



STEELHEAD FISH HATCHERY EVALUATIONS—IDAHO

Project Progress Report

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**LSRCP Hatchery Evaluation Studies in Idaho
Part 1: Steelhead Trout**

1998 Annual Report

By

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ABSTRACT

This annual report summarizes activities associated with Idaho-Lower Snake River Compensation Plan (LSRCP) hatcheries' activities from October 1, 1997 through September 30, 1998. Included in this report are all fall 1997 and spring 1998 adult steelhead *Oncorhynchus mykiss* returns and all releases of juvenile steelhead made within the reporting period. Information presented in this report supersedes that included in previous reports.

An estimated minimum of 13,763 adult LSRCP steelhead returned to Idaho in the fall of 1997 and spring of 1998. This return total consisted of 6,031 estimated to have returned from Hagerman National Fish Hatchery releases, 7,359 estimated to have returned from Magic Valley Fish Hatchery releases, and 373 from Clearwater Fish Hatchery releases. Though well below the LSRCP goal of 39,260 adult steelhead, this was the best return year in a long time.

In April and May 1998, the Idaho-LSRCP hatcheries released 3,369,756 steelhead smolts. Clearwater Fish Hatchery released 702,286 smolts, all of which were brood year 1996 Dworshak B-stock. Hagerman National Fish Hatchery released 1,008,645 smolts that were all brood year 1996 A-stock. Magic Valley Fish Hatchery released 1,658,825 smolts of which 956,975 were B-stock, while the remaining 701,850 were A-stock.

The out-migration conditions in 1998 were about average. Total flow and spill at Lower Granite during the peak migration period were about average, though conditions improved during the extended migration period. Out-migrant survival was consistent with previous years.

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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 the HES activities and hatchery accomplishments for the LSRCP steelhead facilities in Idaho from October 1, 1997 through September 30, 1998.

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, 1997 and September 30, 1998 are documented in this report. Any information relevant to the quality of the brood year 1997 smolts released in

1998, or relevant to the early rearing success of brood year 1998, is discussed. Information concerning size at release, health problems, and dietary considerations was obtained through the Hatchery Brood Year and Run reports from each hatchery. Further information on final numbers and mark information was obtained through the Release database maintained by the IDFG coded-wire tag recovery laboratory.

Migration Conditions

One of the most important factors found to influence survival to adult of Idaho anadromous salmonids is the condition of the river corridor during the out-migration. 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. This reporting period covers the adults that return as three, four, or five-year-olds during the fall of 1997 and the spring of 1998. These adults were from the out-migrations in the springs of 1994, 1995, or 1996. Therefore, the flow conditions during the emigration period for these three years, as well as the flow conditions during the emigration period of 1998, 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. 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. Tagging of hatchery steelhead was performed by IDFG fish marking and HES personnel about one month prior to release, in order to give the fish a chance to recover and to allow any tagging-induced mortality to manifest itself. 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 the tag group was obtained from the hatchery and was submitted to PTAGIS by the tag coordinator.

PIT tags were interrogated at five of the dams on the Snake and Columbia rivers. 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, a minimum smolt survival index and migration timing information was obtained. The survival index is a minimum value for several reasons: 1) A variable number of smolts pass over the spillway at the dams rather than going through the bypass system; 2) mortality occurs after leaving the hatchery but prior to arrival at an interrogation site; 3) mechanical errors allow fish to pass through the interrogation system undetected; 4) a small number of PIT tags fail for mechanical reasons (approximately 2%, Russell Kiefer, IDFG, personal communication); 5) a small number of smolts may shed the tag, which often goes undetected, and 6) a small but unknown number of smolts may die prior

to release and not be recovered, although all mortalities recovered by hatcheries are scanned for PIT tags.

Median travel time to Lower Granite dam was calculated for each of the PIT tag groups released in 1998. Interrogation rates were calculated for each PIT tag group by dividing the number of unique interrogations at Lower Granite, Little Goose, Lower Monumental, and McNary dams by the number of PIT tagged fish released, multiplied by 100.

Adult Returns

The HMP estimated the number of LSRCP steelhead that returned to Idaho in the 1997-1998 return year (Hansen and White In Press). This estimate includes steelhead caught in the sport harvest, or at hatchery racks, as well as LSRCP steelhead that escaped to spawn naturally. Hansen and White'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 adult returns was used to determine an estimated smolt-to-adult return (SAR) rate for each group. These values are compared to LSRCP hatchery targets as a measure of success.

Fisheries Contribution

All steelhead released from the three LSRCP hatcheries had a fin removed prior to release to indicate their hatchery origin. Representative samples destined for most release sites received coded-wire tags according to the marking plan developed by fishery managers and research biologists. All production B-stock steelhead that received a coded-wire tag had the left ventral fin removed to indicate the presence of a tag. Coded-wire-tagged A-stock steelhead did not receive an externally visible tag indicator mark. Snouts from tagged steelhead recovered by creel clerks in the fishery were sent to the Idaho Coded-Wire Tag Recovery Lab in Lewiston, Idaho for processing. The HMP derived a harvest estimate by river section for the fishery through a phone survey of angler success (Hansen and White 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 and White 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, Sawtooth Fish Hatchery, and Clearwater Fish Hatchery weirs. The Clearwater Fish Hatchery weirs are located on Crooked River and Red River, which are tributaries to the South Fork Clearwater River. No subsampling of recovered adults took place at any of these weirs during the spring of 1998, 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 Coded-Wire Tag Recovery Lab in Lewiston, Idaho 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

Hagerman National Fish Hatchery

Acclimation Experiment—1998 was the last release year of a study initiated in 1992 that compared migration and survival for steelhead acclimated at Sawtooth Fish Hatchery for two to three weeks prior to release with steelhead released directly at the Sawtooth Fish Hatchery weir. All fish used in the experiment were Sawtooth A-stock steelhead raised at Hagerman National Fish Hatchery. This report documents out-migration survival and timing for the brood year 1997 fish released in the spring of 1997, as well as adult recovery information for the brood year 1994 (2-ocean Sawtooth A-stock) and brood year 1995 (1-ocean Sawtooth A-stock) that returned in the fall of 1997 and spring of 1998. Osborne and Rhine (1999a) summarized migration survival and timing for all but the last year of this study, along with the first year of recovery data. A final report on migration timing and survival for the complete study along with all adult recoveries will be published separately.

Magic Valley Fish Hatchery

Squaw Pond—The Squaw Pond acclimation facility was put into operation for the first time in 1998. The Squaw Pond 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, late migrants, and non-migrants were PIT tagged to measure out-migration survival and timing. The non-migrant group was taken from the fish remaining in the pond after all boards have been removed.

Prior to trucking from Magic Valley Fish Hatchery, the population of smolts destined for Squaw Pond was sampled for size and population characteristics. At the termination of volitional migration from the pond, the same information was obtained from a random sample taken from the fish remaining in the pond. Furthermore, a mark-recapture study was performed to determine the actual number of smolts remaining in the pond after migration was halted.

Complete information about the design and operation of the Squaw Pond study in 1998 can be found in Osborne and Rhine (1999b).

RESULTS

Hatchery Operations Documentation

Clearwater Fish Hatchery

Brood Year 1997—In 1997, smolt production at Clearwater Fish Hatchery was reduced from an objective of 2,000,000 down to 800,000 to comply with the National Marine Fisheries Service hatchery production cap for the Snake River basin. Clearwater Fish Hatchery had not yet attained the higher objective, though smolt production had been growing every year.

A total of 828,458 Dworshak B-stock eyed steelhead eggs were received from Dworshak National Fish Hatchery (McGehee and George 1998). These eggs were all from the middle or later egg takes and did not represent the entire run. This is common practice for Clearwater Fish Hatchery steelhead since the fish will be released off-site and will not be part of a broodstock program.

Survival from eyed-egg to smolt was reported to be 84.8% (McGehee and George 1998), which is comparable to the previous year. No disease incidence was reported for the brood year 1997 steelhead.

The brood year 1997 Dworshak B-stock steelhead were divided into two groups during marking in the summer of 1997 (McGehee and George 1998). The first group was the production group. All steelhead in this group had their adipose fin excised to designate them as harvestable in the fishery. A representative number of each harvestable release received a code-wire tag to allow the HMP group to evaluate fishery contribution of the different releases. All fish that received a coded-wire tag also had the left ventral fin removed as a visible external indicator of the coded-wire tag. Furthermore, a representative selection from each release received PIT tags to measure out-migration survival and timing. The second group of steelhead created at the time of marking was a stock supplementation group released in the Red River, a tributary to the upper South Fork Clearwater River. This group consisted of 4,497 PIT-tagged steelhead. None of the supplementation fish received any externally visible mark. Further information on release sites and exact numbers of each mark type can be found in Appendix A. Table 1.

Survival to the dams was only about 60% for the groups released in the lower South Fork Clearwater River, as well as in Clear Creek (Table 1). This is considerably lower than the previous year and is somewhat disappointing. However, survival for the group released in the upper South Fork Clearwater River was only about two-thirds the survival of the groups released in the lower sections of the South Fork Clearwater River. Furthermore, the travel time for the upper group was almost 19 days, compared to 6 to 10 days for the lower release groups.

As seen in previous years (Rhine et al. 1999; Harrington, In Press), releases in the upper South Fork Clearwater River showed decreased survival when compared with other releases in the Clearwater. However, the decrease in survival was not as extreme as in some previous years.

Brood Year 1998—During the month of April, Clearwater Fish Hatchery received 699,768 eyed Dworshak B-stock steelhead eggs from the middle takes at Dworshak National

Fish Hatchery (McGehee and Patterson 1999). Survival was greater than 85% with no health problems reported.

Hagerman National Fish Hatchery

Brood Year 1997—A total of 1,235,100 eyed steelhead eggs were received from Sawtooth Fish Hatchery (Hagerman National Fish Hatchery 1997) to comprise the total releases in 1998. These eggs consisted of two stocks: 836,000 Sawtooth A-stock, and 398,000 Pahsimeroi A-stock (Hagerman National Fish Hatchery 1997). Survival from egg to release was 79.1% for the Sawtooth A-stock and 87.3% for the Pahsimeroi A-stock. The figures for Sawtooth A-stock survival may be somewhat inaccurate, since they may include about 50,000 steelhead that were part of a fin erosion diet study and were subsequently donated to the resident fishery program when they were found to behave unusually (Hagerman National Fish Hatchery 1998). If the figures are recalculated to remove those fish, the survival for the Sawtooth A-stock smolts increases to 84.2%, which is much closer to the survival of the Pahsimeroi A-stock group.

The adipose fin was removed from all fish used in steelhead production releases during the end of September and the first half of October. During early November, representative groups of steelhead from most of the releases received coded-wire tags to evaluate return success and contribution to the fishery. Prior to release, 2,400 of the coded-wire-tagged fish received PIT tags to measure run timing and juvenile out-migration success.

Survival of the PIT-tagged fish to the dams was comparatively low, with detection rates ranging from a low of 59.1% to a high of 70.0% (Table 1). The best performance, with a detection rate of 70.0%, came from a group released in the Little Salmon River at Stinky Springs, which had a much shorter migration than the other releases that were all in the upper Salmon River drainage.

Complete information on release timing and marks on production steelhead can be found in Appendix A, Table 2. This table does not include the approximately 50,000 Sawtooth A-stock fish that were donated to the resident fishery program after participating in a failed diet study. These fish are not included in the total hatchery release, as they are not expected to migrate and do not contribute to the LSRCP mitigation goal.

Brood Year 1998—During late May and early June of 1998, a total of 1,355,000 eyed steelhead eggs were received from Sawtooth Fish Hatchery and Oxbow Fish Hatchery (Hagerman National Fish Hatchery 1998). These eggs consisted of 803,000 Sawtooth A-stock and 552,000 Oxbow A-stock. Hatching success for the two stocks was about 98% (Hagerman National Fish Hatchery 1998).

Magic Valley Fish Hatchery

Brood Year 1997—During the latter part of April, all of May, and the first part of June, Magic Valley Fish Hatchery received four stocks of eyed steelhead eggs consisting of: 1,403,900 Dworshak B, 356,340 East Fork B, 325,000 Pahsimeroi A, and 530,000 Sawtooth A eggs (Moore et al. 1999). Survival to release for the East Fork B, Pahsimeroi A, and Sawtooth A stocks was 84.6%, 89.7%, and 77.4%, respectively. Survival to release for the Dworshak B-stock fish was only 46.7%. Considerably lower survival is consistent for Dworshak B-stock fish raised at Magic Valley Fish Hatchery (Dave May, IDFG, Personal Communication). For this

brood year, the higher mortality for the Dworshak B-stock fish occurred early in development. Fingerling to smolt survival for the Dworshak B-stock fish was consistent with the other stocks (Moore et al. 1999).

