



# **RAPID RIVER FISH HATCHERY**

## **2000 BROOD YEAR REPORT**



**By**

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## ABSTRACT

The Rapid River Fish Hatchery (RRFH) trap operated from March 14 to September 20, 2000. From May 5 to August 30, 4,799 marked Chinook (*Oncorhynchus tshawytscha*) were collected. The run was composed of 1,701 jacks, 3,086 four-year-olds, and 12 five-year-olds. Of these, 1,123 were marked with an operculum punch and returned to the Little Salmon River to re-enter the sport fishery. After the marked fish were released, 402 were recaptured, including 26 that returned to the trap more than once. This year 111 marked Chinook were removed from the trap and transported by the Idaho Department of Fish and Game (Department) to Newsome Creek.

There were 4,934 fish ponded at RRFH. This total includes 3,967 Rapid River returns and 967 received from Oxbow Fish Hatchery (OFH). Of these, 973 were removed, identified by sex, and transported to the Clearwater River drainage for supplementation, 1 adult female was sent to the University of Georgia, and 1,221 Rapid River jacks were killed and given to various organizations. This left 2,739 fish for broodstock. The sex ratio of the 3,967 Rapid River fish ponded was 1,094 adult males (27.58%), 1,375 females (34.66%), and 1,498 jacks (37.76%). The age-class structure of the 3,705 Rapid River fish kept for broodstock and jack distribution was 1,498 three-year-olds (40.43%), 2,198 four-year-olds (59.32%), and 9 five-year-olds (0.25%). The sex ratio of the 967 fish received from OFH was 385 adult males (39.81%), 565 females (58.32%), and 17 jacks (1.76%). The age-class structure was 17 three-year-olds (1.76%), 949 four-year-olds (98.14%), and 1 five-year-old (0.10%).

A sport fishery was opened on the Little Salmon River in 2000. The Department's creel census estimated 2,883 marked Chinook were harvested (2,174 adults and 709 jacks). Nez Perce Tribal officials reported a harvest of 2,557 marked and 38 unmarked salmon. Tribal fisheries were confined to Rapid River below the hatchery trap.

Ancillary species were trapped in 2000. From May 20 to August 3, 106 unmarked Chinook were trapped and released into Rapid River above the trap. The age-class composition of the unmarked salmon run was 42 three-year-olds, 63 four-year-olds, and 1 five-year-old. From April 4 to May 18, 18 wild and 15 hatchery steelhead (*O. mykiss*) were trapped. The sex ratio of the returning steelhead was 12 wild males, 6 wild females, 11 hatchery males, and 4 hatchery females. Wild steelhead were released above the trap. Hatchery-produced steelhead were released into the Little Salmon River. From May 16 to July 26, 300 bull trout (*Salvelinus confluentus*) were trapped and released into Rapid River.

Prespawning mortality of the 4,934 fish placed in holding ponds was 200 fish or 4.1% of the fish held. The breakdown by sex ratio was 43 adult males (0.87%), 124 females (2.51%), and 33 jacks (0.67%). Mortality by origin was 149 or 3.8% of ponded Rapid River fish and 51 or 5.3% of the fish received from OFH.

Spawning took place from August 14 to September 14, 2000. A total of 1,308 females were spawned. Average fecundity was 3,900 eggs/ female. Eggs from 82 females (about 319,800 eggs, based on average fecundity) were culled as part of a Bacterial Kidney Disease prevention program, which left 4,780,850 green eggs (based on electromechanical count) from 1,226 females. Survival to eye-up was 4,405,479 or 92.1%. During spawning, green eggs from 386 females that were transferred to OFH where they were incubated to the eyed stage. After eye-up, they were picked before being returned to RRFH or transferred to the Clearwater Fish Hatchery. Clearwater Fish Hatchery received 911,919 eyed eggs. The total inventory remaining at RRFH after the return of eggs from OFH was 3,493,560 eyed eggs.

## **INTRODUCTION**

### **Funding Source**

The Rapid River Fish Hatchery (RRFH) was constructed in 1964 by Idaho Power Company (IPC) to mitigate for the loss of spring Chinook salmon (*Oncorhynchus tshawytscha*) due to construction of Brownlee, Oxbow, and Hells Canyon dams. Mitigation mandated by the Federal Energy Regulatory Commission (FERC) required IPC to transplant a run of spring Chinook salmon from the Snake River to the Salmon River drainage and to provide funds for the annual production of three million spring Chinook salmon smolts at this facility. These fish are designated for release into Rapid River and the Snake River below Hells Canyon Dam. The RRFH is staffed and operated by the Idaho Department of Fish and Game (Department) and funded by IPC.

### **Location**

The RRFH is located in Idaho County seven miles southwest of Riggins. It lies on Rapid River, a tributary of the Little Salmon River. Travel distance for salmon to the ocean is approximately 600 river-miles.

## **OBJECTIVES**

The following are the objectives of RRFH:

1. Produce three million spring Chinook salmon smolts annually. The average size is to be approximately 20 fish per pound (fpp). These fish are to be released into Rapid River and the Snake River below Hells Canyon Dam.
2. Trap and spawn adult spring Chinook salmon returning to Rapid River.
3. Evaluate various strategies and techniques for rearing spring Chinook salmon.
4. Provide eggs and/or fry for supplementation purposes.

## **FACILITY DESCRIPTION**

Fish-rearing facilities at RRFH consist of 52 double vertical stack incubators, 12 outdoor concrete raceways (6-ft x 90-ft), and six earthen rearing ponds (RP) with concrete side walls: RP-1A and RP-1B (42-ft x 188-ft each), RP-2A and RP-2B (35-ft x 197-ft), and RP-2C and RP-2D (37-ft x 173-ft each). Holding facilities for adult salmon broodstock consist of one concrete holding pond (HP), HP-1 (80-ft x 25-ft), and one earthen holding pond, HP-2 (40-ft x 150-ft). These holding ponds provide space for up to 4,000 adult salmon before spawning. Production capacities by unit are listed in Appendix 1. Rearing space by unit is shown in Appendix 2.

The RRFH facilities include a fish trap located on Rapid River approximately 1.5 miles downstream from the hatchery. It is designed to trap and hold adult fish migrating upstream. The trap consists of a permanent wooden velocity barrier, a seven-step fish ladder, and a two-stage trap. Adult salmon can be transferred from the trap by means of an Alaska Steep Pass Ladder to a 500-gallon bucket that is lifted by an overhead hoist to a 1,000-gallon tank truck for transport to the hatchery. The trap facility allows unimpeded migration of anadromous and resident fish around the velocity barrier when trapping operations are not in progress.

## **RECOMMENDED FACILITY IMPROVEMENTS**

Two areas for improvement of the facility have existed for many years. One relates to adult salmon handling and the other to general hygiene and disease control. Average prespawning mortality at RRFH from 1970 to 1994 was 18.3%, with holding in all ponds. In 2002, it was 19.8% using both holding ponds. Examination of prespawning mortality records show that a sharp increase occurs after first sort and subsequent handling of the adults. Our current method of gathering fish for sorting involves netting all adult fish in a large seine each spawn day. This method causes severe handling stress twice each week during the spawning season. An improved system for crowding adult fish would reduce prespawning mortality. This approach would require replacement of HP-2 to provide a better environment for holding adult salmon. The other area of improvement involves the way in which water is supplied to RP-1. All water entering RP-1 must pass through the raceways. When fingerlings are in the raceways, RP-1 receives their effluent. This can be a sanitation problem if detritus from sweeping raceways is directed into RP-1. Direct supply to RP-1 would solve this problem; however, the handling of fish waste from all rearing systems remains. This question must be addressed as the Environmental Protection Agency (EPA) reevaluates hatchery discharge permits in the near future.

## **WATER SUPPLY**

### **Water Source**

Rapid River originates in Adams County and flows through an undeveloped canyon before reaching the hatchery. The drainage is protected as part of the Wild and Scenic Rivers Act. It is not subjected to perturbations, such as logging or road building. Rapid River generally provides adequate water for rearing salmon; however, the steep nature of the drainage makes it a highly variable river. Spring runoff and flash floods can be violent and carry a tremendous volume of silt into the hatchery. Specific water-measurement data are recorded by the National Forest Service but are not available for the spring of 2000 at this time. Runoff during the spring of 2000 was the most benign in recent years and presented no problem to hatchery operations. Water temperature also varies considerably. The minimum in January 2000 was 33.8°F, and the maximum in August 2000 was 62.0°F. Pond temperatures during adult holding are shown in Appendix 3.

### **Water Supply**

Hatchery water is obtained through one 30-inch and one 24-inch pipeline. A 5-ft high wooden diversion dam provides the necessary hydraulic head. Under a state license, RRFH has specific water rights to 28 ft<sup>3</sup>/s for the hatchery facility and 18.6 ft<sup>3</sup>/s for the fish trap. This water is diverted from Rapid River and then returned after passing through the hatchery. Rearing units operate on gravitational flow. Water for the incubation system is pumped from the headrace by one of two 5600-W electric pumps. A gasoline-operated pump and a gravitational-flow filter bed provide water during electrical failures. Water quality parameters are listed in Appendix 4. Effluent is monitored according to EPA guidelines.

## **STAFFING**

Three permanent employees: a Fish Hatchery Manager II, an Assistant Fish Hatchery Manager, and a Fish Culturist staff RRFH. Approximately five seasonal employees are hired each year. Housing accommodations include three residences for the permanent staff and a 65-ft x 14-ft mobile home for seasonal employees.

## FISH PRODUCTION

### Adult Collection

#### **Spring Chinook Salmon Returns to Rapid River**

The RRFH fish trap operated from March 14 through September 20, 2000. Water conditions were benign for Rapid River during the steelhead and salmon runs, and did not inhibit fish migration. As in past years, the trapping operation was interrupted periodically for sand removal. This year the trap was never closed for more than a few hours at a time. Trapping was suspended overnight several times during storms due to turbidity and debris. These conditions and the associated cleanup required closure of the trap less often than usual this year.

The first marked Chinook arrived on May 5 and the last on August 30, 2000. The peak of the run was the second week of June. The first fish and the peak of the run were two to three weeks earlier than normal. This year, 4,799 marked Chinook (1,701 jacks and 3,098 adults) were trapped.

Marked Chinook were transported to holding ponds at the hatchery. The large number of hatchery returns allowed trapped fish to be returned to the sport fishery in the Little Salmon River. These fish were removed from the trap, loaded onto tanker trucks, and released below the Salmon River Road Bridge at Riggins. All 1,123 hatchery Chinook that were returned to the Little Salmon River received a dorsal fin punch to identify recaptures. Counts then showed that 402 fish were recaptured including 26 fish that were recaptured more than once (Appendix 5). This brought the total marked Chinook processed including recaptures, to 5,201.

This year 1,222 hatchery fish were removed from holding ponds and given to various organizations for distribution (Appendix 6). With the exception of one adult female sent to the University of Georgia for the Nez Perce Tribe, all of the fish donated were jacks. They were sequestered in live boxes in the RP-1 catch basin and not injected or anesthetized. When they were picked up they were killed, measured, and scanned for tags. These data were included in the database for age-class and sex ratio statistics.

Fish from RRFH were used to supplement wild spawning in other parts of the state. A total of 111 were removed from the trap and loaded directly onto Department tanker trucks for release into Newsome Creek. Another 973 were removed from holding ponds and transported by the Nez Perce Tribe for release into the Clearwater River drainage. All 1,084 of these fish were released in cooperation with the Nez Perce Tribe. A record of adult fish transfers is shown in Appendix 7.

Data collection was complicated this year by the need to return fish to sport fisheries or distribute them to humanitarian organizations quickly and without drug treatment. Hatchery management and research staff met before the 2000 run to establish data collection standards that would meet agency needs and be feasible, given time and fish quality constraints. It was agreed that data collected for research and hatchery evaluation purposes should be collected at

spawning and entered into a database. Although not formally randomized, this sub-sample represents the entire run to Rapid River and statistics for age-class and sex ratio can probably be extrapolated to the entire run.

Data collected on run timing and total number were collected at the trap and are based on all 4,799 returns to Rapid River Trap (Appendices 8, and 9). The entire run was scanned for Coded Wire Tags (CWT) or Passive Integrated Transponder (PIT) tags and scrutinized for jaw-tags, visual identification (VI) tags, radio transmitters, and fin clips. Fin clips recorded for this sample were all adipose fin (AD) clips and no ventral fin clips. We detected 1,080 CWT or 22.5% of the 4,799 fish trapped and scanned. Other trapping statistics including fork lengths, and injuries were recorded at the trap for all Rapid River returns placed in holding. They were not recorded for fish redistributed directly from the trap.

There were 4,934 fish ponded including 3,967 Rapid River returns and 967 received from OFH. The RRFH and OFH fish were held separately. Sex ratio and age-class statistics were recorded for each group. The sex of fish that were loaded from holding ponds for release was recorded but they were not measured for length. Thus, the sample size for Rapid River fish for sex ratio (3,967) is not the same as that for age-classes (3,705). Data from the fish that remained after releases were entered into an electronic database. Polymodal analysis of length frequencies helped with age-class determination but was incomplete due to the presence of only two modes. Additional age-class criteria were based on CWT return data.

The sex ratio of the sub-sample of 3,967 Rapid River fish was 1,094 adult males (27.58%), 1,375 females (34.66%), and 1,498 jacks (37.76%) including 3,705 fish held and 262 (130 males and 132 females) removed from HP-2 for release and the donated fish. Age-class composition for the 3,705 fish sub-sample held for broodstock or donated was 1,498 (40.43%) three-year-olds (< 62 cm), 2,198 (59.32%) four-year-olds (62–85 cm), and 9 (0.25%) five-year-olds (> 85 cm) (Appendices 10 and 11).

The sex ratio of the 967 fish received from OFH was 385 adult males (39.8%), 565 females (58.4%), and 17 jacks (1.8%). This sub-sample included 255 fish held, 711 (331 males, 367 females, and 13 jacks) removed from HP-1 for release, and the adult female removed from HP-1 and sent to the University of Georgia. The age-class ratio of the 255 fish sub-sample of OFH fish held for broodstock was 4 (1.57%) three-year-olds (< 62 cm), 250 (98.04%) four-year-olds (62–85 cm), and 1 (0.39%) five-year-old (> 85 cm). The statistics for OFH are biased because jacks were given away at OFH prior to transfer to RRFH. They do not reflect the Snake River run.

Ancillary species were collected, recorded, and released. Unmarked Chinook, unmarked steelhead and bull trout were released into Rapid River above the trap, and marked steelhead were released into the Little Salmon River about one mile above its confluence with Rapid River.

Tag information was recorded for all fish entering Rapid River trap and rechecked for all Rapid River and Snake River salmon at disposal. A total of 217 PIT-tags were detected in marked Rapid River, and marked Snake River salmon (Appendix 12). Another 11 Chinook arrived at Rapid River with radio transmitters and VI tags (Appendix 13). No fish with jaw tags were trapped this year.

Injuries were documented throughout the trapping season. When multiple injuries were present on the same fish, they were recorded separately. Injuries consisted of 105 nitrogen burns, 4 gill net scars, 15 gaff wounds, and 79 other types of injuries (Appendix 14). This year we observed many fishhooks in trapped fish, but the actual number was not recorded.

## **Hells Canyon Spring Chinook Salmon Returns**

Idaho Power personnel transported 967 Chinook (950 adults and 17 jacks) from the OFH trap to RRFH. Age-class composition and sex ratio for these fish are included above with the broodstock. This does not reflect the entire run trapped in Hells Canyon because jacks were donated from the hatchery and not transported to RRFH. For more information about trapping in Hells Canyon, see the *Oxbow Hatchery Spring Chinook salmon Run Report for 2000*.

## **Inventory of Miscellaneous Species**

This year 106 unmarked Chinook entered the trap from May 20 through August 3, 2000 (Appendices 15 and 16). This component of the Rapid River run included 64 adults and 42 jacks. They were measured to the nearest centimeter fork length (Appendices 12 and 18), injected with antibiotics, and then released above the trap into Rapid River. The released salmon received a caudal fin punch to identify recaptures. Age-class composition of this part of the salmon run was 42 three-year-olds (39.62%), 63 four-year-olds (59.44%), and 1 five-year-old (0.94%). The sex ratio was 33 males (31.13%), 31 females (29.25%), and 42 jacks (39.62%).

From April 4 through May 18, 2000, we trapped 33 steelhead (Appendices 17 and 18). They were measured to the nearest centimeter fork length (Appendices 19 and 20), and included 18 wild and 15 hatchery fish. The sex ratio by origin was 6 wild males, 12 wild females, 11 hatchery males, and 4 hatchery females. Hatchery steelhead were transported back to the Little Salmon River and released above the confluence of Rapid River. Wild steelhead were released into Rapid River upstream from the trap. All released steelhead received a caudal fin punch to identify recaptures.

A total of 300 bull trout were trapped from May 16 through July 26, 2000 (Appendices 21 and 22). These fish ranged in size from 32 cm to 61 cm total length (Appendices 23 and 24). Department researchers continued a study of bull trout movement this year. Hatchery personnel assisted them with implanting PIT-tags, marking, and various other aspects of their study. Further information regarding this study should be obtained from the Department Research Office. An inventory of all species trapped in 2000 is shown in Appendix 25.

