36.2	42.9
1985	86.9	87.2	0.7	1.5
1986	93.4	105.7	0.1	4.6
1987	57.7	62.3	0	0
1988	55.0	64.1	0	0
1989	94.1	87.2	0	0
1990	63.8	66.4	0	0
1991	44.0	70.8	0	0.3
1992	54.8	57.3	0	0
1993	69.8	114.0	0	19.7
1994	64.1	75.9	0	12.0
1995	72.1	97.2	2.6	14.0
1996	111.9	124.4	37.1	44.4
1997	149.1	169.9	43.6	57.0
1998	81.4	123.9	17.3	37.6
1999	109.1	111.8	36.8	41.1
2000	100.3	88.7	25.8	22.8
2001	42.5	57.8	0	0
2002	76.1	76.2	28.3	26.5

Table 3. Estimated number of LSRCP hatchery steelhead that returned to Idaho in 2001-2002. The adult returns in 2001-2002 included fish from three age classes. Steelhead were reared at Clearwater, Hagerman National, and Magic Valley fish hatcheries. These estimates were prepared by the Idaho Department of Fish and Game Harvest Monitoring Project and only include steelhead harvested in Idaho's sport fisheries, steelhead that returned to hatchery racks, and in-river escapement. These are minimum estimates and do not include all tributary and mainstem strays or in-river prespawning mortalities.

Hatchery	Brood Year	3-Ocean	2-Ocean	1-Ocean
Clearwater	1997	333	—	—
Clearwater	1998	—	4,246	—
Clearwater	1999	—	—	554
Estimated Fish Returned in 2001-2002			**5,133**	
Hagerman	1997	6	—	—
Hagerman	1998	—	3,273	—
Hagerman	1999	—	—	18,581
Estimated Fish Returned in 2001-2002			**21,860**	
Magic Valley	1997	0	—	—
Magic Valley	1998	—	4,736	—
Magic Valley	1999	—	—	17,547
Estimated Fish Returned in 2001-2002			**22,283**	
GRAND TOTAL			**49,276**	

Table 4. Steelhead smolts released from Magic Valley, Hagerman National, and Clearwater fish hatcheries that contributed to the 2001-2002 steelhead return. The number of steelhead smolts released and the estimated number of adults that returned were compared to the production targets and projected adult return goals for each facility.

Brood Year	Fish Hatchery	Number Released	Design Target	Percent of Target	2000-01 Adult Returns
1997	Clearwater	702,286	2,000,000	35.1%	333
1997	Hagerman National	1,032,407	2,400,000	43.0%	6
1997	Magic Valley	1,658,825	2,000,000	82.9%	0
	Total	**3,393,518**	**6,150,000**	**55.2%**	**339**
1998	Clearwater	595,997	2,000,000	29.8%	4,246
1998	Hagerman National	1,133,825	2,400,000	47.2%	3,273
1998	Magic Valley	1,941,406	2,000,000	97.1%	4,736
	Total	**3,671,228**	**6,150,000**	**59.7%**	**12,255**
1999	Clearwater	735,266	2,000,000	36.8%	554
1999	Hagerman National	1,174,883	2,400,000	49.0%	18,581
1999	Magic Valley	2,050,039	2,000,000	102.5%	17,547
	Total	**3,960,188**	**6,150,000**	**64.4%**	**36,682**
	Mean annual release as percent of target:			59.8%	
				Total adult return:[a]	**49,276**
				Adult return goal:	**39,260**
				Percent of goal achieved:	**125.5%**

[a] Does not include tributary strays and in-river prespawning mortalities.

Table 5. Summary of the 2002 A-stock steelhead return to the Sawtooth Fish Hatchery weir including fish of hatchery and natural origin. Hatchery aging criteria, based on length, were used to determine age[a]. ND indicates that the data were not available. Data are from Snider et al. (2003).

HATCHERY ORIGIN n = 7,009										
	Males n = 3,443					Females n = 3,566				
Age[a]	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	3,088[g]	ND	ND	0	ND	2,878[g]	ND	ND	ND	ND
2-ocean	355[g]	ND	ND	0	ND	688[g]	ND	ND	ND	ND
Total	3,443	600[c]	542	0	2,301[d]	3,566	600[c]	542	2	2,422[d]

NATURAL ORIGIN n = 95										
	Males n = 56					Females n =39				
Age[a]	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	41	41	0	0	0	26	26	0	0	0
2-ocean	15	15	0	0	0	13	13	0	0	0
Total	56	56[e]	0	0	0	39	39[e]	0	0	0

Total Number Trapped	7,104	Green Egg Number	2,858,525
Trapping Period	3/20 – 5/2/02	Eyed Egg Number	2,526,935[f] (88.4% eye up)

[a] Fish were aged using the following aging criteria: Males below 68 cm and females below 65 cm were classified as 1-ocean, while all others were classified as 2-ocean.

[b] Hatchery fish classified as 1-ocean were brood year 1999, released in 2000. Hatchery fish classified as 2-ocean were brood year 1998, released in 1999.

[c] Of these fish, 15 pairs (15 male, 15 female) were released in Beaver and Frenchman creeks, while an additional 70 pair were released into the Salmon River at the Vienna pullout for natural spawning as part of a supplementation study. A further 200 pairs were released into the Yankee Fork for the Shoshone-Bannock Tribe. The remaining released hatchery fish were all released below the weir at O'Brien Bridge to enhance angling opportunity.

[d] Fish were killed but not used for spawning. About 700 of these fish were donated to the Shoshone-Bannock and Duck Valley Tribes, while the rest were donated to charitable organizations or anglers on spawn days.

[e] Fish were released above the weir.

[f] Eyed-eggs were shipped to other hatcheries for rearing.

[g] Age breakdown estimated from a length subsample of 4,001 trapped hatchery adults.

Table 6. Summary of the 2002 steelhead return to the East Fork Salmon River weir. The fish return included fish of hatchery and natural origin. Hatchery aging criteria, based on length, were used to determine age[a]. ND indicates that the data were not available. Data are from Snider et al. (2003).

HATCHERY ORIGIN n = 11										
	Males n = 11					Females n = 0				
Age[a]	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	11	0	11	0	0	0	0	0	0	0
2-ocean	0	0	0	0	0	0	0	0	0	0
Total	11	0	11[b]	0	0	0	0	0	0	0

NATURAL ORIGIN n = 27										
	Males n = 8					Females n = 19				
Age[a]	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	6	6	0	0	0	12	ND	ND	0	0
2-ocean	2	2	0	0	0	7	ND	ND	0	0
Total	8	8[c]	0	0	0	19	9[c]	10	0	0

Total Number Trapped	38	Green Egg Number	48,205
Trapping Period	3/28 – 5/21/02	Eyed Egg Number	32,382[d] (67.2% eye up)

[a] Fish were aged using the following aging criteria:

RUN	SEX	LENGTH	AGE (Years in Ocean)
B	Male	≤73 cm	1-Ocean
B	Male	>73 cm	2- or 3-Ocean
B	Female	≤68 cm	1-Ocean
B	Female	>68 cm	2- or 3-Ocean

[b] These hatchery males were spawned with females recovered at the Squaw Creek trap and transported to the East Fork Trap.

[b] Fish were released above the weir; some of the males were partially stripped of milt prior to release.

[c] Eyed-eggs were shipped to Magic Valley Fish Hatchery for rearing.

Table 7. Summary of the 2002 B-stock steelhead return to the Crooked River weir. Data are from unpublished run reports.

HATCHERY ORIGIN n = 0										
	Males n = 0					Females n = 0				
Age	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	0	0	0	0	0	0	0	0	0	0
2-ocean	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0

NATURAL ORIGIN n = 7										
	Males n = 4					Females n = 3				
Age	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	ND	ND	0	0	0	ND	ND	0	0	0
2-ocean	ND	ND	0	0	0	ND	ND	0	0	0
Total	4	4[a]	0	0	0	3	3[a]	0	0	0

Total Number Trapped	7	Green Egg Number	0
Trapping Period	3/3 – 6/1/98	Eyed Egg Number	0

[a] Fish were released above the weir.

Table 8 Annual steelhead releases from each of the Idaho LSRCP steelhead hatcheries since 1990.

Brood Year	Clearwater	Hagerman	Magic Valley	Total
1990	NA	2,402,873	2,062,000	4,464,873
1991	NA	1,448,155	2,160,400	3,608,555
1992	326,300	1,496,737	1,925,700	3,748,737
1993	722,990	1,525,963	1,919,250	4,168,203
1994	773,589	1,149,677	1,731,355	3,654,621
1995	778,610	1,322,849	1,868,085	3,969,544
1996	654,107	1,145,918	1,643,201	3,443,226
1997	702,286	1,032,407	1,658,825	3,393,518
1998	595,998	1,133,825	1,941,405	3,671,228
1999	735,266	1,174,882	2,050,039	3,960,187
2000	786,654	1,229,288	2,022,017	4,037,959
2001	575,071	1,318,660	1,905,719	3,799,450

Table 9. Running total of returns from each brood year produced by Idaho LSRCP steelhead hatcheries for the last 10 years.

