

# FISHERY RESEARCH



## STEELHEAD FISH HATCHERY EVALUATIONS—IDAHO

### Project Progress Report

October 1, 2002 to September 30, 2003



Dmitri Videgar; photo courtesy of Ken Cole

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# **Steelhead Fish Hatchery Evaluations—Idaho**

**2003 Annual Report**

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**To**

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## ABSTRACT

This annual report summarizes activities associated with Idaho-Lower Snake River Compensation Plan (LSRCP) hatcheries' activities from October 1, 2002 through September 30, 2003. Included in this report are all fall 2002 and spring 2003 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 43,293 adult LSRCP steelhead returned to Idaho in the fall of 2002 and spring of 2003. This return total consisted of 10,337 estimated to have returned from Hagerman National Fish Hatchery releases, 26,169 estimated to have returned from Magic Valley Fish Hatchery releases, and 6,787 estimated to have returned from Clearwater Fish Hatchery releases. Totals do not include returns of nonadipose clipped adults, which could not be evaluated. The total adult return exceeded the LSRCP goal of 39,260 for Idaho steelhead facilities.

In April and May 2003, the Idaho-LSRCP hatcheries released 3,960,962 steelhead smolts of brood year 2002. Clearwater Fish Hatchery released 894,605 Dworshak B-stock smolts. Hagerman National Fish Hatchery released 1,265,418 smolts that were a mixture of Sawtooth A, Pahsimeroi A, and Dworshak B-stock. Magic Valley Fish Hatchery released 1,800,939 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 2003 were about average. Total flow and spill at Lower Granite during both the peak migration period and the extended migration period were about average. All steelhead arriving at Lower Granite Dam that were determined to have a PIT tag were diverted onto barges for transport. This meant that the use of PIT tags to determine survival to Lower Granite Dam was unreliable.

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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 the documentation of 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, 2002 and September 30, 2003 are documented in this report. Any information relevant to the quality of the brood year 2002 smolts released in 2003, or relevant to the early rearing success of brood year 2003, 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 IDFG coded-wire tag recovery laboratory.

### **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 which 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, 352,304 steelhead from Clearwater Fish Hatchery, 517,517 steelhead from Hagerman National Fish Hatchery, and 27,707 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 27,707 supplementation steelhead released from Magic Valley Fish Hatchery 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 2002 and the spring of 2003. These adults were from the out-migrations in the springs of 1999, 2000, or 2001. Therefore, the flow conditions during the emigration period for these three years, as well as the flow conditions during the emigration period of 2003, are reported. Water flow data for these periods was obtained through the Columbia River DART (Data Access in Real Time) web site.

Petrosky (1991) defined two time periods that accounted for most of the Chinook 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.

### **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 crews 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 (HMP) estimated the number of LSRCP steelhead that returned to Idaho in the 2002-2003 return year (Hansen In Press). This estimate includes steelhead caught in the sport harvest, 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 that had fish returning to spawn in the spring of 2003 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 recovery of all steelhead for the section was 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, 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. All adult steelhead recovered at the traps were measured for length, 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 2003, 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**

#### **Magic Valley Fish Hatchery**

**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.

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, 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 and late migrants were PIT tagged to measure out-migration survival and timing. The late migrant group was taken from among the last few thousand smolts remaining in the pond after the last dam board had been removed.

Beginning in 2003, the fish released into Squaw Pond consisted of roughly equal numbers of both Dworshak and Upper Salmon B-stock smolts. All fish released into the pond had previously received coded-wire tags, and the two stocks were tagged with different codes, which allowed for a comparison of both pond retention as well as adult return performance. This was a departure from previous years when the Upper Salmon B-stock smolts had been released directly into the creek and, therefore, could not be directly compared to the Dworshak B-stock smolts. One result of this release strategy was that it was impossible to be certain which stock received the PIT tags used for migration survival determinations. It had to be assumed that migration performance for the two stocks was comparable.

A sample of the smolts remaining in the pond at the time of PIT tagging was examined for internal signs of precocial development. Smolts were examined until 100 males had been sampled. Since the two stocks of fish in the pond had different tag codes, snouts were removed from fish sampled during the precocity study to determine whether the rate of retention in the pond, or the rate of precocity of the males were different between the two stocks.

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 2002**—A total of 1,065,391 Dworshak B-stock eyed steelhead eggs were received from Dworshak National Fish Hatchery (McGehee and Hutzenbiler 2003). These eggs were all from the middle or later egg takes and did not represent the entire run. It is common practice for steelhead eggs taken for the Clearwater Fish Hatchery to not represent the entire run, since the juveniles will not be expected to return to a hatchery weir and will not be part of a broodstock program. Survival from eyed-egg to smolt was reported to be 87.9% (McGehee and Hutzenbiler 2003), which is comparable to previous years.

The brood year 2002 steelhead were ad clipped as they were moved to the final rearing raceways using the Mass Automated Tagging System (MATS) trailers. This was the first year that the MATS system, which is capable of marking fish without the use of anesthetic and with minimal handling stress on the fish, was used to mark steelhead. However, since the MATS trailer is incapable of clipping the ventral fins, all coded-wire-tagged steelhead that received a left ventral clip to indicate the presence of a tag had to be marked manually. Complete information on marks applied, release sites, numbers released, and release timing can be found in Appendix A, Table 1.

Survival to Lower Granite Dam for brood year 2002 could not be accurately determined. Prior to the migration period, a decision was made to shunt all PIT-tagged smolts detected at Lower Granite Dam into barges. This action violated the assumptions of the SURPH model used to estimate survival, which means that none of the survival values for any of the sites is reliable for brood year 2002. The calculated survival estimates are presented in Table 1.

**Brood Year 2003**—A total of 1,545,221 Dworshak B-stock eyed steelhead eggs were received from Dworshak National Fish Hatchery (George et al. 2004). These eggs were all from fish spawned in the middle of the run and, therefore, did not represent the entire run. It is common practice for steelhead eggs taken for the Clearwater Fish Hatchery to not represent the entire run, since the juveniles will not be expected to return to a hatchery weir, and will not be part of a broodstock program. The eggs from brood year 2003 were received before they had been picked to remove unfertilized or dead eggs. Once these nonviable eggs had been removed, the total number of viable eyed eggs had been reduced to 1,481,444.

Survival of the eyed eggs to the time they were moved into the ponds was 95.7%. This figure reflects only the viable eggs that remained after the first picking, and does not include any eggs that were determined to be nonviable at the time they arrived from Dworshak National Fish Hatchery.

### **Hagerman National Fish Hatchery**

**Brood Year 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) to comprise the total releases in 2002. These eggs received from Sawtooth Fish Hatchery consisted of two stocks: 965,031 Sawtooth A-stock, and 212,405 Pahsimeroi A-stock, while the eggs from Clearwater Fish Hatchery consisted of 217,400 Dworshak B-stock (Hagerman National Fish Hatchery 2002). Survival from egg to release was 91.2% for the Sawtooth A-stock, 92.1% for the Pahsimeroi A-stock, and 87.5% for the Dworshak B-stock. This was very good survival for all stocks, and reflected the excellent health of all stocks seen during the entire year.

Portions of the brood year 2002 steelhead at Hagerman National Fish Hatchery were being used to test the effectiveness of beta-glucan supplemented feed and vaccines in reducing mortality during hatchery rearing (Hagerman National Fish Hatchery 2003). This study was initiated to find a way to reduce the impact of a recurring Furunculosis problem at the hatchery. However, the excellent health of this stock throughout the hatchery cycle made it difficult to evaluate the effectiveness of the feed and vaccine treatments.

Survival to Lower Granite Dam for brood year 2002 could not be accurately determined. Prior to the migration period, a decision was made to shunt all PIT-tagged smolts detected at Lower Granite Dam into barges. This action violated the assumptions of the SURPH model used to estimate survival, which means that none of the survival values for any of the sites is reliable for brood year 2002. The calculated survival estimates are presented in Table 1.

Complete information on release timing and marks on production steelhead can be found in Appendix A, Table 2.

**Brood Year 2003**—During late May and early June 2002, a total of 1,405,008 eyed steelhead eggs were received from Sawtooth Fish Hatchery and Clearwater Fish Hatchery (Hagerman National Fish Hatchery 2003). The eggs received from Sawtooth Fish Hatchery consisted of 939,025 Sawtooth A-stock and 218,749 Pahsimeroi A-stock, while the eggs received from Clearwater Fish Hatchery consisted of 247,234 Dworshak B-stock. Hatching success for the two A-strain stocks was about 97.5% (Hagerman National Fish Hatchery 2003), while the hatching success for the Dworshak B-stock was 88.6%.

## **Magic Valley Fish Hatchery**

**Brood Year 2002**—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: 1,019,468 Dworshak B, 81,206 Upper Salmon B, 910,249 Pahsimeroi A, 399,000 Sawtooth A, and 32,382 East Fork Natural eggs (Lowell et al. 2003). Average survival to release for all stocks was 81%, with the Dworshak B, Upper Salmon B, and East Fork Natural stocks having survival to release of 80.2%, 71.6%, and 85.6%, respectively. Survival for the two A stocks was 85.0% for the Pahsimeroi A and 73.5% for the Sawtooth A. Unlike past years, the Dworshak B stock performed at the average of all stocks. Normally, the Dworshak B-stock has a lower egg-to-smolt survival at Magic Valley Fish Hatchery. Complete information on marks applied, release locations, and release timing can be found in Appendix A, Table 3.

The Dworshak B-stock steelhead had an outbreak of Infectious Hematopoietic Necrosis (IHN), which caused some mortality in this stock (Lowell et al. 2003). The disease was treated by reducing feeding and stress on the stock until mortalities had declined. No other significant disease outbreaks occurred in the brood year 2002 steelhead.

Survival to Lower Granite Dam of the PIT-tagged fish was largely inconclusive, with percent survival ranging from 35% to 99% (Table 1). However, because there was a policy of intercepting and barging all PIT-tagged steelhead in 2003, as noted for Clearwater Fish Hatchery, the SURPH model had insufficient data to create a survival estimate for three of the groups, and the estimate for the remaining groups is likely to be inaccurate.

Mean travel time of the PIT-tagged groups of fish varied from 15 days to 30 days (Table 1) with the only exception being the late group from Squaw Creek, which had a mean migration time of only 9.6 days. This fast migration from a point that is nearly the furthest from the dam for all release sites was caused by the fish being released into an exceptional flood event. At the time of release, Squaw Creek was out of its banks, and the Salmon River was exhibiting extremely high flows.

**Brood Year 2003**—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: 932,191 Dworshak B, 78,006 Upper Salmon B, 854,718 Pahsimeroi A, 480,000 Sawtooth A, and 57,876 East Fork Natural eggs (Lowell et al. 2004). The Dworshak B-stock early survival was estimated to be somewhat lower than the other stocks, but still around 90% (Rick Lowell, IDFG, personal communication). This indicates that there were no severe problems during early rearing, which would have caused a noticeable increase in the mortality for one or more of the stocks.

### **Migration Conditions**

Flows at Lower Granite Dam during the spring migration period in 2003 were near the average for the last decade (Table 2). Since the last decade included several years that could be considered drought years, an average flow may still result in lower juvenile survival through the migration corridor. However, despite the average flows, a larger proportion of the flow was directed over the spillways than had been seen in past years. Because of this increase in spill, it is likely that a greater percentage of migrating smolts went over the spillway, which may have an impact on their survival. However, some studies have shown that this impact, while beneficial for natural-origin fish, might not be beneficial for hatchery-origin fish (Berggren et al. 2006).

### **Migration Timing and Juvenile Survival**

A total of 9,155 steelhead smolts were released with PIT tags in 2003. These included a mix of production and supplementation fish. Unfortunately, a decision was made to divert all PIT-tagged smolts detected at Lower Granite Dam into barges for transporting through the system. As noted earlier, this violated the assumptions of the SURPH model and rendered the results unreliable. All survival and mean migration times can be found in Table 1; however, there are several release groups for which there were not enough PIT tags detected at dams below Lower Granite to generate any survival estimate, while for other groups the survival estimate was well over 100% with very large confidence intervals. In general, because of the decision to retain tagged fish, the results from 2003 showed no pattern.