## **Sport and Tribal Fishery**

The 2000 sport fishery on the Little Salmon River was productive again this year. The season extended from May 12 to July 4. The Department creel census estimated 2,883 marked Chinook (2,174 adult and 709 jacks) were harvested. For more information regarding the sport fishery on the Little Salmon River, contact the Department McCall Sub region Office. Nez Perce Tribal officials reported harvest of 2,557 marked and 38 unmarked Chinook.

## **Holding and Spawning**

### **Adult Treatments**

Hatchery personnel removed fish from the trap daily and processed them on-site. They were handled as little as possible and processed while the fish were immersed. All Chinook placed in holding or released above the weir were anesthetized with 40 ppm MS-222, measured to the nearest cm fork length, and given an injection of Erythromycin-based injectable (Gallimycin-100) at 20 mg/kg body weight. This was administered according to veterinary extra-label usage, as prescribed by Dr. Dave Hunter at the Department's Caldwell Wildlife Laboratory. Neither fish removed from the trap and released to supplement fisheries, nor those donated for consumption were anesthetized or injected.

The holding period extended from May 5 to September 14, 2000. This year 3,967 marked Rapid River Chinook were placed in HP-2 and the catch basin of RP-1. An additional 967 Chinook were received from OFH and placed in HP-1. This yielded 4,934 Chinook held at RRFH. From this, 973 fish were removed from holding and released (Appendix 7), and 1,222 were donated to various institutions (Appendix 6). The remaining 2,739 were held for spawning.

Formalin treatments were administered to both ponds three times each week from June 2 through August 11. Treatments consisted of pre-charging the pond with formalin to 170 ppm and then introducing formalin into inflow water at a rate of 170 ppm for one hour. During the holding and spawning period, water temperatures ranged from 40.0°F to 62.0°F (Appendix 3). The Walco Company hauled carcasses to a landfill twice each week.

### **Prespawning Mortality**

The combined prespawning mortality for Rapid River and Hells Canyon Chinook was 200 fish or 4.1% of the 4,934 fish placed in holding. After August 20, males were not considered in prespawning mortality. This included 149 Rapid River fish and 51 from OFH. The breakdown by sex ratio was 43 adult males (0.87%), 124 females (2.51%), and 33 jacks (0.67%). Mortality by origin was 149 or 3.8% of ponded Rapid River fish and 51 or 5.3% of the fish received from OFH. This mortality rate was the lowest ever recorded at RRFH.

Hatchery personnel did routine necropsies of all prespawning mortalities. Causal factors for prespawning mortality are shown in Appendix 26. A profile of cumulative prespawning

mortality is shown in Appendix 27. Snouts were collected from fish in which a CWT was detected at disposal or after spawning and sent to the Department Fish Marking Laboratory at Lewiston, Idaho.

## **Salmon Spawning**

In 2000, 1,308 female Chinook were spawned from August 14 to September 14. About 319,800 eggs (based on average fecundity) from 82 females were culled as part of a disease management program. The remaining 1,226 females produced 4,780,850 green eggs (based on mechanical count) (Appendix 28). During spawning, 10 females were destroyed and their eggs rejected because they showed gross evidence of BKD. Each female was sampled during spawning for BKD analysis. The results of enzyme-linked immunosorbant assay (ELISA) tests are shown in Appendix 29.

Spawning followed standard procedure recommended by the Integrated Hatchery Operations Team (IHOT) for random cross of two males per female. This procedure was followed to ensure that all females were fertilized with a fertile male. Females were killed with a blow to the head. The eggs from each female were put in a colander to drain off the ovarian fluid. Then they were transferred to a bucket where they were fertilized with the milt from two males and mixed with approximately 250 ml of temperature-adjusted wellwater. The two jacks were included for fertilization, and no male was used more than three times. Males were given a right operculum punch to identify them as having been spawned and then returned to the holding pond. All fertilized eggs were water-hardened for 30 minutes in a minimum of 100-ppm iodophor. After water-hardening, green eggs were placed in vertical stack incubators that were set to a flow rate of 6 gallons per minute (gpm) or transported in chilled water to OFH.

## **Incubation**

The 2000 egg-take (after culling 82 females) was 4,780,850 green eggs from 1,226 females, and the average fecundity was 3,900 eggs per female. After primary pick of 375,371 bad eggs, 4,405,479 eyed-eggs remained. Eye-up was 92.1%. Most of the eggs were incubated at a rate of one female per tray to segregate individual fish pending results of ELISA studies although some trays received two females due to incubation space limitations. After the ELISA results were received, eggs from 69 females with an optical density (OD) reading of 0.25 or greater were culled and discarded. They accounted for 5% of the 1,311 females sampled. This shows a continued reduction in BKD levels from previous years. Eggs from 13 additional females were culled as part of two-female-trays or by mistake.

RRFH has incubation facilities for just over three million eggs. Because additional rearing space was required, eggs from 403 females were transferred to OFH for incubation. Eggs from 16 females were culled before to eye-up. The rest were incubated to eye-up and picked. Eggs from 246 females were shipped from OFH to CWH. The remaining eggs from 141 females were returned to RRFH. One more was culled after eggs were transported, leaving 140 that were disinfected in 100-ppm iodine and placed in clean incubator trays.

A total 3,493,560 eyed-eggs were reared at RRFH after eggs were returned from OFH. These came from 3,818,285 green eggs taken from 980 females. Eye-up for this group was 91.5% and average fecundity was 3,896 eggs per female.

Eggs reared at RRFH were shocked at 500 daily temperature units (DTU) by pouring them from the trays into water. They were picked two days later using a salt bath. A Jentsort egg counter was used to inventory eggs. After counting, the eggs were returned to clean trays. The trays were picked again at 760 DTUs, 1,000 DTUs, and 1,500 DTUs. All trays were rodded weekly after 300 DTUs. Formalin was administered to each incubator stack at a rate of 1,667 ppm for 15 minutes three times each week to retard external mycosis. This procedure was discontinued after each lot accumulated 800 DTUs. Mycosis was controlled, and fry will be ponded at approximately 1,700 DTUs.

### **Early Rearing**

Fry were ponded from February 5, 2000 through March 21, 2001. The first lot was initially placed in one indoor vat. The subsequent lots were transferred to 10 raceways when they reached 1,750 DTUs. Initially the raceways were densely loaded to facilitate feed training. After the fish were acclimated and feeding well, we increased raceway volume to lower density to a Density Index (DI) below 0.3. Initial water depth was set to 24 inches, and flow was adjusted to 0.25 ft<sup>3</sup>/sec. As the fish grew, water depth and flows were increased to a maximum depth of 36 inches and flow of 1.62 ft<sup>3</sup>/sec. The fingerlings remained in the raceways until marking when they were transferred to rearing ponds. The average weight at the start of marking on June 25, 2001 was 120 fish per pound (fpp) and ranged from 117 fpp to 128 fpp. The average DI was 0.43 and the average Flow Index (FI) was 1.14. Initial raceway density is shown in Appendix 30 and final raceway density is shown in Appendix 31. Mortality during early rearing was 24,304 fish or 0.6% of the number ponded, which was calculated as the total inventory reported at marking plus the mortality recorded before marking.

### **Final Rearing**

We disinfected the ponds with 200 ppm active chlorine before introducing fish. The fingerlings were transferred from raceways to ponds through four-inch irrigation pipe. The marking crew reported that 3,473,011 fingerlings were marked and moved from June 25 through July 17, 2001. This total was an increase of 2.5% from hatchery inventory for the raceways based on electronically counted eggs minus recorded mortality. As in the past, hatchery inventory numbers were adjusted to the number reported marked. Initial pond loading densities are reported in Appendix 32. Fingerlings were ponded at a mean length of 3.02 inches and grew to 4.92 inches at release. Average DI before volitional releases began on March 25, 2002, was 0.17, and the average FI was 1.36 (Appendix 33). The maximum DI recommended by the Department is 0.30. The maximum recommended FI for O<sub>2</sub>-saturated water at 41°F and 2,100 ft above sea level is 2.42. These parameters were within prescribed limits. Mortality during final rearing was 4,271 fish or 0.12% of the inventory reported at marking. Total mortality from swim-up through release was 28,575 fish or 0.82% of the number marked plus the mortality before marking.

## **Feed Use and Conversion**

A total of 226,464 lbs of feed was used for Brood Year 2000 fish before release. The overall feed conversion was 1.30. Specific data on feed types/sizes are listed in Appendix 34.

Two medicated feed treatments were administered to Brood Year 2000 fingerlings. Starting May 8, 2000 and continuing for 28 days, they were fed 2.25% Aquamycin-100 at a rate of 2.2% body weight/day to yield a dose of 100 mg/Kg/day Erythromycin. Then starting September 18, 2000 and continuing for 28 days, they were fed 4.5% Aquamycin-100 at a rate of 1.1% body weight/day to yield a dose of 100mg/Kg/day Erythromycin. Treatments were performed according to guidelines set forth in Investigational New Animal Drug (INAD) number 6013/4333 and were followed by toxicity testing.

## **Fish Health**

Portions of this section of the *Rapid River Hatchery 2000 Brood Year Report* are reproduced with permission from Mr. Doug Munson of the Eagle Fish Health Laboratory (EFHL). A summary of EFHL results for individual inspections of Brood Year 2000 juveniles and broodstock is shown in Appendix 35.

## **Diseases Encountered and Treatments**

Rapid River applied two prophylactic erythromycin-medicated feed treatments to reduce the likelihood of mortalities due to *Renibacterium*. Despite prophylactic intra-peritoneal erythromycin injections as adult Chinook are trapped for spawning, these Chinook experienced pre-spawning mortality higher than normal and the prevalence of high BKD ELISA positives were higher than expected.

## **Organosomatic Index**

The Organosomatic Index in this context is a measure of fish health developed as part of the Autopsy-Based Fish Health/Condition Assessment System (Goede and Houghton 1987). A summary of the fish autopsy is shown in Appendix 36.

## **Acute Losses**

No acute losses were experienced at Rapid River Hatchery in the Brood Year 2000 Chinook.

## **Other Assessments**

In prior years when Chinook were held in both the mud pond and the concrete holding ponds, the population of adult fish held in the concrete pond had noticeably less prevalence of high BKD females, as measured by routine sampling via ELISA technology. Elevated prespawning mortality and an unexpected high prevalence of high BKD ELISA adults can be explained by all adult Chinook being held in the mud ponds. This antiquated Chinook holding pond needs to be replaced by a modern holding facility. Once this objective is achieved, Rapid River Hatchery will benefit from lower pre-spawning mortality and lower prevalence of ELISA high BKD females at spawning. This will give RRFH flexibility in spawning strategies, reduce the amount manual labor involved in spawning activities, shorten the spawning work day, and increase the amount of fish and eggs available for other programs. In years of low adult returns to this facility, this renovation could be the difference in filling the hatchery and not filling the hatchery.

### **Fish Marking**

Protocol requires the adipose fin to be removed from all hatchery-reared salmon. The marking crew reported 3,473,011 fish were AD clipped and CWTs were placed in 353,049. Marking occurred from June 25 to July 17, 2001. After marking, 3,041 fish were sampled during monthly pound counts for a quality check of AD clips. The results showed 77.4% with full clips, 2.1% without clips and 20.5% with marginal clips.

PIT-tags were placed in 183,546 fish from February 5 through February 28, 2002. A total of 55,000 fish were tagged for the CSS study and 128,546 were tagged for the National Marine Fisheries Service. As the fish were marked, they were transferred from RP-2A to RP-2B. During the remainder of the final rearing period, all mortalities from RP-2B were collected and scanned for PIT-tags.

Specific release information about marked fish is presented in Appendix 37. For more information regarding marking, consult the *Annual Release Summary of Marked Salmon and Steelhead* published by the Department.

### **Fish Distribution**

#### **Egg Transfers**

Rapid River Fish Hatchery transferred 911,919 eyed-eggs to Clearwater Fish Hatchery.

## **Fingerling Transfers**

No brood year 2000 fingerling were transferred to or from RRFH.

## **Smolt Releases**

There were 3,469,689 smolts (173,572 lbs) released from RRFH in 2002 (Appendix 38). Of these 500,195 (22,900 lbs) were loaded onto trucks and released into the Snake River below Hells Canyon Dam. Another 300,018 (16,130 lbs) were loaded onto trucks and released into the Little Salmon River above the confluence of Hazard Creek. The remaining 2,669,476 (134,542 lbs) were released volitionally from RRFH. Releases took place from March 11 through April 22, 2002.

Final sample counts were taken at the hatchery before fish were transported to Hells Canyon Dam on March 11, 2002. Smolts averaged 19.8 fpp and 5.2 inches fork length. Rearing densities at the time of release are listed in Appendix 31. Volitional release into Rapid River from RP-1 commenced on March 12 and from RP-2 on March 18. Based on visual observations, we estimated that almost 100% of the smolts emigrated volitionally from RP-1 and 99.0% from RP-2. The remaining fish were seined from RP-2. The last fish emigrated on April 22. Survival from marking to release was 99.9% (Appendix 39).

Before the volitional release from RP-2, hatchery personnel assisted technicians from Bio-Mark Inc in placing a pair of PIT-tag antennas in the tail of RP-2B. Outmigration of PIT-tagged fish was monitored during volitional release and recorded by the Pacific States Marine Fisheries Commission (PSMFC).

## **Cost of Production**

The total cost of production for any specific brood year is not a straightforward calculation. At RRFH, the rearing cycle is 19 months. For any brood year, the cycle extends from September, when spawning starts, through March, nineteen months later when the smolts are released. Over the years the cost of production has been reported as the total cost incurred by IPC for the entire 19-month period. The overlap in brood year classes causes expenditures for September through March of the first year, and expenditures for September through March of the second year to be reported twice. Our traditional method reports total cost for 14 months of the 19-month rearing cycle in three successive brood year reports. The result is an inflated estimate of production costs. We report inflated production cost figures because we report the total cost paid by IPC for the entire period rather than costs associated with production of a given brood year. To address this problem, IPC has supplied us with total cost broken down by month (letter dated June 14 2002, from Paul Abbott, IPC Hatchery Biologist, PO Box 70, Boise, Idaho). One approach would be to apportion each month's cost by the percentage that a given brood year's fish comprise the total hatchery inventory. In our report for Brood Year 1995, we proposed this apportionment plan and compared total cost. The method would have resulted in reporting cost numbers only once. The resulting cost per pound that year was one-third the cost calculated using the old method. However, at the IHOT evaluation

meeting held March 8, 1996, we were directed to continue using the old method to keep the data consistent with data from previous years. We recommend a future meeting with continued discussion on this concern and agreement on a solution. For now, we continue to report the total cost paid by IPC for the entire period.

The total cost paid by IPC for September 1, 2000, through March 30, 2002, was \$1,007,374.52 (letter dated June 14 2002, from Paul Abbott, IPC Hatchery Biologist, PO Box 70, Boise, Idaho). This was used to calculate the cost of production data listed in Appendix 40. For comparison, the total cost apportioned by percent of total monthly inventory for the same period was \$768,072.64. This is 76.2% of the total cost for the same period, and addresses the problem of reporting the same dollars twice. It also has the effect of smoothing cost per pound or cost per 1,000 over years with greater or smaller inventory. This may be important because fixed costs stay the same from year to year while variable costs, such as feed, change with inventory. Using this method cost per thousand fish went from \$290.33 to \$221.36 and cost per pound went from \$5.79 to \$4.42.

### **HISTORICAL INFORMATION**

As always, we have included some archival information for context. Historic information about returns by return year is listed in Appendix 41 and by brood year in Appendix 42. Average feed and growth statistics are listed in Appendix 43. Release and transfer information is listed in Appendix 44.

## **ACKNOWLEDGEMENTS**

The crew at RRFH would like to thank Mr. Paul Abbott and the staff at IPC for their support and assistance in helping us maintain and improve the hatchery facility. We would also like to thank Department personnel who helped us during the spawning and trapping season. Our gratitude goes to Officer Brian Holbrook and other conservation officers for security at the hatchery and trapping facility. In addition, we extend our appreciation to Doug Munson and the Eagle Fish Health Lab staff for diagnostic work at the hatchery and assistance in preparing this document. This team effort helps Rapid River continue to be a successful hatchery.

## LITERATURE CITED

Goede, R. W., and S. Houghton. 1987. ASUM: A computer program for the Autopsy-Based Fish Health/Condition Assessment System. Utah Division of Wildlife Resources Fisheries Experiment Station, 1465 West 200 North, Logan, Utah 84321.

## APPENDICES

Appendix 1. Rapid River Hatchery production capacity.

<b>Rearing unit</b>	<b>Volume</b>		<b>Carrying capacity</b>	
Incubators	800	Trays	3,200,000	Eggs
Raceways (12)	1,890	ft <sup>3</sup>	3,800,000	Fry
Rearing Ponds 1	54,625	ft <sup>3</sup>	1,000,000	Smolts
Rearing Ponds 2	92,827	ft <sup>3</sup>	2,000,000	Smolts
Adult Holding Pond 1	12,000	ft <sup>3</sup>	1,000	Adults
Adult Holding Pond 2	24,000	ft <sup>3</sup>	3,000	Adults

Appendix 2. Rapid River Hatchery pond volume.