Brood Year	Clearwater	Hagerman	Magic Valley	Total
1990	NA	5,356	7,460	12,816
1991	NA	1,900	2,354	4,254
1992	2	4,562	3.043	7,607
1993	278	4,155	4,313	8,746
1994	633	6,812	7,109	14,554
1995	1,332	5,683	5,633	12,648
1996	1,061	3,742	4,012	8,815
1997	1,481	9,277	5,669	16,427
1998[a]	4,481	13,934	11,033	29,448
1999[b]	554	18,581	17,547	36,682

[a] This year only includes 1- and 2-ocean adult returns, and may be incomplete.
[b] This year only includes 1-ocean returns and is definitely incomplete.

Table 10. Annual contribution to adult steelhead returns in Idaho of each of the Idaho LSRCP steelhead hatcheries for the last 10 years.

Return Year	Clearwater	Hagerman	Magic Valley	Total
1993	0	6,005	5,589	11,594
1994	0	3,088	4,446	7,534
1995	0	3,327	3,551	6,878
1996	2	4,732	3,434	8,168
1997	510	6,103	5,880	12,493
1998	373	6,031	7,359	13,763
1999	1,385	4,045	3,888	9,318
2000	1,028	8,279	5,559	14,866
2001	1,394	13,012	8,249	22,655
2002	5,133	21,860	22,283	49,276

Table 11 Out-of-state recoveries of LSRCP steelhead reported to RMIS by January 2007 for recovery year 2002 broken down by release, age, and recovery type. Releases are combined into Idaho river sections, and only rows that had data were included in this table. C & S refers to tribal ceremonial and subsistence fisheries. For a map showing river sections, see Figure 1.

River Section (Release)	Recovery Type and Location								
	Deschutes River			Columbia River		Snake River	Ocean		
	C & S	Sport	Weirs	Sport	Tribal	Sport	Harvest	Other	Total
16									
Age 3	4	76	43	385	137	72	0	4	677
17									
Age 3	5	29	24	135	78	82	0	0	353
18									
Age 3	0	112	35	99	250	0	0	7	504
Age 4	0	0	0	9	0	26	0	0	36
19									
Age 3	0	59	14	390	485	46	0	0	994
Age 4	0	0	0	54	0	0	0	0	54
20 B-Stock									
Age 3	0	0	5	0	0	0	0	0	5
Age 4	0	0	22	0	0	0	0	0	22
Age 5	0	0	0	4	0	0	0	0	4
Clearwater									
Age 3	0	0	0	0	19	0	7	7	32
Age 4	0	14	0	288	218	48	0	0	567
East Fork B									
Age 4	3	22	7	21	50	28	0	0	132
Age 5	0	0	3	0	0	0	0	0	3
Squaw Cr.									
Age 4	0	18	8	111	38	0	0	0	175
TOTAL	12	320	128	1,497	1,274	302	7	17	3,558

Table 12 Total adult steelhead recovered at Squaw Creek Trap during the spring of 2002 (number of natural-origin fish in parenthesis).

Size Class[a]	Male	Female	Total
A	99 (5)	42 (2)	141 (7)
B	8 (0)	16 (1)	24 (1)
Total	**107 (5)**	**58 (3)**	**165 (8)**

[a] All males 79 cm and greater and all females 75 cm and greater were considered to be B size adults. All steelhead below these cutoffs were considered to be A-strain. No attempt was made to separate out 1-ocean B-strain from 1-ocean A-strain.

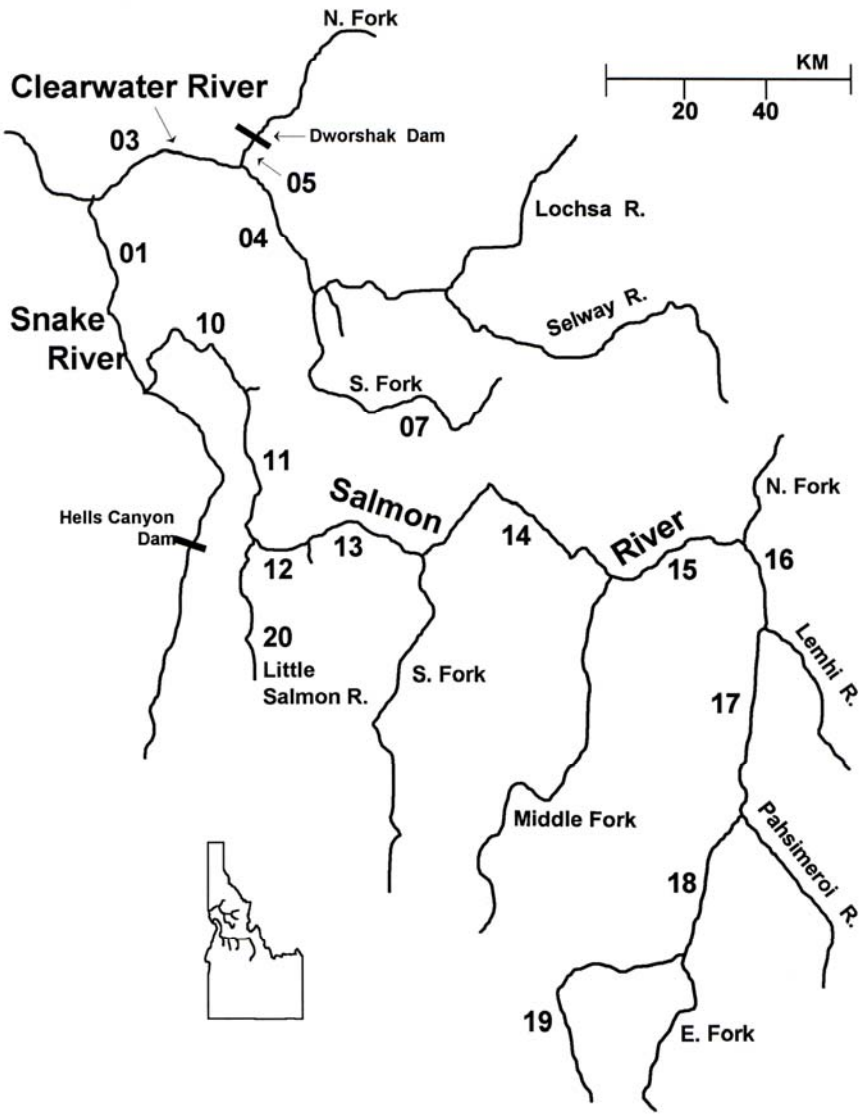

Figure 1. Map of river sections defined by Idaho Department of Fish and Game for all rivers sections that contain steelhead runs that are available to anglers.

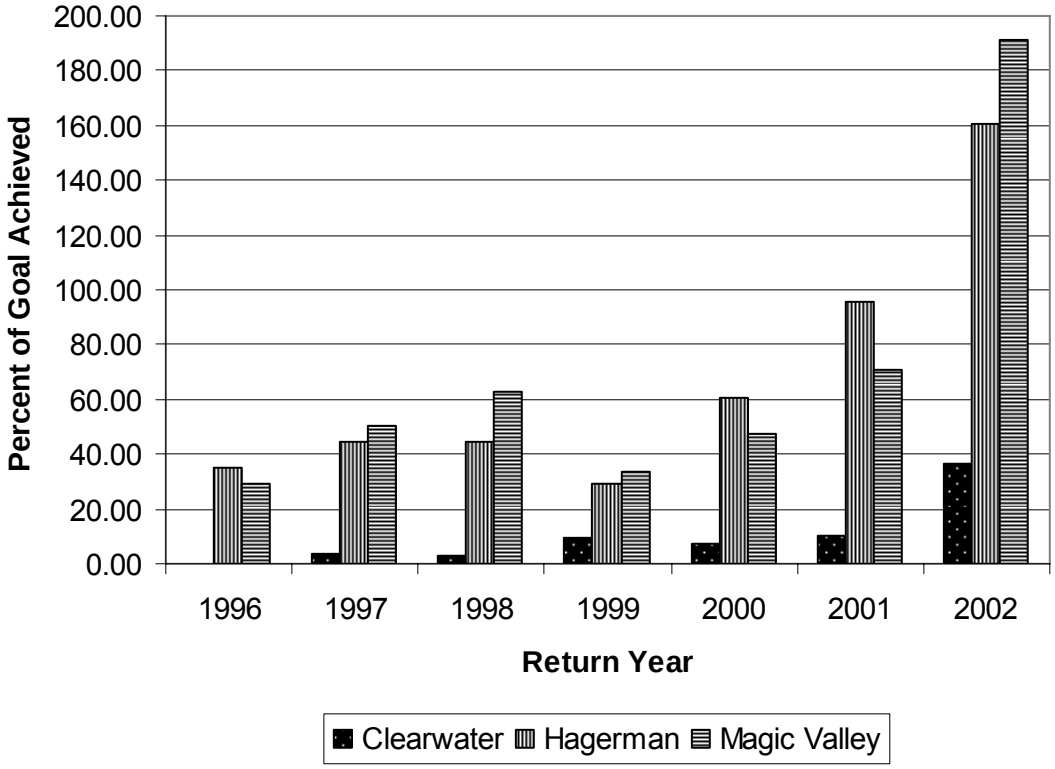

Figure 2. Percent of the adult steelhead return goal achieved by Clearwater, Hagerman National, and Magic Valley fish hatcheries between 1996 and 2002. Annual adult return goals for Clearwater, Hagerman National, and Magic Valley fish hatcheries were 14,000, 13,600, and 11,660, respectively.