### **Adult Returns**

The HMP (Hansen In Press) estimated that Hagerman National, Magic Valley, and Clearwater fish hatcheries returned a minimum of 43,293 adult steelhead to Idaho waters in the fall of 2001 and spring of 2002 (Table 3). 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, which were not marked and were therefore not accessible to either the fishery or a hatchery weir. Hansen (In Press) estimated that anglers harvested 28,774 steelhead, while 14,519 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 2002-2003 return year was the best return year for Magic Valley and Clearwater fish hatcheries, though there was an unexplained decline in the returns for Hagerman National Fish Hatchery when compared to the previous return year. 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 1,868 adult steelhead (Table 12). The majority of the recoveries were in the Columbia River (78.1%), with the Deschutes River accounting for most of the remainder. Unfortunately, it is clear that not all of the out-of-state recoveries have been reported by other states. Most notably, there were no recoveries reported for the entire Snake River outside of Idaho, which is only possible if either

the fisheries were not sampled or if the data has not yet been reported. 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 40,543 hatchery steelhead during the 2002-2003 steelhead season. Of these, 28,774 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 2,461 adult A-stock steelhead were trapped at the Sawtooth Fish Hatchery weir between March 18 and May 5, 2003 (Snider et al. 2004). This total consisted of 1,168 males (47.5%) and 1,293 females (52.5%) (Table 5). Of the 1,168 males, 1,154 were of hatchery-origin (98.8%), and 962 (83.4%) of those were 1-ocean fish. Of the 1,293 females, 1,277 were of hatchery-origin (98.8%) with 619 (48.5%) of those being 1-ocean fish.

All wild/natural fish were released directly above the weir for natural spawning (Snider et al. 2004). An additional 10 pairs of hatchery fish (10 males and 10 females) were released into weired off sections of both Frenchman and Beaver Creeks for IDFG supplementation studies (Byrne 2004), and 200 pair were released into the Yankee Fork for the Shoshone-Bannock Tribe supplementation program. The remaining 48 hatchery-origin adults that were released were released at Torrey's Hole to enhance angling opportunity.

A total of 508 pairs of hatchery-origin steelhead were spawned at the Sawtooth trap in 2003, yielding 2,807,840 green eggs (Snider et al. 2004). Survival to eye-up for these eggs was 84.2%, which resulted in 2,363,746 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**—The East Fork Trap was operated from March 25 through May 9 in 2003, and a total of 47 adult steelhead were trapped during that time (Snider et al. 2004). These fish were primarily natural origin fish, and no adult hatchery-origin steelhead were expected to return to the trap in 2003. Of the 44 natural-origin fish recovered, 14 (31.8%) were male and 30 (68.2%) were female. Eight of the natural-origin males (53.3%), and 24 of the natural-origin females (80%), were 2-ocean adults based on the length criteria used at the trap. All three of the hatchery-origin adult steelhead recovered at the weir in 2003 were 1-ocean males. The complete disposition of all fish trapped can be found in Table 6.

**Crooked River Weir**—Trapping at the Crooked River trap began on March 4, 2003 and continued through the Chinook salmon run later in the summer (Clearwater Fish Hatchery, Unpublished Run Report). During that time, 13 adult steelhead, of which six (46.2%) were natural-origin and seven (53.8%) were hatchery-origin, were recovered at the trap. Only one male in each origin type was classified as a 1-ocean adult, while the remainder were classified as 2-ocean adults. Five of the hatchery-origin and four of the natural-origin adults were males, which meant that there were only two natural-origin and two hatchery-origin females.

All natural-origin steelhead were released above the weir for spawning, while all hatchery-origin steelhead were returned to the river below the weir. No fish were spawned at the hatchery, and no eggs were taken. The complete breakdown of fish trapped, and disposition, can be found in Table 7.

**Red River Weir**—The Red River trap began operation on March 17, 2003 and continued through Chinook season (Clearwater Fish Hatchery, Unpublished Run Report). A total of 11 adults, of which 10 were natural-origin were trapped during this time. The single hatchery-origin adult was a 2-ocean male, which was released below the trap as required by the trap protocol. Of the 10 natural-origin adults, all were classified as 2-ocean adults, and nine of the 10 were males. The complete breakdown of fish trapped and disposition can be found in Table 8.

**Squaw Creek Weir**—All information for trapping at Squaw Creek can be found under the Squaw Creek portion of the Experimentation.

### **Smolt-to-Adult Return Rates**

#### **Clearwater Fish Hatchery**

The 2003 return year completed the run of the brood year 1998 steelhead released from Clearwater Fish Hatchery in 1999. A total of 143, 3-ocean adult steelhead were recovered in the 2003 run year, which gave a total SAR for the adipose-clipped smolts of 0.78% (Appendix D, Table 1). There were 4,993 unclipped smolts included in the release of brood year 1998 steelhead. An SAR was not calculated for these smolts. The 3-ocean adult returns in 2004 comprised 3.09% of the total adult returns of brood year 1998 steelhead.

A total of 6,238, 2-ocean steelhead were estimated to have returned in 2003, from the total brood year 1999 release of 495,273 adipose clipped smolts (Appendix C, Table 1). In addition to the clipped smolts, the brood year 1999 release included 239,993 unclipped smolts. No SAR estimate could be derived for these fish. The SAR for the clipped fish released from brood year 1999 after two years of adult returns was 1.37%.

A total of 406, 1-ocean steelhead were estimated to have returned from a total brood year 2000 release of 346,605 (Appendix B, Table 1). In addition to the clipped smolts, the brood year 2000 release included 440,049 unclipped smolts. No SAR estimate could be derived for these fish. The SAR for the clipped fish released from brood year 2000, after their first year's returns, was 0.09%. Since all of the smolts in this release were B-run, which typically do not return as 1-ocean fish, this number is likely to rise considerably in subsequent years.

#### **Hagerman National Fish Hatchery**

There were 37 adult steelhead recovered in 2003 from a total brood year 1998 release of 1,133,825 (Appendix D, Table 2). This was not unexpected, since the entire brood year 1998 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 1999 was 1.23%, which continued the improving performance seen in past years.

A total of 6,114 2-ocean adult steelhead returned in 2003 from a brood year 1999 release of 1,174,883 (Appendix C, Table 2). This return greatly improved the SAR over the first

year's returns, but considering the large number of both 1-ocean and 2-ocean returns from brood year 1999, it is reasonable to expect that there will be a few 3-ocean returns contributing to the total SAR for this brood year. After two years, the SAR was 2.10%, which is considerably better than brood year 1998 and will probably not rise very much after the 2004 returns.

The first year of returns for brood year 2000 was quite a bit lower than the first year of either brood years 1999 or 1998. This decrease probably indicates declining ocean conditions. A total of 4,186 adult steelhead were recovered from a release of 1,229,288 (Appendix B, Table 2). However, this total included 521,454 smolts that did not receive an adipose clip. Once these fish had been removed from the total, the first-year SAR for brood year 2000 was 0.59.

### **Magic Valley Fish Hatchery**

A total of 26, 3-ocean adult steelhead were recovered from a total release 1,941,406 brood year 1998 smolts (Appendix D, Table 3). The total SAR for brood year 1998 smolts was 0.57%. The SAR for the Dworshak B-stock steelhead, which made up slightly more than half of the total release, was 0.15%, while the SARs for the Pahsimeroi A-stock smolts, which made up the remainder of the release, was 1.07%. Neither stock returned at the same rate as the smolts released from Hagerman National Fish Hatchery, but the Pahsimeroi stock was reasonably close.

A total of 5,684 adult 2-ocean steelhead contributed to the 2003 return from an ad clipped smolt release of 1,784,181 from brood year 1999 (Appendix C, Table 3). The total smolt release from brood year 1999 included 265,858 unmarked fish, but the returns from these releases could not be adequately evaluated as they were neither caught in the fishery nor returned to a hatchery weir. This gave an overall SAR for brood year 1999 of 1.30%. The different stocks included in this return had markedly different SARs, with the Dworshak B stock having an SAR of only 0.28%, while the Pahsimeroi A, Sawtooth A, and Hells Canyon A-stocks had SARs of 2.24%, 2.21%, and 2.93%, respectively. The Upper Salmon B-stock had an SAR of 0.38%.

The first year of adult recoveries for brood year 2000 steelhead was 20,459 which gives an SAR of 1.01% overall (Appendix B, Table 3). The Dworshak B and Upper Salmon B-stock smolts, which would not be expected to return as 1-ocean adults, had SARs of only 0.05% and 0.54%, respectively. The A-run stocks, which return predominantly as 1-ocean adults, had a combined SAR of 1.25%.

## **Experimentation**

### **Squaw Pond**

The PIT tagged group of smolts taken from among the first thousand smolts leaving the pond had a considerably higher survival to Lower Granite Dam (81.4%) than did the group which was released directly into the creek (69.0%) (Table 1). The group that was tagged from the last few thousand fish remaining in the pond had a survival to lower Granite Dam (55.8%) which was a little lower than the creek group, but was still quite high. As noted earlier, the majority of PIT-tagged smolts in 2003 were diverted onto barges at Lower Granite Dam for transport through the hydrosystem. This violated the assumptions for the SURPH model and renders the survival estimates of the early and creek groups unreliable. However, the late group

was not diverted, and the estimate for that group is probably the most reliable of all groups of PIT-tagged steelhead released in 2003. Since the early and creek groups are not reliable, no comparison with them should be made; however, it is worth noting that the survival of the late group was fairly good.

A precocity sample taken from among the early fish leaving the pond showed zero precocial males out of a total of 107 males sampled. The sex ratio for the fish sampled at this time was 93 females (46.5%) to 107 males (53.5%).

Of the 102 males sampled for precocity among the fish remaining in the pond at the end of the study, 19 (18.6%) were found to have any precocial development, which is considerably higher than the sample taken from among the early migrant group. However, the sex ratio of the late migrant group was only slightly changed from that of the early migrant group, with 80 females (44.0%) to 102 males (56.0%). This meant that a significant number of the smolts retained in the pond were actually females, and the high survival of the PIT-tagged smolts suggests that the majority of these fish, if they had been forced out of the pond, would have successfully migrated.

The adult trap was moved downstream about a kilometer to a location approximately 100 meters upstream from the mouth of Squaw Creek in 2003. This move was made because of the large numbers of adult steelhead observed below the trap in 2002 that were forming redds and did not ascend the creek far enough to be trapped.

Throughout the trapping season, 91 adult steelhead were recovered at the Squaw Creek Trap. Of these adults, only 28 (5 natural-origin, 23 hatchery-origin) were large enough to meet the size criteria used for B-run fish. A complete breakdown of the origin, gender, and size criteria of fish trapped at the Squaw Creek Trap can be found in Table 13. All of the hatchery-origin B-size adults were transported to the East Fork Trap facility to be held for spawning.

Sixteen adult females were spawned at the East Fork Trap yielding 128,379 green eggs (Snider et al. 2004). The relatively small number of B-size males recovered at the trap meant that most males had to be spawned multiple times, which probably depressed fertilization. Only 78,006 eyed eggs were produced, which gives an eye-up percentage of only 60.8% for brood year 2003.

The heavy weir that had first been used in 2002 was used again in 2003, though no high water was encountered during trapping. The entrance to the trap box was altered several times over the course of the trapping season to try to increase the retention of adults that entered the trap. Several adult steelhead were observed to enter the trap, then swim back out. While these adults may have been trapped at a later date, the fact that steelhead were capable of exiting the trap almost certainly reduced the total trap numbers in 2003.

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Table 1. Survival estimate and 95% confidence interval to Lower Granite Dam for PIT-tagged steelhead smolts for the 2003 migration period. All data was generated from the SURPH program using data obtained from the PTAGIS web site. These values are suspect due to a decision to barge all collected smolts during the bulk of 2003.