During September and October of 1997, all the steelhead had their adipose fins removed to indicate their hatchery origin, and 452,720 received coded-wire tags. Tag loss due to mortality and shedding resulted in only approximately 440,903 tags being released. Representative groups from most of the releases were tagged to determine fishery contribution. All coded-wire-tagged B-stock steelhead had the left ventral fin removed as an externally visible indicator of the presence of the tag. A-stock steelhead did not receive any externally visible indicator marks.

In February, about two months prior to release, 3,005 PIT tags were inserted into representative groups of fish to track migration timing and survival. Whenever possible, PIT tags were put into coded-wire-tagged fish. Rejection and short-term mortality due to PIT tagging was very low, with only one PIT-tagged mortality recorded prior to release. Further information on release sites, mark numbers, and size at release can be found in Appendix A, Table 3.

Moore et al. (1999) reported that the precocity problem they observed in previous years was resolved after turning off the security light that was shining on one of the raceways. Precocity for all raceways was reportedly very low, with the highest incidence being only 1.3% (Moore et al. 1999).

An outbreak of Cold Water Disease *Flavobacterium psychrophilus* was noted by the hatchery during the summer (Moore et al. 1999); however, the mortality they report does not seem to have significantly affected total survival. The differences in survival between different stocks appear small, with the exception of the continued poor performance of Dworshak B-stock steelhead prior to fingerling stage.

Survival to the dams of the PIT-tagged fish was good, with a total survival of 60.3% for Dworshak B-stock fish, 65.5% for East Fork B-stock fish, and 72.3% for Pahsimeroi A-stock fish (Table 1). This reduced survival of Dworshak B-stock fish compared to the A-stock fish is not a consistent trend, though early survival of Dworshak B-stock fish in the Hagerman Valley appears to be lower than A-stock survival.

Median travel time of the PIT-tagged groups of fish varied from 10 days to 22 days (Table 1). Migration is usually highly influenced by flow levels and distance of travel. However, the two raceways released at Stinky Springs on the Little Salmon River were released on the same date, yet had considerably different average migration times. The fish from raceway 8E took 16 days, whereas the fish from raceway 12E took 22 days.

Brood Year 1998—From April to June of 1998, Magic Valley Fish Hatchery received a total of 2,313,652 eyed steelhead eggs comprised of four stocks: 1,295,412 Dworshak B, 7,700 East Fork B, 887,000 Pahsimeroi A, and 123,540 Oxbow A (Moore et al. 2000). The Dworshak B-stock steelhead had a hatching percentage of 98%, which is comparable to the hatching percentages of the other three stocks that ranged from 94-99%. The lower survival of Dworshak B-stock steelhead during early rearing at Magic Valley, which has been reported during the last few years, was not evident this year.

Migration Conditions

Highest flows were delayed during the migration window in 1998 (Table 2). Petrosky (1991) identified two periods that were important for migrating chinook salmon. Since steelhead smolts migrate during the same window, these periods are probably significant for them as well. During the Peak period, flows were down near the 20-year average, but they picked up considerably later on, and the Extended migration period had relatively high flows. Spill at Lower Granite Dam followed the same pattern as flow, which may have harmed early migrating steelhead, since spill may represent an improved migration path through the dam relative to either the turbines or the smolt bypass system.

The three migration years that contributed to the 1998 adult return were 1994, 1995, and 1996. Of these three years, only the last one had flows during the peak migration period that were above the average of 80.8 kcfs observed since 1977. However, only 1994 had a flow that was below average during the extended migration period. Migration year 1996 had above average flows during both migration periods, which may have boosted survival during this year.

Migration Timing and Juvenile Survival

A total of 11,410 steelhead smolts were released with PIT tags in 1998. These included a mix of production and supplementation fish. Overall, 54.0% (6,160) of the PIT tags were interrogated at the dams (Table 1). However, this percentage was somewhat reduced by the inclusion of a group released in the upper South Fork Clearwater River that contained nearly 50% of the PIT tags but had a detection rate of only 41%. If this release from the upper South Fork Clearwater River is removed, the detection rate jumps to 62.2%, which is probably a more accurate representation of overall performance for migration year 1998.

In addition, the juvenile detection points at the dams detected small numbers of fish from other files. Detections from the 1997 migration year are probably steelhead that did not migrate their first year. Detections from earlier migration years are probably adults that fell back through the detection system. In either case, these detections were exceedingly rare and were not reported here.

Adult Returns

The HMP (Hansen and White In Press) estimated that Hagerman National, Magic Valley, and Clearwater fish hatcheries returned a minimum of 13,763 adult steelhead to Idaho waters in the fall of 1997 and spring of 1998 (Table 3). This estimate does not include in-stream prespawning mortalities, which includes those adults that failed to spawn successfully. Hansen and White (In Press) estimated that anglers harvested 9,845 steelhead, while 3,918 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 1 shows adult returns from steelhead released by each of the three LSRCP steelhead hatcheries as a percentage of their return goals for the last five years. The 1997-1998 return year was the best return year for Magic Valley Fish Hatchery and about the same as the previous year for the other two hatcheries. This figure may be somewhat misleading in the case of Clearwater Fish Hatchery. The only steelhead released by Clearwater Fish Hatchery that

would be expected to return to a weir were the ones released from the Crooked River Satellite Facility. The migration survival of this group was quite poor relative to other releases (Rhine et al. 1999), and no hatchery-origin adults were trapped in 1998 (Table 8). Therefore, return estimates are based exclusively on creel survey data and occasional strays recovered at the Dworshak National Fish Hatchery weir.

Fisheries Contribution

Hansen and White (In Press) estimated that anglers harvested 36,782 hatchery steelhead during the 1997-98 season. Of these, 9,845 were produced by the three Idaho facilities, 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 768 adult A-stock steelhead were trapped at the Sawtooth Fish Hatchery weir between March 23 and May 8, 1998 (Schilling et al. 1998). This total consisted of 506 males (65.9%) and 262 females (34.1%) (Table 5). Of the 506 males, 503 were of hatchery-origin, and 416 (82.7%) of those were 1-ocean fish. Of the 262 females, 259 were of hatchery-origin with 145 (56.0%) of those being 1-ocean fish.

All wild/natural fish along with two hatchery-origin males were released directly above the weir for natural spawning (Schilling et al. 1999). An additional 10 hatchery males and 10 hatchery females were released into a weired off section of Beaver Creek. This last release was part of a natural spawning study associated with IDFG's steelhead supplementation studies program. All other hatchery-origin adults shown as released in Table 5 were released below the weir to provide angling opportunity.

Two hundred and forty-six pairs of hatchery-origin steelhead were spawned at the Sawtooth Fish Hatchery weir in 1998, yielding 1,116,350 green eggs (Table 5) (Schilling et al. 1998). Survival to eye-up for these eggs was 88.2%, which left 984,600 eyed eggs for distribution to Magic Valley and Hagerman National Fish Hatcheries. Complete disposition for all fish trapped can be found in Table 5.

East Fork Salmon River Weir—Twenty-seven B-stock steelhead were recovered at the East Fork trap that operated between April 6 and May 11, 1998 (Schilling et al. 1998). These fish were primarily returns from East Fork progeny that had been raised at Magic Valley or Hagerman National fish hatcheries. Of the 27 fish recovered, 12 (44.4%) were male and 15 (55.6%) were female. Two of the males and 12 of the females were of natural-origin, while the rest were all hatchery-origin. All of the natural-origin steelhead, along with three hatchery-origin males, were released above the weir to spawn naturally (Schilling et al. 1998). Complete disposition for all fish trapped can be found in Table 6.

Slate Creek Weir—Five adult steelhead were recovered at the temporary Slate Creek trap that was installed on March 31 and operated through May 5, 1998 (Schilling et al. 1998). Adult steelhead recovered at the Slate Creek weir were divided into A-stock or B-stock based on the length criteria listed at the bottom of Table 7. If the fish was not longer than the minimum size for a 2-ocean B, the fish was classified as an A (B. Snider, IDFG, Personal Communication). All of the fish trapped at the Slate Creek weir were killed without spawning

since they were neither wild/natural fish nor long enough to be considered B-stock. Some of these fish could have been 1-ocean B returns, but those are relatively uncommon and there was no way to positively identify most of them as such. Complete disposition for all fish trapped can be found in Table 7.

Crooked River Weir—Trapping at the Crooked River trap commenced on March 19, 1998, and concluded in June (Patterson 1998). During that time, only two steelhead were trapped. Both of these fish were of wild/natural-origin and were released above the weir. This was not a surprise, since there were no B-stock releases in this area that could have contributed to a 2-ocean return. No 3-ocean returns were expected after the dismal 2-ocean return of the previous year. Complete disposition for all fish trapped can be found in Table 8.

Red River Weir—The Red River trap began operation on March 20 and continued through chinook season (Patterson 1998). No adult steelhead were trapped during this time, though Patterson (1998) does report that high runoff and debris caused the trap to be inoperable for part of the trapping season.

Smolt-to-Adult Return Rates

Clearwater Fish Hatchery

In 1994, Clearwater Fish Hatchery released 722,990 brood year 1993, Dworshak B-stock smolts (Appendix D, Table 1). About 278 adults were estimated to have returned from this release. This was disappointing, especially considering that about one tenth of the number was released from the Crooked River satellite facility on the upper South Fork Clearwater River, though no hatchery-origin adults were recovered there. Unfortunately, releases in the upper South Fork Clearwater River appear to migrate very poorly, though the reason for this is not well understood. No other releases were expected to return to a hatchery rack, so the return estimates were based upon creel survey data. Considering the large area in which these fish can be caught, and the small fraction (<30% overall) of the steelhead with coded-wire tags, the creel survey was probably inadequate to fully characterize the total return from this hatchery (Jon Hanson, IDFG, personal communication).

The second factor influencing this poor return was that production was well below the target of 2,000,000 (Table 4). Production at the Clearwater facility was curtailed to allow for enhanced production in the Salmon River (Rhine and Osborne 2000). As long as the production remains at or below a quarter of the design goals for the facility, returns cannot be expected to approach the original target of 14,000 adult steelhead returning. The formal objectives were scaled down in 1997, but the effect of the reduction was felt earlier.

The 2-ocean returns for brood year 1994 releases show continued improvement over the performance of brood year 1993. However, the two major factors limiting adult recoveries for Clearwater Fish Hatchery steelhead still applied, with only 596 adults being recovered from a release of 637,752 (Appendix C, Table 1). It must be noted that nearly one tenth of this total release (49,790) consisted of supplementation fish released at Red River. As has been noted previously, out-migration survival of steelhead smolts released into the upper South Fork Clearwater River is very poor. Furthermore, since these fish did not have their adipose fin removed, they were inaccessible to the fishery, which reduced probable detections considerably.

Hagerman National Fish Hatchery

The 1997-1998 adult steelhead return included fish from two release years. All of the fish released from Hagerman National Fish Hatchery in 1994-1996 were A-stock fish, which seldom return as 3-ocean fish. Indeed, no 3-ocean fish were recovered for the brood year 1993 fish released in 1994 (Appendix D, Table 2). The HMP estimated that 6,793 adult 2-ocean steelhead were recovered from a total brood year 1994 release of 1,150,060 (Appendix C, Table 2). Of these, fishermen accounted for 4,767, while the rest either returned to the hatchery rack or escaped to spawn naturally.

Smolt-to-adult recovery (SAR) rates were generally poor, with SARs for upper Salmon River releases generally exceeding 0.5%, but . The SARs for the Little Salmon River were somewhat lower, but were generally better than the previous year. The SARs for the Little Salmon Release may appear a little below the actual return numbers, since there are no rack recoveries for the river. All data for the Little Salmon River are based on creel survey data, along with exploitation rate estimates by Ball (1999) and Hansen and White (In Press).

The first year of returns for brood year 1995 fish looked moderately promising. A total of 4,048 adult steelhead have been recovered from a release of 1,322,418 (Appendix B, Table 2). Overall, SAR after the first year was 0.31%. While this is not as high as might be hoped, a fair number of A-stock fish will return as 2-ocean adults, so this number can be expected to rise as the second year returns come in. However, even with the higher releases, brood year 1995 probably will not attain the total returns seen for brood year 1994.

Magic Valley Fish Hatchery

Adult returns from Magic Valley releases potentially consisted of fish from three different brood years. However, there was no contribution from brood year 1993, since no adult B-stock steelhead returned as a 3-ocean fish (Appendix D, Table 3). These are disappointing results, since SARs for the brood year 1993 B-stock releases from Magic Valley were high enough to expect some 3-ocean returns. This is especially true for the East Fork B releases. Little Salmon River B-stock releases have not shown very good returns yet, so no 3-ocean fish were expected.

With the exception of releases in the Little Salmon River and B-stock releases in the East Fork, the brood year 1994 steelhead recovered as two-ocean adults returned at a comparatively high rate (Appendix C, Table 3). Ball and White (2001) and Hansen and White (In Press) estimated 7,009 adult steelhead returned from a total release of 1,731,353. This gives an overall SAR of 0.40%, but this number is considerably depressed by the very poor return of B-stock fish to both the East Fork and Little Salmon Rivers. This suggests that brood year 1994 encountered considerably above average conditions during out-migration and their first year in the ocean. This is not born out by flow and spill levels found in Table 2, which were no better than the previous year.