APPENDICES

Appendix A. Table 1. Release data for all steelhead released from Clearwater Fish Hatchery during 2002. Releases are arranged by coded-wire tag group. The coded-wire tag group includes one or more unique tag codes, along with all untagged fish represented by those tags. If PIT tags were put into fish in a raceway that had more than one tag code, the PIT tags are assumed to be put into the various tag codes proportionally.

Release Site/Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
N. Fk Clwtr @	DWOR B	AD	Untagged	63,957	Surplus Production
Ahsahka Ramp		PIT		None	
9/30- 9/30/2002		**Total:**		**63,957**	
S Fk Clwtr R@	DWOR B	NONE	Untagged	26,460	NPT Supplementation
Meadow Cr.		PIT		None	
4/29- 4/29/2002		**Total:**		**26,460**	
Clear Cr:	DWOR B	AD	Untagged	40,499	LSRCP Production
Clwtr R		PIT		None	
4/19 - 4/19/2002		**Total:**		**40,499**	
Crooked R Ponds	DWOR B	CWT,AD,LV	106370	12,573	LSRCP Production
		CWT,AD,LV	106570	9,403	
4/29– 4/29/2002		AD,LV	Shed Tags	680	
		AD	Untagged	11,234	LSRCP Production
		PIT		300	
		Total:		**33,890**	
Red River:	DWOR B	AD	Untagged	31,306	LSRCP Production
S Fk Clwtr		PIT		301	
4/25- 4/25/2002		**Total:**		**31,306**	
Red River:	DWOR B	NONE	Untagged	150,010	Supplementation
S Fk Clwtr		PIT		None	
4/25- 4/25/2002		**Total:**		**150,010**	
S Fk Clwtr@	DWOR B	CWT,AD,LV	104812	22,629	LSRCP Production
Red House Hole		CWT,AD,LV	104811	22,326	
4/19 - 4/19/2002		CWT,AD,LV	104810	21,104	
		AD,LV	Shed Tags	2,044	
		AD	Untagged	70,666	LSRCP Production
		PIT		302	
		Total:		**138,769**	
Lolo Cr	DWOR B	NONE	Untagged	18,000	NPT Supplementation
		PIT		None	
4/29 - 4/29/2002		**Total:**		**18,000**	
S Fk Clwtr R@	DWOR B	NONE	Untagged	34,000	NPT Supplementation
Mill Cr		PIT		None	
4/29 - 4/29/2002		**Total:**		**34,000**	
Crooked R Ponds	DWOR B	BWT	Untagged	19,918	Supplementation Blank Wire
		PIT		301	
4/29 - 4/29/2002		**Total:**		**19,918**	
Crooked R Ponds	DWOR B	NONE	Untagged	82,219	Supplementation
		PIT		None	
4/29 – 4/29/2002		**Total:**		**82,219**	
Total Release For Clearwater In 2002			**639,028**		

Appendix A. Table 2. Release data for all steelhead released from Hagerman National Fish Hatchery during 2002. Releases are arranged by coded-wire tag group. The coded-wire tag group includes one or more unique tag codes, along with all untagged fish represented by those tags. If PIT tags were put into fish in a raceway that had more than one tag code, the PIT tags are assumed to be put into the various tag codes proportionally.

Release Site/Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Yankee Fk Dredge Ponds	SAWTOOTH A	AD	Untagged	139,445	Production
		PIT		300	
5/2/2002 - 5/6/2002		**Total:**		**139,445**	
Newsome Cr:	DWOR B	NONE	Untagged	85,722	NPT Agreement Fish
S Fk Clwtr R		PIT		None	
5/10/2002 - 5/15/2002		**Total:**		**85,722**	
American R:	DWOR B	NONE	Untagged	94,232	NPT Agreement
S Fk Clwtr R		PIT		None	
4/30/2002 - 5/8/2002		**Total:**		**94,232**	
Lt Salmon R @ Hwy 95 Bridge	PAH A	NONE	Untagged	218,124	Production
		PIT		300	
4/1/2002 - 4/15/2002		**Total:**		**218,124**	
Sawtooth Hatchery	SAWTOOTH A	CWT,AD,LV	100772	43,087	Production
		AD,LV	Shed Tags	571	
4/3/2002 - 4/29/2002		AD	Untagged	737,479	Production
		PIT		599	
		Total:		**781,137**	
Total Release For Hagerman NFH In 2002			**1,318,660**		

Appendix A. Table 3. Release data for all steelhead released from Magic Valley Fish Hatchery during 2002. Releases are arranged by coded-wire tag group. The coded-wire tag group includes one or more unique tag codes, along with all untagged fish represented by those tags. If PIT tags were put into fish in a raceway that had more than one tag code, the PIT tags are assumed to be put into the various tag codes proportionally.

Release Site/Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Salmon R @	SAWTOOTH A	CWT,AD,LV	106770	21,504	Production
Challis		CWT,AD,LV	101172	10,943	
4/24/2002 - 4/24/2002		AD,LV	Shed Tags	1,003	
		AD	Untagged	24,150	
		PIT		None	
		Total:		**57,600**	
Squaw Cr	EAST FK B	CWT,AD	106670	20,439	Production
		CWT,AD	101072	9,893	Squaw Creek
4/24/2002 - 4/25/2002		AD	Untagged	29,024	
		PIT		300	
		Total:		**59,356**	
Squaw Cr Ponds	DWOR B	AD	Untagged	96,440	Squaw Pond
		PIT		601	Acc. Study
4/8/2002 - 4/8/2002		**Total:**		**96,440**	
Squaw Cr	DWOR B	CWT,AD,LV	109371	31,518	Production
		AD,LV	Shed Tags	975	Squaw Creek
4/25/2002 - 5/1/2002		AD	Untagged	197,685	
		PIT		None	
		Total:		**230,178**	
Hayden Cr	PAH A	NONE	Untagged	37,500	Production
Hatchery		PIT		None	
5/3/2002 - 5/3/2002		**Total:**		**37,500**	
Yankee Fk Dredge	SAWTOOTH A	AD	Untagged	99,738	Production
Ponds		PIT		300	
5/2/2002 - 5/2/2002		**Total:**		**99,738**	
Salmon R @	SAWTOOTH A	AD	Untagged	62,048	Production
Cottonwood Cg		PIT		300	
4/22/2002 - 4/22/2002		**Total:**		**62,048**	
Salmon R @	SAWTOOTH A	AD	Untagged	70,590	Production
McNabb Point		PIT		None	
4/23/2002 - 4/23/2002		**Total:**		**70,590**	
Lt Salmon R @	PAH A	AD	Untagged	54,000	Production
Stinky Springs		PIT		300	
4/12/2002 - 4/12/2002		**Total:**		**54,000**	
Salmon R @	PAH A	AD	Untagged	39,005	Production
Colston Corner		PIT		None	
4/12/2002 - 4/12/2002		**Total:**		**39,005**	
Salmon R @	PAH A	AD	Untagged	49,194	Production
Wagonhammer		PIT		None	
4/15/2002 - 4/15/2002		**Total:**		**49,194**	
Salmon R @	PAH A	AD	Untagged	63,000	Production
Shoup Brdg		PIT		300	
4/18/2002 - 4/18/2002		**Total:**		**63,000**	

Appendix A. Table 3. Continued.

Release Site/Date	Stock Name	Mark Type	CWT Code	Release Number	Marking Purpose
Salmon R @	PAH A	AD	Untagged	43,415	Production
Lewis Clark		PIT		None	
4/15/2002 - 4/15/2002		**Total:**		**43,415**	
Salmon R @	PAH A	AD	Untagged	34,085	Production
Red Rock		PIT		None	
4/19/2002 - 4/19/2002		**Total:**		**34,085**	
Salmon R @	SAWTOOTH A	AD	Untagged	7,353	Production
Red Rock		PIT		None	
4/19/2002 - 4/19/2002		**Total:**		**7,353**	
Salmon R @	SAWTOOTH A	AD	Untagged	49,800	Production
Tunnel Rock		PIT		None	
4/22/2002 - 4/23/2002		**Total:**		**49,800**	
E Fk Salmon R @	DWOR B	AD	Untagged	214,252	Production
Dumpster		PIT		None	
4/29/2002 - 5/1/2002		**Total:**		**214,252**	
Salmon R @	SAWTOOTH A	AD	Untagged	41,350	Production
Eyehole		PIT		None	
4/19/2002 - 4/22/2002		**Total:**		**41,350**	
Lemhi R:	PAH A	AD	Untagged	84,608	Production
Salmon R		PIT		300	
4/18/2002 - 4/19/2002		**Total:**		**84,608**	
Lemhi R @	PAH A	CWT,AD,LV	106870	21,328	Production
St. Charles Bridge		CWT,AD,LV	101272	10,833	
5/6/2002 - 5/7/2002		AD,LV	Shed Tags	995	
		AD	Untagged	82,067	Production
		PIT		300	
		Total:		**151,076**	
Lemhi R @	PAH A	NONE	Untagged	108,295	Supplementation
St. Charles Bridge		PIT		300	
5/3/2002 - 5/7/2002		**Total:**		**72,442**	
E Fk Salmon R	EAST FK B	NONE	Untagged	3,800	E Fk Natural
Trap		PIT		None	Program
5/1/2002 - 5/1/2002		**Total:**		**3,800**	
Lt Salmon R @	DWOR B	AD	Untagged	105,167	Production
Stinky Springs		PIT		None	
4/8/2002 - 4/9/2002		**Total:**		**105,167**	
Salmon R @	PAH A	AD	Untagged	179,722	Production
Hammer Creek		PIT		300	
4/10/2002 - 4/11/2002		**Total:**		**179,722**	
Total Release For Magic Valley In 2002			**1,905,719**		