<b>Rearing/holding area</b>	<b>Volume (ft<sup>3</sup>)</b>
Rearing pond 1A	27,496
Rearing pond 1B	27,129
Rearing pond 2A	23,858
Rearing pond 2B	22,607
Rearing pond 2C	22,468
Rearing pond 2D	23,894
Adult holding pond 1	12,000
Adult holding pond 2	24,000

Appendix 3. Rapid River Hatchery adult holding pond temperatures (°F) for 2000.

<b>Month</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Average</b>	<b>Ten-year average</b>
May	48.4	40.0	45.1	46.6
June	52.9	42.1	48.9	50.2
July	60.0	49.6	53.9	54.3
August	62.0	49.6	55.0	55.7
September	55.8	43.0	49.8	51.4

Appendix 4. Rapid River water quality analysis.

Analyte	PQL	Result	Units
Nitrate/N	0.1	ND	mg/L
Nitrite	0.1	ND	mg/L
Sulfate	0.1	19.9	mg/L
Orthophosphate	0.05	ND	mg/L
Ammonia/N	0.05	ND	mg/L
Alkalinity	10	69	mg/L as CaCO <sub>3</sub>
Hardness	0.1	85	mg/L as CaCO <sub>4</sub>
PH		7.63	mg/L
Hydrogen Sulfide	0.5	ND	mg/L
Res Chlorine	0.1	ND	mg/L
Arsenic	0.001	ND	mg/L
Cadmium	0.001	ND	mg/L
Chromium	0.001	ND	mg/L
Mercury	0.0001	ND	mg/L
Lead	0.001	ND	mg/L
Selenium	0.001	ND	mg/L
Silver	0.005	ND	mg/L
Iron	0.03	0.07	mg/L
Zinc	0.001	ND	mg/L
Cooper	0.001	ND	mg/L
Alpha-BHC	0.01	ND	µg/L
gamma-BHC (Lindane)	0.01	ND	µg/L
Heptachlor	0.01	ND	µg/L
Aldern	0.01	ND	µg/L
beta- BHC	0.01	ND	µg/L
Delta-BHC	0.01	ND	µg/L
Heptachlor Epoxide	0.01	ND	µg/L
Endosulfan I	0.01	ND	µg/L
4,4'-DDE	0.01	ND	µg/L
Dieldrin	0.01	ND	µg/L
Endfin	0.01	ND	µg/L
Endosulfan II	0.01	ND	µg/L
44,4'DDD	0.01	ND	µg/L
4,4'DDT	0.01	ND	µg/L
Endrin aldehyde	0.01	ND	µg/L
Endosulfin Sulfate	0.01	ND	µg/L
Methoxychlor	0.05	ND	µg/L

Appendix 4. (Continued)

Endrin Ketone	0.01	ND	µg/L
Chlordane	0.1	ND	µg/L
Toxaphene	0.1	ND	µg/L
Dichlorovos	0.5	ND	µg/L
Mevinphos	0.3	ND	µg/L
Demeton	0.1	ND	µg/L
Ethoprop	0.1	ND	µg/L
Phorate	0.1	ND	µg/L
EPN	0.1	ND	µg/L
Diazinon	0.1	ND	µg/L
Dimethoate	0.1	ND	µg/L
Disulfoton	0.1	ND	µg/L
Methyl Parathion	0.1	ND	µg/L
Ethyl Parathion	0.1	ND	µg/L
Ronnel	0.1	ND	µg/L
Malathion	0.1	ND	µg/L
Fenthion	0.1	ND	µg/L
Chlorpyrifos	0.1	ND	µg/L
Trichloronate	0.1	ND	µg/L
Stiropfos	0.1	ND	µg/L
Tokuthion	0.1	ND	µg/L
Fensulfothion	0.1	ND	µg/L
Bolstar	0.1	ND	µg/L
Azinphos-Methyl	0.1	ND	µg/L
Coumaphos	0.1	ND	µg/L
Merphos	0.1	ND	µg/L
Naled	0.3	ND	µg/L
Sulfotep	0.1	ND	µg/L

PQL = Practical Quantitation Limit

ND = not detected(< PQL)

Appendix 5. Rapid River releases into the Little Salmon River and recaptures.

Date	Recaptures			Recruits	Total	Disposition
	First time	Second time	Third time			
6/10				45	45	Adults to HP-2
6/10				92	92	Adults to LSR
6/10				5	5	Jacks to HP-2
6/10				43	43	Jacks to LSR
6/11				22	22	Adults to HP-2
6/11				33	33	Adults to LSR
6/11				1	1	Jack to HP-2
6/11				30	30	Jacks to LSR
6/12				27	27	Adults to HP-2
6/12				44	44	Adults to LSR
6/12				3	3	Jacks to HP-2
6/12				24	24	Jacks to LSR
6/13				36	36	Adults to HP-2
6/13				39	39	Adults to LSR
6/13				3	3	Jacks to HP-2
6/13				44	44	Jacks to LSR
6/13				3	3	Jacks to RP-1
6/14				25	25	Adults to HP-2
6/14				53	53	Adults to LSR
6/14				2	2	Jacks to HP-2
6/14				4	4	Jacks to LSR
6/14				70	70	Jacks to RP-1
6/15				60	60	Adults to HP-2
6/15				1	1	Jacks to HP-2
6/15	10			107	117	Adults to LSR
6/15	16			95	111	Jacks to LSR
6/15				21	21	Jacks to RP-1
6/16				76	76	Adults to HP-2
6/16				7	7	Jacks to HP-2
6/16	14			78	92	Adults to LSR
6/16	17			90	107	Jacks to LSR
6/17				20	20	Adults to HP-2
6/17	7			44	51	Adults to LSR
6/17				3	3	Jacks to HP-2
6/17	8			42	50	Jacks to RP-1
6/18				10	10	Adults to HP-2
6/18	2			8	10	Adults to LSR
6/18	1			20	21	Jacks to RP-1

Appendix 5. (Continued).

Date	Recaptures			Recruits	Total	Disposition
	First time	Second time	Third time			
6/19				27	27	Adults to HP-2
6/19				13	13	Jacks to RP-1
6/20	11			101	112	Adults to HP-2
6/20	1			89	90	Jacks to RP-1
6/21	9			60	69	Adults to HP-2
6/21	16			40	56	Jacks to RP-1
6/21				1	1	Jack to HP-2
6/22				51	51	Adults to HP-2
6/22	25	3	1	64	93	Adults to LSR
6/22	22			60	82	Jacks to RP-1
6/23				44	44	Adults to HP-2
6/23	21			49	70	Adults to LSR
6/23	23			49	72	Jacks to RP-1
6/23				13	13	Jacks to LSR
6/26				26	26	Adults to HP-2
6/26	13			40	53	Adults to LSR
6/26	7			40	47	Jacks to RP-1
6/27	16	3		48	67	Adults to HP-2
6/27	16	2		28	46	Jacks to RP-1
6/28	13	1		60	74	Adults to HP-2
6/28	9			28	37	Jacks to RP-1
6/29	7			32	39	Adults to HP-2
6/29	3			30	33	Jacks to Rp-1
7/6	19	6		73	98	Adults to Newsome
7/6	11			29	40	Jacks to RP-1
7/6				13	13	Jacks to Newsome
7/7	1			5	6	Jacks to RP-1
7/7	2			3	5	Adults to HP-2
7/10	13	3		27	43	Adults to HP-2
7/10	13	2		43	58	Jacks to RP-1
7/11	4			9	13	Adults to HP-2
7/11	3			27	30	Jacks to RP-1
7/12	2	2		18	22	Adults to HP-2
7/12	5			21	26	Jacks to RP-1
7/13	6	2		15	23	Adults to HP-2
7/13	2			25	27	Jacks to RP-1
7/14	3			20	23	Adults to Hp-2
7/14	4			22	26	Jacks to RP-1

Appendix 5. (Continued).

Date	Recaptures			Recruits	Total	Disposition
	First time	Second time	Third time			
7/17				5	5	Adults to HP-2
7/17				3	3	Jacks to RP-1
7/18				6	6	Adults to HP-2
7/18				10	10	Jacks to RP-1
7/20				4	4	Adults to HP-2
7/20				5	5	Jacks to RP-1
7/21				5	5	Adults to HP-2
7/21				8	8	jacks to RP-1
7/25	1	1		8	10	Adults to HP-2
7/25				7	7	Jacks to RP-1
7/26				1	1	Adults to HP-2
7/26				9	9	Jacks to HP-2
7/27				3	3	Jacks to HP-2
7/28				2	2	Adults to HP-2
7/28				2	2	Jacks to HP-2
8/1				18	18	Adults to HP-2
8/1				9	9	Jacks to HP-2
8/2				7	7	Jacks to HP-2
8/3				1	1	Adult to HP-2
8/3				2	2	Jacks to HP-2
8/7				15	15	Adults to HP-2
8/7				7	7	Jacks to HP-2
8/10				1	1	Adult HP-2
8/11				4	4	Adults to HP-2
8/11				1	1	Jack to HP-2
8/16				3	3	Adults to HP-2
8/22				4	4	Adults to HP-2
8/22				1	1	Jack to HP-2
8/30				9	9	Adults to HP-2
8/30				1	1	Jack to HP-2
Total	376	25	1	2834	3236	

Dorsal fin punches were used to identify released fish. Additional punches were added to denote first, second, or third time of recapture. All fish were released below the Salmon River Road Bridge in Riggins. Recruit = First time at trap, i.e., not a recapture.

Appendix 6. Salmon donated to Idaho institutions in 2000.

<b>Date</b>	<b>Number of fish</b>	<b>Name of group</b>
5/30	33	Nez Perce Tribe
6/5	82	Nez Perce Tribe
6/8	24	Idaho Hunger Action Counsel, Riggins
6/9	204	Nez Perce Tribe
6/15	107	Nez Perce Tribe
6/20	1	Univ. of Georgia for Nez Perce Tribe
6/23	250	Shoshone Bannock Tribe
6/23	32	Western Idaho Community Action Program, McCall
6/30	178	Shoshone Bannock Tribe
7/3	48	Western Idaho Community Action Program, McCall
7/13	191	Nez Perce Tribe
7/14	37	Nez Perce Tribe
8/17	35	Idaho Hunger Action Counsel, Kooskia
<b>Total</b>	<b>1,222</b>	

All of the fish listed above except the one sent to the University of Georgia were jacks.

Appendix 7. Rapid River Fish Hatchery Chinook released outside the Little Salmon River Drainage in 2000.

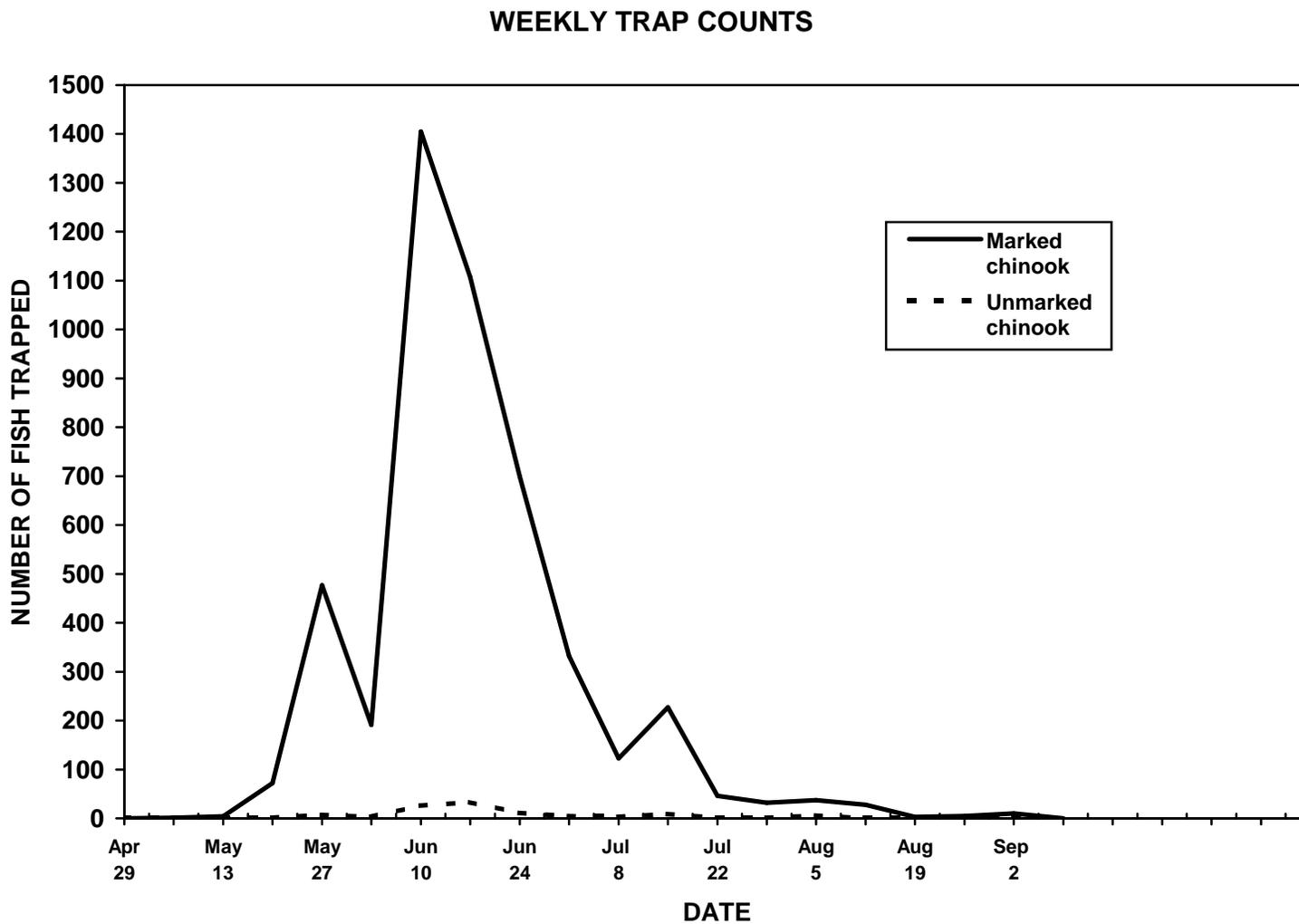
Date	Department catalog number	Stream	County	Region	Number of fish	Weight (kg)	Actual Site	Remarks
7/6/00	0619400000	Newsome Cr.	Idaho	2	111	1110	Sing Lee Camp	Rapid River Broodstock Removed From Trap
Total released directly from trap					111	1110		
8/1/00	0619400000	Newsome Cr.	Idaho	2	262	2620	Sing Lee Camp	Rapid River Broodstock Removed From HP-2 130 females and 132 males
8/25/00	0618150023	Meadow Cr.	Idaho	2	150	1500	Slim's Camp	Rapid River Broodstock Removed From HP-1 100 females and 50 males
9/1/00	0618150023	Meadow Cr.	Idaho	2	225	2250	Slim's Camp	Rapid River Broodstock Removed From HP-1 150 females and 75 males
9/8/00	0618150000	Selway River	Idaho	2	286	2860	Gedney Cr. and O Hera Cr.	Rapid River Broodstock Removed From HP-1 92 females and 194 males
9/8/00	0619210000	Mill Cr.	Idaho	2	50	500		Rapid River Broodstock Removed From HP-1 25 females and 25 males
Total released from holding pods					973	9730		
TOTAL					1084	10840		

These fish were claimed by the Nez Perce Tribe. The fish released on 7/6/00 were transported by IDFG. All others were released by the Nez Perce Tribe.

Appendix 8. Rapid River marked Chinook run timing for 2000.

<b>Week ending</b>	<b>Number of fish</b>	<b>Percentage of marked Chinook</b>
April 29	0	0.0
May 6	1	0.02
May 13	4	0.08
May 20	72	1.50
May 27	477	9.94
June 3	191	3.98
June 10	1405	29.28
June 17	1107	23.07
June 24	699	14.57
July 1	332	6.92
July 8	123	2.56
July 15	227	4.73
July 22	46	0.96
July 29	32	0.67
August 5	37	0.77
August 12	28	0.58
August 19	3	0.06
August 26	5	0.10
September 2	10	0.21
September 9	0	0.00
Total	4799	100.00

Appendix 9. Salmon returns to Rapid River trap during 2000.



Appendix 10. Rapid River Chinook broodstock lengths for 2000.