The first year of adult recoveries for brood year 1995 steelhead was about the same as the previous year. The number of smolts released increased to 1,868,086, and the number of 1-ocean adults increased to 3,971. This return is considerably reduced by the fact that over half of the release consisted of B-stock fish that typically return as two-ocean adults. Once all of the returns are in for this brood year, the SARs may rise as high as the previous year.

Experimentation

Hagerman National Fish Hatchery

Acclimation Experiment—Brood year 1997 was the final brood year included in this study. A summary of migration success for brood years 1991-1996 was published as a progress report in 1999 (Osborne and Rhine 1999a). A complete analysis of the data will be published separately from this annual report once all recoveries have been completed.

Magic Valley Fish Hatchery

Squaw Pond—Comparisons between migrant and non-migrant populations of steelhead smolts from brood year 1997 did not show any notable benefit from volitional release (Osborne and Rhine, 1999b). Migrants and non-migrants were detected at about the same rate at the Lower Snake River dams (Table 1). Furthermore, the sex ratio of the non-migrants was about the same as the prestocking ratio (Osborne and Rhine, 199b). Therefore, it does not appear from the first year's data that there was any survival benefit due to a volitional release strategy. Furthermore, there was not much evidence that the non-migrant population differed from the migrant population with regards to physical characteristics. Though the non-migrants were longer and heavier than the migrants, the sex ratio remained the same, which suggests that the fish that didn't migrate were not necessarily residualized steelhead.

One further observation reported by Osborne and Rhine (1999b) was that the rate of precocity was higher for the non-migrants than it was in the prestocking population. However, they note that this may be due to factors unrelated to the operation of the pond, and does not definitively demonstrate a benefit to volitional release.

1998 was the first year of operation for the Squaw Pond acclimation facility. Though the results of the first year did not show a benefit from the volitional release, it is entirely possible that the facility was not operated in a manner that optimized results. Osborne and Rhine (1999b) recommended several changes to pond operation based on their observations from this first year. Implementation of these changes could reasonably be expected to improve facility performance.

Full information on facility design and operations, along with complete information on results, can be found in Osborne and Rhine (1999b).

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Table 1. Number of unique interrogations of PIT-tagged steelhead smolts, by release site/PIT tag file(s), at Lower Granite Dam (GRJ), Little Goose Dam (GOJ), Lower Monumental Dam (LMJ), and McNary Dam (MCJ) for the 1998 migration period. A total of 11,401T-tagged steelhead were released from Clearwater, Hagerman National, and Magic Valley fish hatcheries during April and May of 1998. Median travel time is to Lower Granite Dam.

Coordinator	Release Site	Rel. Date	No. Rel.	Number / Percent Interrogated								Total		Median Travel Time (Days)
				GRJ		GOJ		LMJ		MCJ				
				No.	%	No.	%	No.	%	No.	%	No.	%	
Clearwater Fish Hatchery														
<i>Dworshak B-Stock:</i>														
AAB	Red River	4/24/98	4,495	1,036	23.0	497	11.1	299	6.7	30	0.7	1,862	41.4	18.9
TDR	Clear Creek	4/20/98	302	125	41.4	32	10.6	23	7.6	3	1.0	183	60.6	9.8
TDR	South Fork Clearwater R.	4/27/98	300	104	34.7	47	15.7	32	10.7	1	0.3	184	61.3	5.6
Total			5,097									2,229	43.7	
Clearwater Fish Hatchery Grand Total			5,097									2,229	43.7	
Hagerman National Fish Hatchery														
<i>Sawtooth A-Stock:</i>														
TDR	Sawtooth Hatchery													
	Acclimated Release													
	TDR98056.H47	4/24/98	300	124	41.3	33	11.0	15	5.0	2	0.7	174	58.0	17.7
	TDR98056.H51	4/24/98	300	119	39.7	42	14.0	15	5.0	4	1.3	180	60.0	17.5
	TDR98056.H50	4/24/98	300	128	42.7	37	12.3	17	5.7	2	0.7	184	61.3	16.4
	TDR98056.H52	4/24/98	300	123	41.0	35	11.7	20	6.7	2	0.7	180	60.0	17.8
	Direct Release													
	TDR98056.H46	4/24/98	300	156	52.0	29	9.7	22	7.3	0	0	207	69.0	7.9
	Fast Feed Group													
	TDR98056.H42	4/24/98	300	122	40.7	35	11.7	24	8.0	1	0.3	182	60.7	13.4
	TDR98056.H43	4/24/98	300	134	44.7	42	14.0	10	3.3	4	1.3	190	63.3	17.2
<i>Pahsimeroi A-Stock:</i>														
TDR	Lt. Salmon @ Stinky Springs	4/20/98	300	157	52.3	37	12.3	14	4.7	2	0.7	210	70.0	9.4
Hagerman National Grand Total			2,400									1,507	62.8	

Table 1. Continued.

Coordinator	Release Site	Rel. Date	No. Rel.	Number / Percent Interrogated								Median Travel Time (Days)		
				GRJ		GOJ		LMJ		MCJ			Total	
				No.	%	No.	%	No.	%	No.	%		No.	%
<u>Magic Valley Fish Hatchery</u>														
<i>Dworshak B-Stock</i>														
TDR	Lt. Salmon @ Stinky Springs													
	TDR98054.M8E	4/13/98	300	114	38.0	39	13.0	23	7.7	2	0.7	178	59.3	15.8
	TDR98054.12E	4/13/98	300	130	43.3	35	11.7	25	8.3	1	0.3	191	63.6	21.9
TDR	E. Fk. Salmon @ Dumpster													
	TDR98054.M2E-M7E	4/28/98	605	224	37.0	87	14.4	33	5.5	5	0.8	349	57.7	10.0
	TDR98054.M1E	4/25/98	300	134	44.7	36	12.0	18	6.0	1	0.3	189	63.0	13.4
TDR	Squaw Pond Study													
	Early Migrants	4/29/98	298	163	54.7	33	11.1	25	8.4	1	0.3	222	74.5	11.7
	Late Migrants	5/19/98	301	52	17.3	32	10.6	22	7.3	4	1.3	110	36.5	11.5
	Non-Migrants	5/19/98	300	53	17.7	39	13.0	28	9.3	5	1.7	125	41.7	12.2
	Total		2,404									1,364	56.7	
<i>Pahsimeroi A-Stock</i>														
TDR	Salmon R. @ Red Rock	4/23/98	300	156	52.0	45	15.0	26	8.7	1	0.3	228	76.0	14.5
TDR	Salmon River @ Shoup Bridge	4/21/98	300	166	55.3	44	14.7	13	4.3	1	0.3	224	74.7	11.4
TDR	Salmon River @ McNabb Pt.	4/16/98	300	151	50.3	28	9.3	17	5.7	3	1.0	199	66.3	15.0
	Total		900									651	72.3	
<i>East Fork B-Stock</i>														
TDR	E. Fork Salmon R. @ Weir	4/30/98	300	168	56.0	38	12.7	16	5.3	1	0.3	223	74.3	10.4
TDR	Slate Creek: U. Sal. River.	5/5/98	300	126	42.0	42	14.0	17	5.7	1	0.3	186	62.0	11.2
	Total		600									409	68.2	
Magic Valley Fish Hatchery Grand Total			3,904									2,424	62.1	

Table 2. Snake River mean daily outflow and spill (thousand cubic feet per second) for the Lower Granite Dam fore bay in Washington from 1977-1998 during the Peak and Extended chinook salmon smolt migration periods as defined by Petrosky (1991).

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

Table 3. Estimated number of LSRCP hatchery steelhead that returned to Idaho in 1997-1998. The adult returns in 1997-1998 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 fish that escaped to spawn naturally. 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	1993	5	—	—
Clearwater	1994	—	359	—
Clearwater	1995	—	—	9
Estimated Fish Returned in 1997-1998			373	
Hagerman	1993	0	—	—
Hagerman	1994	—	1,983	—
Hagerman	1995	—	—	4,048
Estimated Fish Returned in 1997-1998			6,031	
Magic Valley	1993	0	—	—
Magic Valley	1994	—	3,388	—
Magic Valley	1995	—	—	3,971
Estimated Fish Returned in 1997-1998			7,359	
GRAND TOTAL			13,763	

Table 4. Steelhead smolts released from Magic Valley, Hagerman National, and Clearwater fish hatcheries that contributed to the 1997-1998 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.

Releases Contributing to the 1997-1998 Adult Returns					
Brood Year	Fish Hatchery	Number Released	Design Target	Percent of Target	1997-98 Adult Returns
1993	Clearwater	722,990	2,000,000	36.1%	5
1993	Hagerman National	1,525,948	2,400,000	63.6%	0
1993	Magic Valley	1,919,250	2,000,000	96.0%	0
	Total	4,168,188	6,150,000	67.8%	5
1994	Clearwater	637,752	2,000,000	31.9%	359
1994	Hagerman National	1,150,050	2,400,000	47.9%	1,999
1994	Magic Valley	1,731,353	2,000,000	86.6%	3,388
	Total	3,519,155	6,150,000	57.2%	5,746
1995	Clearwater	838,553	2,000,000	41.9%	9
1995	Hagerman National	1,322,419	2,400,000	55.1%	4,042
1995	Magic Valley	1,868,086	2,000,000	93.4%	3,971
	Total	4,029,058	6,150,000	65.5%	8,022
Mean annual release as percent of target:				65.5%	
Total adult return:^a					13,773
Adult return goal:					39,260
Percent of goal achieved:					35.1%

^a These are minimum estimates that include only steelhead harvested in Idaho's sport fisheries, steelhead that returned to hatchery racks, and off-site escapement. Tributary strays and in-river prespawning mortalities are not included.

Table 5. Summary of the 1998 A-stock steelhead return to the Sawtooth Fish Hatchery weir. The fish return included fish of hatchery and natural origin. Hatchery aging criteria, based on length, were used to determine age^a. ND indicates that the data were not available. Data is from Schilling et al. (1998).

HATCHERY ORIGIN n = 762										
Age ^b	Males n = 503					Females n = 259				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	416	114	ND	0	ND	145	8	ND	0	ND
2-ocean	87	23	ND	0	ND	114	2	ND	0	ND
Total	503	137 ^c	246	0	120 ^d	259	10 ^c	246	0	3 ^d

NATURAL ORIGIN n = 6										
Age ^b	Males n = 3					Females n = 3				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	3	3	0	0		1	1	0	0	
2-ocean	0	0	0	0		2	2	0	0	
Total	3	3 ^e	0	0		3	3 ^e	0	0	

Total Number Trapped	768	Green Egg Number	1,116,350
Trapping Period	3/23 – 5/8/98	Eyed Egg Number	984,600 ^f (88.2% eye up)

^a 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	≤ 5 cm	1-Ocean
A	Female	> 65 cm	2-Ocean

^b Hatchery fish classified as 1-ocean were brood year 1995, released in 1996. Hatchery fish classified as 2-ocean were brood year 1994, released in 1995.

^c Of these fish, 20 (10 male, 10 female) were released in Beaver Creek for natural spawning as part of a supplementation study. A further eight (5 male, 3 female) were released above the weir. The remaining released hatchery fish were all released below the weir to enhance angling opportunity.

^d Fish were killed but not used for spawning.

^e Fish were released above the weir.

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

Table 6. Summary of the 1998 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^a. ND indicates that the data were not available. Data is from Schilling et al. (1998).

HATCHERY ORIGIN n = 13										
Age^b	Males n = 10					Females n = 3				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	5	1	ND	0	ND	0	0	ND	0	0
2-ocean	5	2	ND	0	ND	3	0	ND	0	0
Total	10	3 ^c	3	0	4 ^d	3	0	3	0	0

NATURAL ORIGIN n = 14										
Age^b	Males n = 2					Females n = 12				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	0	0	0	0	0	3	3	0	0	0
2-ocean	2	2	0	0	0	9	9	0	0	0
Total	2	2 ^c	0	0	0	12	12 ^c	0	0	0

Total Number Trapped	27	Green Egg Number	11,550
Trapping Period	4/6 – 5/11/98	Eyed Egg Number	7,700 ^e (67.0% eye up)

^a Fish were aged using the following aging criteria:

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

^b Hatchery fish classified as 1-ocean were brood year 1995, released in 1996. Hatchery fish classified as 2-ocean were brood year 1994, released in 1995.

^c Fish were released above the weir

^d Fish were killed but not used for spawning.

^e Eyed-eggs were shipped to other hatcheries for rearing.

Table 7. Summary of the 1998 B-stock steelhead return to the Slate Creek weir. The fish return included fish of hatchery and natural origin. Hatchery aging criteria, based on length, were used to determine age^a. ND indicates that the data were not available. Data is from Schilling et al. (1998).