Appendix B. Table 1. Release and recovery data for brood year 1999 steelhead released from Clearwater Fish Hatchery. Only 1-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Clear Cr:	1999	DWOR B	105419	43,375	AD,LV	Contribution	1	6	7	13	0.03
Clwtr R							2	ND	ND	ND	
4/19-4/20/2000							3	ND	ND	ND	
Clear Cr:	1999	DWOR B	Untagged	140,482	AD	Contribution	1	19	23	42	0.03
Clwtr R							2	ND	ND	ND	
4/19-4/20/2000							3	ND	ND	ND	
			Totals:	**183,857**				**25**	**30**	**55**	**0.03**
S Fk Clwtr@	1999	DWOR B	105408	31,197	AD,LV	Contribution	1	11	33	44	0.14
Red House Hole							2	ND	ND	ND	
4/20-4/21/2000							3	ND	ND	ND	
S Fk Clwtr@	1999	DWOR B	105426	32,101	AD,LV	Contribution	1	30	0	30	0.09
Red House Hole							2	ND	ND	ND	
4/20-4/21/2000							3	ND	ND	ND	
S Fk Clwtr@	1999	DWOR B	Untagged	248,118	AD	Contribution	1	161	264	425	0.17
Red House Hole							2	ND	ND	ND	
4/20-4/21/2000							3	ND	ND	ND	
			Totals:	**311,416**				**202**	**297**	**499**	**0.16**
Red River	1999	DWOR B	Untagged	139,662	NONE	NPT no mark	1	ND	ND	ND	
Rearing Ponds						release	2	ND	ND	ND	
5/4/2000							3	ND	ND	ND	
			Totals:	**139,662**				**ND**	**ND**	**ND**	
Crooked R	1999	DWOR B	Untagged	100,331	NONE	NPT no mark	1	ND	ND	ND	
Ponds						release	2	ND	ND	ND	
5/4/2000		(No. PIT Tags: 300)					3	ND	ND	ND	
			Totals:	**100,331**				**ND**	**ND**	**ND**	
			Total 1-Ocean:			**554**					
			Total 2-Ocean:			**ND**					
			Total 3-Ocean:			**ND**					
			Total Harvest Recoveries:			**227**					
			Total Hatchery Recoveries:			**327**					
			Total Releases:			**735,266**					
			Total Recoveries:			**554**					

Appendix B. Table 2. Release and recovery data for brood year 1999 steelhead released from Hagerman National Fish Hatchery. Only 1-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Sawtooth Hatchery 4/26/2000	1999	SAW A	105527	19,809	AD,LV	Late Egg Take, Direct Rel.	1 2 3	164 ND ND	103 ND ND	267 ND ND	1.35
Sawtooth Hatchery 4/26/2000	1999	SAW A	105525	20,758	AD,LV	Late Egg Take, Direct Rel.	1 2 3	131 ND ND	90 ND ND	221 ND ND	1.06
Sawtooth Hatchery 4/26/2000	1999	SAW A	105526	19,549	AD,LV	Late Egg Take, Direct Rel.	1 2 3	156 ND ND	91 ND ND	247 ND ND	1.26
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	839	AD	Late Egg Take, Direct Rel.	1 2 3	6 ND ND	4 ND ND	10 ND ND	1.19
			Totals:	**60,955**				**457**	**288**	**745**	**1.22**
Hazard Cr: Lt Salmon R 4/7/2000-4/28/2000	1999	HELLS CANYON A	Untagged	51,161	AD	Supplementation	1 2 3	401 ND ND	633 ND ND	1,034 ND ND	2.02
			Totals:	**51,161**				**401**	**633**	**1,034**	**2.02**
Sawtooth Hatchery 4/26/2000	1999	SAW A	105522	19,563	AD,LV	Acclimation % Body Wt. Diet	1 2 3	116 ND ND	92 ND ND	208 ND ND	1.06
Sawtooth Hatchery 4/26/2000	1999	SAW A	105519	19,441	AD,LV	Acclimation % Body Wt. Diet	1 2 3	153 ND ND	99 ND ND	252 ND ND	1.30
Sawtooth Hatchery 4/26/2000	1999	SAW A	105520	19,999	AD,LV	Acclimation % Body Wt. Diet	1 2 3	222 ND ND	79 ND ND	301 ND ND	1.51
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	486,823	AD	Acclimation % Body Wt. Diet	1 2 3	4,051 ND ND	2,090 ND ND	6,141 ND ND	1.26
			Totals:	**545,826**				**4,542**	**2,360**	**6,902**	**1.26**
Sawtooth Hatchery 4/26/2000	1999	SAW A	105518	19,670	AD,LV	Early Egg Take, Direct Rel.	1 2 3	179 ND ND	125 ND ND	304 ND ND	1.55
Sawtooth Hatchery 4/26/2000	1999	SAW A	105516	17,726	AD,LV	Early Egg Take, Direct Rel.	1 2 3	196 ND ND	132 ND ND	328 ND ND	1.85
Sawtooth Hatchery 4/26/2000	1999	SAW A	105517	20,187	AD,LV	Early Egg Take, Direct Rel.	1 2 3	217 ND ND	112 ND ND	329 ND ND	1.63

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	SAR (%)
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	1,606	AD	Early Egg Take, Direct Rel.	1 2 3	17 ND ND	10 ND ND	27 ND ND	1.68
			Totals:	**59,189**				**609**	**379**	**988**	**1.67**
Sawtooth Hatchery 4/26/2000	1999	SAW A	105524	20,170	AD,LV	Feed/Fast, Acclimated	1 2 3	168 ND ND	92 ND ND	260 ND ND	1.29
Sawtooth Hatchery 4/26/2000	1999	SAW A	105521	19,312	AD,LV	Feed/Fast, Acclimated	1 2 3	194 ND ND	106 ND ND	300 ND ND	1.55
Sawtooth Hatchery 4/26/2000	1999	SAW A	105523	18,153	AD,LV	Feed/Fast, Acclimated	1 2 3	178 ND ND	112 ND ND	290 ND ND	1.60
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	4,193	AD	Feed/Fast, Acclimated	1 2 3	39 ND ND	21 ND ND	60 ND ND	1.43
			Totals:	**61,828**				**579**	**331**	**910**	**1.47**
Lt Salmon R Stinky Springs 4/3-5/8/2000	1999	HELLS CANYON A	Untagged	395,924	AD	Contribution	1 2 3	3,101 ND ND	4,901 ND ND	8,002 ND ND	2.02
			Totals:	**395,924**				**3,101**	**4,901**	**8,002**	**2.02**

Total 1-Ocean:	**18,581**
Total 2-Ocean:	**ND**
Total 3-Ocean:	**ND**
Total Harvest Recoveries:	**9,689**
Total Hatchery Recoveries:	**8,892**
Total Releases:	**1,174,883**
Total Recoveries:	**18,581**

Appendix B. Table 3. Release and recovery data for brood year 1999 steelhead released from Magic Valley Fish Hatchery. Only 1-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Salmon R @ Tunnel Rock 4/20-4/21/2000	1999	SAW A	105415	50,301	AD,LV	Contribution	1 2 3	380 ND ND	623 ND ND	1,003 ND ND	1.99
Salmon R @ Tunnel Rock 4/20-4/21/2000	1999	SAW A	104829	11,153	AD,LV	Contribution	1 2 3	112 ND ND	138 ND ND	250 ND ND	2.24
Salmon R @ Tunnel Rock 4/20-4/21/2000	1999	SAW A	Untagged	47,219	AD	Contribution	1 2 3	378 ND ND	584 ND ND	962 ND ND	2.04
			Totals:	**108,673**				**870**	**1,345**	**2,215**	**2.04**
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	105414	46,865	AD,LV	Contribution	1 2 3	313 ND ND	580 ND ND	893 ND ND	1.91
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	104648	7,663	AD,LV	Contribution	1 2 3	48 ND ND	95 ND ND	143 ND ND	1.87
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	Untagged	13,400	AD	Contribution	1 2 3	99 ND ND	166 ND ND	265 ND ND	1.98
			Totals:	**67,928**				**460**	**841**	**1,301**	
Efk Salmon R Dumpster 4/27-5/2/2000	1999	DWOR B	Untagged	239,981	AD	Production	1 2 3	35 ND ND	4 ND ND	39 ND ND	0.02
			Totals:	**239,981**				**35**	**4**	**39**	**0.02**
Salmon R @ Kilpatrick 4/18/2000	1999	SAW A	Untagged	21,500	AD	Production	1 2 3	159 ND ND	266 ND ND	425 ND ND	1.98
			Totals:	**21,500**				**159**	**266**	**425**	**1.98**
Salmon R @ Eyehole 4/18/2000	1999	SAW A	Untagged	21,500	AD	Production	1 2 3	159 ND ND	266 ND ND	425 ND ND	1.98
			Totals:	**21,500**				**159**	**266**	**425**	**1.98**
Salmon R @ McNabb Point 4/18-4/21/2000	1999	SAW A	Untagged	105,578	AD	Production	1 2 3	651 ND ND	1,307 ND ND	1,958 ND ND	1.85
			Totals:	**105,578**				**651**	**1,307**	**1,958**	**1.85**