Coord. ID	Release Site	Number Rel.	Release Date	LGR % Survival	95% CI	Mean Travel Time (days)	95 % CI
<b>Clearwater Fish Hatchery</b>							
<i>Dworshak B-stock</i>							
DTV	Red House Hole						
	DTV03057.10E	294	4/18/03	105.1	62.1	8.5	5.8
	DTV03057.11E	292	4/18/03	67.8	18.9	11.3	8.1
	DTV03057.12E	298	4/18/03	75.8	19.7	8.8	6.3
DTV	Crooked R Ponds (Ad LV CWT)	299	4/19/03	75.9	39.6	26.5	12.8
DTV	Crooked River Ponds (No Mark)	543	4/19/03	39.1	5.4	29.2	13.0
DTV	Red River Ponds	535	4/17/03	86.7	37.1	25.7	11.9
DTV	Lolo Creek	535	4/22/03	82.1	28.3	11.5	6.7
DTV	Mill Creek	526	4/23/03	31.4	4.7	17.0	6.1
<b>Hagerman National Fish Hatchery</b>							
<i>Sawtooth A</i>							
DTV	Sawtooth Fish Hatchery	300	4/9/03	Ins.	-	31.7	13.5
DTV	Yankee Fork Dredge Ponds	299	5/14/03	Ins.	-	12.5	5.3
<i>Pahsimeroi A</i>							
DTV	Little Salmon River	299	3/31/03	99.3	57.8	30.0	14.6
<i>Dworshak B</i>							
DTV	American River	534	5/2/03	105.1	66.8	23.1	11.9
DTV	Newsome Creek	533	5/7/03	150.3	102.4	17.3	12.6
<b>Magic Valley Fish Hatchery</b>							
<i>Pahsimeroi A</i>							
DTV	Lemhi R @ Hayden Creek	299	4/7/03	85.2	23.7	15.2	11.3
DTV	Lemhi R @ County Scale	298	4/7/03	34.9	2.8	29.6	17.2
DTV	Salmon R @ Colston Corner	599	4/15/03	46.6	2.0	20.2	10.8
DTV	Salmon R @ Hammer Creek	298	4/11/03	85.2	23.7	15.2	11.3
DTV	Salmon R @ McNabb Point	300	4/18/03	Ins.	-	19.8	10.9
DTV	Salmon R @ Red Rock	301	4/14/03	Ins.	-	20.8	9.9
<i>Sawtooth A</i>							
DTV	West Fork Yankee Fork	300	4/28/03	60.3	28.2	19.8	7.4
DTV	Valley Creek	298	4/25/03			21.6	8.2
<i>Dworshak B</i>							
DTV	Little Salmon R @ Stinky Springs	279	4/9/03	99.3	57.8	30.0	14.6
DTV	Squaw Creek	297	4/21/03	69.0	23.0	23.8	6.9
<i>Dworshak B / Upper Salmon B</i>							
DTV	Squaw Pond (early group)	300	4/29/03	81.4	13.6	19.6	6.5
DTV	Squaw Pond (late group)	299	6/03/03	55.8	5.3	9.6	8.5

Table 2. Snake River mean daily outflow and spill (thousand cubic feet per second) for the Lower Granite Dam fore bay in Washington from 1977-2003 during the Peak and Extended Chinook salmon smolt migration periods as defined by Petrosky (1991).

<b>Year</b>	<b>Peak (4/15 – 5/5)</b>	<b>Extended (4/20 – 5/30)</b>	<b>Peak Spill (4/15 – 5/5)</b>	<b>Extended Spill (4/20 – 5/30)</b>
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
2003	72.4	86.3	20.5	26.9

Table 3. Estimated number of LSRCP hatchery steelhead that returned to Idaho in 2002-2003. The adult returns in 2002-2003 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	1998	143	—	—
Clearwater	1999	—	6,238	—
Clearwater	2000	—	—	406
<b>Estimated Fish Returned in 2002-2003</b>			<b>6,787</b>	
Hagerman	1998	37	—	—
Hagerman	1999	—	6,114	—
Hagerman	2000	—	—	4,186
<b>Estimated Fish Returned in 2002-2003</b>			<b>10,337</b>	
Magic Valley	1998	26	—	—
Magic Valley	1999	—	5,684	—
Magic Valley	2000	—	—	20,459
<b>Estimated Fish Returned in 2002-2003</b>			<b>26,169</b>	
<b>GRAND TOTAL</b>			<b>43,293</b>	

Table 4. Steelhead smolts released from Magic Valley, Hagerman National, and Clearwater fish hatcheries that contributed to the 2002-2003 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.

<b>Brood Year</b>	<b>Fish Hatchery</b>	<b>Number Released</b>	<b>Design Target</b>	<b>Percent of Target</b>	<b>2000-01 Adult Returns</b>	
1998	Clearwater	595,997	2,000,000	29.8%	143	
1998	Hagerman National	1,133,825	2,400,000	47.2%	37	
1998	Magic Valley	1,941,406	2,000,000	97.1%	26	
	<b>Total</b>	<b>3,671,228</b>	<b>6,150,000</b>	<b>59.7%</b>	<b>206</b>	
1999	Clearwater	735,266	2,000,000	36.8%	6,238	
1999	Hagerman National	1,174,883	2,400,000	49.0%	6,114	
1999	Magic Valley	2,050,039	2,000,000	102.5%	5,684	
	<b>Total</b>	<b>3,960,188</b>	<b>6,150,000</b>	<b>64.4%</b>	<b>18,036</b>	
2000	Clearwater	786,654	2,000,000	39.3%	406	
2000	Hagerman National	1,229,288	2,400,000	51.2%	4,186	
2000	Magic Valley	2,022,018	2,000,000	101.1%	20,459	
	<b>Total</b>	<b>4,037,960</b>	<b>6,150,000</b>	<b>65.7%</b>	<b>25,051</b>	
Mean annual release as percent of target:				63.3%		
					<b>Total adult return:<sup>a</sup></b>	<b>43,293</b>
					<b>Adult return goal:</b>	<b>39,260</b>
					<b>Percent of goal achieved:</b>	<b>110.3%</b>

<sup>a</sup> Does not include tributary strays and in-river prespawning mortalities.

Table 5. Summary of the 2003 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<sup>a</sup>. ND indicates that the data were not available. Data are from Snider et al. (2004).

<b>HATCHERY ORIGIN n = 2,431</b>										
<b>Age<sup>b</sup></b>	<b>Males n = 1,154</b>					<b>Females n = 1,277</b>				
	<b>Trapped</b>	<b>Released</b>	<b>Spawned</b>	<b>Morts</b>	<b>Other</b>	<b>Trapped</b>	<b>Released</b>	<b>Spawned</b>	<b>Morts</b>	<b>Other</b>
1-ocean	962	ND	ND	0	ND	619	ND	ND	0	ND
2-ocean	192	ND	ND	0	ND	658	ND	ND	0	ND
Total	1,154	244 <sup>b</sup>	508	0	402 <sup>c</sup>	1,277	244 <sup>b</sup>	508	0	525 <sup>c</sup>

<b>NATURAL ORIGIN n = 30</b>										
<b>Age<sup>b</sup></b>	<b>Males n = 14</b>					<b>Females n =16</b>				
	<b>Trapped</b>	<b>Released</b>	<b>Spawned</b>	<b>Morts</b>	<b>Other</b>	<b>Trapped</b>	<b>Released</b>	<b>Spawned</b>	<b>Morts</b>	<b>Other</b>
1-ocean	6	6	0	0	0	4	4	0	0	0
2-ocean	8	8	0	0	0	12	12	0	0	0
Total	14	14 <sup>e</sup>	0	0	0	16	16 <sup>e</sup>	0	0	0

Total Number Trapped	2,461	Green Egg Number	2,807,840
Trapping Period	3/18 – 5/5/03	Eyed Egg Number	2,363,746 <sup>f</sup> (84.2% eye up)

<sup>a</sup> Fish were aged using the following aging criteria:

RUN	SEX	LENGTH	AGE (Years in Ocean)
A	Male	≤68 cm	1-Ocean
A	Male	>68 cm	2-Ocean
A	Female	≤65 cm	1-Ocean
A	Female	>65 cm	2-Ocean

<sup>b</sup> Of these fish, ten pairs (10 male, 10 female) were released in Beaver and Frenchman Creeks, and a further 200 pairs were released into the Yankee Fork for Shoshone-Bannock supplementation programs. The remaining 48 were released downriver at Torrey's Hole to enhance angler opportunity. The gender of these 48 was not identified, so they have been assumed to be equally mixed in this table.

<sup>c</sup> Fish were killed but not used for spawning. A total of 136 were donated to charitable organizations, and a further 396 were given to the Shoshone-Bannock and Duck Valley Tribes. The remainder was given away to anglers on spawn days.

<sup>d</sup> Fish were released above the weir.

<sup>e</sup> Eyed-eggs were shipped to other hatcheries for rearing.

Table 6. Summary of the 2003 B-stock 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<sup>a</sup>. ND indicates that the data were not available. Data are from Snider et al. (2004).

HATCHERY ORIGIN n = 3										
Age	Males n = 3					Females n = 0				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	3	0	3	0	0	0	0	0	0	0
2-ocean	0	0	0	0	0	0	0	0	0	0
Total	3	0	3 <sup>d</sup>	0	0	0	0	0	0	0

NATURAL ORIGIN n = 44										
Age	Males n = 14					Females n = 30				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	6	6	ND	0	0	6	ND	ND	0	0
2-ocean	8	8	ND	0	0	24	ND	ND	0	0
Total	15	10 <sup>b</sup>	5	0	0	30	19 <sup>b</sup>	11	0	0

Total Number Trapped	47	Green Egg Number	86,184
Trapping Period	3/25 – 5/9/03	Eyed Egg Number	57,876 <sup>c</sup> (67.2% eye up)

2

<sup>a</sup> 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

<sup>f</sup> Fish were released above the weir. Six of the males were partially stripped of milt prior to release. The milt was used to fertilize the eggs from the spawned females.

<sup>g</sup> Eyed-eggs were shipped to other hatcheries for rearing.

<sup>h</sup> These males were spawned with females recovered at the Squaw Creek Trap and transported to the East Fork Trap.

Table 7. Summary of the 2003 B-stock steelhead return to the Crooked River weir. Hatchery aging criteria, based on length, were used to determine age<sup>a</sup>. Data are from the unpublished Clearwater Fish Hatchery Run Report.

HATCHERY ORIGIN n = 7										
Age <sup>a</sup>	Males n = 5					Females n = 2				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	1	1	0	0	0	0	0	0	0	0
2-ocean	4	4	0	0	0	2	2	0	0	0
Total	5	5 <sup>b</sup>	0	0	0	2	2 <sup>b</sup>	0	0	0

NATURAL ORIGIN n = 6										
Age <sup>a</sup>	Males n = 4					Females n = 2				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	1	1	0	0	0	0	0	0	0	0
2-ocean	3	3	0	0	0	2	2	0	0	0
Total	4	3 <sup>c</sup>	0	0	0	2	2 <sup>c</sup>	0	0	0

Total Number Trapped	13	Green Egg Number	0
Trapping Period	4/4 – 6/1/03	Eyed Egg Number	0

23

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. Fish were released below the weir
- c. Fish were released above the weir.

Table 8. Summary of the 2003 B-stock steelhead return to the Red River weir. Data are from the unpublished Clearwater Fish Hatchery 2003 steelhead run report.

HATCHERY ORIGIN n = 1										
Age <sup>a</sup>	Males n = 1					Females n = 0				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	0	0	0	0	0	0	0	0	0	0
2-ocean	1	1	0	0	0	0	0	0	0	0
Total	1	1 <sup>b</sup>	0	0	0	0	0	0	0	0

NATURAL ORIGIN n = 10										
Age <sup>a</sup>	Males n = 9					Females n = 1				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	0	0	0	0	0	0	0	0	0	0
2-ocean	9	9	0	0	0	1	1	0	0	0
Total	9	9 <sup>c</sup>	0	0	0	1	1 <sup>c</sup>	0	0	0

Total Number Trapped	11	Green Egg Number	0
Trapping Period	3/17 – 6/1/03	Eyed Egg Number	0

24

<sup>a</sup> 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

<sup>i</sup> Fish were released below the weir.

<sup>j</sup> Fish were released above the weir.

Table 9 Annual steelhead releases from each of the Idaho LSRCP steelhead hatcheries since brood year 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
2002	901,066	1,265,418	1,970,121	4,136,605

Table 10. Running total of returns from each brood year produced by Idaho LSRCP steelhead hatcheries since brood year 1990.

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	4,624	13,980	11,059	29,663
1999 <sup>a</sup>	6,792	24,695	23,231	54,718
2000 <sup>b</sup>	406	4,186	20,459	25,051

<sup>a</sup> This year only includes 1- and 2-ocean adult returns and may be incomplete.

<sup>b</sup> This year only includes 1-ocean returns and is definitely incomplete.

Table 11. Annual contribution to adult steelhead returns in Idaho of each of the Idaho LSRCP steelhead hatcheries since return year 1993.