HATCHERY ORIGIN n = 5										
Age^b	Males n = 4					Females n = 1				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	4	0	0	0	4	1	0	0	0	1
2-ocean	0	0	0	0	0	0	0	0	0	0
Total	4	0	0	0	4 ^c	1	0	0	0	1 ^c
NATURAL ORIGIN n = 0										
Age^b	Males n = 0					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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Total Number Trapped			5			Green Egg Number			0	
Trapping Period			3/31 – 5/5/98			Eyed Egg Number			0	

^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 Hatchery fish classified as 1-ocean were brood year 1995, released in 1996. Hatchery fish classified as 2-ocean were brood year 1994, released in 1995.

^c Fish were killed without spawning.

Table 8. Summary of the 1998 B-stock steelhead return to the Crooked River weir. There were no fish of hatchery-origin trapped in 1998. Hatchery aging criteria, based on length, were used to determine age^a. Data is from Patterson (1998).

HATCHERY ORIGIN n = 0										
Age^b	Males n = 0					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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0

NATURAL ORIGIN n = 2										
Age^b	Males n = 1					Females n = 1				
	Trapped	Released	Spawned	Morts	Other	Trapped	Released	Spawned	Morts	Other
1-ocean	ND	ND	0	0	0	ND	ND	0	0	0
2-ocean	ND	ND	0	0	0	ND	ND	0	0	0
Total	1	1 ^c	0	0	0	1	1 ^c	0	0	0

Total Number Trapped	2	Green Egg Number	0
Trapping Period	3/19 – 6/1/98	Eyed Egg Number	0

^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 Hatchery fish classified as 1-ocean were brood year 1995, released in 1996. Hatchery fish classified as 2-ocean were brood year 1994, released in 1995.

^c Fish were released above the weir

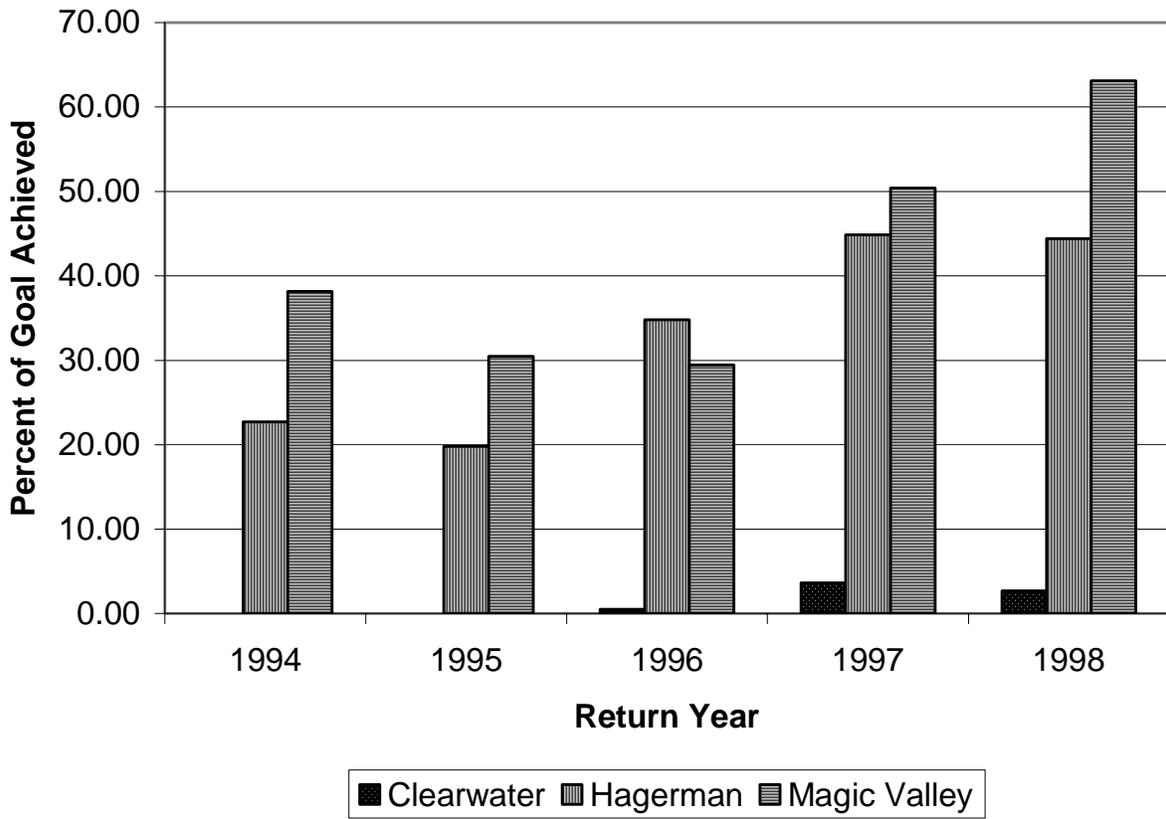


Figure 1. Percent of the adult steelhead return goal achieved by Clearwater, Hagerman National, and Magic Valley fish hatcheries between 1994 and 1998. Annual adult return goals for Clearwater, Hagerman National, and Magic Valley fish hatcheries were 14,000, 13,600, and 11,660, respectively.

APPENDICES

Appendix A. Table 1. Release data for all steelhead released from Clearwater Fish Hatchery during 1998. Releases are arranged by coded-wire tag (CWT) group and raceway. The CWT 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	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R05W	66,011	CWT,AD,LV	104740	20,994	6.1	Contribution
					CWT,AD,LV,PIT	104740	99		
					CWT,AD,LV	104739	20,980		
					CWT,AD,LV,PIT	104739	99		
					CWT,AD,LV	104738	21,757		
					CWT,AD,LV,PIT AD,LV	104738	102 1,980		
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R01E	50,345	AD		50,345	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R02E	60,995	AD		60,995	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R02W	60,995	AD		60,995	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R03E	60,970	AD		60,970	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R03W	60,970	AD		60,970	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R04E	61,007	AD		61,007	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R04W	61,007	AD		61,007	5.98	Contribution
S Fk Clwtr @ Red House Hole 4/20/98-4/29/98	1997	DWOR B	R05E	50,005	AD		50,005	6.1	Contribution
Total CWT Release:							64,031		
Total non-CWT Release:							468,274		
Total Group Release:							532,305		

Appendix A. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Red River: S Fk Clwtr 4/24/1998	1997	DWOR B	R07W	4,495	PIT		4,495	6.1	Supplementation, PIT tag only.
							Total CWT Release:	0	
							Total non-CWT Release:	4,497	
							Total Group Release:	4,497	
Clear Ck: Clwtr R 4/20/98-4/29/98	1997	DWOR B	R05E	21,496	CWT,AD,LV CWT,AD,LV,PIT AD,LV	105225 105225	20,549 302 645	6	Contribution
Clear Ck: Clwtr R 4/20/98-4/29/98	1997	DWOR B	R05W	959	AD		959	6	Contribution
Clear Ck: Clwtr R 4/20/98-4/29/98	1997	DWOR B	R06E	71,570	AD		71,570	6	Contribution
Clear Ck: Clwtr R 4/20/98-4/29/98	1997	DWOR B	R06W	71,459	AD		71,459	6	Contribution
							Total CWT Release:	20,851	
							Total non-CWT Release:	144,633	
							Total Group Release:	165,484	
Total DWOR B-Stock CWT Release								84,882	
Total DWOR B-Stock non-CWT Release								617,404	
Total DWOR B-Stock Release								702,286	
Total CWT Release for Clearwater								84,882	
Total non-CWT Release for Clearwater								617,404	
Total PIT tag Release for Clearwater Fish Hatchery								5,097	
Total Clearwater Fish Hatchery Release								702,286	

Appendix A. Table 2. Release data for all steelhead released from Hagerman National Fish Hatchery during 1998. Releases are arranged by coded-wire tag (CWT) group and raceway. The CWT 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	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R59	15,082	AD		15,082	4.41	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R60	18,777	AD		18,777	4.53	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R81	9,020	AD		9,020	3.79	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R82	13,642	AD		13,642	4.48	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R83	13,406	AD		13,406	4.17	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R84	15,322	AD		15,322	4.65	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R85	15,098	AD		15,098	4.91	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R86	14,170	AD		14,170	4.36	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R95	13,108	AD		13,108	4.52	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R87	14,386	AD		14,386	4.44	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R88	14,838	AD,CWT AD, CWT AD,CWT,PIT AD	104708 104614 104614	3,707 10,386 300 445	4.39	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R96	14,967	AD		14,967	4.57	Contribution

Appendix A. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R89	15,351	AD,CWT AD	104708	14,890 461	4.2	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R90	13,836	AD		13,836	4.18	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R97	14,375	AD		14,375	4.19	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R91	14,173	AD		14,173	4.15	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R92	14,642	AD		14,642	4.54	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R98	13,440	AD		13,440	4.2	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R100	17,298	AD		17,298	4.54	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R93	12,051	AD		12,051	4.17	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R94	16,632	AD		16,632	4.56	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R99	14,508	AD		14,508	4.68	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R101	15,568	AD		15,568	4.48	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/29/98	1997	PAH A	R102	13,780	AD		13,780	4.24	Contribution
Total CWT Release:							29,283		
Total non-CWT Release:							318,187		
Total Group Release:							347,470		
Sawtooth Hatchery 3/31/1998	1997	SAWTOOTH A	R47	19,669	AD,CWT AD,CWT,PIT	104720 104720	19,369 300	4.43	Acclimated

Appendix A. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Sawtooth Hatchery 3/31/1998	1997	SAWTOOTH A	R48	21,054	AD,CWT AD	104503	20,422 632	4.84	Acclimated
Sawtooth Hatchery 3/31/1998	1997	SAWTOOTH A	R49	19,797	AD,CWT AD	104504	19,203 594	4.62	Acclimated
Total CWT Release:							59,294		
Total non-CWT Release:							1,226		
Total Group Release:							60,520		
Sawtooth Hatchery 4/24/1998	1997	SAWTOOTH A	R44	19,635	AD,CWT AD	104717	19,046 589	3.74	Non-Acc. Feed-Fast
Sawtooth Hatchery 4/24/1998	1997	SAWTOOTH A	R45	585	AD,CWT AD	104718	567 18	3.84	Non-Acc. Feed-Fast
Sawtooth Hatchery 4/24/1998	1997	SAWTOOTH A	R46	20,451	AD,CWT AD,CWT,PIT	104719 104719	20,151 300	4.25	Non-Acc. Feed-Fast
Total CWT Release:							40,064		
Total non-CWT Release:							607		
Total Group Release:							40,671		
Sawtooth Hatchery 3/31/98-4/1/98	1997	SAWTOOTH A	R41	18,360	AD,CWT AD,CWT,PIT	104547 104547	18,060 300	4.59	Acclimated Feed-Fast
Sawtooth Hatchery 3/31/98-4/1/98	1997	SAWTOOTH A	R42	19,666	AD,CWT AD,CWT,PIT	104548 104548	19,366 300	4.92	Acclimated Feed-Fast
Sawtooth Hatchery 3/31/98-4/1/98	1997	SAWTOOTH A	R43	21,168	AD,CWT AD,CWT,PIT	104549 104549	20,868 300	4.64	Acclimated Feed-Fast
Total CWT Release:							59,194		
Total non-CWT Release:							0		
Total Group Release:							59,194		
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R37	19,664	AD		19,664	5.01	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R38	19,519	AD		19,519	4.79	Acclimated normal diet

Appendix A. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R53	21,314	AD		21,314	4.25	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R54	16,518	AD		16,518	4.45	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R55	18,274	AD		18,274	4.49	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R39	18,601	AD		18,601	4.61	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R68	14,617	AD		14,617	3.94	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R69	15,656	AD		15,656	4.22	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R70	14,074	AD		14,074	4.17	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R40	18,814	AD		18,814	4.35	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R61	10,855	AD		10,855	4.24	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R71	16,459	AD		16,459	4.36	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R72	15,406	AD		15,406	4.25	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R73	15,552	AD		15,552	4.32	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R74	16,673	AD		16,673	4.73	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R50	20,330	AD,CWT AD,CWT,PIT	104550 104550	20,030 300	5.07	Acclimated normal diet

Appendix A. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R51	19,632	AD,CWT AD,CWT,PIT	104608 104608	19,332 300	4.8	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R52	22,065	AD,CWT AD,CWT,PIT	104609 104609	21,765 300	5.09	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R62	15,619	AD		15,619	4.21	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R63	15,501	AD		15,501	4.48	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R75	16,199	AD		16,199	4.39	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R76	15,540	AD		15,540	4.44	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R77	16,199	AD		16,199	4.45	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R64	15,765	AD		15,765	4.72	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R78	15,674	AD		15,674	4.61	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R79	14,586	AD		14,586	4.42	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R80	15,085	AD		15,085	4.31	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R65	13,947	AD		13,947	4.09	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R66	16,220	AD		16,220	4.01	Acclimated normal diet
Sawtooth Hatchery 4/1/98-4/9/98	1997	SAWTOOTH A	R67	16,432	AD		16,432	4.16	Acclimated normal diet