Appendix B. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
S Fk Clwtr R@ Mill Cr 5/2/2000	1999	DWOR B	Untagged	19,556	NONE	Supplementation	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**19,556**				**ND**	**ND**	**ND**	
Red River: S Fk Clwtr 5/10/2000	1999	DWOR B	Untagged	30,480	NONE	Supplementation Late Eggs	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**30,480**				**ND**	**ND**	**ND**	
American R: S Fk Clwtr R 5/5-5/9/2000	1999	DWOR B	Untagged	96,187	NONE	Supplementation Late Eggs	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**96,187**				**ND**	**ND**	**ND**	
Newsome Cr: S Fk Clwtr R 5/4-5/9/2000	1999	DWOR B	Untagged	100,078	NONE	Supplementation Late Eggs	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**100,078**				**ND**	**ND**	**ND**	
S Fk Clwtr R@ Meadow Cr. 5/2/2000	1999	DWOR B	Untagged	19,557	NONE	Supplementation Late Eggs	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**19,557**				**ND**	**ND**	**ND**	
Squaw Cr 4/24-6/5/2000	1999	DWOR B	104647	10,523	AD,LV	Contribution	1 2 3	0 ND ND	0 ND ND	0 ND ND	0.00
Squaw Cr 4/24-6/5/2000	1999	DWOR B	105413	50,819	AD,LV	Contribution	1 2 3	9 ND ND	0 ND ND	9 ND ND	0.02
Squaw Cr 4/24-6/5/2000	1999	DWOR B	Untagged	132,294	BWT,AD	Contribution	1 2 3	19 ND ND	2 ND ND	21 ND ND	0.02
			Totals:	**193,636**				**28**	**2**	**30**	**0.02**
Squaw Cr Ponds 4/10-4/11/2000	1999	DWOR B	Untagged	106,135	AD	Production	1 2 3	15 ND ND	2 ND ND	17 ND ND	0.02
			Totals:	**106,135**				**15**	**2**	**17**	**0.02**
Squaw Cr 4/20-4/21/2000	1999	EAST FK B	Untagged	51,866	AD	Production	1 2 3	8 ND ND	1 ND ND	9 ND ND	0.02
			Totals:	**51,866**				**8**	**1**	**9**	**0.02**
Salmon R @ Cottonwood Cg 4/14-4/21/2000	1999	SAW A	Untagged	45,753	AD	Production	1 2 3	282 ND ND	566 ND ND	848 ND ND	1.85
			Totals:	**45,753**				**282**	**566**	**848**	**1.85**
Lemhi R: Salmon R 4/12-4/21/2000	1999	PAH A	103606	62,081	AD,LV	Contribution	1 2 3	500 ND ND	768 ND ND	1,268 ND ND	2.04

Appendix B. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Lemhi R:	1999	PAH A	Untagged	51,286	AD	Contribution	1	379	635	1,014	1.98
Salmon R							2	ND	ND	ND	
4/12-4/21/2000							3	ND	ND	ND	
			Totals:	**113,367**				**879**	**1,403**	**2,282**	**2.01**
Lt Salmon R @	1999	DWOR B	103605	63,244	AD,LV	Production	1	0	1	1	0.00
Stinky Springs							2	ND	ND	ND	
4/11-4/27/2000							3	ND	ND	ND	
Lt Salmon R @	1999	DWOR B	Untagged	232,640	AD,BWT	Production	1	0	4	4	0.00
Stinky Springs							2	ND	ND	ND	
4/11-4/27/2000							3	ND	ND	ND	
			Totals:	**295,884**				**0**	**5**	**5**	**0.00**
Lt Salmon R @	1999	HELLS	Untagged	115,423	AD	Stinky HC-A	1	904	1,429	2,333	
Stinky Springs		CANYON A				Contribution	2	ND	ND	ND	
4/11-4/12/2000							3	ND	ND	ND	
			Totals:	**115,423**				**904**	**1,429**	**2,333**	
Lt Salmon R @	1999	DWOR B	Untagged	4,639	BWT,AD	Precocity study	1	0	0	0	0.00
Stinky Springs							2	ND	ND	ND	
4/11-4/27/2000							3	ND	ND	ND	
			Totals:	**4,639**				**0**	**0**	**0**	**0.00**
Salmon R @	1999	PAH A	Untagged	62,670	AD	Contribution	1	463	776	1,239	1.98
Red Rock							2	ND	ND	ND	
4/12/2000							3	ND	ND	ND	
			Totals:	**62,670**				**463**	**776**	**1,239**	**1.98**
Salmon R @	1999	PAH A	Untagged	61,732	AD	Contribution	1	456	764	1,220	1.98
Lewis Clark							2	ND	ND	ND	
4/17/2000							3	ND	ND	ND	
			Totals:	**61,732**				**456**	**764**	**1,220**	**1.98**
Salmon R @	1999	PAH A	Untagged	36,419	AD	Production	1	225	451	676	1.86
Cottonwood Cg							2	ND	ND	ND	
4/14-4/21/2000							3	ND	ND	ND	
			Totals:	**36,419**				**225**	**451**	**676**	**1.86**
Salmon R @	1999	SAW A	Untagged	11,533	AD	Production	1	85	143	228	1.98
Colston Corner							2	ND	ND	ND	
4/18/2000							3	ND	ND	ND	
			Totals:	**11,533**				**85**	**143**	**228**	**1.98**
Salmon R @	1999	PAH A	Untagged	9,092	AD	Production	1	67	113	180	1.98
Colston Corner							2	ND	ND	ND	
4/18/2000							3	ND	ND	ND	
			Totals:	**9,092**				**67**	**113**	**180**	**1.98**
Salmon R @	1999	SAW A	Untagged	24,491	AD	Production	1	131	303	434	1.77
Challis							2	ND	ND	ND	
4/13-4/24/2000							3	ND	ND	ND	
			Totals:	**24,491**				**131**	**303**	**434**	**1.77**

Appendix B. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Salmon R @ Challis	1999	PAH A	Untagged	21,250	AD	Production	1	131	263	394	1.85
							2	ND	ND	ND	
4/13-4/24/2000							3	ND	ND	ND	
			Totals:	**21,250**				**131**	**263**	**394**	**1.85**
Salmon R @ Wagonhammer	1999	SAW A	Untagged	1,845	AD	Production	1	14	23	37	2.01
							2	ND	ND	ND	
4/17/2000							3	ND	ND	ND	
			Totals:	**1,845**				**14**	**23**	**37**	**2.01**
Salmon R @ Wagonhammer	1999	PAH A	Untagged	39,246	AD	Production	1	290	486	776	1.98
							2	ND	ND	ND	
4/17/2000							3	ND	ND	ND	
			Totals:	**39,246**				**290**	**486**	**776**	**1.98**
Lemhi R: Salmon R	1999	SAW A	Untagged	24,040	AD	Production	1	178	298	476	1.98
							2	ND	ND	ND	
4/12-4/21/2000							3	ND	ND	ND	
			Totals:	**24,040**				**178**	**298**	**476**	**1.98**

Total 1-Ocean:	**17,547**
Total 2-Ocean:	**ND**
Total 3-Ocean:	**ND**
Total Harvest Recoveries:	**6,490**
Total Hatchery Recoveries:	**11,057**
Total Releases:	**2,050,039**
Total Recoveries:	**17,547**

Appendix C. Table 1. Release and recovery data for brood year 1998 steelhead released from Clearwater Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press) and Harrington (2005).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	105234	20,321	AD,LV	Bio-Diet Feed (Feed Exp.)	1 2 3	19 0 ND	1 0 ND	20 0 ND	0.10
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	Untagged	38,649	AD	Bio-Diet Feed (Feed Exp.)	1 2 3	20 0 ND	2 0 ND	22 0 ND	0.06
			Totals:	**58,970**				**39**	**3**	**42**	**0.07**
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	105233	20,668	AD,LV	Moore/Clark DietDiet (Feed Exp.)	1 2 3	0 70 ND	0 24 ND	0 94 ND	0.45
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	Untagged	110,901	AD	Moore/Clark DietDiet (Feed Exp.)	1 2 3	0 376 ND	4 129 ND	4 505 ND	0.46
			Totals:	**131,569**				**446**	**157**	**603**	**0.46**
Red River@ Soda Cr Brdg 4/20/1999	1998	DWOR B	Untagged	4,993	NONE	Supplementation (PIT tag Only)	1 2 3	ND ND ND	ND ND ND	ND ND ND	
			Totals:	**4,993**				**ND**	**ND**	**ND**	
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105235	20,648	AD,LV	Contribution	1 2 3	16 67 ND	1 110 ND	17 177 ND	0.94
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105236	21,193	AD,LV	Contribution	1 2 3	11 112 ND	1 113 ND	12 225 ND	1.12
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105237	20,766	AD,LV	Contribution	1 2 3	0 58 ND	1 110 ND	1 168 ND	0.81
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	Untagged	337,858	AD	Contribution	1 2 3	146 1,279 ND	13 1,798 ND	159 3,077 ND	0.96
			Totals:	**400,465**				**1,689**	**2,147**	**3,836**	**0.96**