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
2003	6,787	10,337	26,169	43,293

Table 12 Out of state recoveries of LSRCP steelhead reported to RMIS by January 2007 for recovery year 2003 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	Other	Total	
	C & S	Sport	Weirs	Sport	Tribal	Sport	Harvest			
<b>11</b>										
	Age 3	0	51	28	145	22	ND	0	3	249
<b>16</b>										
	Age 3	0	41	20	79	34	ND	0	3	177
	Age 4	0	16	0	27	11	ND	0	4	58
<b>17</b>										
	Age 3	0	0	15	59	5	ND	0	0	79
	Age 4	0	0	5	2	7	ND	0	0	14
<b>18</b>										
	Age 3	0	0	11	86	0	ND	0	0	97
	Age 4	0	0	7	41	27	ND	0	0	75
<b>19</b>										
	Age 4	0	19	0	46	102	ND	0	0	167
<b>20 A-Stock</b>										
	Age 3	0	0	107	0	0	ND	0	0	107
<b>20 B-Stock</b>										
	Age 3	0	4	4	11	0	ND	0	0	19
	Age 4	0	0	10	47	28	ND	0	0	85
<b>Clearwater</b>										
	Age 3	0	0	0	0	23	ND	5	0	28
	Age 4	0	14	0	108	482	ND	0	0	604
<b>Squaw Cr.</b>										
	Age 3	0	0	2	0	0	ND	0	0	2
	Age 4	0	10	20	15	40	ND	0	11	96
	Age 5	0	0	0	0	11	ND	0	0	11
<b>TOTAL</b>		<b>0</b>	<b>155</b>	<b>229</b>	<b>666</b>	<b>792</b>	<b>ND</b>	<b>5</b>	<b>21</b>	<b>1,868</b>

Table 13. Adult steelhead recovered at Squaw Creek Trap during the spring of 2003. The number is the total number in each category with the number of natural-origin fish in parenthesis.

Size Class <sup>a</sup>	Male	Female	Total
<b>B</b>	8(1)	20(4)	28(5)
<b>A</b>	30(8)	33(7)	63(15)
<b>Total</b>	38(9)	53(11)	91(20)

<sup>a</sup> 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.

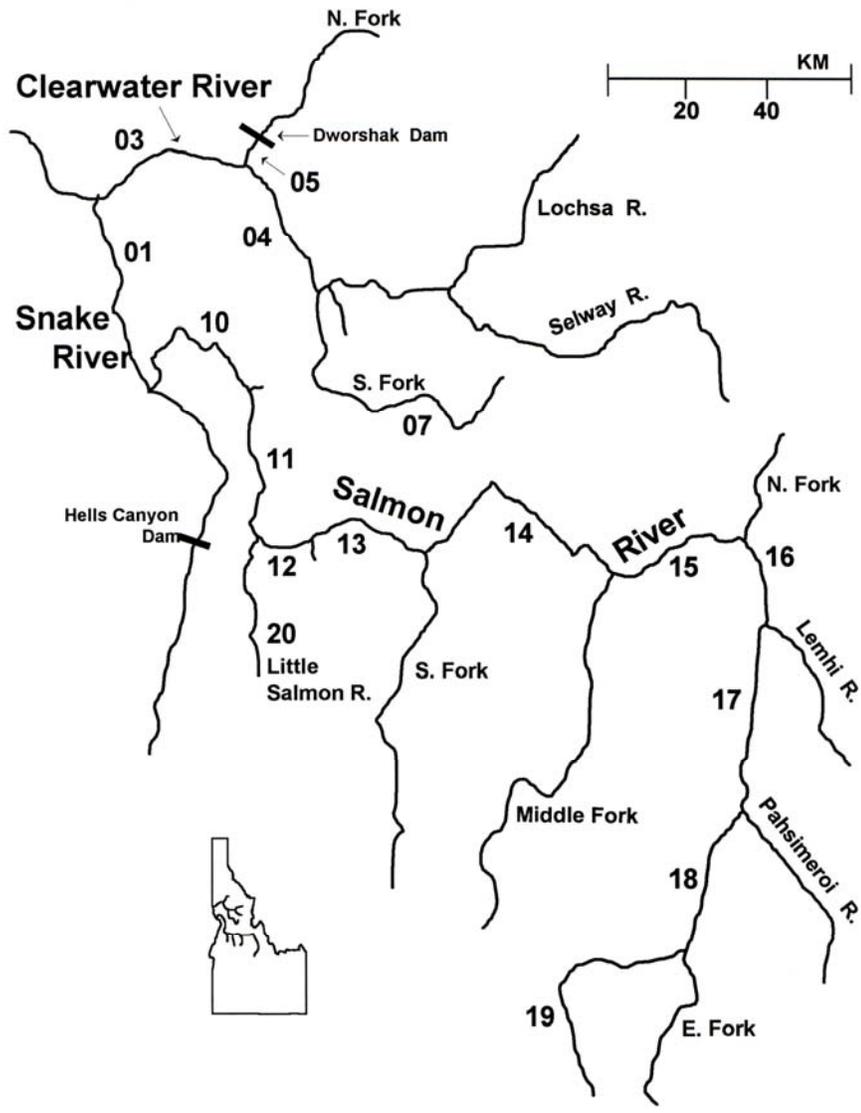


Figure 1. Map of river sections defined by Idaho Department of Fish and Game for all rivers sections that contain steelhead runs that are available to anglers.

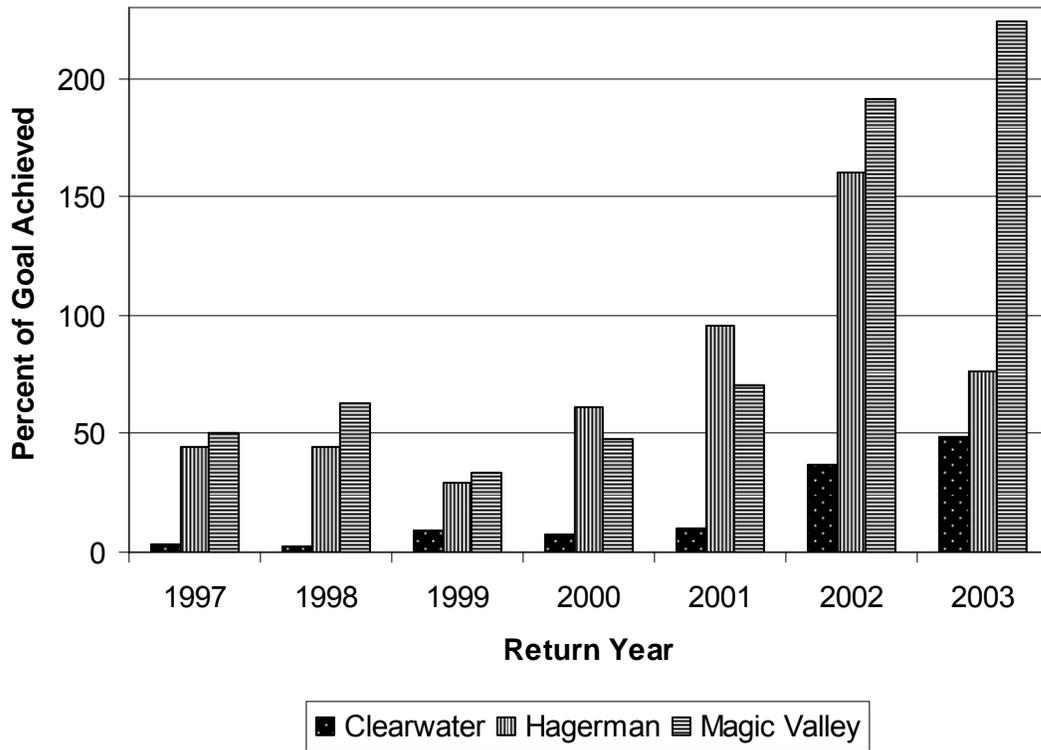


Figure 2. Percent of the adult steelhead return goal achieved by Clearwater, Hagerman National, and Magic Valley fish hatcheries between 1997 and 2003. Annual adult return goals for Clearwater, Hagerman National, and Magic Valley fish hatcheries were 14,000, 13,600, and 11,660, respectively.

## **APPENDICES**

Appendix A. Table 1. Release data for all steelhead released from Clearwater Fish Hatchery during 2003. Releases are arranged by coded-wire tag group and raceway. 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
Crooked R Ponds 4/19 - 4/19/2003	DWOR B	CWT,AD,LV	109672	62,848	Production
		AD,LV	Shed Tags	1,944	
		AD	Untagged	97,832	
		PIT		299	
		<b>Total:</b>		<b>162,624</b>	
S Fk Clwtr@ Red House Hole 4/17 - 4/18/2003	DWOR B	CWT,AD,LV	109572	62,806	Production
		AD,LV	Shed Tags	1,942	
		AD	Untagged	84,919	
		PIT		884	
		<b>Total:</b>		<b>149,667</b>	
S Fk Clwtr@ Red House Hole 9/26 - 9/26/2003	DWOR B	AD	Untagged	22,599	Surplus Pre-smolts
		PIT		None	
		<b>Total:</b>		<b>22,599</b>	
Clear Cr Clwtr R 4/21 - 4/21/2003	DWOR B	AD	Untagged	108,052	Production
		PIT		None	
		<b>Total:</b>		<b>108,052</b>	
Lolo Cr 4/22 - 4/22/2003	DWOR B	NONE	Untagged	43,070	NPT Agreement
		PIT		535	
		<b>Total:</b>		<b>43,070</b>	
S Fk Clwtr R@ Mill Cr 4/23 - 4/23/2003	DWOR B	NONE	Untagged	33,362	NPT Agreement
		PIT		526	
		<b>Total:</b>		<b>33,362</b>	
S Fk Clwtr R@ Meadow Cr 4/22 - 4/22/2003	DWOR B	NONE	Untagged	23,310	NPT Agreement
		PIT		None	
		<b>Total:</b>		<b>23,310</b>	
Crooked R Ponds 4/19-4/23/2003	DWOR B	CWT,NONE	108970	20,722	Supplementation
		NONE	Untagged	81,212	
		PIT		543	
		<b>Total:</b>		<b>101,934</b>	
Red River Rearing Ponds 4/17 - 4/18/2003	DWOR B	AD	Untagged	100,000	Production
		PIT		535	
		<b>Total:</b>		<b>100,000</b>	
Red River Rearing Ponds 4/17 - 4/17/2003	DWOR B	NONE	Untagged	149,987	Supplementation
		PIT		None	
		<b>Total:</b>		<b>149,987</b>	
<b>Total Release For Clearwater In 2003</b>			<b>894,605</b>		

Appendix A. Table 2. Release data for all steelhead released from Hagerman National Fish Hatchery during 2003. Releases are arranged by coded-wire tag group and raceway. 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.

<b>Release Site/Date</b>	<b>Stock Name</b>	<b>Mark Type</b>	<b>CWT Code</b>	<b>Release Number</b>	<b>Marking Purpose</b>
Sawtooth Hatchery 4/9 - 4/29/2003	SAW A	CWT,AD,LV	107970	17,361	Production
		CWT,AD,LV	108070	17,239	
		AD,LV	Shed Tags	295	
		AD	Untagged	713,006	Production
		PIT		300	
<b>Total:</b>				<b>747,901</b>	
Hazard Cr Lt Salmon R 4/7 - 4/7/2003	PAH A	NONE	Untagged	35,549	NPT Agreement
		PIT		None	
		<b>Total:</b>		<b>35,549</b>	
Lt Salmon R @ Stinky Springs 3/31 - 4/4/2003	PAH A	NONE	Untagged	160,176	NPT Agreement
		PIT		299	
		<b>Total:</b>		<b>160,176</b>	
Yankee Fk Dredge Ponds 5/12 - 5/14/2003	SAW A	NONE	Untagged	131,659	Shoshone Bannock
		PIT		299	
		<b>Total:</b>		<b>131,659</b>	
Newsome Cr S Fk Clwtr R 5/5 - 5/9/2003	DWOR B	NONE	Untagged	88,093	NPT Agreement
		PIT		533	
		<b>Total:</b>		<b>88,093</b>	
American R: S Fk Clwtr R 4/30 - 5/5/2003	DWOR B	NONE	Untagged	102,040	NPT Agreement
		PIT		534	
		<b>Total:</b>		<b>102,040</b>	
<b>Total Release For Hagerman NFH In 2003</b>				<b>1,265,418</b>	

Appendix A. Table 3. Release data for all steelhead released from Magic Valley Fish Hatchery during 2003. Releases are arranged by coded-wire tag group and raceway. 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
Pahsimeroi R: Salmon R 4/17 - 4/17/2003	PAH A	CWT,AD,LV	106073	32,846	Pah evaluation group
		AD,LV	Shed Tags	1,016	
			Untagged	0	
		PIT		None	
		<b>Total:</b>		<b>33,862</b>	
Salmon R @ McNabb Point 4/17 - 4/18/2003	PAH A	CWT,AD,LV	106173	32,892	Production
		AD,LV	Shed Tags	1,017	
		AD	Untagged	59,195	
		PIT		300	
		<b>Total:</b>		<b>93,104</b>	
W Fk Yankee Fk: Yankee Fk 4/28 - 4/29/2003	SAW A	CWT,AD,LV	106273	33,633	Supplementation
		AD,LV	Shed Tags	1,040	
		AD	Untagged	132,122	
		PIT		300	
		<b>Total:</b>		<b>166,793</b>	
Salmon R @ Red Rock 4/14 - 4/15/2003	PAH A	CWT,AD,LV	106373	32,446	Production
		AD,LV	Shed Tags	1,003	
		AD	Untagged	98,892	
		PIT		301	
		<b>Total:</b>		<b>132,341</b>	
Lemhi R @ County Scale 4/7 - 4/8/2003	PAH A	CWT,AD,LV	106473	31,583	Production
		AD,LV	Shed Tags	977	
			Untagged	0	
		PIT		298	
		<b>Total:</b>		<b>32,560</b>	
Lemhi R: Salmon R 4/16 - 4/17/2003	PAH A	AD	Untagged	70,848	Production
		PIT		None	
		<b>Total:</b>		<b>70,848</b>	
Hammer Cr Salmon R 4/11 - 4/14/2003	PAH A	AD	Untagged	183,634	Production
		PIT		298	
		<b>Total:</b>		<b>183,634</b>	
Lemhi R @ Hayden Cr 4/7 - 4/7/2003	PAH A	AD	Untagged	83,157	Production
		PIT		299	
		<b>Total:</b>		<b>83,157</b>	
Valley Cr U Salmon R 4/25 - 4/25/2003	SAW A	AD	Untagged	32,655	Supplementation
		PIT		298	
		<b>Total:</b>		<b>32,655</b>	

Appendix A. Table 3. Continued.