Appendix A. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
							Total CWT Release:	62,027	
							Total non-CWT Release:	438,763	
							Total Group Release:	500,790	
							Total PAH A-Stock CWT Release	29,283	
							Total PAH A-Stock non-CWT Release	318,187	
							Total PAH A-Stock Release	347,470	
							Total SAWTOOTH A-Stock CWT Release	220,579	
							Total SAWTOOTH A-Stock non-CWT Release	440,596	
							Total SAWTOOTH A-Stock Release	661,175	
							Total CWT Release for Hagerman NFH	249,862	
							Total non-CWT Release for Hagerman NFH	758,783	
							Total PIT tag Release for Hagerman NFH	2,400	
							Total Hagerman NFH Release	1,008,645	

Appendix A. Table 3. Release data for all steelhead released from Magic Valley Fish Hatchery during 1998. Releases are arranged by coded-wire tag (CWT) group and raceway. The CWT 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	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
E Fk Salmon R Trap 4/30/98-5/1/98	1997	EAST FK B	R13E	68,385	CWT,AD,LV	104707	20,682	4	Contribution
					CWT,AD,LV,PIT	104707	99		
					CWT,AD,LV	104706	20,988		
					CWT,AD,LV,PIT	104706	100		
					CWT,AD,LV	104705	21,271		
					CWT,AD,LV,PIT	104705	101		
AD		3,188							
AD,LV		1,956							
E Fk Salmon R Trap 4/30/98-5/1/98	1997	EAST FK B	R14E	45,795	AD		45,795	4.3	Contribution
E Fk Salmon R Trap 4/30/98-5/1/98	1997	EAST FK B	R15E	12,740	AD		12,740	4.8	Contribution
Total CWT Release:							63,241		
Total non-CWT Release:							63,679		
Total Group Release:							126,920		
E Fk Salmon R @ Dumpster 4/24/98-4/29/98	1997	DWOR B	R01E	20,997	CWT,AD,LV	102143	20,267	4.4	Contribution
					CWT,AD,LV,PIT	102143	100		
					AD,LV		630		
E Fk Salmon R @ Dumpster 4/24/98-4/29/98	1997	DWOR B	R01E	42,003	CWT,AD,LV	102145	19,714	4.4	Contribution
					CWT,AD,LV,PIT	102145	97		
					CWT,AD,LV	102144	20,829		
					CWT,AD,LV,PIT	102144	103		
AD,LV		1,260							
E Fk Salmon R @ Dumpster 4/24/1998	1997	DWOR B	R02E	46,420	AD AD,PIT		46,320 100	4.3	Contribution
E Fk Salmon R @ Dumpster 4/24/1998	1997	DWOR B	R03E	55,575	AD AD,PIT		55,474 101	5.6	Contribution

Appendix A. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
E Fk Salmon R @ Dumpster 4/24/1998	1997	DWOR B	R04E	48,590	AD AD,PIT		48,490 100	5	Contribution
E Fk Salmon R @ Dumpster 4/24/1998	1997	DWOR B	R06E	50,840	AD AD,PIT		50,740 100	4.1	Contribution
E Fk Salmon R @ Dumpster 4/24/1998	1997	DWOR B	R07E	21,600	AD AD,PIT		21,557 104	4.5	Contribution
Total CWT Release:							61,110		
Total non-CWT Release:							224,915		
Total Group Release:							286,025		
35 Salmon R @ McNabb Point 4/16/98-4/17/98	1997	SAWTOOTH A	R04W	62,880	CWT,AD	102142	19,688	4.2	Contribution
					CWT,AD,PIT	102142	98		
					CWT,AD	102141	20,093		
					CWT,AD,PIT	102141	99		
					CWT,AD	102140	20,913		
					CWT,AD,PIT AD	102140	103 1,886		
Salmon R @ McNabb Point 4/16/98-4/17/98	1997	SAWTOOTH A	R05W	46,560	AD		46,560	4.7	Contribution
Salmon R @ McNabb Point 4/16/98-4/17/98	1997	SAWTOOTH A	R06W	49,220	AD		49,220	4.5	Contribution
Total CWT Release:							60,994		
Total non-CWT Release:							97,666		
Total Group Release:							158,660		
Salmon R @ Shoup Bridge 4/20/98-4/21/98	1997	SAWTOOTH A	R07W	46,350	AD		46,350	4.8	Contribution
Salmon R @ Shoup Bridge 4/20/98-4/21/98	1997	SAWTOOTH A	R08W	62,565	CWT,AD	102139	17,427	4	Contribution
					CWT,AD,PIT	102139	87		
					CWT,AD	102138	21,372		
					CWT,AD,PIT	102138	106		

Appendix A. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
					CWT,AD	102137	21,589		
					CWT,AD,PIT	102137	107		
					AD		1,877		
					Total CWT Release:		60,688		
					Total non-CWT Release:		48,227		
					Total Group Release:		108,915		
Salmon R @ Red Rock 4/23/98-4/24/98	1997	PAH A	R12W	31,680	AD		31,680	4.8	Contribution
Salmon R @ Red Rock 4/23/98-4/24/98	1997	PAH A	R13W	44,200	AD		44,200	5	Contribution
Salmon R @ Red Rock 4/23/98-4/24/98	1997	PAH A	R14W	61,180	CWT,AD	102136	16,216	4.8	Contribution
					CWT,AD,PIT	102136	83		
					CWT,AD	102135	21,530		
					CWT,AD,PIT	102135	109		
					CWT,AD	102134	21,299		
					CWT,AD,PIT	102134	108		
					AD		1,835		
					Total CWT Release:		59,345		
					Total non-CWT Release:		77,715		
					Total Group Release:		137,060		
Lt Salmon R @ Stinky Springs 4/13/1998	1997	DWOR B	R08E	40,480	AD		40,180	4.1	Contribution
					AD,PIT		300		
Lt Salmon R @ Stinky Springs 4/13/98-4/15/98	1997	DWOR B	R09E	47,000	AD		47,000	4	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/15/98	1997	DWOR B	R10E	47,530	AD		47,530	3.5	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/15/98	1997	DWOR B	R11E	50,880	AD		50,880	4.2	Contribution

Appendix A. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
Lt Salmon R @ Stinky Springs 4/13/98-4/15/98	1997	DWOR B	R12E	21,632	CWT,AD,LV CWT,AD,LV,PIT AD,LV	102132 102132	20,882 101 649	4.2	Contribution
Lt Salmon R @ Stinky Springs 4/13/98-4/15/98	1997	DWOR B	R12E	42,928	CWT,AD,LV CWT,AD,LV,PIT CWT,AD,LV CWT,AD,LV,PIT AD,LV	102133 102133 102131 102131	20,116 96 21,325 103 1,288	4.2	Contribution
Lt Salmon R @ Stinky Springs 4/15/1998	1997	DWOR B	R07E	30,500	AD AD,PIT		30,439 61	4.5	Contribution
Total CWT Release:							62,623		
Total non-CWT Release:							218,327		
Total Group Release:							280,950		
37 Slate Ck: U Salmon R 5/4/98-5/7/98	1997	EAST FK B	R15E	36,260	AD		36,260	4.8	Contribution
Slate Ck: U Salmon R 5/4/98-5/7/98	1997	EAST FK B	R15W	49,490	CWT,AD,LV CWT,AD,LV AD AD,LV	102148 102147	17,324 3,556 27,964 646	5.2	Contribution
Slate Ck: U Salmon R 5/4/98-5/7/98	1997	EAST FK B	R16E	47,470	AD		47,470	4.7	Contribution
Slate Ck: U Salmon R 5/4/98-5/7/98	1997	EAST FK B	R16W	41,360	CWT,AD,LV CWT,AD,LV,PIT CWT,AD,LV CWT,AD,LV,PIT AD AD,LV	102147 102147 102146 102146	17,486 136 21,009 164 1,365 1,200	4.5	Contribution
Total CWT Release:							59,675		
Total non-CWT Release:							114,905		
Total Group Release:							174,580		

Appendix A. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
E Fk Salmon R @ Dumpster 4/28/1998	1997	DWOR B	V01	35,700	AD		35,700	Unknown	Fin Erosion Study
							Total CWT Release:	0	
							Total non-CWT Release:	35,700	
							Total Group Release:	35,700	
Squaw Ck Ponds 4/10/1998	1997	DWOR B (899 PIT tags added at various times (Table 1.))	R05E	52,800	AD		52,800	4.4	Volitional Release Study
							Total CWT Release:	0	
							Total non-CWT Release:	52,800	
							Total Group Release:	52,800	
Salmon R @ Cottonwood Cg 4/17/98-4/20/98	1997	SAWTOOTH A	R01W	47,475	AD		47,475	4.9	Contribution
Salmon R @ Cottonwood Cg 4/17/98-4/20/98	1997	SAWTOOTH A	R02W	47,925	AD		47,925	5	Contribution
Salmon R @ Cottonwood Cg 4/17/98-4/20/98	1997	SAWTOOTH A	R03W	47,250	AD		47,250	4.6	Contribution
							Total CWT Release:	0	
							Total non-CWT Release:	142,650	
							Total Group Release:	142,650	
Lemhi R: Salmon R 4/21/98-4/22/98	1997	PAH A	R09W	47,025	AD		47,025	4.4	Contribution
Lemhi R: Salmon R 4/21/98-4/22/98	1997	PAH A	R10W	46,440	AD		46,440	4.6	Contribution
Lemhi R: Salmon R 4/21/98-4/22/98	1997	PAH A	R11W	47,460	AD		47,460	4.4	Contribution
Lemhi R: Salmon R 4/21/98-4/22/98	1997	PAH A	R12W	13,640	AD		13,640	4.8	Contribution

Appendix A. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	Raceway Number	Raceway Total	Mark Type	CWT Code	Release Number	Size (FPP)	Marking Purpose
							Total CWT Release:	0	
							Total non-CWT Release:	154,565	
							Total Group Release:	154,565	
								Total EAST FK B-Stock CWT Release	122,916
								Total EAST FK B-Stock non-CWT Release	178,584
								Total EAST FK B-Stock Release	301,500
								Total DWOR B-Stock CWT Release	123,733
								Total DWOR B-Stock non-CWT Release	531,742
								Total DWOR B-Stock Release	655,475
								Total SAWTOOTH A-Stock CWT Release	121,682
								Total SAWTOOTH A-Stock non-CWT Release	288,543
								Total SAWTOOTH A-Stock Release	410,225
								Total PAH A-Stock CWT Release	59,345
								Total PAH A-Stock non-CWT Release	232,280
								Total PAH A-Stock Release	291,625
								Total CWT Release for Magic Valley	427,676
								Total non-CWT Release for Magic Valley	1,231,149
								Total PIT tag Release for Magic Valley Fish Hatchery	3,005^a
								Total Magic Valley Fish Hatchery Release	1,658,825

^a 100 of these PIT tags were in 5E, but were held separately and not included in the Squaw Pond release from 5E. Instead, they were released in the East Fork at the dumpster site.

Appendix B. Table 1. Release and recovery data for brood year 1995 steelhead released from Clearwater Fish Hatchery. Only 1-ocean recoveries are available at this time. Data is 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 survey 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 is from Hansen and White (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 (%)
Red River: S Fk Clwtr 4/16/1996	1995	DWOR B	104630	6,163	LV	Supplementation NBS	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Red River: S Fk Clwtr 4/16/1996	1995	DWOR B	Untagged	191	NONE	Supplementation NBS	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				6,354			0	0	0	0	
S Fk Red River 9/6/1995	1995	DWOR B	102022	40,970	NONE	Supplementation	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Red River 9/6/1995	1995	DWOR B	Untagged	6,256	NONE	Supplementation	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				47,226			0	0	0	0	
S Fk Clwtr @ Red House Hole 4/17/1996	1995	DWOR B	102029	63,743	LV	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Clwtr @ Red House Hole 4/17/1996	1995	DWOR B	Untagged	121,471	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				185,214			0	0	0	0	

Appendix B. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
S Fk Clwtr; 2nd Br Up 4/18/1996	1995	DWOR B	103515	64,254	AD,LV	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
S Fk Clwtr; 2nd Br Up 4/18/1996	1995	DWOR B	Untagged	61,755	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				126,009			0	0	0	0	
Clear Ck: Clwtr R 4/19/96-4/24/96	1995	DWOR B	103053	63,556	AD,LV	Contribution	1	0	2	2	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Clear Ck: Clwtr R 4/19/96-4/24/96	1995	DWOR B	Untagged	99,049	AD	Contribution	1	0	3	3	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				162,605			0	5	5	0	
Cottonwood Ck: S Fk Clwtr R 4/18/1996	1995	DWOR B	103514	63,551	AD,LV	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Cottonwood Ck: S Fk Clwtr R 4/18/1996	1995	DWOR B	Untagged	57,739	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				121,290			0	0	0	0	
Red River: S Fk Clwtr 4/17/1996	1995	DWOR B	Untagged	8,000	AD	Alan Byrne Project	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				8,000			0	0	0	0	
Clear Ck: Clwtr R 4/17/1996	1994	DWOR B	Untagged	135,837	AD	2 Yr Rearing	1	0	4	4	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				135,837			0	0	0	0	