Total 1-Ocean: **235**
Total 2-Ocean: **4,246**
Total 3-Ocean: **ND**

Total Harvest Recoveries: **2,174**
Total Hatchery Recoveries: **2,307**

Total Releases: **595,997**
Total Recoveries: **4,481**

Appendix C. Table 2. Release and recovery data for brood year 1998 steelhead released from Hagerman National Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns, along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press) and Harrington (2005).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Sawtooth Hatchery 4/23/1999	1998	SAW A	105263	19,678	AD	Acclimated Feed/Fast	1 2 3	130 40 ND	34 7 ND	164 47 ND	1.07
Sawtooth Hatchery 4/23/1999	1998	SAW A	105259	19,171	AD	Acclimated Feed/Fast	1 2 3	39 38 ND	31 17 ND	70 55 ND	0.65
Sawtooth Hatchery 4/23/1999	1998	SAW A	105260	19,426	AD	Acclimated Feed/Fast	1 2 3	37 17 ND	41 17 ND	78 34 ND	0.58
Sawtooth Hatchery 4/23/1999	1998	SAW A	Untagged	2,013	AD	Acclimated Feed/Fast	1 2 3	7 3 ND	8 1 ND	15 4 ND	0.94
			Totals:	**60,288**				**311**	**156**	**467**	**0.77**
Sawtooth Hatchery 4/23/1999	1998	SAW A	105261	17,807	AD	Acclimated, % Body Wt. Diet	1 2 3	80 20 ND	21 7 ND	101 27 ND	0.72
Sawtooth Hatchery 4/23/1999	1998	SAW A	105257	18,973	AD	Acclimated, % Body Wt. Diet	1 2 3	36 32 ND	36 15 ND	72 47 ND	0.63
Sawtooth Hatchery 4/23/1999	1998	SAW A	105258	18,786	AD	Acclimated, % Body Wt. Diet	1 2 3	7 10 ND	32 24 ND	39 34 ND	0.39
Sawtooth Hatchery 4/23/1999	1998	SAW A	Untagged	372,500	AD	Acclimated, % Body Wt. Diet	1 2 3	825 416 ND	1519 303 ND	2,344 719 ND	0.82
			Totals:	**428,066**				**1,426**	**1,957**	**3,383**	**0.79**
Sawtooth Hatchery 4/21-4/26/1999	1998	SAW A	Untagged	104,521	AD	Direct Release	1 2 3	275 171 ND	426 32 ND	701 203 ND	0.86
			Totals:	**104,521**				**446**	**458**	**904**	**0.86**
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104637	10,004	AD	Contribution	1 2 3	52 67 ND	52 21 ND	104 88 ND	1.92
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104636	10,137	AD	Contribution	1 2 3	7 23 ND	7 21 ND	14 44 ND	0.57
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104635	10,326	AD	Contribution	1 2 3	32 0 ND	32 21 ND	64 21 ND	0.82

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	SAR (%)
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104638	10,317	AD	Contribution	1 2 3	32 0 ND	32 21 ND	64 21 ND	0.82
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	Untagged	378,252	AD	Contribution	1 2 3	3,159 835 ND	3,159 781 ND	6,318 1,616 ND	2.10
			Totals:	**419,036**				**4,207**	**4,147**	**8,354**	**1.99**
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105110	9,309	AD	Early Egg Progeny	1 2 3	16 10 ND	9 7 ND	25 17 ND	0.45
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105109	9,495	AD	Early Egg Progeny	1 2 3	12 10 ND	8 5 ND	20 15 ND	0.21
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105301	20,133	AD	Early Egg Progeny	1 2 3	36 16 ND	31 10 ND	67 26 ND	0.46
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105302	18,088	AD	Early Egg Progeny	1 2 3	48 76 ND	7 11 ND	55 87 ND	0.79
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	Untagged	1,127	AD	Early Egg Progeny	1 2 3	2 2 ND	5 1 ND	7 3 ND	0.89
			Totals:	**58,152**				**228**	**94**	**322**	**0.53**
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	105107	9,008	AD	Late Egg Progeny	1 2 3	46 11 ND	21 6 ND	67 17 ND	0.93
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104634	9,701	AD	Late Egg Progeny	1 2 3	26 12 ND	18 8 ND	44 20 ND	0.66
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104643	9,257	AD	Late Egg Progeny	1 2 3	20 21 ND	16 7 ND	36 28 ND	0.69
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104644	9,344	AD	Late Egg Progeny	1 2 3	38 22 ND	12 9 ND	50 31 ND	0.87
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104645	9,509	AD	Late Egg Progeny	1 2 3	23 25 ND	18 6 ND	41 31 ND	0.76
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104646	9,874	AD	Late Egg Progeny	1 2 3	35 12 ND	23 8 ND	58 20 ND	0.79
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	Untagged	7,069	AD	Late Egg Progeny	1 2 3	23 13 ND	29 5 ND	52 18 ND	0.99
			Totals:	**63,762**				**327**	**186**	**513**	**0.80**
			Total 1-Ocean:			**10,670**					
			Total 2-Ocean:			**3,273**					
			Total 3-Ocean:			**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	SAR (%)
		Total Harvest Recoveries:				**6,945**					
		Total Hatchery Recoveries:				**6,998**					
		Total Releases:				**1,133,825**					
		Total Recoveries:				**13,943**					

Appendix C. Table 3. Release and recovery data for brood year 1998 steelhead released from Magic Valley Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press) and Harrington (2005).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Salmon R @	1998	PAH A	105406	60,343	AD	Contribution	1	278	191	469	1.23
Red Rock							2	146	125	271	
4/16-4/26/1999							3	ND	ND	ND	
Salmon R @	1998	PAH A	Untagged	111,421	AD	Contribution	1	481	352	833	1.20
Red Rock							2	270	230	500	
4/16-4/26/1999							3	ND	ND	ND	
			Totals:	**171,764**				**1,175**	**898**	**2,073**	**1.21**
Salmon R @	1998	PAH A	105405	60,453	AD	Contribution	1	261	191	452	1.20
Shoup Brdg							2	148	125	273	
4/19-4/20/1999							3	ND	ND	ND	
Salmon R @	1998	PAH A	Untagged	71,967	AD	Contribution	1	311	228	539	1.20
Shoup Brdg							2	176	149	325	
4/19-4/20/1999							3	ND	ND	ND	
			Totals:	**132,420**				**896**	**693**	**1,589**	**1.20**
Salmon R @	1998	PAH A	105404	60,660	AD	Contribution	1	166	192	358	0.98
Tunnel Rock							2	110	125	235	
4/21-5/3/1999							3	ND	ND	ND	
Salmon R @	1998	PAH A	Untagged	68,553	AD	Contribution	1	188	217	405	0.98
Tunnel Rock							2	124	142	266	
4/21-5/3/1999							3	ND	ND	ND	
			Totals:	**129,213**				**588**	**676**	**1,264**	**0.98**
E Fk Salmon R @	1998	DWOR B	105403	59,129	AD,LV	Contribution	1	25	0	25	0.19
Dumpster							2	86	0	86	
4/29-5/5/1999							3	ND	ND	ND	
E Fk Salmon R @	1998	DWOR B	Untagged	209,796	AD	Contribution	1	89	0	89	0.19
Dumpster							2	305	0	305	
4/29-5/5/1999							3	ND	ND	ND	
			Totals:	**268,925**				**505**	**0**	**505**	**0.19**
Salmon R @	1998	DWOR B	105401	53,679	AD,LV	Contribution	1	0	0	0	0.11
Tunnel Rock							2	59	0	59	
4/28-5/3/1999							3	ND	ND	ND	
Salmon R @	1998	DWOR B	Untagged	24,455	AD	Contribution	1	0	0	0	0.12
Tunnel Rock							2	27	3	30	
4/28-5/3/1999							3	ND	ND	ND	
			Totals:	**78,134**				**86**	**3**	**89**	**0.11**
Squaw Cr	1998	DWOR B	105402	58,514	AD,LV	Contribution	1	28	0	28	0.18
							2	79	1	80	
4/30-5/11/1999							3	ND	ND	ND	