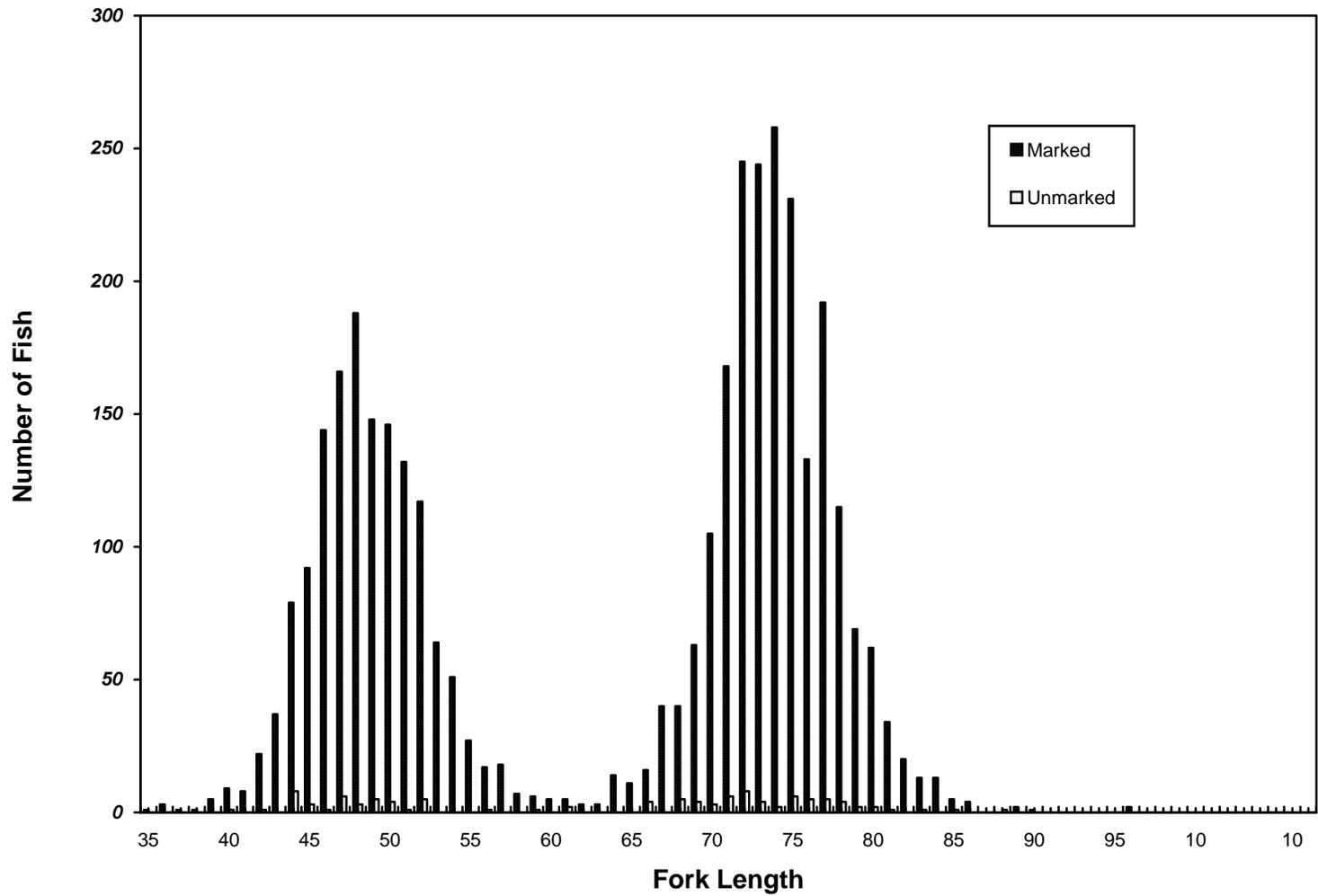
Fork length (cm)	Number of fish	Fork length (cm)	Number of fish
< 50	904	88	2
50	146	89	1
51	132	90	0
52	117	91	0
53	64	92	0
54	51	93	0
55	27	94	0
56	17	95	0
57	18	96	2
58	7	97	0
59	6	98	0
60	5	99	0
61	5	100	0
62	3	> 100	0
63	3	Total	3705
64	14		
65	11		
66	16		
67	40	<sup>a</sup> Sex composition data	
68	40	1,498 ( 37.76%)	jacks
69	63	1,094 ( 27.58%)	males
70	105	1,375 ( 34.66%)	females
71	168	3,967 (100.00%)	total
72	245		
73	244		
74	258	<sup>b</sup> Age-class data	
75	231	1,498 ( 40.43%)	three-year-old
76	233	2,198 ( 59.32%)	four-year-old
77	192	9 ( 0.25%)	five-year old
78	115	3,705 (100.00%)	total
79	69		
80	62		
81	34		
82	20	Age-class criteria	
83	13	< 62 cm =	three-year old
84	13	62 – 85 cm =	four-year-old
85	5	> 85 cm =	five-year-old
86	4		
87	0		

<sup>a</sup>Sex composition data includes fish removed from ponds for outplant.

<sup>b</sup>Age-class data includes only fish held for spawning and jacks given away.

Appendix 11. Length-frequency of Rapid River Fish Hatchery broodstock for 2000.

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Appendix 12. Rapid River Chinook PIT-tag detection for 2000.

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
5/19	510A2E394B	H	70	AD			Ponded, HP-2		Fish hook in mouth
5/20	513B2F4415	H	80	AD		F	Ponded, HP-2/SR 8/21/00		
5/20	513737230F	H	78	AD			Ponded, HP-2		
5/20	525F7B7B3D	H	47	AD			Ponded, HP-2		
5/23	513A29470D	H	76	AD			Ponded, HP-2		
5/23	51367D444D	H	77	AD			Ponded, HP-2		
5/23	51345A4E20	H	70	AD			Ponded, HP-2		
5/24	530E14780F	H	48	AD		M	Ponded, HP-2		
5/24	513A0A4822	H	73	AD			Ponded, HP-2		
5/24	5118254671	H	70	AD		F	Ponded, HP-2/spawned 8/29/00		
5/24	513A4F6404	H	74	AD		F	Ponded, HP-2/spawned 8/28/00		
5/24	513659761F	H	76	AD			Ponded, HP-2		
5/24	513B6D312E	H	68	AD			Ponded, HP-2		
5/25	5277481C3B	H	45	AD			Ponded, HP-2		
5/25	511D080272	H	79	AD			Ponded, HP-2		
5/25	51397B6777	H	74	AD			Ponded, HP-2		
5/26	51401B406D	H	75	AD			Ponded, HP-2		
5/26	5139721B6C	H	78	AD			Ponded, HP-2		
5/26	5137093215	H	78	AD			Ponded, HP-2		
5/26	5138630671	H	67	AD			Ponded, HP-2		
5/28	5112615326	H	71	AD			Ponded, HP-2		
5/29	513D4A4B1B	H	71	AD			Ponded, HP-2		
5/29	510C6D066A	H	71	AD			Ponded, HP-2		
5/29	5130523C1B	H	76	AD			Ponded, HP-2		
5/29	51337F4008	H	72	AD	CWT	F	Ponded, HP-2/spawned 8/28/00	RC839	
5/29	5139177C75	H	68	AD			Ponded, HP-2		
5/30	5106491246	H	74	AD		F	Ponded, HP-2/spawned 8/31/00		
5/31	513735007C	H	77	AD			Ponded, HP-2		
5/31	513576147D	H	73	AD			Ponded, HP-2		
6/3	513A7E0E63	H	77	AD			Ponded, HP-2		
6/4	5136203A63	H	75	AD			Ponded, HP-2		
6/5	513B6E1B2C	H	72	AD			Ponded, HP-2		
6/5	51397F6830	H	76	AD			Ponded, HP-2		
6/5	513E6C460B	H	69	AD			Ponded, HP-2		
6/5	5136230D60	H	77	AD			Ponded, HP-2		

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Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
6/5	513A2E2F4E	H	73	AD			Ponded, HP-2		
6/5	5134645152	H	72	AD			Ponded, HP-2		
6/5	4153482837	H	87	AD			Ponded, HP-2		
6/5	51315E0C59	H	65	AD			Ponded, HP-2		
6/5	52782A1A41	H	46	AD	CWT	M	Ponded, RP-1/NPT	RC43	
6/5	5310426056	H	44	AD		M	Ponded, RP-1/NPT		
6/5	530E493B23	H	49	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/6	5136552E05	H	64	AD			Ponded, HP-2		
6/6	513958322D	H	79	AD		M	Ponded, HP-2/PM 9/11/00		
6/7	513A2D3A7A	H	70	AD			Ponded, HP-2		
6/7	5137375C40	H	72	AD			Ponded, HP-2		
6/7	510F1A7D67	H	70	AD			Ponded, HP-2		
6/7	523B468B3D	H	52	AD		M	Ponded, RP-1		
6/7	52713D6169	H	52	AD		M	Ponded, RP-1		
6/8	5131446865	H	74	AD		F	Ponded, HP-2/spawned 9/7/00		
6/8	5137582D39	H	72	AD		F	Ponded, HP-2/spawned 8/31/00		
6/8	5117726766	H	76	AD			Ponded, HP-2		
6/8	512F473050	H	76	AD			Ponded, HP-2		
6/8	5137105F3F	H	76	AD		F	Ponded, HP-2/spawned 8/28/00		
6/8	512F264E5E	H	71	AD	CWT	M	Ponded, HP-2/PM 9/11/00	RC543	
6/8	512F220459	H	72	AD			Ponded, HP-2		
6/8	513A656E51	H	76	AD			Ponded, HP-2		
6/8	510F727500	H	69	AD			Ponded, HP-2		
6/8	512F1E6E71	H	77	AD			Ponded, HP-2		
6/8	522C1A6475	H	51	AD		M	Ponded, RP-1		
6/8	5134072A02	H	65	AD			Ponded, HP-2		
6/8	5275336109	H	49	AD		M	Ponded, HP-2/PM 9/7/00		
6/8	5110183F2E	H	73	AD	CWT	M	Ponded, HP-2/PM 9/11/00	RC536	
6/9	5137242C5B	H	76	AD			Ponded, HP-2		
6/9	5139193258	H	74	AD		F	Ponded, HP-2/spawned 9/6/00		
6/9	51391B1A7A	H	?	AD			Ponded, HP-2		
6/9	5138684002	H	74	AD			Ponded, HP-2		
6/9	51064D7230	H	71	AD			Ponded, HP-2		
6/9	5131012B72	H	72	AD			Ponded, HP-2		

Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
6/9	51240B7129	H	75	AD			Ponded, HP-2		
6/9	51397C2B2D	H	76	AD			Ponded, HP-2		
6/9	5108610E05	H	71	AD			Ponded, HP-2		
6/9	51337F4E60	H	74	AD			Ponded, HP-2		
6/9	5139106606	H	73	AD			Ponded, HP-2		
6/9	5137345B3E	H	67	AD			Ponded, HP-2		
6/9	5134091A43	H	75	AD			Ponded, HP-2		
6/9	510F0E362F	H	75	AD			Ponded, HP-2		
6/9	513D57437E	H	72	AD			Ponded, HP-2		
6/9	5140197912	H	73	AD			Ponded, HP-2		
6/9	513761362E	H	74	AD			Ponded, HP-2		
6/10	513B5C3375	H	52	AD			Ponded, HP-2		
6/10	51394B5248	H	83	AD			Ponded, HP-2		
6/10	510F08263A	H	72	AD			Ponded, HP-2		
6/10	5134356221	H	72	AD			Ponded, HP-2		
6/10	5139727C1B	H	75	AD			Ponded, HP-2		
6/11	513A21157D	H	73	AD			Ponded, HP-2		
6/11	512F1F5244	H	79	AD			Ponded, HP-2		
6/12	51342F5200	H	74	AD			Ponded, HP-2		
6/12	511D18710D	H	74	AD			Ponded, HP-2		
6/12	513A567F04	H	74	AD			Ponded, HP-2		
6/13	5134080562	H	79	AD			Ponded, HP-2		
6/13	513A56027F	H	77	AD			Ponded, HP-2		
6/13	513E0B1B7A	H	71	AD			Ponded, HP-2		
6/13	523E59333C	H	48	AD		M	Ponded, HP-2		
6/13	511754714A	H	73	AD			Ponded, HP-2		
6/14	5135395263	H	73	AD			Ponded, HP-2		
6/14	5128700A14	H	78	AD			Ponded, HP-2		
6/14	510B301E71	H	72	AD			Ponded, HP-2		
6/15	5129063703	H	75	AD			Ponded, HP-2		
6/15	51345C5D22	H	79	AD			Ponded, HP-2		
6/15	51386D3A6C	H	73	AD			Ponded, HP-2		
6/15	51356E1939	H	80	AD			Ponded, HP-2		
6/15	5136274553	H	73	AD			Ponded, HP-2		
6/15	5131347273	H	71	AD			Ponded, HP-2		

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Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
6/15	51337B453D	H	72	AD			Ponded, HP-2		
6/15	52680C752A	H	71	AD			Ponded, HP-2		
6/15	5134595C19	H	75	AD			Ponded, HP-2		
6/15	526B237B6E	H	52	AD		M	Ponded, HP-2/PM 9/11/00		
6/15	511E27352E	H	74	AD			Ponded, HP-2		
6/15	53003B544E	H		AD					
6/15	51782C7572	H		AD					
6/15	5240381902	H		AD					
6/15	52714E1942	H		AD					
6/16	416E3A7476	H	69	AD			Ponded, HP-2		
6/16	5136525638	H	73	AD	CWT	M	Ponded, HP-2/PM 9/13/00	RC671	
6/16	5135667837	H	72	AD	CWT	F	Ponded, HP-2/spawned 8/28/00	RC859	
6/16	5137281336	H	72	AD			Ponded, HP-2		
6/16	5134097D34	H	73	AD			Ponded, HP-2		
6/16	513A062271	H	72	AD	CWT	F	Ponded, HP-2/spawned 8/24/00	RC761	
6/16	5134616719	H	79	AD			Ponded, HP-2		
6/16	526E4F3F18	H	47	AD		M	Ponded, HP-2		
6/16	526638074C	H	52	AD		M	Ponded, HP-2		
6/16	5267186F03	H	43	AD		M	Ponded, HP-2		
6/17	5265336B5D	H	45	AD		M	Ponded, HP-2/spawned 9/5/00		
6/17	51375A134B	H	72	AD		F	Ponded, HP-2/spawned 8/29/00		
6/17	51370C3F72	H	77	AD			Ponded, HP-2		
6/18	5139256E23	H	74	AD			Ponded, HP-2		
6/18	5134667A67	H	75	AD			Ponded, HP-2		
6/19	51375C6A41	H	70	AD			Ponded, HP-2		
6/19	51134E537D	H	71	AD			Ponded, HP-2		
6/19	510F193B43	H	68	AD			Ponded, HP-2		
6/20	5137074637	H	71	AD			Ponded, HP-2		
6/20	5109425C36	H	70	AD			Ponded, HP-2		
6/21	527F4C4641	H	71	AD			Ponded, HP-2		
6/21	5118284975	H	66	AD			Ponded, HP-2		
6/22	511C3D3B6D	H	74	AD			Ponded, HP-2		

Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout tag #	Comments
6/22	510A2A2A2E	H	76	AD			Ponded, HP-2		
6/22	512F525F15	H	72	AD	CWT	M	Ponded, HP-2/PM 9/11/00	RC589	
6/22	51372A3A37	H	71	AD			Ponded, HP-2		
6/22	513629002F	H	74	AD			Ponded, HP-2		
6/22	513A283133	H	75	AD			Ponded, HP-2		
6/22	513A007E41	H	69	AD			Ponded, HP-2		
6/22	51372F5A56	H	77	AD		M	Ponded, HP-2		
6/23	5139431345	H	73	AD			Ponded, HP-2		
6/23	513057493E	H	72	AD	CWT	F	Ponded, HP-2/spawned 8/28/00	RC919	
6/23	513A267B04	H	70	AD			Ponded, HP-2		
6/23	513A632108	H	69	AD			Ponded, HP-2		
6/23	513957173F	H	75	AD			Ponded, HP-2		
6/23	512F15632A	H	74	AD			Ponded, HP-2		
6/23	511D3C0C6D	H	74	AD			Ponded, HP-2		
6/23	513A283F5B	H	74	AD			Ponded, HP-2		
6/23	526340742A	H	49	AD	CWT	M	Ponded, RP-1/NPT	RC99	Detected at disposal. Date is disposal date.
6/23	522C08730D	H	48	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/23	523F646771	H	48	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/23	5176116F6B	H	45	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/23	522C17472E	H	48	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/23	5273416466	H	57	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
6/23	5176116F6B	H	45	AD	CWT	M	Ponded, RP-1/NPT	RC136	Detected at disposal. Date is disposal date.
6/23	526777525F	H	54	AD		M	Ponded, RP-1/NPT		
6/26	51376D105B	H	72	AD			Ponded, HP-2		
6/26	51337C7F4D	H	73	AD			Ponded, HP-2		
6/26	513753622F	H	76	AD			Ponded, HP-2		
6/26	51364B4164	H	72	AD			Ponded, HP-2		
6/28	5117700E1E	H	73	AD			Ponded, HP-2		
6/28	513A671757	H	73	AD			Ponded, HP-2		
6/28	510B2D5277	H	81	AD			Ponded, HP-2		
6/28	51372F1E36	H	74	AD			Ponded, HP-2		
6/30	5235605070	H	51	AD	CWT	M	Ponded RP-1/NPT	RC66	Detected at disposal. Date is disposal date.
6/30	526A1D4827	H	48	AD		M	Ponded RP-1/NPT		Detected at disposal. Date is disposal date.

Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
6/30	50752A565F	H	49	AD		M	Ponded RP-1/NPT		Detected at disposal. Date is disposal date.
6/30	526B4D0A03	H	46	AD		M	Ponded RP-1/NPT		Detected at disposal. Date is disposal date.
7/6	50760C7F56	H	74	AD			Ponded, HP-2		
7/6	510F06294D	H	65	AD			Ponded, HP-2		
7/6	52753F2705	H	43	AD			Ponded, HP-2		
7/6	52744F565C	H	48	AD			Ponded, HP-2		
7/7	513A03581F	H	70	AD			Ponded, HP-2		
7/10	504C44336D	H	74	AD		M	Ponded, HP-2/spawned 9/5/00		
7/11	5137034F5E	H	73	AD		M	Ponded, HP-2/PM 9/11/00		
7/13	504405291E	H	40	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
7/14	52770C3704	H	37	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
7/14	52704A104F	H	48	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
7/14	526B7C476A	H	40	AD		M	Ponded, RP-1/NPT		Detected at disposal. Date is disposal date.
7/14	51351C7756	H	70	AD			Ponded, HP-2		
7/21	513A7D083E	H	70	AD			Ponded, HP-2		
7/25	5140277204	H	60	AD		M	Ponded, RP-1/FB		Detected at disposal. Date is disposal date.
7/25	525F72644B	H	45	AD		M	Ponded, Rp-1/FB		Detected at disposal. Date is disposal date.
7/25	53102C1018	H	54	AD		M	Ponded, RP-1/FB		Detected at disposal. Date is disposal date.
7/25	5310546D2E	H	46	AD		M	Ponded, RP-1/FB		Detected at disposal. Date is disposal date.
7/25	51782C4321	H	43	AD		M	Ponded, RP-1/FB		Detected at disposal. Date is disposal date.
8/1	53011A6359	H	50	AD			Ponded, HP-2		
8/1	4155647974	H	89	AD			Ponded, HP-2		
8/7	526D13790A	H	52	AD			Ponded, HP-2		
8/30	53011A6359	H		AD					
8/30	4155647974	H		AD					
8/28	5134091A43	H	77	AD		F	Ponded, HP-2/spawned		Detected at disposal. Date is disposal date.
8/28	51345C5D22	H	80	AD		F	Ponded, HP-2/spawned		Detected at disposal. Date is disposal date.
8/28	5131012B72	H	74	AD	CWT	F	Ponded, HP-2/spawned	RC846	Detected at disposal. Date is disposal date.
8/28	513057493E	H		AD		F	Ponded, HP-2/spawned		Detected at disposal. Date is disposal date.
8/28	5108610E05	H	75	AD		F	Ponded, HP-2/spawned		Detected at disposal. Date is disposal date.
8/31	5139106606	H		AD		F	Ponded, HP-2/spawned		Detected at disposal. Date is disposal date.
9/1	51193C1013	H		AD		F	Ponded HP-1/spawned 9/1/00		Detected at disposal. Date is disposal date.
9/5	513957173F	H		AD		F	Ponded, HP-2/spawned 9/5/00		Detected at disposal. Date is disposal date.

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Appendix 12. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Snout bag #	Comments
9/5	513467436B	H		AD		F	Ponded, HP-2/spawned 9/5/00		Detected at disposal. Date is disposal date.
9/11	5106112C09	H	70	AD	CWT	M	Ponded, HP-2/PM	RC603	Detected at disposal. Date is disposal date.
9/11	5129063703	H	71	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	513735C40	H	73	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	513735007C	H	76	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	51394B5248	H	85	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	51380B0369	H	70	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	5137650E19	H	67	AD	CWT	M	Ponded, HP-2/PM	RC515	Detected at disposal. Date is disposal date.
9/11	5117520311	H	69	AD		M	Ponded, HP-2/PM		Detected at disposal. Date is disposal date.
9/11	5137093215	H	80	AD	CWT	M	Ponded, HP-2/PM	RC533	Detected at disposal. Date is disposal date.
9/11	510B301E71	H	74	AD	CWT	M	Ponded, HP-2/PM	RC522	Detected at disposal. Date is disposal date.
9/12	51351E0C59	H	67	AD	CWT	M	Ponded, HP-2/PM	RC653	Detected at disposal. Date is disposal date.
9/12	51042E394B	H	72	AD	CWT	M	Ponded, HP-2/PM	RC638	Detected at disposal. Date is disposal date.
9/13	5112615326	H	75	AD	CWT	M	Ponded, HP-2/PM	RC665	Detected at disposal. Date is disposal date.
9/13	5134667A67	H	76	AD	CWT	M	Ponded, HP-2/PM	RC666	Detected at disposal. Date is disposal date.

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Appendix 13. Rapid River Hatchery recaptures with VI and radio tags during 2000.

Trap date	VI tag number	Radio CH/code	Fin Clip	Length (cm)	Sex	*Disposition
6/5/00	A45	16/15	AD	70	U	H
6/7/00		16/71	AD	71	U	H
6/9/00	A43	16/20	AD	70	U	H
6/13/00	F45	122//19	AD	72	U	H
6/15/00	E83	19/17	AD	71	U	H
6/17/00	F96	19/105	AD	71	U	H
6/21/00	A46	16/2	AD	74	U	H
6/23/00		22/98	AD	71	U	H
6/23/00	B17		AD	73	U	H
6/26/00		15/126	AD	76	U	H
6/29/00		22/116	AD	74	U	H

\*H = held, R = released, D = donated for consumption

Appendix 14. Injuries to Chinook returning to Rapid River Hatchery for 2000.

<b>Nitrogen blister</b>	<b>Body injury</b>	<b>Gill net scar</b>	<b>Gaff wound</b>	<b>Eye damage</b>	<b>Lamprey mark</b>	<b>Fin damage</b>	<b>Body scar</b>	<b>Bite wound</b>
105	34	4	15	3	13	0	20	9

These numbers are from a sample size of 4,799 Rapid River returns.

Appendix 15. Rapid River unmarked Chinook run timing for 2000.

<b>Week ending</b>	<b>Number of fish</b>	<b>Percentage of unmarked Chinook</b>
May 20	1	0.9
May 27	7	6.6
June 3	3	2.8
June 10	26	24.5
June 17	33	31.1
June 24	11	10.4
July 1	5	4.7
July 8	3	2.8
July 15	9	8.5
July 22	1	0.9
July 29	1	0.9
August 5	6	5.7
August 12	0	0.0
Total	106	100

Appendix 16. Rapid River unmarked Chinook lengths for 2000.

Fork length (cm)	Number of fish	Fork length (cm)	Number of fish
< 50	28	88	1
50	04	89	0
51	01	90	0
52	5	91	0
53	0	92	0
54	0	93	0
55	0	94	0
56	1	95	0
57	0	96	0
58	0	97	0
59	1	98	0
60	0	99	0
61	2	100	0
62	0	> 100	0
63	0	Total	106
64	0		
65	0		
66	4		
67	0		
68	5		
69	4		
70	3		
71	6		
72	8		
73	4		
74	2		
75	6		
76	5		
77	5		
78	4		
79	2		
80	2		
81	1		
82	0		
83	1		
84	0		
85	1		
86	0		
87	0		

Sex composition data	
42 ( 39.62%)	jacks
33 ( 31.13%)	males
31 ( 29.25%)	females
106 (100.00%)	*total

Age-class data	
42 ( 39.62%)	three-year-old
63 ( 59.44%)	four-year-old
1 ( 0.94%)	five-year old
106 (100.00%)	total

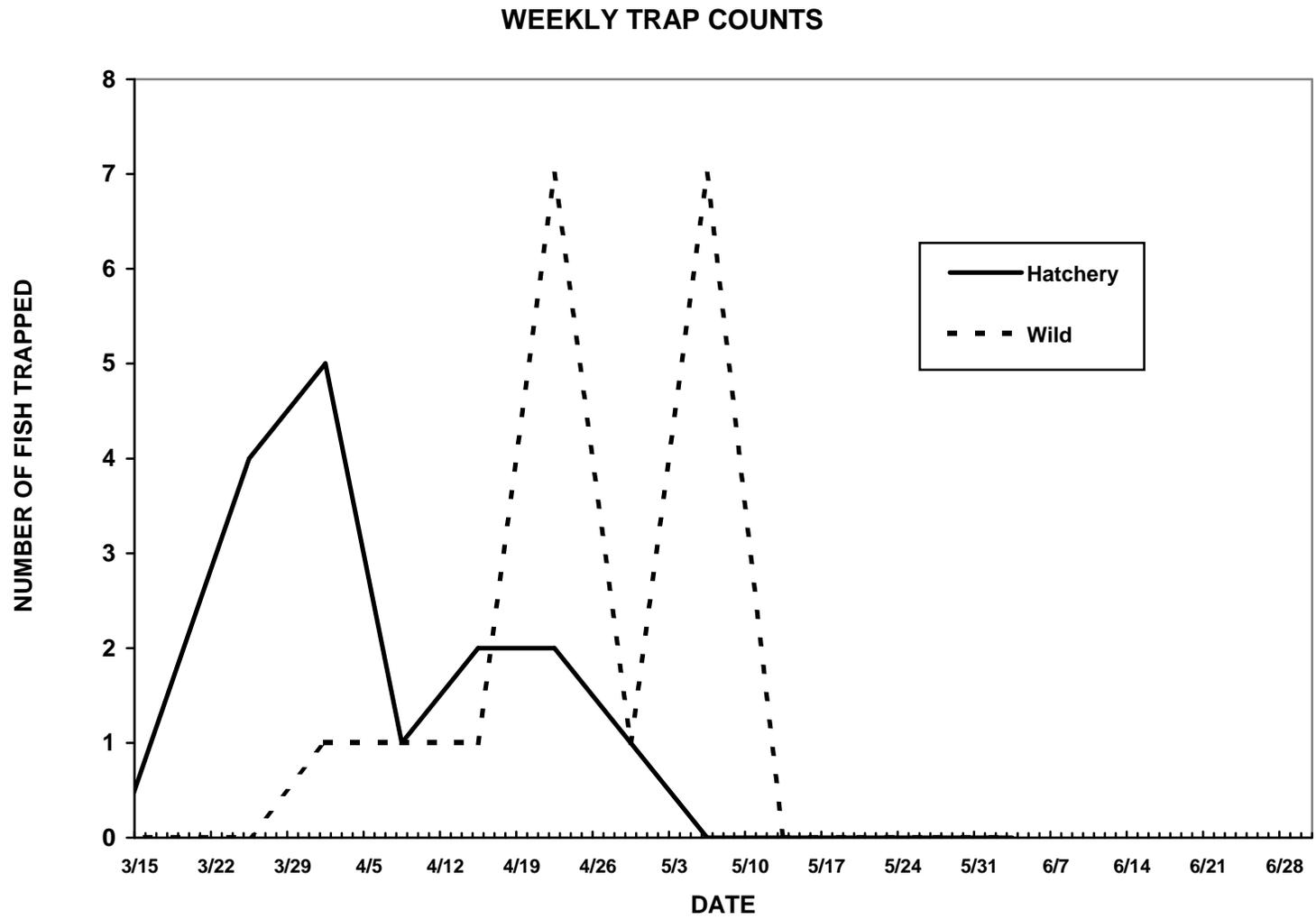
Age-class criteria	
< 62 cm =	three-year old
62 – 85 cm =	four-year-old
> 85 cm =	five-year-old

This table includes all Chinook released above Rapid River Trap.

Appendix 17. Rapid River steelhead run timing for 2000.

<b>Week ending</b>	<b>Number of hatchery fish</b>	<b>Percentage of steelhead run</b>	<b>Number of wild fish</b>	<b>Percentage of steelhead run</b>
April 1	0	0.00	0	0.00
April 8	4	12.12	0	0.00
April 15	5	15.15	1	3.03
April 22	1	3.03	1	3.03
April 29	2	6.06	1	3.03
May 6	2	6.06	7	21.21
May 13	1	3.03	1	3.03
May 20	0	0.00	7	21.21
May 27	0	0.00	0	0.00
June 3	0	0.00	0	0.00
Total by origin	15	45.45	18	54.55
Total steelhead		33		

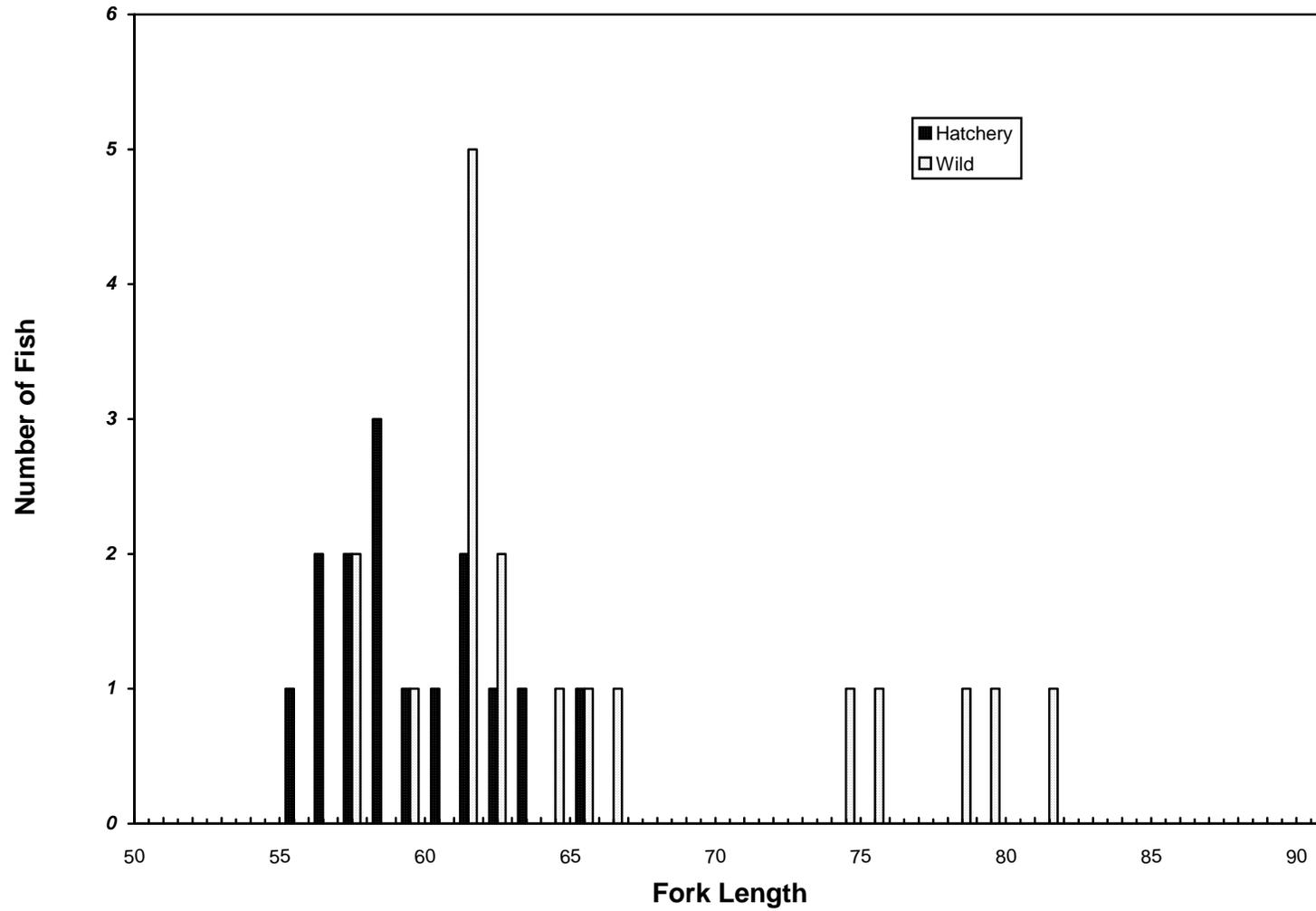
Appendix 18. Adult steelhead returns to Rapid River during 2000.



Appendix 19. Rapid River steelhead fork lengths for 2000.