Appendix B. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Crooked R Ponds 4/15/1996	1995	DWOR B	Untagged	15,215	LV	Wild Selway Stock	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:		0	0	0
Crooked R Ponds 4/15/1996	1995	DWOR B	Untagged	16,144	LV	Selway Study, Hatchery Stock	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:		0	0	0
Crooked R Ponds 4/15/1996	1995	DWOR B	Untagged	14,659	LV	Hatch/Wild Selway study	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:		0	0	0
Total 1-Ocean:							9				
Total 2-Ocean:							ND				
Total 3-Ocean:							ND				
Total Harvest Recoveries:							0				
Total Hatchery Recoveries:							9				
Total Releases:							838,553				
Total Recoveries:							9				

Appendix B. Table 2. Release and recovery data for brood year 1995 steelhead released from Hagerman National Fish Hatchery. Only 1-ocean recoveries are available at this time. Data is 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 survey 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 is from Hansen and White (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 @ Warm Spr Br 4/8/96-4/22/96	1995	OXBOW A	104538	19,954	AD	Contribution	1	37	37	74	0.37
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	OXBOW A	104539	20,702	AD	Contribution	1	82	82	164	0.79
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	OXBOW A	104540	20,126	AD	Contribution	1	54	54	108	0.54
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	OXBOW A	Untagged	274,749	AD	Contribution	1	404	404	808	0.29
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				335,531				577	577	1,154	0.34
Salmon R @ Torrey's Hole 3/26/96-4/4/96	1995	SAWTOOTH A	104528	21,559	AD	Acclimated 2-weeks	1	20	5	25	0.12
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Torrey's Hole 3/26/96-4/4/96	1995	SAWTOOTH A	104526	20,490	AD	Acclimated 2-weeks	1	48	13	61	0.3
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Torrey's Hole 3/26/96-4/4/96	1995	SAWTOOTH A	104527	21,437	AD	Acclimated 2-weeks	1	88	23	111	0.52
							2	ND	ND	ND	
							3	ND	ND	ND	
Salmon R @ Torrey's Hole 3/26/96-4/4/96	1995	SAWTOOTH A	Untagged	2,708	AD	Acclimated 2-weeks	1	5	1	6	0.22
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				66,194				161	42	203	0.31

Appendix B. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104525	21,455	AD	Acclimation Saw A stock	1	13	18	31	0.14
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104523	20,039	AD	Acclimation Saw A stock	1	26	21	47	0.23
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104524	21,356	AD	Acclimation Saw A stock	1	40	17	57	0.27
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	Untagged	330,117	AD	Acclimation Saw A stock	1	793	278	1,071	0.32
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				392,967				872	334	1,206	0.31
Sawtooth Hatchery 4/15/96-4/16/96	1995	PAH A	104532	21,289	AD	Acclimation Pah A stock	1	73	10	83	0.39
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	PAH A	104533	21,301	AD	Acclimation Pah A stock	1	34	10	44	0.21
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	PAH A	104534	19,499	AD	Acclimation Pah A stock	1	16	4	20	0.1
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	PAH A	Untagged	182,121	AD	Acclimation Pah A stock	1	435	153	588	0.32
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				244,210				558	177	735	0.3
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	PAH A	104535	19,941	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	PAH A	104536	20,074	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	

Appendix B. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	PAH A	104537	19,500	AD	Contribution	1	8	8	16	0.08
							2	ND	ND	ND	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/8/96-4/22/96	1995	PAH A	Untagged	3,309	AD	Contribution	1	3	3	6	0.18
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				62,824				11	11	22	0.04
Pahsimeroi Hatchery 3/26/1996	1995	PAH A	Untagged	21,196	AD	Contribution	1	80	38	118	0.56
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				21,196				80	38	118	0.56
Hazard Ck: Lt Salmon R 4/24/96-4/29/96	1995	OXBOW A	Untagged	130,911	AD	Contribution	1	192	192	384	0.29
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				130,911				192	192	384	0.29
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104531	20,781	AD	Direct Release	1	57	16	73	0.35
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104529	20,199	AD	Direct Release	1	70	17	87	0.43
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	104530	20,983	AD	Direct Release	1	32	12	44	0.21
							2	ND	ND	ND	
							3	ND	ND	ND	
Sawtooth Hatchery 4/15/96-4/16/96	1995	SAWTOOTH A	Untagged	6,622	AD	Direct Release	1	16	6	22	0.33
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				68,585				175	51	226	0.33
Total 1-Ocean:						4,048					
Total 2-Ocean:						ND					
Total 3-Ocean:						ND					

Appendix B. Table 3. Release and recovery data for brood year 1995 steelhead released from Magic Valley Fish Hatchery. Only 1-ocean recoveries are available at this time. Data is 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 survey 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 is from Hansen and White (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 (%)
Slate Ck: U Salmon R 4/26/96-5/2/96	1995	DWOR B	103507	61,962	AD,LV	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Slate Ck: U Salmon R 4/26/96-5/2/96	1995	DWOR B	Untagged	41,523	AD	Contribution	1	0	1	1	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				103,485				0	1	1	0
47 Hazard Ck: Lt Salmon R 4/9/96-4/12/96	1995	DWOR B	103509	31,217	AD,LV	Contribution	1	4	4	8	0.03
							2	ND	ND	ND	
							3	ND	ND	ND	
Hazard Ck: Lt Salmon R 4/9/96-4/12/96	1995	DWOR B	Untagged	80,480	AD	Contribution	1	5	5	10	0.01
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				111,697				9	9	18	0.02
N Fk Salmon Release 4/15/96-4/16/96	1995	PAH A	103510	61,852	AD	Contribution	1	408	151	559	0.9
							2	ND	ND	ND	
							3	ND	ND	ND	
N Fk Salmon Release 4/15/96-4/16/96	1995	PAH A	Untagged	1,913	AD	Contribution	1	13	5	18	0.9
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				63,765				421	156	577	0.9
Salmon R @ McNabb Point 4/15/96-4/17/96	1995	PAH A	103511	61,552	AD	Contribution	1	214	79	293	0.48
							2	ND	ND	ND	
							3	ND	ND	ND	

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 @ McNabb Point 4/15/96-4/17/96	1995	PAH A	Untagged	1,904	AD	Contribution	1	7	3	10	0.53
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	63,456	221	82	
Lemhi R: Salmon R 4/15/96-4/26/96	1995	PAH A	103512	61,673	AD	Contribution	1	262	97	359	0.58
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	63,580	270	100	
Lemhi R: Salmon R 4/15/96-4/26/96	1995	PAH A	Untagged	1,907	AD	Contribution	1	8	3	11	0.58
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	63,580	270	100	
Salmon R @ Bruno Bridge 4/17/96-4/19/96	1995	PAH A	103513	62,686	AD	Contribution	1	127	47	174	0.28
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	64,625	131	49	
Salmon R @ Bruno Bridge 4/17/96-4/19/96	1995	PAH A	Untagged	1,939	AD	Contribution	1	4	2	6	0.31
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	64,625	131	49	
Slate Ck: U Salmon R 4/26/96-5/2/96	1995	DWOR B	Untagged	132,812	AD	Contribution	1	0	4	4	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	132,812	0	4	
E Fk Salmon R @ Dumpster 4/27/96-5/4/96	1995	DWOR B	Untagged	210,459	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	210,459	0	0	
Hazard Ck: Lt Salmon R 4/9/96-4/12/96	1995	DWOR B	Untagged	291,584	AD	Contribution	1	17	17	34	0.01
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	291,584	17	17	

Appendix B. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Lemhi R: Salmon R 4/15/96-4/26/96	1995	PAH A	Untagged	137,632	AD	Contribution	1	585	216	801	0.58
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	137,632	585	216	801
Salmon R @ Bruno Bridge 4/17/96-4/19/96	1995	PAH A	Untagged	142,620	AD	Contribution	1	289	106	395	0.28
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	142,620	289	106	395
Salmon R @ McNabb Point 4/15/96-4/17/96	1995	PAH A	Untagged	138,513	AD	Contribution	1	481	177	658	0.48
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	138,513	481	177	658
49 N Fk Salmon Release 4/15/96-4/16/96	1995	PAH A	Untagged	63,943	AD	Contribution	1	421	155	576	0.9
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	63,943	421	155	576
E Fk Salmon R Trap 4/24/96-4/30/96	1995	DWOR B	Untagged	64,190	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	64,190	0	0	0
E Fk Salmon R Below Herd Ck 4/12/1996	1995	DWOR B	Untagged	38,320	AD	Contribution	1	5	1	6	0.02
							2	ND	ND	ND	
							3	ND	ND	ND	
							Totals:	38,320	5	1	6
E Fk Salmon R Trap 4/24/96-4/30/96	1995	EAST FK B	104709	22,225	AD,LV	Contribution	1	0	1	1	0
							2	ND	ND	ND	
							3	ND	ND	ND	

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 (%)
E Fk Salmon R Trap 4/24/96-4/30/96	1995	EAST FK B	104613	10,891	AD,LV	Contribution	1	7	1	8	0.07
							2	ND	ND	ND	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/24/96-4/30/96	1995	EAST FK B	Untagged	29,804	AD	Contribution	1	34	5	39	0.13
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				62,920				41	7	48	0.08
E Fk Salmon R Trap 4/24/96-5/4/96	1995	DWOR B	103508	63,440	AD,LV	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/24/96-5/4/96	1995	DWOR B	Untagged	51,045	AD	Contribution	1	0	0	0	0
							2	ND	ND	ND	
							3	ND	ND	ND	
Totals:				114,485				0	0	0	0
Total 1-Ocean:						3,971					
Total 2-Ocean:						ND					
Total 3-Ocean:						ND					
Total Harvest Recoveries:						2,891					
Total Hatchery Recoveries:						1,080					
Total Releases:						1,868,086					
Total Recoveries:						3,971					

Appendix C. Table 1. Release and recovery data for brood year 1994 steelhead released from Clearwater Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data is 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 survey 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 is from Ball and White (2001) and Hansen and White (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@ Red House Hole 4/19/95-4/20/95	1994	DWOR B	104621	42,581	AD,LV	Contribution	1	0	0	0	0.04
							2	19	0	19	
							3	ND	ND	ND	
S Fk Clwtr@ Red House Hole 4/19/95-4/20/95	1994	DWOR B	Untagged	136,975	AD	Contribution	1	16	16	32	0.08
							2	51	24	75	
							3	ND	ND	ND	
Totals:				179,556				86	40	126	0.07
Cottonwood Ck: S Fk Clwtr R 4/20/1995	1994	DWOR B	104727	21,252	AD,LV	Contribution	1	0	0	0	0
							2	0	1	1	
							3	ND	ND	ND	
Cottonwood Ck: S Fk Clwtr R 4/20/1995	1994	DWOR B	Untagged	84,150	AD	Contribution	1	8	8	16	0.07
							2	31	15	46	
							3	ND	ND	ND	
Totals:				105,402				39	24	63	0.06
S Fk Red River 10/27/1994	1994	DWOR B	104506	21,590	NONE	Supplementation	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
S Fk Red River 10/27/1994	1994	DWOR B	104505	22,060	NONE	Supplementation	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
S Fk Red River 10/27/1994	1994	DWOR B	Untagged	6,140	NONE	Supplementation	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
Totals:				49,790				0	0	0	0

Appendix C. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)	
Clear Ck: Clwtr R 4/18/1995	1994	DWOR B	102025	56,533	AD,LV	Fin Erosion Study	1	143	2	145	0.29	
							2	0	17	17		
							3	ND	ND	ND		
Clear Ck: Clwtr R 4/18/1995	1994	DWOR B	102026	62,834	AD,LV	Fin Erosion Study	1	0	1	1	0.1	
							2	28	34	62		
							3	ND	ND	ND		
Clear Ck: Clwtr R 4/18/1995	1994	DWOR B	102027	58,301	AD,LV	Fin Erosion Study	1	0	2	2	0.14	
							2	51	28	79		
							3	ND	ND	ND		
Clear Ck: Clwtr R 4/18/1995	1994	DWOR B	Untagged	6,044	AD,LV	Fin Erosion Study	1	5	0	5	0.18	
							2	3	3	6		
							3	ND	ND	ND		
Totals:				183,712				230	87	317	0.17	
S Fk Clwtr R@ MP18 4/19/1995	1994	DWOR B	104728	20,710	AD,LV	Contribution	1	10	0	10	0.05	
							2	0	0	0		
							3	ND	ND	ND		
S Fk Clwtr R@ MP18 4/19/1995	1994	DWOR B	Untagged	98,582	AD	Contribution	1	13	13	26	0.08	
							2	37	17	54		
							3	ND	ND	ND		
Totals:				119,292				60	30	90	0.08	
Total 1-Ocean:							237					
Total 2-Ocean:							359					
Total 3-Ocean:							ND					
Total Harvest Recoveries:							415					
Total Hatchery Recoveries:							181					
Total Releases:							637,752					
Total Recoveries:							596					