Appendix C. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Squaw Cr	1998	DWOR B	Untagged	146,292	AD	Contribution	1	70	0	70	0.19
							2	198	3	201	
4/30-5/11/1999							3	ND	ND	ND	
			Totals:	**204,806**				**375**	**4**	**379**	**0.19**
Squaw Creek Pond	1998	DWOR B	105255	14,422	AD,LV	Contribution	1	0	0	0	0.24
Below Outlet							2	32	3	35	
5/5/-5/12/1999							3	ND	ND	ND	
Squaw Creek Pond	1998	DWOR B	105253	16,772	AD,LV	Contribution	1	8	0	8	0.16
Below Outlet							2	17	2	19	
5/5-5/12/1999							3	ND	ND	ND	
Squaw Creek Pond	1998	DWOR B	105254	17,651	AD,LV	Contribution	1	12	0	12	0.10
Below Outlet							2	6	0	6	
5/5-5/12/1999							3	ND	ND	ND	
Squaw Creek Pond	1998	DWOR B	Untagged	58,165	AD	Contribution	1	24	0	24	0.16
Below Outlet							2	65	6	71	
5/5-5/12/1999							3	ND	ND	ND	
			Totals:	**107,010**				**164**	**11**	**175**	**0.16**
Squaw Cr Ponds	1998	DWOR B	Untagged	78,244	AD	Volitional	1	37	0	37	0.17
						Release Study	2	88	8	96	
4/7-4/12/1999							3	ND	ND	ND	
			Totals:	**78,244**				**125**	**8**	**133**	**0.17**
Lt Salmon R @	1998	PAH A	Untagged	41,620	AD	Contribution	1	82	82	164	0.60
Stinky Springs							2	0	86	86	
4/12-4/16/1999							3	ND	ND	ND	
			Totals:	**41,620**				**82**	**168**	**250**	**0.60**
Sawtooth	1998	PAH A	Untagged	39,660	AD	Contribution	1	104	162	266	0.96
Hatchery							2	65	50	115	
4/23/1999							3	ND	ND	ND	
			Totals:	**39,660**				**169**	**212**	**381**	**0.96**
Salmon R @	1998	PAH A	Untagged	121,210	AD	Contribution	1	332	383	715	0.98
McNabb Point							2	220	250	470	
4/23-4/28/1999							3	ND	ND	ND	
			Totals:	**121,210**				**552**	**633**	**1,185**	**0.98**
Lt Salmon R @	1998	DWOR B	105256	16,416	AD,LV	Contribution	1	0	0	0	0.10
Stinky Springs							2	15	1	16	
4/12-4/16/1999							3	ND	ND	ND	
Lt Salmon R @	1998	DWOR B	Untagged	308,139	AD	Contribution	1	0	0	0	0.10
Stinky Springs							2	282	11	293	
4/12-4/16/1999							3	ND	ND	ND	
			Totals:	**324,555**				**297**	**12**	**309**	**0.10**
Lemhi R:	1998	PAH A	Untagged	157,865	AD	Contribution	1	682	499	1,181	1.20
Salmon R							2	386	326	712	
4/19-4/26/1999							3	ND	ND	ND	
			Totals:	**157,865**				**1,068**	**825**	**1,893**	**1.20**
Salmon R @	1998	PAH A	Untagged	85,980	AD	Contribution	1	235	272	507	0.94
Cottonwood Cg							2	124	177	301	
4/29-5/5/1999							3	ND	ND	ND	

Appendix C. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
			Totals:	**85,980**				**359**	**449**	**808**	**0.94**
			Total 1-Ocean:			**6,182**					
			Total 2-Ocean:			**4,736**					
			Total 3-Ocean:			**ND**					
			Total Harvest Recoveries:			**6,441**					
			Total Hatchery Recoveries:			**4,592**					
			Total Releases:			**1,941,406**					
			Total Recoveries:			**11,033**					

Appendix D. Table 1. Release and recovery data for brood year 1997 steelhead released from Clearwater Fish Hatchery. All returns are complete at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
S FK CLWTR@	1997	DWOR B	104740	21,093	AD,LV	Contribution	1	0	2	2	0.13
RED HOUSE HOLE							2	0	7	7	
4/20-4/29/1998							3	14	4	18	
S FK CLWTR@	1997	DWOR B	104738	21,859	AD,LV	Contribution	1	0	2	2	0.34
RED HOUSE HOLE							2	48	7	55	
4/20-4/29/1998							3	14	4	18	
S FK CLWTR@	1997	DWOR B	104739	21,079	AD,LV	Contribution	1	0	2	2	0.06
RED HOUSE HOLE							2	0	7	7	
4/20-4/29/1998							3	0	4	4	
S FK CLWTR@	1997	DWOR B	Untagged	468,274	AD	Contribution	1	0	45	45	0.18
RED HOUSE HOLE							2	351	157	508	
4/20-4/29/1998							3	205	88	293	
			Totals:	**532,305**				**632**	**329**	**961**	**0.18**
RED RIVER:	1997	DWOR B	Untagged	4,497	NONE	Supplementation	1	0	0	0	0.18
S FK CLWTR						PIT tag only.	2	0	8	8	
4/24/1998							3	ND	ND	ND	
			Totals:	**4,497**				**0**	**8**	**8**	**0.18**
CLEAR CR:	1997	DWOR B	105225	20,851	AD,LV	Contribution	1	0	2	2	0.29
CLWTR R							2	51	7	58	
4/20-4/29/1998							3	0	0	0	
CLEAR CR:	1997	DWOR B	Untagged	144,633	AD	Contribution	1	0	14	14	0.31
CLWTR R							2	354	84	438	
4/20-4/29/1998							3	0	0	0	
			Totals:	**165,484**				**405**	**107**	**512**	**0.31**

Total 1-Ocean:	**67**
Total 2-Ocean:	**1,081**
Total 3-Ocean:	**333**
Total Harvest Recoveries:	**1,037**
Total Hatchery Recoveries:	**444**
Total Releases:	**702,286**
Total Recoveries:	**1,481**

Appendix D. Table 2. Release and recovery data for brood year 1997 steelhead released from Hagerman National Fish Hatchery. All returns are complete at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press), and Harrington (2005).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Sawtooth Hatchery 4/24/1998	1997	SAW A	104719	20,168	AD	Direct Rel./FeedRel. Feed-Fast Diet	1 2 3	77 10 0	35 1 0	112 11 0	0.61
Sawtooth Hatchery 4/24/1998	1997	SAW A	104717	19,105	AD	Direct Rel./FeedRel. Feed-Fast Diet	1 2 3	105 16 0	37 4 0	142 20 0	0.85
Sawtooth Hatchery 4/24/1998	1997	SAW A	104718	20,060	AD	Direct Rel./FeedRel. Feed-Fast Diet	1 2 3	73 15 0	39 3 0	112 18 0	0.65
Sawtooth Hatchery 4/24/1998	1997	SAW A	Untagged	2,022	AD	Direct Rel./FeedRel. Feed-Fast Diet	1 2 3	10 3 0	7 2 0	17 5 0	1.09
			Totals:	**61,355**				**309**	**128**	**437**	**0.71**
Lt Salmon R @ Stinky Springs 4/13-4/29/1998	1997	PAH A	104614	10,544	AD	Contribution	1 2 3	6 24 0	6 24 0	12 48 0	0.57
Lt Salmon R @ Stinky Springs 4/13-4/29/1998	1997	PAH A	104708	19,295	AD	Contribution	1 2 3	66 19 0	66 19 0	132 38 0	0.88
Lt Salmon R @ Stinky Springs 4/13-4/29/1998	1997	PAH A	Untagged	317,631	AD	Contribution	1 2 3	766 458 0	766 458 0	1,532 916 0	0.77
			Totals:	**347,470**				**1,339**	**1,339**	**2,678**	**0.77**
Sawtooth Hatchery 4/1-4/9/1998	1997	SAW A	104609	20,929	AD	Acclimated/ %body wt. diet	1 2 3	58 43 0	18 4 0	76 47 0	0.59
Sawtooth Hatchery 4/1-4/9/1998	1997	SAW A	104550	19,891	AD	Acclimated/ %body wt. diet	1 2 3	54 35 3	16 0 0	70 35 3	0.54
Sawtooth Hatchery 4/1-4/9/1998	1997	SAW A	104608	19,208	AD	Acclimated/ %body wt. diet	1 2 3	110 7 0	25 4 0	135 11 0	0.76
Sawtooth Hatchery 4/1-4/9/1998	1997	SAW A	Untagged	443,940	AD	Acclimated/ %body wt. diet	1 2 3	2,176 625 0	1,527 470 0	3,703 1,095 0	1.08
			Totals:	**503,968**				**3,111**	**2,064**	**5,175**	**1.03**
Sawtooth Hatchery 3/31/1998	1997	SAW A	104504	19,535	AD	Acclimated	1 2 3	114 14 3	31 6 0	145 20 3	0.86