<b>Release Site/Date</b>	<b>Stock Name</b>	<b>Mark Type</b>	<b>CWT Code</b>	<b>Release Number</b>	<b>Marking Purpose</b>
E Fk Salmon R @ Dumpster 4/23 - 4/25/2003	DWOR B	AD PIT <b>Total:</b>	Untagged	215,666 None <b>215,666</b>	Production
Salmon R @ Tunnel Rock 4/18 - 4/21/2003	SAW A	AD PIT <b>Total:</b>	Untagged	76,643 None <b>76,643</b>	Production
Squaw Cr Ponds 4/8 - 4/8/2003	U SALMON B	CWT,AD CWT,AD AD PIT <b>Total:</b>	105773 105873 Shed Tags Untagged	29,522 26,874 1,744 0 299 <b>58,140</b>	Squaw Pond USB
Squaw Cr Ponds 4/8 - 4/9/2003	DWOR B	CWT,AD AD PIT <b>Total:</b>	109872 Shed Tags Untagged	61,042 1,888 0 300 <b>62,930</b>	Squaw Pond DWOR B
Squaw Cr 4/21 - 4/23/2003	DWOR B	CWT,AD,LV AD,LV AD PIT <b>Total:</b>	109772 Shed Tags Untagged	68,744 2,126 131,209 297 <b>202,079</b>	Squaw Creek Release
E Fk Salmon R Trap 4/23 - 4/25/2003	EAST FK B	NONE PIT <b>Total:</b>	Untagged	27,707 None <b>27,707</b>	E. Fk Naturals
Salmon R @ Colston Corner 4/15 - 4/16/2003	PAH A	CWT,AD,LV AD,LV AD PIT <b>Total:</b>	105973 Shed Tags Untagged	31,751 982 128,287 599 <b>161,020</b>	Production
Lt Salmon R @ Stinky Springs 4/9 - 5/1/2003	DWOR B	CWT,AD,LV AD,LV AD PIT <b>Total:</b>	109972 Shed Tags Untagged	65,097 2,013 269,873 279 <b>336,983</b>	Production
<b>Total Release For Magic Valley In 2003</b>			<b>1,970,121</b>		

Appendix B. Table 1. Release and recovery data for brood year 2000 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 pre-spawning 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 R@ Meadow Cr 4/13/2001	2000	DWOR B	Untagged	23,459	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>23,459</b>	<b>ND</b>	<b>ND</b>	
S Fk Clwtr R@ Mill Cr 4/12/2001	2000	DWOR B	Untagged	24,549	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>24,549</b>	<b>ND</b>	<b>ND</b>	
Lolo Cr  4/16/2001	2000	DWOR B	Untagged	48,523	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>48,523</b>	<b>ND</b>	<b>ND</b>	
Clear Cr: Clwtr R 4/26/2001	2000	DWOR B	104802	21,439	AD,LV	Supplementation Late Eggs	1	0	2	2	0.01
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>21,439</b>	<b>2</b>	<b>2</b>	<b>0.01</b>
Clear Cr: Clwtr R 4/26/2001	2000	DWOR B	Untagged	76,101	AD	Supplementation Late Eggs	1	0	7	7	0.01
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>97,540</b>	<b>0</b>	<b>9</b>	<b>9</b>
S Fk Clwtr@ Red House Hole 4/19/2001	2000	DWOR B	104826	20,736	AD,LV	production	1	8	10	18	0.09
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>20,736</b>	<b>8</b>	<b>10</b>	<b>18</b>
S Fk Clwtr@ Red House Hole 4/19/2001	2000	DWOR B	104827	22,076	AD,LV	production	1	0	11	11	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>22,076</b>	<b>0</b>	<b>11</b>	<b>11</b>
S Fk Clwtr@ Red House Hole 4/19/2001	2000	DWOR B	104828	20,914	AD,LV	production	1	65	10	75	0.36
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>20,914</b>	<b>65</b>	<b>10</b>	<b>75</b>
S Fk Clwtr@ Red House Hole 4/19/2001	2000	DWOR B	Untagged	34,040	AD	production	1	39	17	56	0.16
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>97,766</b>	<b>112</b>	<b>48</b>	<b>160</b>
Red River: S Fk Clwtr 4/20/2001	2000	DWOR B	Untagged	23,220	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>23,220</b>	<b>ND</b>	<b>ND</b>	
Red River: S Fk Clwtr 4/26/2001	2000	DWOR B	Untagged	126,126	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>126,126</b>	<b>ND</b>	<b>ND</b>	
Crooked R: S Fk Clwtr 4/26/2001	2000	DWOR B	Untagged	96,632	BWT,NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>96,632</b>	<b>ND</b>	<b>ND</b>	

Appendix B. Table 1. Continued.

Release Site/Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Crooked R: S Fk Clwtr 4/26/2001	2000	DWOR B	104825	21,977	AD,LV	Production	1	0	11	11	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
Crooked R: S Fk Clwtr 4/26/2001	2000	DWOR B	104823	22,679	AD,LV	Production	1	0	11	11	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
Crooked R: S Fk Clwtr 4/26/2001	2000	DWOR B	104824	22,011	AD,LV	Production	1	0	11	11	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
Crooked R: S Fk Clwtr 4/26/2001	2000	DWOR B	Untagged	82,248	AD	Production	1	0	41	41	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>148,915</b>				<b>0</b>	<b>74</b>	<b>74</b>	<b>0.05</b>
Red River: S Fk Clwtr 4/26/2001	2000	DWOR B	Untagged	99,924	AD	Production	1	114	49	163	0.16
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>99,924</b>				<b>114</b>	<b>49</b>	<b>163</b>	<b>0.16</b>
<b>Total 1-Ocean:</b>							<b>406</b>				
<b>Total 2-Ocean:</b>							<b>ND</b>				
<b>Total 3-Ocean:</b>							<b>ND</b>				
<b>Total Harvest Recoveries:</b>							<b>226</b>				
<b>Total Hatchery Recoveries:</b>							<b>180</b>				
<b>Total Releases:</b>							<b>786,654</b>				
<b>Total Recoveries:</b>							<b>406</b>				

Appendix B. Table 2. Release and recovery data for brood year 2000 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 (%)
Lt Salmon R @ Stinky Springs 4/2-4/9/2001	2000	PAH A	104804	17,581	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Stinky Springs 4/2-4/9/2001	2000	PAH A	Untagged	139,031	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>156,612</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Yankee Fk Dredge Ponds 5/9-5/11/2001	2000	SAW A	Untagged	137,656	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>137,656</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Newsome Cr: S Fk Clwtr R 5/2-5/7/2001	2000	DWOR B	Untagged	86,441	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>86,441</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
American R: S Fk Clwtr R 4/27-5/2/2001	2000	DWOR B	Untagged	90,188	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>90,188</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Hazard Cr: Lt Salmon R 4/6-4/9/2001	2000	PAH A	Untagged	50,557	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>50,557</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Sawtooth Hatchery 4/11-4/24/2001	2000	SAW A	104806	20,278	AD,LV	Acclimated Production	1	202	15	217	1.07
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/11-4/24/2001	2000	SAW A	104803	20,236	AD,LV	Acclimated Production	1	15	22	37	0.18
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/11-4/24/2001	2000	SAW A	104805	18,445	AD,LV	Acclimated Production	1	0	3	3	0.02
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/11-4/24/2001	2000	SAW A	Untagged	512,185	AD	Acclimated Production	1	1,885	1,216	3,101	0.61
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>571,144</b>			<b>2,102</b>	<b>1,256</b>	<b>3,358</b>	<b>0.59</b>	
Sawtooth Hatchery 3/30-4/26/2001	2000	SAW A	Untagged	136,690	AD	Production Direct Release	1	503	325	828	0.61
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>136,690</b>			<b>503</b>	<b>325</b>	<b>828</b>	<b>.61</b>	



Appendix B. Table 3. Release and recovery data for brood year 2000 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 @ McNabb Point 4/26-4/27/2001	2000	SAW A	Untagged	84,389	AD	Production	1	380	427	807	0.96
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>84,389</b>	<b>380</b>	<b>427</b>	<b>807</b>
Salmon R @ Wagonhammer 4/26/2001	2000	SAW A	Untagged	67,950	AD	Production	1	408	344	752	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>67,950</b>	<b>408</b>	<b>344</b>	<b>752</b>
Salmon R @ Cottonwood Cg 4/25/2001	2000	SAW A	Untagged	77,790	AD	Production	1	350	394	744	0.96
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>77,790</b>	<b>350</b>	<b>394</b>	<b>744</b>
Salmon R @ Colston Corner 4/18/2001	2000	PAH A	Untagged	50,300	AD	Production	1	156	255	411	0.82
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>50,300</b>	<b>156</b>	<b>255</b>	<b>411</b>
Salmon R @ Challis 4/24/2001	2000	SAW A	Untagged	41,850	AD	Production	1	188	212	400	0.96
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>41,850</b>	<b>188</b>	<b>212</b>	<b>400</b>
Salmon R @ Lewis_Clark 4/23-4/24/2001	2000	SAW A	Untagged	76,182	AD	Production	1	458	386	844	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>76,182</b>	<b>458</b>	<b>386</b>	<b>844</b>
Sawtooth Hatchery 4/18/2001	2000	DWOR B	Untagged	1,145	AD	Production	1	0	0	0	0.00
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>1,145</b>	<b>0</b>	<b>0</b>	<b>0</b>
Hayden Cr @ Basin Cr 5/4/2001	2000	PAH A	Untagged	39,819	AD	Supplementation	1	239	202	441	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>39,819</b>	<b>239</b>	<b>202</b>	<b>441</b>
Hayden Cr Hatchery 5/4/2001	2000	PAH A	Untagged	40,044	AD	Production	1	241	203	444	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>40,044</b>	<b>241</b>	<b>203</b>	<b>444</b>
Lemhi R @ Hayden Cr 5/7/2001	2000	PAH A	Untagged	34,052	AD	Supplementation	1	205	172	377	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>34,052</b>	<b>205</b>	<b>172</b>	<b>377</b>
Salmon R @ Eyehole 4/23/2001	2000	SAW A	Untagged	45,270	AD	Production	1	140	229	369	0.82
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>45,270</b>	<b>140</b>	<b>229</b>	<b>369</b>