Appendix C. Table 2. Release and recovery data for brood year 1994 steelhead released from Hagerman National Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data is 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 survey 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 is from Ball and White (2001) and Hansen and White (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 @ Warm Spr Br 4/10/95-4/28/95	1994	OXBOW A	104521	21,810	AD	Contribution	1	17	17	34	0.2
							2	5	5	10	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/10/95-4/28/95	1994	OXBOW A	104522	17,654	AD	Contribution	1	28	28	56	0.48
							2	14	14	28	
							3	ND	ND	ND	
Lt Salmon R @ Warm Spr Br 4/10/95-4/28/95	1994	OXBOW A	Untagged	274,718	AD	Contribution	1	291	290	581	0.27
							2	74	74	148	
							3	ND	ND	ND	
Totals:				314,182				429	428	857	0.27
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104509	19,667	AD	Direct release	1	63	29	92	0.73
							2	43	9	52	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104507	18,912	AD	Direct release	1	20	23	43	0.35
							2	21	3	24	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104508	19,185	AD	Direct release	1	75	22	97	0.7
							2	34	4	38	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	Untagged	119,680	AD	Direct release	1	440	207	647	0.81
							2	292	36	328	
							3	ND	ND	ND	
Totals:				177,444				988	333	1,321	0.74

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 (%)
Salmon R @ Torrey's Hole 3/28/95-3/31/95	1994	SAWTOOTH A	104515	17,069	AD	Contribution @ Indian riffles	1	91	39	130	0.87
							2	16	2	18	
							3	ND	ND	ND	
Salmon R @ Torrey's Hole 3/28/95-3/31/95	1994	SAWTOOTH A	104514	20,818	AD	Contribution @ Indian riffles	1	54	23	77	0.43
							2	10	2	12	
							3	ND	ND	ND	
Salmon R @ Torrey's Hole 3/28/95-3/31/95	1994	SAWTOOTH A	Untagged	1,172	AD	Contribution @ Indian riffles	1	10	4	14	1.37
							2	2	0	2	
							3	ND	ND	ND	
Totals:				39,059				183	70	253	0.65
Sawtooth Hatchery 4/17/95	1994	PAH A	Untagged	193,466	AD	Pah A direct release	1	727	342	1,069	0.83
							2	483	60	543	
							3	ND	ND	ND	
Totals:				193,466				1,210	402	1,612	0.83
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104511	17,941	AD	Saw A acclimated release	1	52	24	76	0.48
							2	7	2	9	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104512	18,996	AD	Saw A acclimated release	1	20	35	55	0.34
							2	7	3	10	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104513	19,889	AD	Saw A acclimated release	1	71	30	101	0.57
							2	8	4	12	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	104510	19,883	AD	Saw A acclimated release	1	46	16	62	0.5
							2	31	7	38	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	SAWTOOTH A	Untagged	194,292	AD	Saw A acclimated release	1	729	344	1,073	0.83
							2	485	60	545	
							3	ND	ND	ND	
Totals:				271,001				1,456	525	1,981	0.73

Appendix C. Table 2. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Lt Salmon R @ Warm Springs Br 4/10/95-4/28/95	1994	PAH A	104516	20,701	AD	Contribution	1	30	30	60	0.29
							2	0	0	0	
							3	ND	ND	ND	
Lt Salmon R @ Warm Springs Br 4/10/95-4/28/95	1994	PAH A	104517	20,357	AD	Contribution	1	0	0	0	0.04
							2	4	4	8	
							3	ND	ND	ND	
Lt Salmon R @ Warm Springs Br 4/10/95-4/28/95	1994	PAH A	Untagged	45,264	AD	Contribution	1	177	177	354	0.84
							2	12	12	24	
							3	ND	ND	ND	
Totals:				86,322				223	223	446	0.52
Sawtooth Hatchery 4/17/95	1994	PAH A	104518	23,561	AD	Pah Acclimated release	1	40	16	56	0.59
							2	81	1	82	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	PAH A	104519	21,327	AD	Pah Acclimated release	1	38	10	48	0.39
							2	35	1	36	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	PAH A	104520	17,553	AD	Pah Acclimated release	1	53	8	61	0.38
							2	4	1	5	
							3	ND	ND	ND	
Sawtooth Hatchery 4/17/95	1994	PAH A	Untagged	6,145	AD	Pah Acclimated release	1	17	7	24	0.57
							2	10	1	11	
							3	ND	ND	ND	
Totals:				68,586				278	45	323	0.47
Total 1-Ocean:						4,810					
Total 2-Ocean:						1,983					
Total 3-Ocean:						ND					
Total Harvest Recoveries:						4,767					
Total Hatchery Recoveries:						2,026					
Total Releases:						1,150,060					
Total Recoveries:						6,793					

Appendix C. Table 3. Release and recovery data for brood year 1994 steelhead released from Magic Valley Fish Hatchery. Only 1- and 2-ocean recoveries are available at this time. Data is 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 survey 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 is from Ball and White (2001) and Hansen and White (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 (%)
E Fk Salmon R Trap 4/19/95-4/25/95	1994	EAST FK B	102024	62,484	AD	Contribution	1	8	11	19	0.22
							2	113	3	116	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/19/95-4/25/95	1994	EAST FK B	Untagged	2,516	AD	Contribution	1	1	0	1	0.28
							2	6	0	6	
							3	ND	ND	ND	
Totals:				65,000				128	14	142	0.22
E Fk Salmon R Trap 4/19/95-4/25/95	1994	DWOR B	102012	21,143	AD	Contribution	1	0	0	0	0.07
							2	15	0	15	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/19/95-4/25/95	1994	DWOR B	102003	21,698	AD	Contribution	1	1	0	1	0.22
							2	45	1	46	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/19/95-4/25/95	1994	DWOR B	102004	20,949	AD	Contribution	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
E Fk Salmon R Trap 4/19/95-4/25/95	1994	DWOR B	Untagged	359,915	AD	Contribution	1	9	13	22	0.11
							2	356	11	367	
							3	ND	ND	ND	
Totals:				423,705				426	25	451	0.11
N Fk Salmon Release 4/13/94-4/14/94	1994	PAH A	104661	31,090	AD	Contribution	1	117	81	198	1.2
							2	114	47	161	
							3	ND	ND	ND	

Appendix C. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
N Fk Salmon Release 4/13/94-4/14/94	1994	PAH A	104660	31,639	AD	Contribution	1	38	26	64	1.25
							2	234	96	330	
							3	ND	ND	ND	
N Fk Salmon Release 4/13/94-4/14/94	1994	PAH A	Untagged	52,321	AD	Contribution	1	133	92	225	1.23
							2	298	122	420	
							3	ND	ND	ND	
Totals:				115,050				934	464	1,398	1.22
Salmon R @ McNabb Point 4/10/94-4/12/94	1994	PAH A	102018	21,328	AD	Contribution	1	67	21	88	0.66
							2	34	18	52	
							3	ND	ND	ND	
Salmon R @ McNabb Point 4/10/94-4/12/94	1994	PAH A	102016	20,862	AD	Contribution	1	63	20	83	0.62
							2	31	16	47	
							3	ND	ND	ND	
Salmon R @ McNabb Point 4/10/94-4/12/94	1994	PAH A	102017	21,078	AD	Contribution	1	105	33	138	0.89
							2	33	17	50	
							3	ND	ND	ND	
Salmon R @ McNabb Point 4/10/94-4/12/94	1994	PAH A	Untagged	144,577	AD	Contribution	1	546	172	718	0.73
							2	227	117	344	
							3	ND	ND	ND	
Totals:				207,845				1,106	414	1,520	0.73
Lemhi R: Salmon R 4/14/94-4/17/94	1994	PAH A	102015	20,783	AD	Contribution	1	53	37	90	0.57
							2	19	10	29	
							3	ND	ND	ND	
Lemhi R: Salmon R 4/14/94-4/17/94	1994	PAH A	102007	20,810	AD	Contribution	1	31	22	53	0.71
							2	63	32	95	
							3	ND	ND	ND	
Lemhi R: Salmon R 4/14/94-4/17/94	1994	PAH A	102008	20,672	AD	Contribution	1	109	76	185	1.08
							2	25	13	38	
							3	ND	ND	ND	

Appendix C. Table 3. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
Lemhi R: Salmon R 4/14/94-4/17/94	1994	PAH A	Untagged	136,005	AD	Contribution	1	441	306	747	0.82
							2	244	126	370	
							3	ND	ND	ND	
Totals:				198,270				985	622	1,607	0.81
Hazard Ck: Lt Salmon R 4/26/94-5/1/94	1994	DWOR B	102014	21,036	AD	Contribution	1	10	10	20	0.17
							2	8	8	16	
							3	ND	ND	ND	
Hazard Ck: Lt Salmon R 4/26/94-5/1/94	1994	DWOR B	102006	20,471	AD	Contribution	1	0	0	0	0.03
							2	3	3	6	
							3	ND	ND	ND	
Hazard Ck: Lt Salmon R 4/26/94-5/1/94	1994	DWOR B	102013	21,137	AD	Contribution	1	0	0	0	0.05
							2	5	5	10	
							3	ND	ND	ND	
Hazard Ck: Lt Salmon R 4/26/94-5/1/94	1994	DWOR B	Untagged	280,035	AD	Contribution	1	49	49	98	0.09
							2	77	77	154	
							3	ND	ND	ND	
Totals:				342,679				152	152	304	0.09
Salmon R @ Bruno Bridge 4/17/94-4/19/94	1994	PAH A	102011	21,135	AD	Contribution	1	85	27	112	1.04
							2	71	37	108	
							3	ND	ND	ND	
Salmon R @ Bruno Bridge 4/17/94-4/19/94	1994	PAH A	102009	20,456	AD	Contribution	1	47	15	62	0.59
							2	38	20	58	
							3	ND	ND	ND	
Salmon R @ Bruno Bridge 4/17/94-4/19/94	1994	PAH A	102010	20,460	AD	Contribution	1	85	28	113	0.86
							2	41	21	62	
							3	ND	ND	ND	
Salmon R @ Bruno Bridge 4/17/94-4/19/94	1994	PAH A	Untagged	100,819	AD	Contribution	1	430	136	566	1.01
							2	298	156	454	
							3	ND	ND	ND	
Totals:				162,870				1,095	440	1,535	0.94

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 (%)
Slate Ck: U Salmon R 4/12/95-4/22/95	1994	DWOR B	102005	21,224	AD	Contribution	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
Slate Ck: U Salmon R 4/12/95-4/22/95	1994	DWOR B	102001	21,065	AD	Contribution	1	0	0	0	0
							2	0	0	0	
							3	ND	ND	ND	
Slate Ck: U Salmon R 4/12/95-4/22/95	1994	DWOR B	102002	21,355	AD	Contribution	1	5	0	5	0.09
							2	13	1	14	
							3	ND	ND	ND	
Slate Ck: U Salmon R 4/12/95-4/22/95	1994	DWOR B	Untagged	152,290	AD	Contribution	1	13	0	13	0.02
							2	19	1	20	
							3	ND	ND	ND	
Totals:				215,934				50	2	52	0.02
Total 1-Ocean:						3,621					
Total 2-Ocean:						3,388					
Total 3-Ocean:						ND					
Total Harvest Recoveries:						4,876					
Total Hatchery Recoveries:						2,133					
Total Releases:						1,731,353					
Total Recoveries:						7,009					

Appendix D. Table 1. Release and recovery data for brood year 1993 steelhead released from Clearwater Fish Hatchery. All returns are complete at this time. Data is 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 survey 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 is from Ball (1999), Ball and White (2001), and Hansen and White (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 (%)
Crooked R Ponds 4/29/94-5/3/94	1993	DWOR B	104737	20,889	AD,LV	Contribution	1	0	0	0	0
							2	0	0	0	
							3	0	0	0	
Crooked R Ponds 4/29/94-5/3/94	1993	DWOR B	104732	21,768	AD,LV	Contribution	1	0	0	0	0
							2	0	0	0	
							3	0	0	0	
Crooked R Ponds 4/29/94-5/3/94	1993	DWOR B	Untagged	61,793	AD	Contribution	1	0	0	0	0
							2	0	0	0	
							3	0	0	0	
Totals:				104,450				0	0	0	0
S Fk Clwtr @ Red House Hole 4/25/1994	1993	DWOR B	104736	21,466	AD,LV	Production	1	0	0	0	0.04
							2	9	0	9	
							3	0	0	0	
S Fk Clwtr @ Red House Hole 4/25/1994	1993	DWOR B	104731	20,428	AD,LV	Production	1	0	0	0	0.1
							2	10	11	21	
							3	0	0	0	
S Fk Clwtr @ Red House Hole 4/25/1994	1993	DWOR B	Untagged	38,986	AD	Production	1	0	0	0	0.07
							2	13	14	27	
							3	0	0	0	
Totals:				80,880			32	25	57	0.07	
S Fk Clwtr R @ MP18 4/25/94-4/26/94	1993	DWOR B	104735	22,137	AD,LV	Production	1	0	0	0	0.09
							2	10	10	20	
							3	0	0	0	