Appendix D. 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	SAR (%)
Sawtooth	1997	SAW A	104503	20,790	AD	Acclimated	1	119	25	144	0.7
Hatchery							2	0	1	1	
3/31/1998							3	0	0	0	
Sawtooth	1997	SAW A	104720	19,442	AD	Acclimated	1	55	35	90	0.59
Hatchery							2	21	4	25	
3/31/1998							3	0	0	0	
Sawtooth	1997	SAW A	Untagged	808	AD	Acclimated	1	4	3	7	1.11
Hatchery							2	1	1	2	
3/31/1998							3	0	0	0	
			Totals:	**60,575**				**331**	**106**	**437**	**0.72**
Sawtooth	1997	SAW A	104549	20,409	AD	Acclimated	1	199	22	221	1.1
Hatchery						Feed-Fast Diet	2	0	3	3	
3/31-4/1/1998							3	0	0	0	
Sawtooth	1997	SAW A	104547	18,337	AD	Acclimated	1	144	31	175	1.02
Hatchery						Feed-Fast Diet	2	11	1	12	
3/31-4/1/1998							3	0	0	0	
Sawtooth	1997	SAW A	104548	17,839	AD	Acclimated	1	52	32	84	0.63
Hatchery						Feed-Fast Diet	2	25	4	29	
3/31-4/1/1998							3	0	0	0	
Sawtooth	1997	SAW A	Untagged	2,454	AD	Acclimated	1	12	8	20	1.06
Hatchery						Feed-Fast Diet	2	3	3	6	
3/31-4/1/1998							3	0	0	0	
			Totals:	**59,039**				**446**	**104**	**550**	**0.93**

Total 1-Ocean:	**6,929**
Total 2-Ocean:	**2,342**
Total 3-Ocean:	**6**
Total Harvest Recoveries:	**5,536**
Total Hatchery Recoveries:	**3,741**
Total Releases:	**1,032,407**
Total Recoveries:	**9,277**

Appendix D. Table 3. Release and recovery data for brood year 1997 steelhead released from Magic Valley Fish Hatchery. All returns are complete at this time. Data are shown by groups, with both hatchery and harvest recoveries for each tag code, along with any untagged fish, shown separately. Harvest estimates are based on angler phone surveys and creel census data. Hatchery estimates include rack returns along with estimates of in-stream escapement values. The total returns represent a minimum estimate of returns that do not include out-of-basin strays or prespawning mortalities. Recovery Data are from Hansen (In Press) and Harrington (2005).

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
E Fk Salmon R	1997	EAST FK B	104707	20,781	AD,LV	Contribution	1	3	0	3	0.35
Trap							2	70	0	70	
4/30-5/1/1998							3	0	0	0	
E Fk Salmon R	1997	EAST FK B	104705	21,372	AD,LV	Contribution	1	10	2	12	0.06
Trap							2	0	1	1	
4/30-5/1/1998							3	0	0	0	
E Fk Salmon R	1997	EAST FK B	104706	21,088	AD,LV	Contribution	1	0	0	0	0.09
Trap							2	17	1	18	
4/30-5/1/1998							3	0	0	0	
E Fk Salmon R	1997	EAST FK B	Untagged	63,679	AD	Contribution	1	13	26	39	0.24
Trap							2	88	27	115	
4/30-5/1/1998							3	0	0	0	
			Totals:	**126,920**				**201**	**57**	**258**	**0.20**
E Fk Salmon R @	1997	DWOR B	102143	20,367	AD,LV	Contribution	1	0	0	0	0.05
Dumpster							2	11	0	11	
4/24-4/29/1998							3	0	0	0	
E Fk Salmon R @	1997	DWOR B	102144	20,932	AD,LV	Contribution	1	0	0	0	0.03
Dumpster							2	7	0	7	
4/24-4/29/1998							3	0	0	0	
E Fk Salmon R @	1997	DWOR B	102145	19,811	AD,LV	Contribution	1	0	0	0	0.04
Dumpster							2	7	0	7	
4/24-4/29/1998							3	0	0	0	
E Fk Salmon R @	1997	DWOR B	Untagged	224,916	AD	Contribution	1	0	7	7	0.04
Dumpster							2	92	0	92	
4/24-4/29/1998							3	0	0	0	
			Totals:	**286,026**				**117**	**7**	**124**	**0.04**
Salmon R @	1997	SAW A	102142	19,786	AD	Contribution	1	109	26	135	0.96
McNabb Point							2	28	26	54	
4/16-4/17/1998							3	0	0	0	
Salmon R @	1997	SAW A	102140	21,016	AD	Contribution	1	125	27	152	0.89
McNabb Point							2	8	28	36	
4/16-4/17/1998							3	0	0	0	
Salmon R @	1997	SAW A	102141	20,191	AD	Contribution	1	75	26	101	0.77
McNabb Point							2	27	27	54	
4/16-4/17/1998							3	0	0	0	
Salmon R @	1997	SAW A	Untagged	97,667	AD	Contribution	1	495	14	509	0.76
McNabb Point							2	101	128	229	
4/16-4/17/1998							3	0	0	0	
			Totals:	**158,660**				**968**	**302**	**1,270**	**0.80**

Appendix D. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Salmon R @ Shoup Brdg 4/20-4/21/1998	1997	SAW A	102139	17,514	AD	Contribution	1	7	23	30	0.41
							2	19	23	42	
							3	0	0	0	
Salmon R @ Shoup Brdg 4/20-4/21/1998	1997	SAW A	102137	21,696	AD	Contribution	1	90	28	118	0.73
							2	9	29	38	
							3	0	0	0	
Salmon R @ Shoup Brdg 4/20-4/21/1998	1997	SAW A	102138	21,478	AD	Contribution	1	70	28	98	0.60
							2	3	28	31	
							3	0	0	0	
Salmon R @ Shoup Brdg 4/20-4/21/1998	1997	SAW A	Untagged	48,227	AD	Contribution	1	134	63	197	0.59
							2	25	63	88	
							3	0	0	0	
			Totals:	**108,915**				**357**	**285**	**642**	**0.59**
Salmon R @ Red Rock 4/23-4/24/1998	1997	PAH A	102136	16,299	AD	Contribution	1	60	21	81	0.67
							2	8	21	29	
							3	0	0	0	
Salmon R @ Red Rock 4/23-4/24/1998	1997	PAH A	102134	21,407	AD	Contribution	1	22	28	50	0.48
							2	25	28	53	
							3	0	0	0	
Salmon R @ Red Rock 4/23-4/24/1998	1997	PAH A	102135	21,639	AD	Contribution	1	105	28	133	0.86
							2	25	28	53	
							3	0	0	0	
Salmon R @ Red Rock 4/23-4/24/1998	1997	PAH A	Untagged	77,715	AD	Contribution	1	245	101	346	0.67
							2	76	102	178	
							3	0	0	0	
			Totals:	**137,060**				**566**	**357**	**923**	**0.67**
Lt Salmon R @ Stinky Springs 4/13-4/15/1998	1997	DWOR B	102133	20,212	AD,LV	Contribution	1	0	0	0	0.00
							2	0	0	0	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/13-4/15/1998	1997	DWOR B	102131	21,428	AD,LV	Contribution	1	0	0	0	0.00
							2	0	0	0	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/13-4/15/1998	1997	DWOR B	102132	20,983	AD,LV	Contribution	1	0	0	0	0.00
							2	0	0	0	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/13-4/15/1998	1997	DWOR B	Untagged	218,326	AD	Contribution	1	0	0	0	0.00
							2	0	0	0	
							3	0	0	0	
			Totals:	**280,949**				**0**	**0**	**0**	**0.00**
E Fk Salmon R @ Dumpster 4/28/1998	1997	DWOR B	Untagged	35,700	AD	Fin Erosion Study	1	0	1	1	0.04
							2	15	0	15	
							3	0	0	0	
			Totals:	**35,700**				**15**	**1**	**16**	**0.04**
Squaw Cr Ponds 4/10-4/13/1998	1997	DWOR B	Untagged	52,800	AD	Volitional Release Study	1	0	0	0	0.00
							2	0	0	0	
							3	0	0	0	
			Totals:	**52,800**				**0**	**0**	**0**	**0.00**

Appendix D. Table 3. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Slate Cr:	1997	EAST FK B	102146	21,173	AD,LV	Contribution	1	7	1	8	0.22
U Salmon R							2	37	1	38	
5/4/-5/7/1998							3	0	0	0	
Slate Cr:	1997	EAST FK B	102147	21,178	AD,LV	Contribution	1	3	1	4	0.19
U Salmon R							2	35	1	36	
5/4/-5/7/1998							3	0	0	0	
Slate Cr:	1997	EAST FK B	102148	17,324	AD,LV	Contribution	1	5	1	6	0.06
U Salmon R							2	4	1	5	
5/4/-5/7/1998							3	0	0	0	
Slate Cr:	1997	EAST FK B	Untagged	114,905	AD	Contribution	1	29	4	33	0.16
U Salmon R							2	146	4	150	
5/4/-5/7/1998							3	0	0	0	
			Totals:	**174,580**				**266**	**14**	**280**	**0.16**
Salmon R @	1997	SAW A	Untagged	142,650	AD	Contribution	1	723	185	908	0.87
Cottonwood Cg							2	147	188	335	
4/17-4/20/1998							3	0	0	0	
			Totals:	**142,650**				**0**	**0**	**0**	**0.87**
Lemhi R:	1997	PAH A	Untagged	154,565	AD	Contribution	1	430	201	631	0.59
Salmon R							2	79	203	282	
4/21-4/22/1998							3	0	0	0	
			Totals:	**154,565**				**509**	**404**	**913**	**0.59**

Total 1-Ocean:	**3,602**
Total 2-Ocean:	**2,067**
Total 3-Ocean:	**0**
Total Harvest Recoveries:	**3,869**
Total Hatchery Recoveries:	**1,800**
Total Releases:	**1,658,825**
Total Recoveries:	**5,669**

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