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 @ Hammer Creek 4/16-4/18/2001	2000	PAH A	105470	20,080	AD,LV	Production	1	201	102	303	1.51
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Hammer Creek 4/16-4/18/2001	2000	PAH A	105670	21,969	AD,LV	Production	1	151	111	262	1.19
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Hammer Creek 4/16-4/18/2001	2000	PAH A	105570	22,239	AD,LV	Production	1	101	113	214	0.96
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Hammer Creek 4/16-4/18/2001	2000	PAH A	Untagged	111,098	AD	Production	1	783	563	1,346	1.21
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>175,386</b>				<b>1,236</b>	<b>889</b>	<b>2,125</b>	<b>1.21</b>
Lt Salmon R @ Stinky Springs 4/9/2001-4/16/2001	2000	DWOR B	105170	21,671	AD,LV	Production	1	0	10	10	0.05
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Stinky Springs 4/9-4/16/2001	2000	DWOR B	105370	13,350	AD,LV	Production	1	52	6	58	0.43
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Stinky Springs 4/9/2001-4/16/2001	2000	DWOR B	105270	21,575	AD,LV	Production	1	17	10	27	0.13
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Stinky Springs 4/9-4/16/2001	2000	DWOR B	Untagged	1,750	AD,LV	Production	1	2	1	3	0.17
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>58,346</b>				<b>71</b>	<b>27</b>	<b>98</b>	<b>0.17</b>
Salmon R @ Tunnel Rock 4/24-4/25/2001	2000	SAW A	104819	21,061	AD,LV	Production	1	48	107	155	0.74
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Tunnel Rock 4/24-4/25/2001	2000	SAW A	104818	21,486	AD,LV	Production	1	205	109	314	1.46
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Tunnel Rock 4/24-4/25/2001	2000	SAW A	104820	20,775	AD,LV	Production	1	32	105	137	0.66
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Tunnel Rock 4/24-4/25/2001	2000	SAW A	Untagged	1,958	AD,LV	Production	1	9	10	19	0.97
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>65,280</b>				<b>294</b>	<b>331</b>	<b>625</b>	<b>0.96</b>
Lemhi R @ L6 Site 5/7/2001	2000	SAW A	105870	22,243	AD,LV	Production	1	293	113	406	1.83
							2	ND	ND	ND	
							3	ND	ND	ND	
Lemhi R @ L6 Site 5/7/2001	2000	SAW A	105970	21,488	AD,LV	Production	1	32	109	141	0.66
							2	ND	ND	ND	
							3	ND	ND	ND	
Lemhi R @ L6 Site 5/7/2001	2000	SAW A	105770	21,744	AD,LV	Production	1	48	110	158	0.73
							2	ND	ND	ND	
							3	ND	ND	ND	
Lemhi R @ L6 Site 5/7/2001	2000	SAW A	Untagged	2,025	AD,LV	Production	1	12	10	22	1.09
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>67,500</b>				<b>385</b>	<b>342</b>	<b>727</b>	<b>1.08</b>

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 @ Red Rock 4/19/2001	2000	SAW A	106270	21,222	AD,LV	Production	1	230	107	337	1.59
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Red Rock 4/19/2001	2000	SAW A	106070	22,310	AD,LV	Production	1	94	113	207	0.93
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Red Rock 4/19/2001	2000	SAW A	106170	21,856	AD,LV	Production	1	69	111	180	0.82
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Red Rock 4/19/2001	2000	SAW A	Untagged	2,022	AD,LV	Production	1	12	10	22	1.09
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>67,410</b>				<b>405</b>	<b>341</b>	<b>746</b>	<b>1.11</b>
Squaw Cr 4/27-5/2/2001	2000	UPPER SALMON B	104816	17,551	AD	Production	1	70	8	78	0.44
							2	ND	ND	ND	
							3	ND	ND	ND	
Squaw Cr 4/27-5/2/2001	2000	UPPER SALMON B	104815	19,332	AD	Production	1	112	9	121	0.63
							2	ND	ND	ND	
							3	ND	ND	ND	
Squaw Cr 4/27-5/2/2001	2000	UPPER SALMON B	Untagged	1,141	AD	Production	1	6	1	7	0.61
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>38,024</b>				<b>188</b>	<b>18</b>	<b>206</b>	<b>0.54</b>
Squaw Cr 4/27-5/2/2001	2000	DWOR B	104822	17,811	AD,LV	Production	1	0	0	0	0.00
							2	ND	ND	ND	
							3	ND	ND	ND	
Squaw Cr 4/27-5/2/2001	2000	DWOR B	104821	18,729	AD,LV	Production	1	12	0	12	0.06
							2	ND	ND	ND	
							3	ND	ND	ND	
Squaw Cr 4/27-5/2/2001	2000	DWOR B	Untagged	85,733	BWT,AD	Production	1	23	0	23	0.03
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>122,273</b>				<b>35</b>	<b>0</b>	<b>35</b>	<b>0.03</b>
Salmon R @ Shoup Brdg 4/19-4/24/2001	2000	SAW A	104835	32,006	AD,LV	Production	1	99	162	261	0.82
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Shoup Brdg 4/19-4/24/2001	2000	SAW A	Untagged	28,986	AD	Production	1	90	147	237	0.82
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>60,992</b>				<b>189</b>	<b>309</b>	<b>498</b>	<b>0.82</b>
Lemhi R: Salmon R 4/17-4/19/2001	2000	SAW A	104836	31,626	AD,LV	Production	1	190	160	350	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
Lemhi R: Salmon R 4/17-4/19/2001	2000	SAW A	Untagged	68,748	AD	Production	1	413	348	761	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>100,374</b>				<b>603</b>	<b>508</b>	<b>1,111</b>	<b>1.11</b>
Lemhi R @ County Scale 5/3-5/4/2001	2000	PAH A	Untagged	20,448	AD	Supplementation	1	123	104	227	1.11
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>20,448</b>				<b>123</b>	<b>104</b>	<b>227</b>	<b>1.11</b>

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 (%)
Squaw Cr Ponds 4/9-4/10/2001	2000	DWOR B	Untagged	75,912	AD	Production	1	20	0	20	0.03
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>20</b>	<b>0</b>	<b>20</b>
Lemhi R @ L6 Site 5/7/2001	2000	PAH A	Untagged	1,269	AD	Supplementation	1	7	6	13	1.02
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>7</b>	<b>6</b>	<b>13</b>
E Fk Salmon R @ Dumpster 4/27/2001	2000	DWOR B	Untagged	51,810	AD	Production	1	14	2	16	0.03
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>14</b>	<b>2</b>	<b>16</b>
Lt Salmon R @ Stinky Springs 4/9-4/16/2001	2000	PAH A	Untagged	430,210	AD	Production	1	5,413	2,179	7,592	1.76
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>5,413</b>	<b>2,179</b>	<b>7,592</b>
Yankee Fk @ 3rd Brdg Up 5/2-5/3/2001	2000	SAW A	Untagged	98,623	AD	Production	1	363	234	597	0.61
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>363</b>	<b>234</b>	<b>597</b>
Lemhi R @ County Scale 5/3-5/4/2001	2000	SAW A	Untagged	21,206	AD	Supplementation	1	127	107	234	1.10
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>127</b>	<b>107</b>	<b>234</b>
Squaw Cr 4/27-5/2/2001	2000	DWOR B	Untagged	8,164	BWT,AD	Precocity study	1	0	0	0	0.00
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>0</b>	<b>0</b>	<b>0</b>
<b>Total 1-Ocean:</b>							<b>20,459</b>				
<b>Total 2-Ocean:</b>							<b>ND</b>				
<b>Total 3-Ocean:</b>							<b>ND</b>				
<b>Total Harvest Recoveries:</b>							<b>12,238</b>				
<b>Total Hatchery Recoveries:</b>							<b>8,221</b>				
<b>Total Releases:</b>							<b>2,022,018</b>				
<b>Total Recoveries:</b>							<b>20,459</b>				

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).

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 4/19-4/20/2000	1999	DWOR B	105419	43,375	AD,LV	Contribution	1	6	7	13	0.76
							2	255	61	316	
							3	ND	ND	ND	
Clear Cr: Clwtr R 4/19-4/20/2000	1999	DWOR B	Untagged	140,482	AD	Contribution	1	19	23	42	0.76
							2	826	198	1,024	
							3	ND	ND	ND	
<b>Totals:</b>				<b>183,857</b>			<b>1,106</b>	<b>289</b>	<b>1,395</b>	<b>0.76</b>	
S Fk Clwtr@ Red House 4/20-4/21/2000	1999	DWOR B	105408	31,197	AD,LV	Contribution	1	11	33	44	1.29
							2	232	113	345	
							3	ND	ND	ND	
S Fk Clwtr@ Red House 4/20-4/21/2000	1999	DWOR B	105426	32,101	AD,LV	Contribution	1	30	0	30	2.13
							2	535	116	651	
							3	ND	ND	ND	
S Fk Clwtr@ Red House 4/20-4/21/2000	1999	DWOR B	Untagged	248,118	AD	Contribution	1	161	264	425	2.18
							2	3,007	895	3,902	
							3	ND	ND	ND	
<b>Totals:</b>				<b>311,416</b>			<b>3,976</b>	<b>1,421</b>	<b>5,397</b>	<b>1.73</b>	
Red River Rearing Ponds 5/4/2000	1999	DWOR B	Untagged	139,662	NONE	NPT no mark release	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>139,662</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Crooked R Ponds 5/4/2000	1999	DWOR B	Untagged	100,331	NONE	NPT no mark release	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>100,331</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
<b>Total 1-Ocean:</b>							<b>554</b>				
<b>Total 2-Ocean:</b>							<b>6,238</b>				
<b>Total 3-Ocean:</b>							<b>ND</b>				
<b>Total Harvest Recoveries:</b>							<b>5,082</b>				
<b>Total Hatchery Recoveries:</b>							<b>1,710</b>				
<b>Total Releases:</b>							<b>735,266</b>				
<b>Total Recoveries:</b>							<b>6,792</b>				

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 respawning 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	164	103	267	1.52
							2	15	19	34	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105525	20,758	AD,LV	Late Egg Take, Direct Rel.	1	131	90	221	1.33
							2	41	15	56	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105526	19,549	AD,LV	Late Egg Take, Direct Rel.	1	156	91	247	1.49
							2	34	11	45	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	839	AD	Late Egg Take, Direct Rel.	1	6	4	10	1.43
							2	1	1	2	
							3	ND	ND	ND	
<b>Totals:</b>				<b>60,955</b>			<b>548</b>	<b>334</b>	<b>882</b>	<b>1,45</b>	
Hazard Cr: Lt Salmon R 4/7-4/28/2000	1999	HELLS CANYON A	Untagged	51,161	AD	Supplementation	1	401	633	1,034	2.93
							2	378	85	463	
							3	ND	ND	ND	
<b>Totals:</b>				<b>51,161</b>			<b>779</b>	<b>718</b>	<b>1,497</b>	<b>2.93</b>	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105522	19,563	AD,LV	Acclimation % Body Wt. Diet	1	116	92	208	1.32
							2	42	9	51	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105519	19,441	AD,LV	Acclimation % Body Wt. Diet	1	153	99	252	1.48
							2	21	14	35	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105520	19,999	AD,LV	Acclimation % Body Wt. Diet	1	222	79	301	1.68
							2	23	12	35	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	486,823	AD	Acclimation % Body Wt. Diet	1	4,051	2,090	6,141	1.54
							2	710	658	1,368	
							3	ND	ND	ND	
<b>Totals:</b>				<b>545,826</b>			<b>5,338</b>	<b>3,053</b>	<b>8,391</b>	<b>1.54</b>	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105518	19,670	AD,LV	Early Egg Take, Direct Rel.	1	179	125	304	2.15
							2	98	20	118	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105516	17,726	AD,LV	Early Egg Take, Direct Rel.	1	196	132	328	2.32
							2	73	11	84	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105517	20,187	AD,LV	Early Egg Take, Direct Rel.	1	217	112	329	1.94
							2	44	18	62	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	1,606	AD	Early Egg Take, Direct Rel.	1	17	10	27	2.24
							2	6	3	9	
							3	ND	ND	ND	
<b>Totals:</b>				<b>59,189</b>			<b>830</b>	<b>431</b>	<b>1,261</b>	<b>2.13</b>	

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 (%)
Sawtooth Hatchery 4/26/2000	1999	SAW A	105524	20,170	AD,LV	Feed/Fast, Acclimated	1	168	92	260	1.43
							2	19	10	29	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105521	19,312	AD,LV	Feed/Fast, Acclimated	1	194	106	300	1.80
							2	24	23	47	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	105523	18,153	AD,LV	Feed/Fast, Acclimated	1	178	112	290	2.02
							2	60	17	77	
							3	ND	ND	ND	
Sawtooth Hatchery 4/26/2000	1999	SAW A	Untagged	4,193	AD	Feed/Fast, Acclimated	1	39	21	60	1.79
							2	7	8	15	
							3	ND	ND	ND	
<b>Totals:</b>				<b>61,828</b>				<b>689</b>	<b>389</b>	<b>1,078</b>	<b>1.74</b>
Lt Salmon R @ Stinky Springs 4/3-5/8/2000	1999	HELLS CANYON A	Untagged	395,924	AD	Contribution	1	3,101	4,901	8,002	2.93
							2	2,926	658	3,584	
							3	ND	ND	ND	
<b>Totals:</b>				<b>395,924</b>				<b>6,027</b>	<b>5,559</b>	<b>11,586</b>	<b>2.93</b>
<b>Total 1-Ocean:</b>							<b>18,581</b>				
<b>Total 2-Ocean:</b>							<b>6,114</b>				
<b>Total 3-Ocean:</b>							<b>ND</b>				
<b>Total Harvest Recoveries:</b>							<b>14,211</b>				
<b>Total Hatchery Recoveries:</b>							<b>10,484</b>				
<b>Total Releases:</b>							<b>1,174,883</b>				
<b>Total Recoveries:</b>							<b>24,695</b>				

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).