Fork length (cm)	Hatchery		Wild	
	Male	Female	Male	Female
51				
52				
53				
54				
55	1			
56	2			
57	1	1		2
58	1	2		
59	1		1	
60	1			
61	1	1	1	4
62	1		1	1
63	1			
64			1	
65	1			1
66			1	
67				
68				
69				
70				
71				
72				
73				
74			1	
75				1
76				
77				
78				1
79				1
80				
81				1
82				
83				
84				
85				
86				
87				
88				
89				
column total	11	4	6	12
origin total		15		18
total run			33	

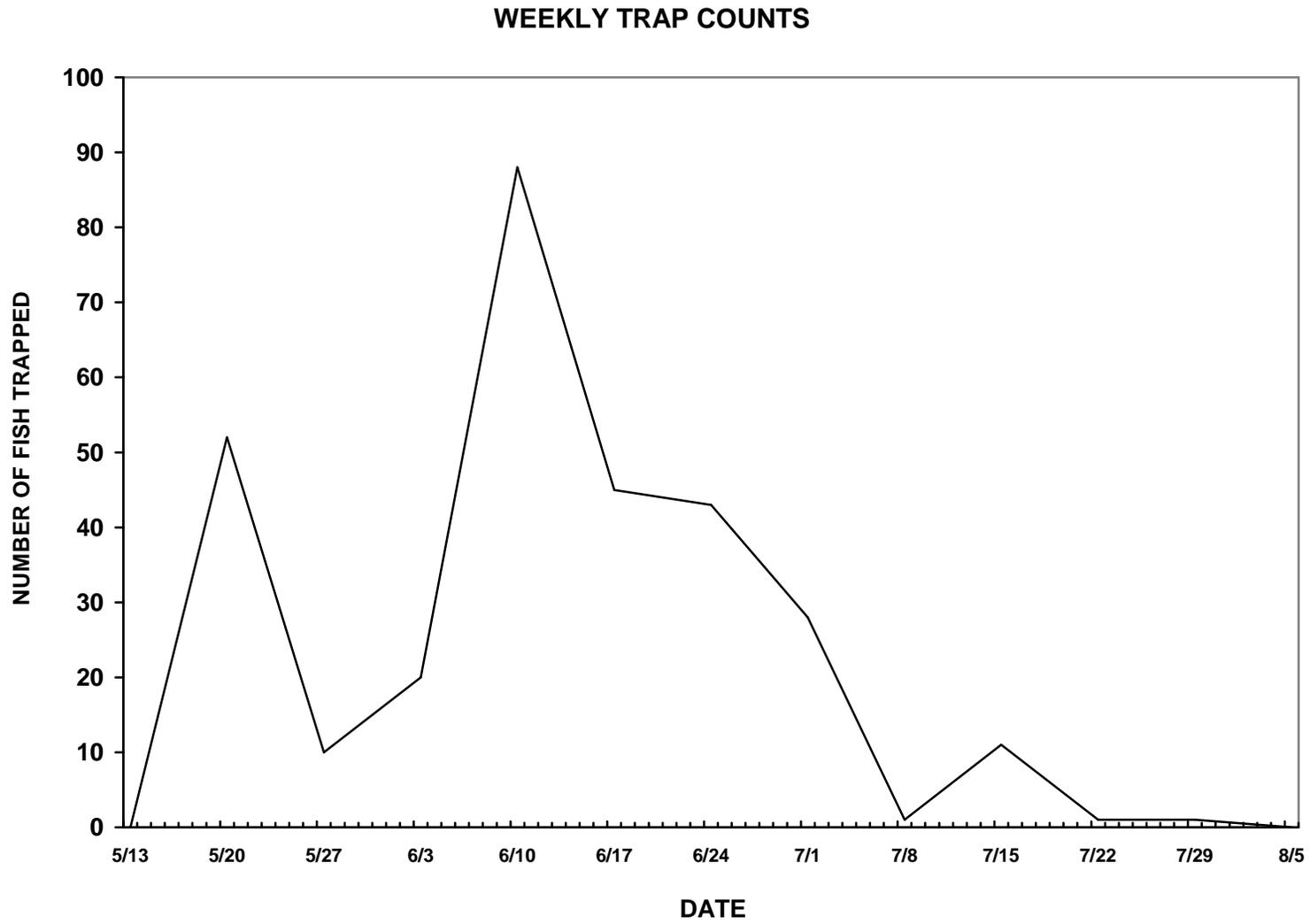
Appendix 20. Length-frequency of steelhead returning to Rapid River trap during 2000.



Appendix 21. Rapid River bull trout run timing for 2000.

<b>Week ending</b>	<b>Number of fish</b>	<b>Percentage of bull trout run</b>
May 13	0	0.00
May 20	52	17.33
May 27	10	3.33
June 3	20	6.67
July 10	88	29.33
July 17	45	15.00
June 24	43	14.33
July 1	28	9.33
July 8	1	0.33
July 15	11	3.67
July 22	1	0.33
July 29	1	0.33
August 5	0	0.00
<b>Total</b>	<b>300</b>	<b>100.00</b>

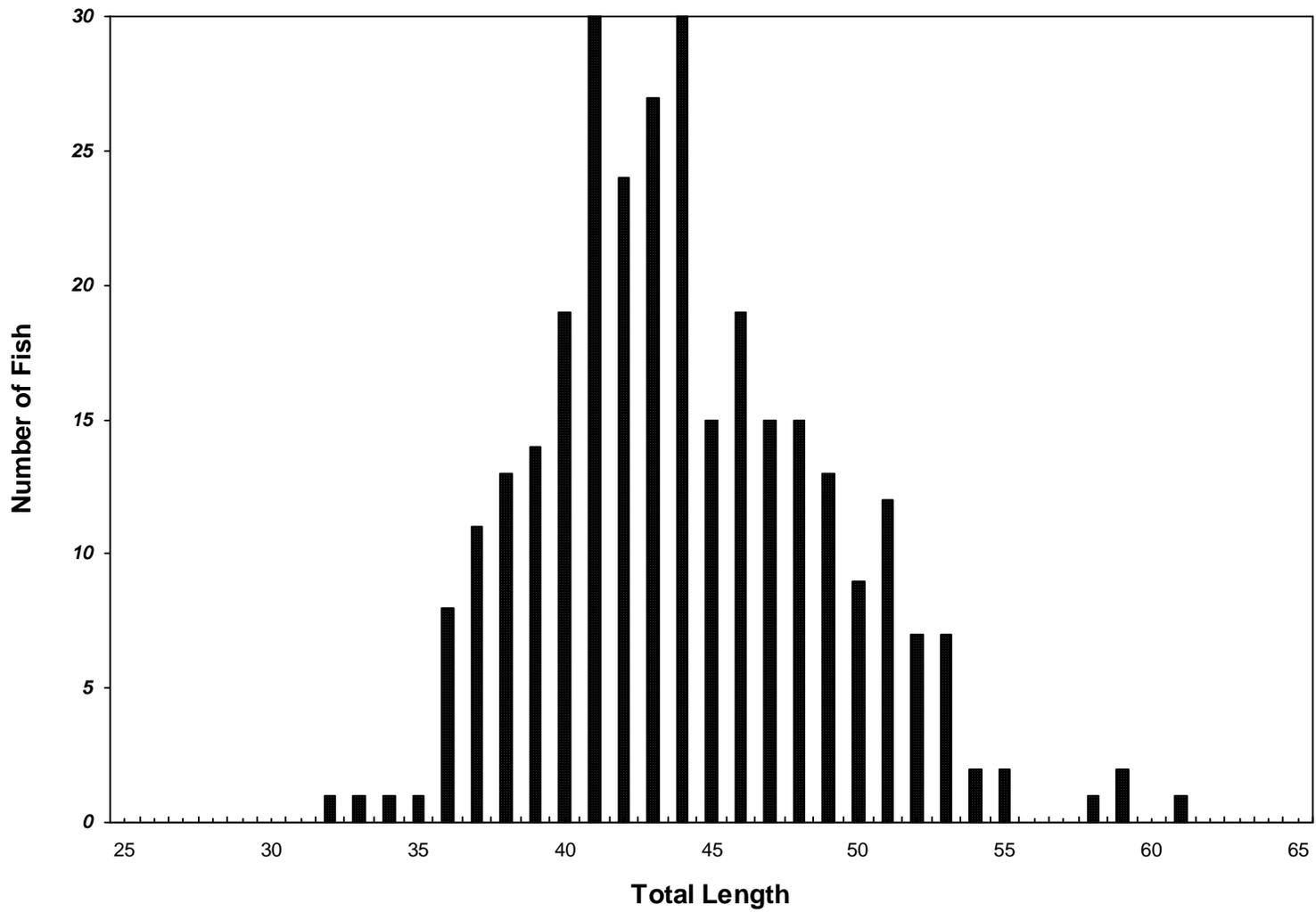
Appendix 22. Adult bull trout returns to Rapid River trap during 2000



Appendix 23. Rapid River bull trout lengths for 2000

Total length (cm)	Number of fish	Total length (cm)	Number of fish
25	0	45	15
26	0	46	19
27	0	47	15
28	0	48	15
29	0	49	13
30	0	50	9
31	0	51	12
32	1	52	7
33	1	53	7
34	1	54	2
35	1	55	2
36	8	56	0
37	11	57	0
38	13	58	1
39	14	59	2
40	19	60	0
41	30	61	1
42	24	62	0
43	27	63	0
44	30	64	0
<b>Total</b>			<b>300</b>

Appendix 24. Length-frequency of adult bull trout returning to Rapid River during 2000



Appendix 25. Species trapped in Rapid River during 2000.

<b>Species</b>	<b>Number trapped</b>
Marked Chinook	4,799
Unmarked Chinook	106
Steelhead	33
Bull trout	300

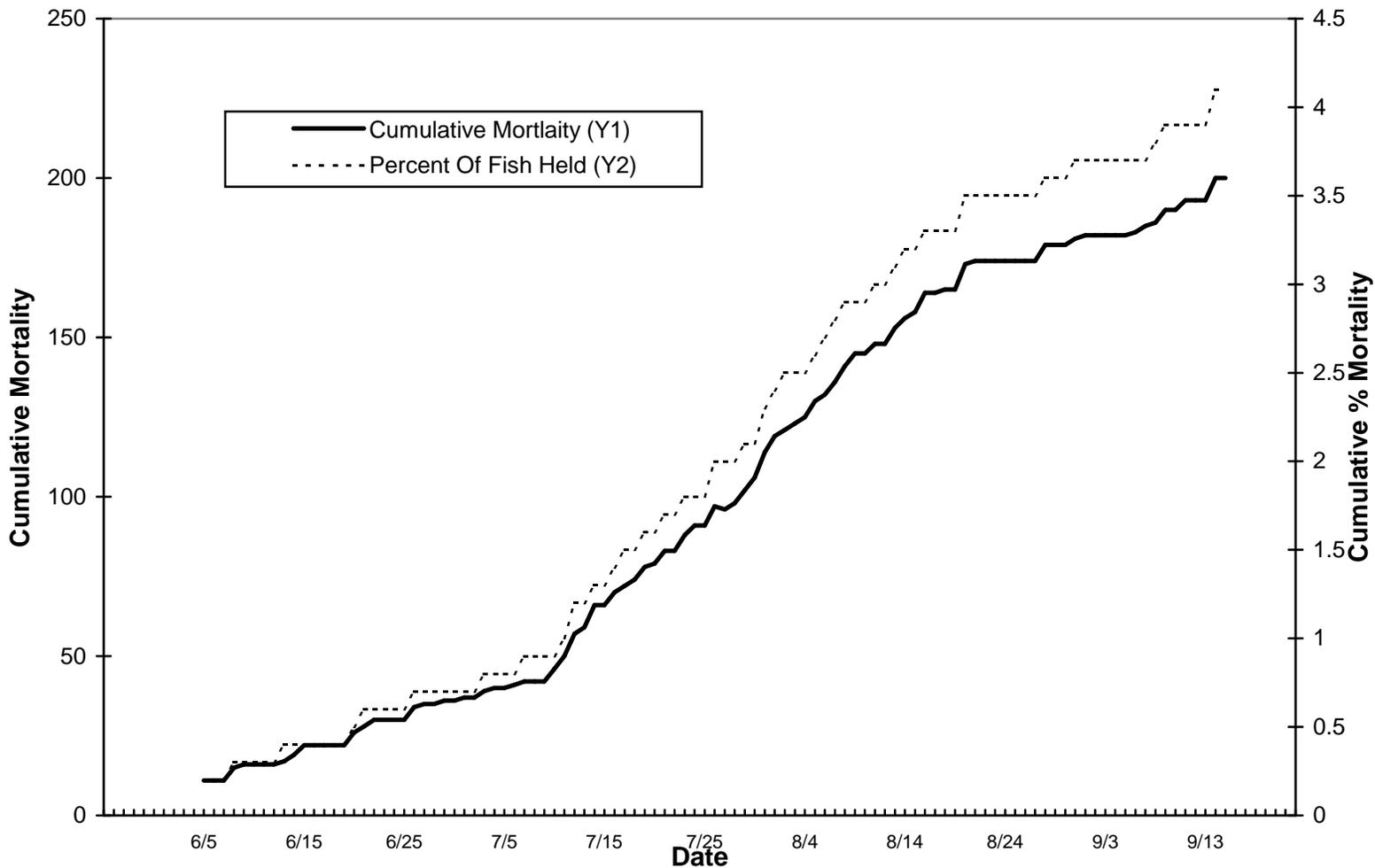
This table does not include recaptures.

Appendix 26. Causes of prespawning mortality at Rapid River Hatchery for 2000.

<b>Cause</b>	<b>Number of fish</b>	<b>*Percentage of fish held</b>
Nitrogen embolism		
25% of head	0	0.00
50% of head	3	0.06
75% of head	1	0.02
100% of head	0	0.00
% of embolism not recorded	0	0.00
Jaundice	4	0.08
Injury	2	0.04
Unknown	190	3.85
<b>Total</b>	<b>200</b>	<b>4.05</b>

\*Percentages are of 4,934 fish placed in holding ponds.

Appendix 27. Cumulative prespawning mortality at Rapid River Fish Hatchery for 2000.



Appendix 28. Rapid River Hatchery egg enumeration for 2000.

<b>Total eggs taken at Rapid River Hatchery in 2000.</b>							
<b>Lot</b>	<b>Spawn date</b>	<b>Eyed</b>	<b>Primary pick</b>	<b>Green</b>	<b>Percent eyed</b>	<b>Average fecundity</b>	<b>Females</b>
1	8/14	9,946	3130	13,076	76.1	3,269	4
2	8/21	297,397	30949	328,346	90.6	3,956	83
3	8/22	873	3182	4,055	21.5	4,055	1
4	8/24	444,858	90269	535,127	83.1	4,116	130
5	8/28	1,075,544	47700	1,123,244	95.8	3,808	295
6	8/29	345,089	33616	378,705	91.1	3,904	97
7	8/31	993,045	105026	1,098,071	90.4	3,880	283
8	9/1	129,459	12328	141,787	91.3	3,832	37
9	9/5	495,936	20217	516,153	96.1	3,910	132
10	9/6	290,815	15807	306,622	94.8	4,035	76
11	9/7	168,758	5118	173,876	97.1	3,864	45
12	9/8	79,100	2684	81,784	96.7	3,894	21
13	9/11	63,541	2850	66,391	95.7	3,688	18
14	9/14	11,118	2495	13,613	81.7	3,403	4
<b>Total</b>		<b>4,405,479</b>	<b>375,371</b>	<b>4,780,850</b>	<b>92.1</b>	<b>3,900</b>	<b>1,226</b>

<b>Eggs transferred to Clearwater Hatchery in 2000.</b>							
<b>Lot</b>	<b>Spawn date</b>	<b>Eyed</b>	<b>Primary pick</b>	<b>Green</b>	<b>Percent eyed</b>	<b>Average fecundity</b>	<b>Females</b>
7	8/31	278,437	17,278	295,715	94.2	3,943	75
8	9/1	129,459	12,328	141,787	91.3	3,832	37
9	9/5	495,936	20,217	516,153	96.1	3,910	132
10	9/6	8,087	823	8,910	90.8	4,455	2
<b>Total</b>		<b>911,919</b>	<b>50,646</b>	<b>962,565</b>	<b>94.7</b>	<b>3,913</b>	<b>246</b>

<b>Eggs reared at Rapid River Hatchery in 2000.</b>							
<b>Lot</b>	<b>Spawn date</b>	<b>Eyed</b>	<b>Primary pick</b>	<b>Green</b>	<b>Percent eyed</b>	<b>Average fecundity</b>	<b>Females</b>
1	8/14	9,946	3130	13,076	76.1	3,269	4
2	8/21	297,397	30949	328,346	90.6	3,956	83
3	8/22	873	3182	4,055	21.5	4,055	1
4	8/24	444,858	90269	535,127	83.1	4,116	130
5	8/28	1,075,544	47700	1,123,244	95.8	3,808	295
6	8/29	345,089	33616	378,705	91.1	3,904	97
7	8/31	714,608	87,748	802,356	89.1	3,857	208
10	9/6	282,728	14,984	297,712	95.0	4,023	74
11	9/7	168,758	5118	173,876	97.1	3,864	45
12	9/8	79,100	2684	81,784	96.7	3,894	21
13	9/11	63,541	2850	66,391	95.7	3,688	18
14	9/14	11,118	2495	13,613	81.7	3,403	4
<b>Total</b>		<b>3,493,560</b>	<b>324,725</b>	<b>3,818,285</b>	<b>91.5</b>	<b>3,896</b>	<b>980</b>

The tables in this appendix do not include females or eggs that were culled.

Appendix 29. Rapid River broodstock ELISA results for 2000.