Appendix D. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
S Fk Clwtr R @ MP18 4/25/94-4/26/94	1993	DWOR B	Untagged	29,966	AD	Production	1	0	0	0	0.07
							2	10	10	20	
							3	0	0	0	
							Totals:	52,103	20	20	
Cottonwood Ck: S Fk Clwtr R 4/25/1994	1993	DWOR B	104734	21,081	AD,LV	Production	1	0	0	0	0
							2	0	1	1	
							3	0	0	0	
							Totals:	52,048	11	12	
Cottonwood Ck: S Fk Clwtr R 4/25/1994	1993	DWOR B	Untagged	30,967	AD	Production	1	0	0	0	0.07
							2	11	11	22	
							3	0	0	0	
							Totals:	52,048	11	12	
Clear Ck: Clwtr R 5/3/1994	1993	DWOR B	104733	20,841	AD,LV	Contribution	1	0	0	0	0
							2	0	0	0	
							3	0	0	0	
							Totals:	52,048	11	12	
Clear Ck: Clwtr R 5/3/1994	1993	DWOR B	104729	21,499	AD,LV	Contribution	1	0	0	0	0.01
							2	0	2	2	
							3	0	1	1	
							Totals:	52,048	11	12	
Clear Ck: Clwtr R 5/3/1994	1993	DWOR B	104730	21,566	AD,LV	Contribution	1	0	0	0	0
							2	0	1	1	
							3	0	0	0	
							Totals:	52,048	11	12	
Clear Ck: Clwtr R 5/3/1994	1993	DWOR B	Untagged	89,959	AD	Contribution	1	0	0	0	0.01
							2	0	4	4	
							3	0	4	4	
							Totals:	153,865	0	12	
S Fk Clwtr@ Red House Hole 4/25/1994	1993	DWOR B	Untagged	104,231	AD	Production	1	0	0	0	0.07
							2	35	38	73	
							3	0	0	0	
							Totals:	104,231	35	38	

Appendix D. Table 1. Continued.

Release Site Date	Brood Year	Stock Name	CWT Code	Tagged Release	Other Marks	Marking Purpose	Ocean Age	Harvest Returns	Hatchery Returns	Total Returns	SAR (%)
S Fk Clwtr R@ MP18 4/25/94-4/26/94	1993	DWOR B	Untagged	52,199	AD	Production	1	0	0	0	0.07
							2	18	19	37	
							3	0	0	0	
							Totals:	52,199	18	19	
Cottonwood Ck: S Fk Clwtr R 4/25/1994	1993	DWOR B	Untagged	51,648	AD	Production	1	0	0	0	0.07
							2	17	19	36	
							3	0	0	0	
							Totals:	51,648	17	19	
Crooked R Ponds 4/29/94-5/3/94	1993	DWOR B (No. PIT Tags: 300)	Untagged	71,566	RV	Supplementation	1	ND	ND	ND	ND
							2	ND	ND	ND	
							3	0	0	0	
							Totals:	71,566	0	0	
Total 1-Ocean:							0				
Total 2-Ocean:							273				
Total 3-Ocean:							5				
Total Harvest Recoveries:							133				
Total Hatchery Recoveries:							145				
Total Releases:							722,990				
Total Recoveries:							278				

Appendix D. Table 2. Release and recovery data for brood year 1993 steelhead released from Hagerman National Fish Hatchery. All returns are complete at this time. Data is 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 survey 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 is from Ball (1999), Ball and White (2001), and Hansen and White (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 4/29/1994	1993	SAWTOOTH A	Untagged	650,389	AD	Pah Stock release	1	1,576	334	1,910	0.37
							2	365	118	483	
							3	0	0	0	
							Totals:	650,389			
Lt Salmon R @ Warm Springs Br 4/22/94-5/2/94	1993	PAH A	104601	20,046	AD,LV	Contribution	1	3	3	6	0.07
							2	4	4	8	
							3	0	0	0	
							Totals:	334,943			
Lt Salmon R @ Warm Springs Br 4/22/94-5/2/94	1993	PAH A	104602	20,039	AD,LV	Contribution	1	2	2	4	0.02
							2	0	0	0	
							3	0	0	0	
							Totals:	334,943			
Lt Salmon R @ Warm Springs Br 4/22/94-5/2/94	1993	PAH A	Untagged	294,858	AD	Contribution	1	35	35	70	0.04
							2	28	28	56	
							3	0	0	0	
							Totals:	334,943			
Lemhi R: Salmon R 4/4/94-4/8/94	1993	PAH A	104603	20,661	AD,LV	Contribution	1	30	15	45	0.39
							2	28	8	36	
							3	0	0	0	
							Totals:	334,943			
Lemhi R: Salmon R 4/4/94-4/8/94	1993	PAH A	Untagged	215,127	AD	Contribution	1	304	153	457	0.38
							2	284	80	364	
							3	0	0	0	
							Totals:	235,788			
Salmon R @ Bruno Bridge 4/11/94-4/12/94	1993	SAWTOOTH A	104926	60,717	AD,LV	Contribution	1	92	7	99	0.33
							2	49	55	104	
							3	0	0	0	
							Totals:	235,788			

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 (%)
Salmon R @ Bruno Bridge 4/11/94-4/12/94	1993	SAWTOOTH A	Untagged	121,366	AD	Contribution	1	179	14	193	0.33
							2	95	107	202	
							3	0	0	0	
Totals:				182,083				415	183	598	0.33
Sawtooth Hatchery 4/29/1994	1993	SAWTOOTH A	104628	59,481	AD,LV	Direct Release	1	3	12	15	0.05
							2	12	2	14	
							3	0	0	0	
Sawtooth Hatchery 4/29/1994	1993	SAWTOOTH A	Untagged	1,840	AD,LV	Direct Release	1	2	1	3	0.22
							2	1	0	1	
							3	0	0	0	
Totals:				61,321				18	15	33	0.05
Sawtooth Hatchery 4/29/1994	1993	PAH A	104629	59,581	AD,LV	Acclimated release	1	45	9	54	0.13
							2	16	7	23	
							3	0	0	0	
Sawtooth Hatchery 4/29/1994	1993	PAH A	Untagged	1,843	AD,LV	Acclimated release	1	6	1	7	0.43
							2	1	0	1	
							3	0	0	0	
Totals:				61,424				68	17	85	0.14
Total 1-Ocean:							2,863				
Total 2-Ocean:							1,292				
Total 3-Ocean:							0				
Total Harvest Recoveries:							3,160				
Total Hatchery Recoveries:							995				
Total Releases:							1,525,948				
Total Recoveries:							4,155				

Appendix D. Table 3. Release and recovery data for brood year 1993 steelhead released from Magic Valley Fish Hatchery. All returns are complete at this time. Data is 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 survey 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 is from Ball (1999), Ball and White (2001), and Hansen and White (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 @ Warm Springs Br 4/23/94-4/27/94	1993	PAH A	104724	21,531	AD,LV	Contribution	1	8	8	16	0.07
							2	0	0	0	
							3	0	0	0	
Lt Salmon R @ Warm Springs Br 4/23/94-4/27/94	1993	PAH A	104723	20,959	AD,LV	Contribution	1	0	0	0	0.04
							2	4	4	8	
							3	0	0	0	
Lt Salmon R @ Warm Springs Br 4/23/94-4/27/94	1993	PAH A	Untagged	72,240	AD	Contribution	1	14	14	28	0.06
							2	7	7	14	
							3	0	0	0	
Totals:				114,730				33	33	66	0.06
Pahsimeroi Ponds 4/16/94-4/22/94	1993	PAH A	104726	21,663	AD,LV	Contribution	1	36	28	64	0.5
							2	31	13	44	
							3	0	0	0	
Pahsimeroi Ponds 4/16/94-4/22/94	1993	PAH A	104725	21,293	AD,LV	Contribution	1	30	28	58	0.46
							2	22	18	40	
							3	0	0	0	
Pahsimeroi Ponds 4/16/94-4/22/94	1993	PAH A	Untagged	78,544	AD	Contribution	1	152	131	283	0.67
							2	177	65	242	
							3	0	0	0	
Totals:				121,500				448	283	731	0.6
E Fk Salmon R Trap 4/11/94-4/16/94	1993	EAST FK B	104712	21,378	AD,LV	Contribution	1	8	4	12	0.16
							2	12	11	23	
							3	0	0	0	

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 (%)
E Fk Salmon R Trap 4/11/94-4/16/94	1993	EAST FK B	104711	20,647	AD, LV	Contribution	1	8	4	12	0.33
							2	44	12	56	
							3	0	0	0	
E Fk Salmon R Trap 4/11/94-4/16/94	1993	EAST FK B	104713	20,728	AD, LV	Contribution	1	2	4	6	0.21
							2	25	12	37	
							3	0	0	0	
E Fk Salmon R Trap 4/11/94-4/16/94	1993	EAST FK B	Untagged	96,987	AD	Contribution	1	86	21	107	0.21
							2	163	70	233	
							3	0	0	0	
Totals:				160,040				348	138	486	0.18
Hazard Ck: Lt Salmon R 4/22/94-4/28/94	1993	DWOR B	104716	21,582	AD, LV	Contribution	1	0	0	0	0.06
							2	6	6	12	
							3	0	0	0	
Hazard Ck: Lt Salmon R 4/22/94-4/28/94	1993	DWOR B	104714	20,881	AD, LV	Contribution	1	0	0	0	0.09
							2	9	9	18	
							3	0	0	0	
Hazard Ck: Lt Salmon R 4/22/94-4/28/94	1993	DWOR B	104715	20,606	AD, LV	Contribution	1	0	0	0	0.11
							2	11	11	22	
							3	0	0	0	
Hazard Ck: Lt Salmon R 4/22/94-4/28/94	1993	DWOR B	Untagged	125,931	AD	Contribution	1	0	0	0	0.08
							2	52	51	103	
							3	0	0	0	
Totals:				189,000				78	77	155	0.08
Slate Ck: U Salmon R 4/12/94-4/20/94	1993	DWOR B	104925	62,510	AD, LV	Contribution	1	11	ND	11	0.06
							2	28	1	29	
							3	0	0	0	
Slate Ck: U Salmon R 4/12/94-4/20/94	1993	DWOR B	Untagged	57,705	AD	Contribution	1	16	ND	16	0.12
							2	52	2	54	
							3	0	0	0	
Totals:				120,215				107	3	110	0.09

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 (%)
E Fk Salmon R Trap 4/11/94-4/16/94	1993	DWOR B	104710	20,657	AD,LV	Contribution	1	0	0	0	0.03
							2	7	0	7	
							3	0	0	0	
E Fk Salmon R Trap 4/11/94-4/16/94	1993	DWOR B	104721	20,437	AD,LV	Contribution	1	0	0	0	0
							2	0	0	0	
							3	0	0	0	
E Fk Salmon R Trap 4/11/94-4/16/94	1993	DWOR B	104722	20,973	AD,LV	Contribution	1	0	0	0	0.04
							2	8	0	8	
							3	0	0	0	
E Fk Salmon R Trap 4/11/94-4/16/94	1993	DWOR B	Untagged	130,333	AD	Contribution	1	0	0	0	0.01
							2	5	2	7	
							3	0	0	0	
Totals:				192,400				20	2	22	0.01
Pahsimeroi Ponds 4/16/94-4/22/94	1993	PAH A	Untagged	362,940	AD	Contribution	1	703	597	1,300	0.66
							2	804	298	1,102	
							3	0	0	0	
Totals:				362,940				1,507	895	2,402	0.66
Lt Salmon R @ Warm Springs Br 4/23/94-4/27/94	1993	PAH A	Untagged	352,820	AD	Contribution	1	66	66	132	0.06
							2	33	33	66	
							3	0	0	0	
Totals:				352,820				99	99	198	0.06
Hazard Ck: Lt Salmon R 4/22/94-4/28/94	1993	DWOR B	Untagged	49,725	AD	Contribution	1	0	0	0	0.08
							2	20	20	40	
							3	0	0	0	
Totals:				49,725				20	20	40	0.08
Slate Ck: U Salmon R 4/12/94-4/20/94	1993	DWOR B	Untagged	91,140	AD	Contribution	1	10	0	10	0.1
							2	81	2	83	
							3	0	0	0	
Totals:				91,140				91	2	93	0.1

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 (%)
E Fk Salmon R Trap 4/11/94-4/16/94	1993	DWOR B	Untagged	164,740	AD	Contribution	1	0	0	0	0.01
							2	7	3	10	
							3	0	0	0	
Totals:				164,740				7	3	10	0.01
Total 1-Ocean:						2,055					
Total 2-Ocean:						2,258					
Total 3-Ocean:						0					
Total Harvest Recoveries:						2,758					
Total Hatchery Recoveries:						1,555					
Total Releases:						1,919,250					
Total Recoveries:						4,313					

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