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	380	623	1,003	2.06
							2	30	2	32	
							3	ND	ND	ND	
Salmon R @ Tunnel Rock 4/20-4/21/2000	1999	SAW A	104829	11,153	AD, LV	Contribution	1	112	138	250	2.37
							2	14	0	14	
							3	ND	ND	ND	
Salmon R @ Tunnel Rock 4/20-4/21/2000	1999	SAW A	Untagged	47,219	AD	Contribution	1	378	584	962	2.39
							2	87	78	165	
							3	ND	ND	ND	
<b>Totals:</b>				<b>108,673</b>			<b>1,001</b>	<b>1,425</b>	<b>2,426</b>	<b>2.23</b>	
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	105414	46,865	AD, LV	Contribution	1	313	580	893	2.17
							2	45	78	123	
							3	ND	ND	ND	
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	104648	7,663	AD, LV	Contribution	1	48	95	143	2.04
							2	0	13	13	
							3	ND	ND	ND	
Salmon R @ Shoup Brdg 4/14/2000	1999	PAH A	Untagged	13,400	AD	Contribution	1	99	166	265	2.22
							2	11	22	33	
							3	ND	ND	ND	
<b>Totals:</b>				<b>67,928</b>			<b>516</b>	<b>954</b>	<b>1,470</b>	<b>2.16</b>	
E Fk Salmon R @ Dumpster 4/27-5/2/2000	1999	DWOR B	Untagged	239,981	AD	Production	1	35	4	39	0.38
							2	853	11	864	
							3	ND	ND	ND	
<b>Totals:</b>				<b>239,981</b>			<b>888</b>	<b>15</b>	<b>903</b>	<b>0.38</b>	
Salmon R @ Kilpatrick 4/18/2000	1999	SAW A	Untagged	21,500	AD	Production	1	159	266	425	2.23
							2	18	36	54	
							3	ND	ND	ND	
<b>Totals:</b>				<b>21,500</b>			<b>177</b>	<b>302</b>	<b>479</b>	<b>2.23</b>	
Salmon R @ Eyehole 4/18/2000	1999	SAW A	Untagged	21,500	AD	Production	1	159	266	425	2.23
							2	18	36	54	
							3	ND	ND	ND	
<b>Totals:</b>				<b>21,500</b>			<b>177</b>	<b>302</b>	<b>479</b>	<b>2.23</b>	
Salmon R @ Mcnabb Point 4/18-4/21/2000	1999	SAW A	Untagged	105,578	AD	Production	1	651	1,307	1,958	2.20
							2	194	175	369	
							3	ND	ND	ND	
<b>Totals:</b>				<b>105,578</b>			<b>845</b>	<b>1,482</b>	<b>2,327</b>	<b>2.20</b>	
S Fk Clwtr R@ Mill Cr 5/2/2000	1999	DWOR B	Untagged	19,556	NONE	Supplementation	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>19,556</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
Red River: S Fk Clwtr 5/10/2000	1999	DWOR B	Untagged	30,480	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>30,480</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		

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 (%)
American R: S Fk Clwtr R 5/5-5/9/2000	1999	DWOR B	Untagged	96,187	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>96,187</b>	<b>ND</b>	<b>ND</b>	
Newsome Cr: S Fk Clwtr R 5/4-5/9/2000	1999	DWOR B	Untagged	100,078	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>100,078</b>	<b>ND</b>	<b>ND</b>	
S Fk Clwtr R@ Meadow Cr 5/2/2000	1999	DWOR B	Untagged	19,557	NONE	Supplementation Late Eggs	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>19,557</b>	<b>ND</b>	<b>ND</b>	
Squaw Cr 4/24-6/5/2000	1999	DWOR B	104647	10,523	AD,LV	Contribution	1	0	0	0	0.60
							2	63	0	63	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>10,523</b>	<b>63</b>	<b>0</b>	
Squaw Cr 4/24-6/5/2000	1999	DWOR B	105413	50,819	AD,LV	Contribution	1	9	0	9	0.32
							2	155	0	155	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>50,819</b>	<b>164</b>	<b>0</b>	
Squaw Cr 4/24-6/5/2000	1999	DWOR B	Untagged	132,294	BWT,AD	Contribution	1	19	2	21	0.37
							2	469	6	475	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>132,294</b>	<b>488</b>	<b>8</b>	
Squaw Cr Ponds 4/10-4/11/2000	1999	DWOR B	Untagged	106,135	AD	Production	1	15	2	17	0.38
							2	377	5	382	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>106,135</b>	<b>392</b>	<b>7</b>	
Squaw Cr 4/20-4/21/2000	1999	UPPER SALMON B	Untagged	51,866	AD	Production	1	8	1	9	0.38
							2	184	2	186	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>51,866</b>	<b>192</b>	<b>3</b>	
Salmon R @ Cottonwood Cg 4/14-4/21/2000	1999	SAW A	Untagged	45,753	AD	Production	1	282	566	848	2.20
							2	84	76	160	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>45,753</b>	<b>366</b>	<b>642</b>	
Lemhi R: Salmon R 4/12-4/21/2000	1999	PAH A	103606	62,081	AD,LV	Contribution	1	500	768	1,268	2.32
							2	68	103	171	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>62,081</b>	<b>568</b>	<b>871</b>	
Lemhi R: Salmon R 4/12-4/21/2000	1999	PAH A	Untagged	51,286	AD	Contribution	1	379	635	1,014	2.84
							2	56	85	141	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>51,286</b>	<b>1,003</b>	<b>1,591</b>	
Lt Salmon R @ Stinky Springs 4/11-4/27/2000	1999	DWOR B	103605	63,244	AD,LV	Production	1	0	1	1	0.11
							2	65	3	68	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>63,244</b>	<b>65</b>	<b>4</b>	
Lt Salmon R @ Stinky Springs 4/11-4/27/2000	1999	DWOR B	Untagged	232,640	AD,BWT	Production	1	0	4	4	0.11
							2	239	10	249	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>232,640</b>	<b>304</b>	<b>18</b>	
Lt Salmon R @ Stinky Springs 4/11-4/27/2000	1999	DWOR B	Untagged	4,639	BWT,AD	Precocity Study	1	0	0	0	0.11
							2	5	0	5	
							3	ND	ND	ND	
							<b>Totals:</b>	<b>4,639</b>	<b>5</b>	<b>0</b>	

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 (%)
Lt Salmon R @ Stinky Springs 4/11-4/12/2000	1999	HELLS CANYON A	Untagged	115,423	AD	Contribution	1	904	1,429	2,333	2.84
							2	853	192	1,045	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>1,757</b>	<b>1,621</b>	<b>3,378</b>
Salmon R @ Red Rock 4/12/2000	1999	PAH A	Untagged	62,670	AD	Contribution	1	463	776	1,239	2.25
							2	69	104	173	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>532</b>	<b>880</b>	<b>1,412</b>
Salmon R @ Lewis Clark 4/17/2000	1999	PAH A	Untagged	61,732	AD	Contribution	1	456	764	1,220	2.25
							2	68	103	171	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>524</b>	<b>867</b>	<b>1,391</b>
Salmon R @ Cottonwood Cg 4/14-4/21/2000	1999	PAH A	Untagged	36,419	AD	Production	1	225	451	676	2.21
							2	67	61	128	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>292</b>	<b>512</b>	<b>804</b>
Salmon R @ Colston Corner 4/18/2000	1999	SAW A	Untagged	11,533	AD	Production	1	85	143	228	2.23
							2	10	19	29	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>95</b>	<b>162</b>	<b>257</b>
Salmon R @ Colston Corner 4/18/2000	1999	PAH A	Untagged	9,092	AD	Production	1	67	113	180	2.23
							2	8	15	23	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>75</b>	<b>128</b>	<b>203</b>
Salmon R @ Challis 4/13-4/24/2000	1999	SAW A	Untagged	24,491	AD	Production	1	131	303	434	2.12
							2	45	41	86	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>176</b>	<b>344</b>	<b>520</b>
Salmon R @ Challis 4/13-4/24/2000	1999	PAH A	Untagged	21,250	AD	Production	1	131	263	394	2.20
							2	39	35	74	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>170</b>	<b>298</b>	<b>468</b>
Salmon R @ Wagonhammer 4/17/2000	1999	SAW A	Untagged	1,845	AD	Production	1	14	23	37	2.27
							2	2	3	5	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>16</b>	<b>26</b>	<b>42</b>
Salmon R @ Wagonhammer 4/17/2000	1999	PAH A	Untagged	39,246	AD	Production	1	290	486	776	2.25
							2	43	65	108	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>333</b>	<b>551</b>	<b>884</b>
Lemhi R: Salmon R 4/12-4/21/2000	1999	SAW A	Untagged	24,040	AD	Production	1	178	298	476	2.25
							2	26	40	66	
							3	ND	ND	ND	
							<b>Totals:</b>		<b>204</b>	<b>338</b>	<b>542</b>
<b>Total 1-Ocean:</b>							<b>17,547</b>				
<b>Total 2-Ocean:</b>							<b>5,684</b>				
<b>Total 3-Ocean:</b>							<b>ND</b>				
<b>Total Harvest Recoveries:</b>							<b>10,755</b>				
<b>Total Hatchery Recoveries:</b>							<b>12,476</b>				
<b>Total Releases:</b>							<b>2,050,039</b>				
<b>Total Recoveries:</b>							<b>23,231</b>				

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) 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	19	1	20	0.10
							2	0	0	0	
							3	0	0	0	
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	Untagged	38,649	AD	Bio-Diet Feed (Feed Exp.)	1	20	2	22	0.06
							2	0	0	0	
							3	0	0	0	
<b>Totals:</b>				<b>58,970</b>			<b>39</b>	<b>3</b>	<b>42</b>	<b>0.07</b>	
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	105233	20,668	AD,LV	Moore/Clark Diet (Feed Exp.)	1	0	0	0	0.45
							2	70	24	94	
							3	0	0	0	
Clear Cr: Clwtr R 4/22-4/23/1999	1998	DWOR B	Untagged	110,901	AD	Moore/Clark Diet (Feed Exp.)	1	0	4	4	0.46
							2	376	129	505	
							3	0	0	0	
<b>Totals:</b>				<b>131,569</b>			<b>446</b>	<b>157</b>	<b>603</b>	<b>0.46</b>	
Red River@ Soda Cr Brdg 4/20/1999	1998	DWOR B	Untagged	4,993	NONE	Supplementation (PIT tag Only)	1	ND	ND	ND	
							2	ND	ND	ND	
							3	ND	ND	ND	
<b>Totals:</b>				<b>4,993</b>			<b>ND</b>	<b>ND</b>	<b>ND</b>		
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105235	20,648	AD,LV	Contribution	1	16	1	17	0.97
							2	67	110	177	
							3	0	7	7	
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105236	21,193	AD,LV	Contribution	1	11	1	12	1.16
							2	112	113	225	
							3	0	8	8	
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	105237	20,766	AD,LV	Contribution	1	0	1	1	0.85
							2	58	110	168	
							3	0	7	7	
S Fk Clwtr@ Red House Hole 4/27-4/29/1999	1998	DWOR B	Untagged	337,858	AD	Contribution	1	146	13	159	0.99
							2	1,279	1,798	3,077	
							3	0	121	121	
<b>Totals:</b>				<b>400,465</b>			<b>1,689</b>	<b>2,290</b>	<b>3,979</b>	<b>0.99</b>	
<b>Total 1-Ocean:</b>							<b>235</b>				
<b>Total 2-Ocean:</b>							<b>4,246</b>				
<b>Total 3-Ocean:</b>							<b>143</b>				
<b>Total Harvest Recoveries:</b>							<b>2,174</b>				
<b>Total Hatchery Recoveries:</b>							<b>2,450</b>				
<b>Total Releases:</b>							<b>595,997</b>				
<b>Total Recoveries:</b>							<b>4,624</b>				