Lot number	Date sampled	Number sampled	Negative		Positive	
			< 0.999	Low .1-.249	Moderate .250-.399	High > .400
1	8/14	4	0	4	0	0
2	8/21	92	12	72	2	6
3	8/22	2	1	0	0	1
4	8/24	148	16	117	5	10
5	8/28	317	17	279	7	14
6	8/29	102	38	59	3	2
7	8/31	295	89	201	2	3
8	9/1	37	27	10	0	0
9	9/5	136	18	115	2	1
10	9/6	85	44	37	2	2
11	9/7	48	0	42	4	2
12	9/8	22	12	10	0	0
13	9/11	19	4	14	0	1
14	9/14	4	0	4	0	0
<b>Total</b>		<b>1,311</b>	<b>278</b>	<b>964</b>	<b>27</b>	<b>42</b>

Appendix 30. Rapid River Hatchery initial raceway loading densities (2/5/01–3/21/01).

<b>Raceway</b>	<b>Inflow (ft<sup>3</sup>/sec)</b>	<b>Number of fish</b>	<b>Weight (lb)</b>	<b>Density Index</b>	<b>Flow Index</b>
2	0.25	343,860	252.03	0.68	1.67
3	0.25	279,462	260.88	0.68	1.70
4	0.25	353,461	255.21	0.69	1.70
5	0.25	352,006	254.16	0.69	1.69
6	0.25	349,627	252.44	0.68	1.68
7	0.25	332,282	239.91	0.65	1.60
8	0.31	354,042	263.23	0.70	1.40
9	0.31	312,636	225.73	0.61	1.21
10	0.31	356,225	266.03	0.71	1.41
11	0.31	294,593	267.69	0.36	1.33
<b>Total</b>		<b>3,328,194</b>			

Inventory data are based on egg enumeration values when final fish were added to each raceway.

Appendix 31. Rapid River Hatchery final raceway loading densities (6/25/01).

<b>Raceway</b>	<b>Inflow (ft<sup>3</sup>/sec)</b>	<b>Number of fish</b>	<b>Weight (lb)</b>	<b>Density Index</b>	<b>Flow Index</b>
2	1.07	340,780	3214.91	0.51	2.12
3	1.07	277,696	2457.49	0.40	1.66
4	1.07	351,050	3220.64	0.52	2.14
5	1.07	350,249	2993.58	0.49	2.04
6	1.07	346,349	3206.94	0.51	2.13
7	1.07	329,615	2535.50	0.43	1.79
8	1.07	352,334	2669.20	0.46	1.89
9	1.07	311,252	2510.10	0.42	1.74
10	1.07	352,162	2497.60	0.44	1.81
11	1.07	292,452	2003.10	0.35	1.47

Inventory data are based on egg enumeration values minus documented mortality; they differ slightly from the number reported marked.

Appendix 32. Rapid River Hatchery initial pond loading densities (6/25/01 to 7/17/01).

<b>Pond</b>	<b>Inflow (ft<sup>3</sup>/sec)</b>	<b>Number of fish</b>	<b>Weight (lb)</b>	<b>Density Index</b>	<b>Flow Index</b>
RP-1A	14.89	637,413	7966	0.09	0.36
RP-1B	9.30	640,359	8711	0.09	0.62
RP-2A	6.22	586,071	6583	0.09	0.74
RP-2B	6.22	481,761	6255	0.08	1.38
RP-2C	6.22	545,968	7797	0.10	0.81
RP-2D	6.22	581,439	6459	0.09	1.61

Inventory data are based on reported number marked, which shows an increase of 2.5% from hatchery inventory based on egg enumeration.

Appendix 33. Rapid River Hatchery pond loading densities at release (3/25/02).

<b>Pond</b>	<b>Inflow (ft<sup>3</sup>/sec)</b>	<b>Number of fish</b>	<b>Weight (lb)</b>	<b>Density Index</b>	<b>Flow Index</b>
RP-1A	6.70	636,745	27,211	0.12	1.87
RP-1B	6.70	639,789	31,362	0.56	2.06
RP-2A	5.70	585,690	25,355	0.58	2.04
RP-2B	5.70	481,223	20,833	0.58	3.72
RP-2C	5.70	545,503	28,264	0.55	2.15
RP-2D	5.70	580,867	23,328	0.60	4.27

Appendix 34. Feed for brood year 2000 at Rapid River Hatchery.

Product		<sup>a</sup> Amount used	Unit price	Total cost
Type/size	Additives			
BioDiet:				
No. 2 Starter		678.8kg	2.23	\$1,513.72
No. 3 Starter		1017.9kg	2.23	\$2,269.92
No. 2 & No. 3	Bio Flake MC			\$ 0.00
1.0 mm Grower		2177.2kg	1.75	\$3,810.10
1.3 mm Grower		1456.9kg	1.71	\$2,491.30
1.3 mm Grower	Aquamycin-100	4769.9kg	3.53	\$16,837.75
1.5 mm Grower				\$ 0.00
2.0 mm Grower				\$ 0.00
				\$ 0.00
				\$ 0.00
BioMoist:				
1.5 mm Grower	<sup>b</sup> EIBS PAC	9000.0lb	0.66	\$5,940.00
2.0 mm Grower	<sup>b</sup> EIBS PAC	40000.0lb	0.73	\$29,200.00
2.5 mm Grower	<sup>b</sup> EIBS PAC	25300.0lb	0.65	\$16,445.00
2.5 mm Grower	Aquamycin-100	26900.0lb	1.94	\$52,186.00
	<sup>b</sup> EIBS PAC			
3.0 mm Feed	<sup>b</sup> EIBS PAC	89000.0lb	0.49	\$43,610.00
3.0 mm Feed		14000lb	0.41	\$5,740.00
<sup>c</sup> Total		226,464.0lb		\$180,043.79

<sup>a</sup>Feed units are given in kg or lb. as provided by manufacturer

<sup>b</sup>EIBS PAC = 5 x C and B12, and 10 x Folic Acid.

<sup>c</sup>Total includes 218,870 lb fed prior to the start of release and 7,594 fed after the start of release.

The size of fish at release and overall feed conversion are based on 226464.0 lb of feed

Appendix 35. Eagle Fish Health Laboratory inspection results for brood year 2000.

<b>Brood</b>											
<b>year</b>	<b>Log</b>										
<b>stock</b>	<b>number</b>	<b>IHN</b>	<b>IPN</b>	<b>EIBS</b>	<b>BKD</b>	<b>FUR</b>	<b>ERM</b>	<b>CWD</b>	<b>WHD</b>	<b>CSH</b>	<b>Comments</b>
<u>juvenile samples</u>											
RRSC	00-057	-	-		-	-	-	-			NO PATHOGENS DETECTED; VIRO 0/10, FAT 0/10, BACTE 0/8
RRSC	00-071	-	-		-				-		NO PATHOGENS DETECTED; VIRO 0/20, FAT 0/20 , ELISA 0/20 PTD-WHD 0/20
RRSC	00-210	-	-		-	-		-			NO PATHOGENS DETECTED, VIRO 0/10, FAT 0/10, BACTE 0/10
RRSC	00-237	-	-		-						NO PATHOGENS DETECTED; VIRO 0/10, FAT 0/10,
RRSC	00-271	-	-		-	-	-	-			DIAGNOSTIC MAS: VIRO 0/10, PSUDOMONAS 2/5
<u>brood samples</u>											
RRSC	00-201	-	-		+						RS; VIRO 0/4, ELISA 4/4 (4LOW)
RRSC	00-202								-		NO PATHOGENS DETECTED; WHD-DIGEST 0/20
RRSC	00-217	-	-	-	+						BKD; VIRO 0/60, ELISA 80/93 (72 LOW, 8 HIGH)
RRSC	00-220				+						BKD; ELISA ½ (1HIGH)
RRSC	00-231				+						BKD; ELISA 132/148(117LOW, 15 HIGH)
RRSC	00-234A				+						BKD; ELISA 299/317 (279 LOW, 20 HIGH)
RRSC	00-234B				+						SEE ACCESSION # 00-234A
RRSC	00-241				+						BKD; ELISA 64/102 (59 LOW, 5 HIGH)
RRSC	00-245A				+						BKD; ELISA 213/295 (208 LOW, 5 HIGH)
RRSC	00-245B				+						SEE ACCESSION # 00-245A
RRSC	00-259				+						RS; ELISA 10/37 (10 LOW)
RRSC	00-260				+						BKD; ELISA 118/136 (115 LOW, 3 HIGH)
RRSC	00-269				+						BKD; ELISA 41/185 41/85 (37 LOW, 4 HIGH)
RRSC	00-270				+						BKD; ELISA 48/48 (45 LOW, 3 HIGH)
RRSC	00-281				+						RS; ELISA 10/22 (10 LOW)
RRSC	00-282				+						BKD; ELISA 15/19 (14 LOW, 1 HIGH)
RRSC	00-305				+						RS; ELISA 4/4 (4 LOW)

54

Appendix 36. Preliberation organosomatic index for brood year 2000.

Hematology						
Date	Hematocrit			Serum protein		
	<sup>a</sup> Mean	<sup>a</sup> SD	<sup>b</sup> CF	<sup>a</sup> Mean	<sup>b</sup> SD	<sup>c</sup> CF
03/11/02	41.9	2.32	0.055	7.6	0.524	0.069

<sup>a</sup>Standard deviation

<sup>b</sup>Coefficient of variation

Combined autopsy summary

Eyes		Gills		Pseudo-branches		Thymus		Mesen. fat		Spleen		Hind gut		Kidney		Liver		Bile	
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	0	0	0
B1	0	F	0	S	0	1	0	1	4	R	0	1	0	S	0	B	20	1	0
B2	0	C	0	L	0	2	0	2	6	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	8	ON	0			G	0	D	0	3	0
E2	0	P	0	I	0			4	2	E	0			U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0		
H2	0			O	0											OT	0		
M1	0																		
OT	0																		

Summary of normals

20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

N = normal

OT = other

Thymus: 0 = no hemorrhage

Mesenteric fat: 0 = none, 1 = < 50% coverage, 2 = 50%, 3 = > 50%, 4 = 100%

Spleen: R = red, E = enlarged (EIBS enlarges spleens)

Hind gut: 0 = no inflammation

Liver: B = pail red

Bile: 0 = yellow bile < full bladder

Appendix 37. Rapid River Hatchery marking summary for brood year 2000

<b>Coded wire tag releases</b>						
<b>Release site</b>	<b>Date released</b>	<b>Number of fish marked</b>	<b>Release group mark code</b>	<b>Clip</b>	<b>Purpose</b>	<b>Pond</b>
Rapid River	3/15-/3/25/02	69,945	10-94-71	AD	US-Canada	1A
Rapid River	3/15-/3/25/02	70,161	10-36-09	AD	US-Canada	1A
Rapid River	3/15-/3/25/02	70,700	10-96-71	AD	US-Canada	1A
Rapid River	3/15-/3/25/02	70,152	10-95-71	AD	US-Canada	1A
Rapid River	3/15-/3/25/0	72,091	10-36-08	AD	US-Canada	1A
<b>Total</b>		<b>353,049</b>				

<b>PIT tag releases</b>						
<b>Release site</b>	<b>Date released</b>	<sup>a</sup> <b>Number of PIT-tagged fish</b>	<b>Release group mark code</b>	<b>Clip</b>	<b>Purpose</b>	<b>Pond</b>
Rapid River	3/11-4/22/02	<sup>b</sup> 183,546	AD only	AD	Hatchery PIT tag study and FPC	2B

<sup>a</sup> See the *Annual Release Summary of Marked Salmon and Steelhead* (unpublished Department document) for estimated numbers of marked fish released.

<sup>b</sup>Total number = 55,000 pit tagged fish for CSS study and 128,546 for National Marine Fish Service study

Appendix 38. Smolts released from Rapid River Hatchery in 2002 (brood year 2000).

<b>Release site date</b>	<b>Release method</b>	<b>Number Released</b>	<b>Weight (lb)</b>
<b>Rapid River</b>			
3/11/02	Loaded to trucks from pond 2D and Released below Hells Canyon Dam.	165,710	7,300.0
3/12/02	Loaded to trucks from pond 2D and Released below Hells Canyon Dam.	170,250	7,500.0
3/13/02	Loaded to trucks from pond 2D and Released below Hells Canyon Dam.	164,235	8,100.0
<b>3/11-3/13/02</b>	<b>Total to Snake River</b>	<b>500,195</b>	<b>22,900.0</b>
3/14/02	Loaded to trucks from pond 2C and Released in the Little Salmon River.	300,018	16,130.0
<b>3/11-3/14</b>	<b>Total release into Little Salmon River</b>	<b>300,018</b>	<b>16,130</b>
3/18-4/22/02	Volitional release into Raid River		
	1A	636,745	29,894.1
	1B	639,789	32,150.2
	2A	585,667	30,034.2
	2B	481,243	24,679.1
	2C	245,469	14,014.2
	2D	80,563	3,770.2
	<b>Total release into Rapid River</b>	<b>2,669,476</b>	<b>134,542</b>
<b>Total hatchery release</b>		<b>2,969,494</b>	<b>150,672lb</b>

Appendix 39. Survival from eggs to smolts at Rapid River Hatchery for brood year 2000.

<sup>a</sup> Green eggs	<sup>b</sup> Eyed egg number	Percent survival	<sup>c</sup> Swimup	<sup>d</sup> Percent survival	<sup>e</sup> Marked number	Released smolts	<sup>f</sup> Percent survival
3,818,285	3,493,560	91.5	3,429,300	89.8	3,473,011	3,469,689	99.9

<sup>a</sup>Does not include 962,565 green eggs transferred to Clearwater Hatchery as eyed eggs.

<sup>b</sup>Does not include 911,919 eyed eggs transferred to Clearwater.

<sup>c</sup>Swimup numbers include initial ponding numbers (Appendix 30) and 101,106 fish used for dewatering study which were disposed of after study.

<sup>d</sup>Survival green eggs to swim-up and survival from eyed eggs to swim up was 98.1%.

<sup>e</sup>The reported number marked was 2.5.% more than hatchery inventory. Inventory was based on electronic enumeration minus eggs used for survival study and mortality to date.

<sup>f</sup>Percent survival from marking to release. Mortality from marking to release was 0.096%.

Appendix 40. Cost of production at Rapid River Hatchery for brood year 2000.

Number of fish	Weight of fish (lb)	Weight of feed (lb)	Cost of feed	Feed Conversion	<sup>a</sup> Total cost	Cost/ thousand fish	Cost/ pound
3,469,689	173,572	226,464	\$180,039.97	1.30	\$1,007,374.52	\$290.33	\$5.79

<sup>a</sup>The total represents the total cost incurred by IPC from 9/1/00 through 3/30/02. This amount may exceed cost associated with production of Brood Year 2000 due to overlap in the brood year rearing cycle (see discussion in the Cost of Production section). These costs include funds provided to the Department by IPC, as well as internal costs incurred by IPC. It does not include IPC capital outlay expenditures.

Appendix 41: Returns to Rapid River Hatchery from 1964 to 2000.

Return Year	Snake R. return (adults)	Rapid R. return (adults)	Rapid R. return (jacks)	Percent Prespawning mortality	Females spawned	Eggs/ female	Number of eggs taken
1964	349			16	182	4,874	887,000
1965	408			21	133	4,541	604,000
1966	1,511			18	621	3,697	2,296,000
1967	974	1,039		11	581	3,537	2,055,000
1968	351	3,416	740	2	1,809	3,671	6,540,000
1969	672	2,817	1,043	8	1,415	3,655	5,151,697
1970		6,470	887	10	3,520	4,136	14,560,280
1971		3,357	1,754	19	1,722	3,507	6,038,785
1972		12,310	943	15	3,825	3,941	15,072,604
1973		17,054	286	37	3,454	3,912	13,510,465
1974		3,457	538	27	1,756	3,924	6,890,186
1975		4,428	573	7	2,184	3,894	8,503,606
1976		6,342	1,765	15	3,055	3,762	11,492,878
1977		7,767	437	11	3,781	3,745	14,160,330
1978		5,735	34	21	2,350	4,266	10,026,888
1979		3,054	350	31	1,141	4,950	5,648,722
1980		1,528	432	30	543	3,235	1,756,827
1981		3,087	176	7	1,666	3,675	6,122,273
1982		3,646	30	11	1,883	3,973	7,482,330
1983		1,864	94	15	859	4,015	3,449,471
1984		1,705	651	7	821	3,807	3,125,911
1985	673	6,376	351	8	2,962	3,741	11,535,461
1986	360	6,546	177	34	2,451	4,355	10,673,138
1987	534	3,808	210	30	1,133	4,379	5,656,145
1988	381	3,608	172	19	1,645	4,879	7,905,702
1989	86	2,372	428	11	1,082	4,139	4,478,045
1990		2,566	40	13	1,063	3,967	4,217,103
1991		1,675	238	10	657	3,886	2,553,218
1992	912	2,370	96	24	1,177	3,988	4,534,404
1993	411	4,451	17	17	1,737	4,090	6,404,312
1994	29	261	4	21	116	4,226	490,249
1995	35	70	59	7	35	3,771	132,002
1996	58	1,412	751	6	329	3,561	1,171,610
1997	788	10,510	10	10	1,138	3,930	4,472,573
1998	60	1,584	7	16	723	4,715	3,409,130
1999	22	224	639	0.8	138	4,406	608,084
2000	967	3,098	1,701	4.1	1226	3,900	4,780,850
2001		12,642	128	34.6	878	3,796	3,333,314
2002	27	6,466	137	19.8	1072	3,522	3,670,292
2003							

From 1985 on, total eggs taken includes those from Snake River adults.