Appendix D. Table 2. Release and recovery data for brood year 1998 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 4/23/1999	1998	SAW A	105263	19,678	AD	Acclimated Feed/Fast	1	130	34	164	1.07
							2	40	7	47	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	105259	19,171	AD	Acclimated Feed/Fast	1	39	31	70	0.65
							2	38	17	55	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	105260	19,426	AD	Acclimated Feed/Fast	1	37	41	78	0.58
							2	17	17	34	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	Untagged	2,013	AD	Acclimated Feed/Fast	1	7	8	15	0.94
							2	3	1	4	
							3	0	0	0	
<b>Totals:</b>				<b>60,288</b>				<b>311</b>	<b>156</b>	<b>467</b>	<b>0.77</b>
Sawtooth Hatchery 4/23/1999	1998	SAW A	105261	17,807	AD	Acclimated, % Body Wt. Diet	1	80	21	101	0.72
							2	20	7	27	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	105257	18,973	AD	Acclimated, % Body Wt. Diet	1	36	36	72	0.63
							2	32	15	47	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	105258	18,786	AD	Acclimated, % Body Wt. Diet	1	7	32	39	0.39
							2	10	24	34	
							3	0	0	0	
Sawtooth Hatchery 4/23/1999	1998	SAW A	Untagged	372,500	AD	Acclimated, % Body Wt. Diet	1	825	1519	2,344	0.82
							2	416	303	719	
							3	0	0	0	
<b>Totals:</b>				<b>428,066</b>				<b>1,426</b>	<b>1,957</b>	<b>3,383</b>	<b>0.79</b>
Sawtooth Hatchery 4/21-4/26/1999	1998	SAW A	Untagged	104,521	AD	Direct Release	1	275	426	701	0.86
							2	171	32	203	
							3	0	0	0	
<b>Totals:</b>				<b>104,521</b>				<b>446</b>	<b>458</b>	<b>904</b>	<b>0.86</b>
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104637	10,004	AD	Contribution	1	52	52	104	2.29
							2	67	21	88	
							3	37	0	37	
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104636	10,137	AD	Contribution	1	7	7	14	0.57
							2	23	21	44	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104635	10,326	AD	Contribution	1	32	32	64	0.82
							2	0	21	21	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	104638	10,317	AD	Contribution	1	32	32	64	0.82
							2	0	21	21	
							3	0	0	0	

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 (%)
Lt Salmon R @ Stinky Springs 4/14-5/10/1999	1998	HELLS CANYON A	Untagged	378,252	AD	Contribution	1	3,159	3,159	6,318	2.10
							2	835	781	1,616	
							3	0	0	0	
							<b>Totals:</b>	<b>419,036</b>	<b>4,244</b>	<b>4,147</b>	
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105110	9,309	AD	Early Egg Progeny	1	16	9	25	0.45
							2	10	7	17	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105109	9,495	AD	Early Egg Progeny	1	12	8	20	0.21
							2	10	5	15	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105301	20,133	AD	Early Egg Progeny	1	36	31	67	0.46
							2	16	10	26	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	105302	18,088	AD	Early Egg Progeny	1	48	7	55	0.79
							2	76	11	87	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/23/1999	1998	SAW A	Untagged	1,127	AD	Early Egg Progeny	1	2	5	7	0.89
							2	2	1	3	
							3	0	0	0	
							<b>Totals:</b>	<b>58,152</b>	<b>228</b>	<b>94</b>	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	105107	9,008	AD	Late Egg Progeny	1	46	21	67	0.93
							2	11	6	17	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104634	9,701	AD	Late Egg Progeny	1	26	18	44	0.66
							2	12	8	20	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104643	9,257	AD	Late Egg Progeny	1	20	16	36	0.69
							2	21	7	28	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104644	9,344	AD	Late Egg Progeny	1	38	12	50	0.87
							2	22	9	31	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104645	9,509	AD	Late Egg Progeny	1	23	18	41	0.76
							2	25	6	31	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	104646	9,874	AD	Late Egg Progeny	1	35	23	58	0.79
							2	12	8	20	
							3	0	0	0	
Sawtooth Hatchery 4/22-4/26/1999	1998	SAW A	Untagged	7,069	AD	Late Egg Progeny	1	23	29	52	0.99
							2	13	5	18	
							3	0	0	0	
							<b>Totals:</b>	<b>63,762</b>	<b>327</b>	<b>186</b>	
<b>Total 1-Ocean:</b>						<b>10,670</b>					
<b>Total 2-Ocean:</b>						<b>3,273</b>					
<b>Total 3-Ocean:</b>						<b>37</b>					
<b>Total Harvest Recoveries:</b>						<b>6,982</b>					
<b>Total Hatchery Recoveries:</b>						<b>6,998</b>					
<b>Total Releases:</b>						<b>1,133,825</b>					
<b>Total Recoveries:</b>						<b>13,980</b>					

Appendix D. Table 3. Release and recovery data for brood year 1998 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 (%)
Salmon R @ Red Rock 4/16-4/26/1999	1998	PAH A	105406	60,343	AD	Contribution	1	278	191	469	
							2	146	125	271	
							3	4	0	4	
Salmon R @ Red Rock 4/16-4/26/1999	1998	PAH A	Untagged	111,421	AD	Contribution	1	481	352	833	1.20
							2	270	230	500	
							3	0	0	0	
<b>Totals:</b>				<b>171,764</b>			<b>1,179</b>	<b>898</b>	<b>2,077</b>	<b>1.21</b>	
Salmon R @ Shoup Brdg 4/19-4/20/1999	1998	PAH A	105405	60,453	AD	Contribution	1	261	191	452	1.21
							2	148	125	273	
							3	4	0	4	
Salmon R @ Shoup Brdg 4/19-4/20/1999	1998	PAH A	Untagged	71,967	AD	Contribution	1	311	228	539	1.20
							2	176	149	325	
							3	0	0	0	
<b>Totals:</b>				<b>132,420</b>			<b>900</b>	<b>693</b>	<b>1,593</b>	<b>1.20</b>	
Salmon R @ Tunnel Rock 4/21-5/3/1999	1998	PAH A	105404	60,660	AD	Contribution	1	166	192	358	0.98
							2	110	125	235	
							3	0	0	0	
Salmon R @ Tunnel Rock 4/21-5/3/1999	1998	PAH A	Untagged	68,553	AD	Contribution	1	188	217	405	0.98
							2	124	142	266	
							3	0	0	0	
<b>Totals:</b>				<b>129,213</b>			<b>588</b>	<b>676</b>	<b>1,264</b>	<b>0.98</b>	
E Fk Salmon R @ Dumpster 4/29-5/5/1999	1998	DWOR B	105403	59,129	AD,LV	Contribution	1	25	0	25	0.19
							2	86	0	86	
							3	4	0	4	
E Fk Salmon R @ Dumpster 4/29-5/5/1999	1998	DWOR B	Untagged	209,796	AD	Contribution	1	89	0	89	0.19
							2	305	0	305	
							3	14	0	14	
<b>Totals:</b>				<b>268,925</b>			<b>523</b>	<b>0</b>	<b>523</b>	<b>0.19</b>	
Salmon R @ Tunnel Rock 4/28-5/3/1999	1998	DWOR B	105401	53,679	AD,LV	Contribution	1	0	0	0	0.11
							2	59	0	59	
							3	0	0	0	
Salmon R @ Tunnel Rock 4/28-5/3/1999	1998	DWOR B	Untagged	24,455	AD	Contribution	1	0	0	0	0.12
							2	27	3	30	
							3	0	0	0	
<b>Totals:</b>				<b>78,134</b>			<b>86</b>	<b>3</b>	<b>89</b>	<b>0.11</b>	
Squaw Cr 4/30-5/11/1999	1998	DWOR B	105402	58,514	AD,LV	Contribution	1	28	0	28	0.18
							2	79	1	80	
							3	0	0	0	
Squaw Cr 4/30-5/11/1999	1998	DWOR B	Untagged	146,292	AD	Contribution	1	70	0	70	0.19
							2	198	3	201	
							3	0	0	0	
<b>Totals:</b>				<b>204,806</b>			<b>375</b>	<b>4</b>	<b>379</b>	<b>0.19</b>	

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 (%)
Squaw Creek Pond Below Outlet 5/5-5/12/1999	1998	DWOR B	105255	14,422	AD,LV	Contribution	1	0	0	0	0.24
							2	32	3	35	
							3	0	0	0	
Squaw Creek Pond Below Outlet 5/5-5/12/1999	1998	DWOR B	105253	16,772	AD,LV	Contribution	1	8	0	8	0.16
							2	17	2	19	
							3	0	0	0	
Squaw Creek Pond Below Outlet 5/5-5/12/1999	1998	DWOR B	105254	17,651	AD,LV	Contribution	1	12	0	12	0.10
							2	6	0	6	
							3	0	0	0	
Squaw Creek Pond Below Outlet 5/5-5/12/1999	1998	DWOR B	Untagged	58,165	AD	Contribution	1	24	0	24	0.16
							2	65	6	71	
							3	0	0	0	
<b>Totals:</b>				<b>107,010</b>				<b>164</b>	<b>11</b>	<b>175</b>	<b>0.16</b>
Squaw Cr Ponds 4/7-4/12/1999	1998	DWOR B	Untagged	78,244	AD	Volitional Release Study.	1	37	0	37	0.17
							2	88	8	96	
							3	0	0	0	
<b>Totals:</b>				<b>78,244</b>				<b>125</b>	<b>8</b>	<b>133</b>	<b>0.17</b>
Lt Salmon R @ Stinky Springs 4/12-4/16/1999	1998	PAH A	Untagged	41,620	AD	Contribution	1	82	82	164	0.60
							2	0	86	86	
							3	0	0	0	
<b>Totals:</b>				<b>41,620</b>				<b>82</b>	<b>168</b>	<b>250</b>	<b>0.60</b>
Sawtooth Hatchery 4/23/1999	1998	PAH A	Untagged	39,660	AD	Contribution	1	104	162	266	0.96
							2	65	50	115	
							3	0	0	0	
<b>Totals:</b>				<b>39,660</b>				<b>169</b>	<b>212</b>	<b>381</b>	<b>0.96</b>
Salmon R @ McNabb Point 4/23-4/28/1999	1998	PAH A	Untagged	121,210	AD	Contribution	1	332	383	715	0.98
							2	220	250	470	
							3	0	0	0	
<b>Totals:</b>				<b>121,210</b>				<b>552</b>	<b>633</b>	<b>1,185</b>	<b>0.98</b>
Lt Salmon R @ Stinky Springs 4/12-4/16/1999	1998	DWOR B	105256	16,416	AD,LV	Contribution	1	0	0	0	0.10
							2	15	1	16	
							3	0	0	0	
Lt Salmon R @ Stinky Springs 4/12-4/16/1999	1998	DWOR B	Untagged	308,139	AD	Contribution	1	0	0	0	0.10
							2	282	11	293	
							3	0	0	0	
<b>Totals:</b>				<b>324,555</b>				<b>297</b>	<b>12</b>	<b>309</b>	<b>0.10</b>
Lemhi R: Salmon R 4/19-4/26/1999	1998	PAH A	Untagged	157,865	AD	Contribution	1	682	499	1,181	1.20
							2	386	326	712	
							3	0	0	0	
<b>Totals:</b>				<b>157,865</b>				<b>1,068</b>	<b>825</b>	<b>1,893</b>	<b>1.20</b>
Salmon R @ Cottonwood Cg 4/29-5/5/1999	1998	PAH A	Untagged	85,980	AD	Contribution	1	235	272	507	0.94
							2	124	177	301	
							3	0	0	0	
<b>Totals:</b>				<b>85,980</b>				<b>359</b>	<b>449</b>	<b>808</b>	<b>0.94</b>
<b>Total 1-Ocean:</b>							<b>6,182</b>				
<b>Total 2-Ocean:</b>							<b>4,851</b>				
<b>Total 3-Ocean:</b>							<b>26</b>				
<b>Total Harvest Recoveries:</b>							<b>6,467</b>				
<b>Total Hatchery Recoveries:</b>							<b>4,592</b>				
<b>Total Releases:</b>							<b>1,941,406</b>				
<b>Total Recoveries:</b>							<b>11,059</b>				

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