Appendix 42: Returns to Rapid River Hatchery by brood year.

Brood year	Year Released	Release into Rapid River	3-year-olds	Year Returned	4-year-olds	Year returned	5-year-olds	Year returned	Returns to Rapid River from release	% Return from release
1964	1966	588,000	1,309	1967	3,422	1968	197	1969	4,928	0.84
1965	1967	479,267	740	1968	2,620	1969	874	1970	4,234	0.88
1966	1968	1,460,150	1,043	1969	5,596	1970	364	1971	7,003	0.48
1967	1969	900,192	887	1970	2,992	1971	1,544	1972	5,423	0.60
1968	1970	3,172,000	1,754	1971	10,766	1972	4,403	1973	16,923	0.53
1969	1971	2,718,720	943	1972	12,654	1973	1,759	1974	15,356	0.56
1970	1972	2,809,200	285	1973	1,698	1974	386	1975	2,369	0.08
1971	1973	2,908,425	538	1974	4,206	1975	1,120	1976	5,864	0.20
1972	1974	2,707,917	573	1975	5,222	1976	634	1977	6,429	0.24
1973	1975	3,373,700	1,765	1976	7,110	1977	1,845	1978	10,720	0.32
1974	1976	3,358,940	437	1977	3,890	1978	2,413	1979	6,740	0.20
1975	1977	2,921,172	34	1978	598	1979	46	1980	678	0.02
1976	1978	2,412,678	350	1979	1,482	1980	146	1981	1,978	0.08
1977	1979	2,866,993	432	1980	3,068	1981	557	1982	4,057	0.14
1978	1980	2,604,823	176	1981	3,089	1982	1,206	1983	4,471	0.17
1979	1981	2,372,607	30	1982	838	1983	356	1984	1,224	0.05
1980	1982	1,476,766	94	1983	1,349	1984	199	1985	1,642	0.11
1981	1983	2,998,103	651	1984	6,177	1985	1,456	1986	8,284	0.28
1982	1984	3,246,197	351	1985	5,090	1986	1,155	1987	6,596	0.20
1983	1985	2,491,238	177	1986	2,444	1987	1,557	1988	4,178	0.17
1984	1986	1,594,688	210	1987	2,051	1988	379	1989	2,640	0.17
1985	1987	2,836,400	172	1988	1,933	1989	135	1990	2,240	0.08
1986	1988	2,630,200	428	1989	2,431	1990	421	1991	3,280	0.12
1987	1989	2,319,500	40	1990	1,254	1991	161	1992	1,455	0.06
1988	1990	2,520,400	238	1991	2,209	1992	1,905	1993	4,352	0.17
1989	1991	2,564,900	96	1992	2,546	1993	122	1994	2,764	0.11
1990	1992	2,615,500	17	1993	139	1994	9	1995	165	0.01
1991	1993	2,060,300	4	1994	61	1995	2	1996	67	0.003
1992	1994	2,547,624	59	1995	659	1996	177	1997	895	0.04
1993	1995	2,786,919	751	1996	10,333	1997	1,322	1998	12,406	0.45
1994	1996	379,167	10	1997	262	1998	72	1999	344	0.09
1995	1997	85,840	7	1998	152	1999	12	2000	171	0.20
1996	1998	896,170	639	1999	3,086	2000	96	2001	3,821	0.43
1997	1999	2,847,283	1,701	2000	12,546	2001	157	2002	14,404	0.51
1998	2000	2,462,354	128	2001	2872	2002		2003	3000	0.12
1999	2001	736,601	119	2002		2003		2004	119	0.02
2000	2002	2,669,476		2003		2004		2005		0.00

Appendix 43: Ten year average feed and growth data for Rapid River Hatchery.

Month	Average Water Temperature (°F)	Density Index	Flow Index	<sup>a</sup> Feed conv.	Hatchery constant	<sup>b</sup> Daily length increase (in)	<sup>b</sup> Monthly length increase (in)	Condition factor C (x10 <sup>4</sup> )	Percent Body Weight fed	Number Feedings per day	Average #/lb at end of month	Average length at end of month (in)
FEB	38	N.A.	N.A.	N.A.	1.98	0.0024	0.07	2.7	1.42	8	1109	1.50
MAR	41	0.24	0.59	1.07	2.26	0.0070	0.20	2.8	1.89	8	809	1.64
APR	44	0.29	0.64	1.02	3.23	0.0105	0.34	3.1	2.40	8	439	1.95
MAY	46	0.29	0.74	1.00	4.54	0.0151	0.29	3.1	2.30	8	271	2.29
JUN	49	0.0	0.69	1.20	7.10	0.0297	0.59	3.1	2.93	4	136	2.87
JUL	54	0.09	0.83	1.59	7.36	0.0155	0.47	3.6	2.75	4	79	3.43
AUG	55	0.12	1.33	1.59	7.82	0.0164	0.50	3.5	2.70	5	46	3.86
SEP	51	0.15	1.57	1.70	8.66	0.0170	0.51	3.5	2.00	5	36	4.31
OCT	46	0.16	1.69	1.71	5.03	0.0098	0.30	3.5	1.37	3	30	4.60
NOV	51	0.17	1.81	2.22	1.54	0.0023	0.07	3.5	0.47	2	28	4.67
DEC	38	0.17	1.88	4.46	2.12	0.0016	0.03	3.4	0.21	1	30	4.67
JAN	37	0.18	1.89	2.83	1.15	0.0013	0.03	3.4	0.21	1	29	4.69
FEB	38	0.18	2.01	1.24	1.47	0.0040	0.12	3.2	0.53	2	26	4.95
MAR	41	0.19	1.97	1.55	3.47	0.0074	0.22	3.2	0.92	2	22	5.19

<sup>a</sup>Feed conversion is expressed as actual feed weight over weight gain.

<sup>b</sup>Growth data may vary during periods of high water.

Appendix 44. Release and transfer summary for Rapid River Hatchery for 1964 to 2000.

Brood year	No. eggs taken	Egg or fry plants and site		Smolt plants and site		Size (g/fish)					
1964	887,000	None		588,000	Rapid River	20.1					
1995	60,400	None		479,267	Rapid River	19.6					
1966	2,296,000	None		1,460,150	Rapid River	18.1					
1967	2,055,000	None		900,192	Rapid River	18.9					
1968	6,540,000	757,376	eggs Clearwater H Channel	3,172,000	Rapid River	22.6					
1969	5,171,697	497,610	eggs Dworshak NFH to start	2,718,720	Rapid River	21.6					
1970	14,560,280	4,417,454	eggs Sweetwater Eye Stat.	2,809,200	Rapid River	23.3					
		2,224,119	eggs Kooskia NFH.				91,800	Lochsa River	23.8		
		526,516	eggs Hayden Cr. Hatchery								
		2,473,983	eggs Clearwater H Channel								
		4,607,736	eggs Rapid River Hatchery								
		200,520	fry Lemhi River								
		353,970	fry Decker Pond								
		100,094	fry Sandpoint Hatchery								
		600,496	eggs Hayden Cr. Hatchery				2,908,425	Rapid River	26.7		
		53,562	fry Lemhi River							197,303	SF Clearwater
		104,300	fry Red River								
		29,800	fry Ten Mile Creek								
		44,700	fry American River								
14,900	fry Papoose Creek										
59,600	fry Brushy Creek										
44,700	fry Fish Creek										
14,900	fry Post Office Creek										
44,700	fry Squaw Creek (Lochsa)										
61,500	fry Lochsa River										
60,000	fry Ten Mile Creek										
200,880	fry Sandpoint Hatchery										
401,305	fry Decker Pond										
1972	15,072,604	5,256,662	eggs Sweetwater Eye Stat.	2,707,917	Rapid River	25.9					
		3,012,358	eggs Hayden Creek Hatchery								
		1,293,592	eggs Red River H Channel								
1973	13,510,464	3,915,900	eggs Sweetwater Eye Stat.	3,373,700	Rapid River	30.6					
		1,295,424	eggs Hayden Creek Hatchery				117,000	SF Clearwater			
		104,760	eggs Hagerman Hatchery								
		502,200	eggs Crooked R. H Channel								
		702,000	eggs Kooskia NFH								
		806,400	eggs Hayden Creek Hatchery								
		504,000	eggs Minnesota walleye trade								
		210,734	fry Sandpoint Hatchery								
		206,360	fry Kooskia NFH								
		88,480	fry Ten Mile Creek.								
		18,200	fry Newsome Creek								
		633,000	fry Lemhi River								
		10,428	fry Capehorn Creek								
1974	6,890,186	809,400	eggs Hayden Creek Hatchery	3,358,940	Rapid River	24.7					
		407,012	eggs Indian Creek				205,700	SF Clearwater			
		203,500	fry Sandpoint Hatchery								
		21,840	fry Capehorn Creek								
		59,962	fry Red River								
		30,750	fry Newsome Creek								
		10,250	fry Ten Mile Creek								
		1,140,300	fry Lemhi River								

Appendix 44. (Continued).

Brood year	No. eggs take	Egg or fry plants and site		Smolt plants and site		Size (g/fish)				
1975	8,503,606	2,363,200	eggs	Sweetwater Eye Stat.	2,921,172	Rapid River	28.5			
		252,200	eggs	Mullan Hatchery		249,750		SF Clearwater		
		255,000	eggs	Hayden Creek Hatchery						
		280,659	eggs	Indian Creek H Chan.						
		4,906,492	eggs	Rapid River Hatchery						
		34,000	fry	Ten Mile Creek						
		156,000	fry	Lemhi River						
		65,960	fry	SF Clearwater River						
		412,800	fry	Decker Pond						
		209,950	fry	Sandpoint Hatchery						
		36,143	fry	Bear Valley Creek						
		1976	11,492,878	1,615,608	eggs	Mullan Hatchery		2,413,678	Rapid River	28.9
				2,937,994	eggs	Sweetwater Eye Stat.				
261,900	eggs			Hayden Creek Hatchery						
261,900	eggs			Sandpoint Hatchery						
1,267,208	eggs			Mackay Hatchery						
47,008	fry			Univ. of Idaho						
311,850	fry			Mackay Hatchery						
104,500	fry			Lolo Creek						
501,600	fry			Red River Pond						
80,600	fry			SF Clearwater						
1977	14,160,330			2,633,400	eggs	Sweetwater Eye Stat.	2,866,993	Rapid River	30.2	
				2,287,800	eggs	Kooskia NFH		156,362		
				2,689,200	eggs	Mullan Hatchery	44,373	Newsome Creek		
		288,000	eggs	Hayden Creek Hatchery						
		20,700	eggs	Univ. of Idaho						
		1,007,340	eggs	Crooked River H Chan.						
		723,000	fry	Mackay Hatchery						
		50,800	fry	Decker Pond						
		200,025	fry	Red River Pond						
		265,600	fry	Lemhi River						
		1978	10,026,888	729,246	eggs	Hayden Creek Hatchery	2,604,823	Rapid River		30.2
				970,728	eggs	Mackay Hatchery		57,440		
				1,540,282	eggs	Sweetwater Eye Stat.				
706,936	eggs			Dworshak NFH						
38,160	eggs			Univ. Of Idaho						
48,940	eggs			U of I Hayden Cr.						
1,250,010	eggs			Crooked River H Chan.						
249,696	eggs			Sweetwater Eye Stat.						
232,500	fry			Red River Pond						
10,000	fry			Ten Mile Creek						
1979	5,646,722			806,400	eggs	Hayden Creek Hatchery	2,372,607	Rapid River	25.3	
				330,880	eggs	Dworshak NFH	1,001,700	Snake River	21.6	
				293,249	fry	Red River Pond				
1980	1,756,827	None		1,473,733	Rapid River	16.2				
1981	6,122,273	608,384	eggs	Pahsimeroi Hatchery	2,998,103	Rapid River	20.6			
		256,608	eggs	Oxbow Hatchery	250,020	Snake River	16.8			
		449,280	eggs	Dworshak NFH						
1982	7,420,450	493,346	eggs	Looking Glass (Ore)	3,246,197	Rapid River	22.7			
		1,332,000	eggs	Pahsimeroi Hatchery	500,850	Snake River	16.8			
		375,028	eggs	Dworshak NFH						
		125,055	eggs	Hagerman NFH						
		306,000	fry	Red River Pond						

Appendix 44. (Continued).

Brood year	No. eggs taken	Egg or fry plants and site		Smolt plants and site		Fish/pound
1983	3,449,471	None		2,491,238	Rapid River	19.7
				437,360	Snake River	16.8
1984	3,125,911	None		1,594,688	Rapid River	20.6
				140,000	Snake River	22.7
				136,000	Red River	15.1
1985	11,535,461	497,520	eggs Oregon	2,630,200	Rapid River	20.2
		3,668,000	eggs Dworshak NFH	103,000	Snake River	14.6
		2,450,907	eggs Sawtooth Hatchery			
		100,590	fry Boulder Creek			
		349,650	fry Crooked River			
		200,158	fry Eldorado Creek			
		55,123	fry Hopeful Creek			
		144,443	fry Crooked Fork Creek			
		70,282	fry White Sand Creek			
		49,437	fry Ten Mile Creek			
		102,282	fry Newsome Creek			
		115,352	fry Brushy Fork Creek			
1986	10,673,138	2,368,400	eggs Dworshak NFH	2,630,200	Rapid River	23.9
		712,905	eggs Sawtooth Hatchery	400,600	Snake River	22.9
		348,600	fry Crooked Fork Creek			
		202,400	fry White Sand Creek			
		98,000	fry Big Flat Creek			
		238,900	fry Red River Pond			
1987	5,656,145	30,000	fry Little Salmon River	2,319,500	Rapid River	20.6
		103,800	fry Lolo Creek	500,000	Snake River	22.7
		53,200	fry Eldorado Creek			
		137,800	fry Crooked Fork Creek			
		62,200	fry Hopeful Creek			
		228,800	fry White Sand Creek			
		72,200	fry Big Flat Creek			
		113,800	fry American River			
		112,100	fry Newsome Creek			
		100,100	fry Meadow Creek			
		200,100	fry Crooked River			
		50,100	fry Red River			
		50,100	fry Yankee Fork			
		202,000	fry Brushy Fork			
		150,100	fry Ten Mile Creek			
		100,200	fry White Sand Creek			
1988	7,881,379	1,475,677	eggs Oregon Fish and Game	2,520,400	Rapid River	17.4
		149,570	fry Little Salmon River	250,000	Little Salmon	16.3
		100,278	fry Ten Mile Creek	551,200	Snake river	15.1
		149,570	fry Little Salmon River			
		100,278	fry Ten Mile Creek			
		101,062	fry Crooked River			
		100,862	fry Crooked River			
		100,628	fry Newsome Creek			
		100,299	fry Boulder Creek			
		100,342	fry Boulder Creek			
		100,097	fry Newsome Creek			
		195,398	fry Brushy Fork			
		99,919	fry White Sand Creek			

Appendix 44. (Continued).

Brood Year	No. eggs Taken	Egg or fry plants and site			Smolt plants and site		Size (g/fish)
1988		100,148	fry	White Sand Creek			
		99,401	fry	American River			
		51,369	fry	American River			
		39,163	fry	Meadow Creek			
1989	3,925,585	211,509	fry	Crooked River	2,564,900	Rapid River	18.7
		548,876	fry	Sawtooth Hatchery	100,100	Little Salmon	20.2
					500,500	Snake River	20.2
1990	4,271,103	200,000	eggs	Looking Glass Hatch.	2,615,500	Rapid River	22.3
		403,400	fry	Sawtooth Hatchery	500,500	Snake River	22.3
1991	2,553,218	3,050	fry	Hayden Creek Hatchery	2,060,300	Rapid River	18.4
		10,126	fry	Squaw Creek	200,300	Snake River	16.9
		90,125	fry	White Sand Creek			
1992	4,534,404	942,897	eggs	Dworshak Hatchery	2,547,642	Rapid River	22.2
					380,504	Snake River	22.1
1993	6,404,312	2,176,157	eggs	Clearwater Hatchery	2,786,919	Rapid River	24.5
					499,536	Snake River	23.7
					379,167	Rapid River	27.0
1994	490,249	58,791	eggs	Clearwater Hatchery	85,840	Rapid River	22.1
1995	132,002	16,402	eggs	Clearwater Hatchery	896,170	Rapid River	22.3
1996	1,171,610	168,754	eggs	Clearwater Hatchery	2,847,283	Rapid River	25.3
1997	4,472,573	1,015,496	eggs	Clearwater Hatchery	200,000	Little Salmon	20.8
					300,000	Snake River	20.8
					2,462,354	Rapid River	19.2
1998	3,409,130	510,848	eggs	Clearwater Hatchery			
1999	608,084				736,601	Rapid River	18.8
					199,010	Eggs received form Lyon's Ferry Hatchery	
2000	4,780,850	911,919	eggs	Clearwater Hatchery	2,669,476	Rapid River	19.8
					300,018	Little Salmon	18.6
					500,195	Snake River	22.7
2001	3,333,314						
2002	3,670,292						

Historical data taken from Brood Year Reports.

**Submitted by:**

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