SAWTOOTH FISH HATCHERY
and
EAST FORK SATELLITE

2004 Spring Chinook Brood Year Report
2005 Steelhead Brood Year Report

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2004 SPRING CHINOOK SALMON

ABSTRACT

In 2004, the Sawtooth Fish Hatchery adult spring Chinook salmon *Oncorhynchus tshawytscha* weir on the Main Salmon River was installed on May 25 and operated through September 15. A total of 2,018 adult Chinook were trapped in 2004, of which 1,535 (588 jacks / 407 adult males / 540 females) were hatchery-produced (marked) fish and 483 (67 jacks / 262 adult males / 154 females) were unmarked. Of the total fish trapped, 709 (226 marked, 483 unmarked) were released above the hatchery weir for volitional spawning and included: 56 marked jacks, 71 marked adult males, 99 marked females, 67 unmarked jacks, 262 unmarked adult males, and 154 unmarked females. The remaining 1,309 Chinook salmon were retained for 2004 hatchery spawn crosses or given to charitable food bank organizations. A total of 158 jacks were given to the Shoshone-Paiute tribe and 192 jacks were given to the Idaho City Food Bank. Fish used for hatchery spawn crosses included; 182 marked jacks, 336 marked adult males, and 441 marked females. Hatchery reared marked fish are defined as fish with either an adipose clip only, adipose clip/CWT, or CWT only.

Spawning began on August 9, and continued through September 14, with a total of 10 spawning days. In 2004 spawn crosses were made by 1:1 (f/m) random cross matings. A total of 434 females were spawned and consisted of the following: 432 age-4 hatchery reserve, 2 age-3 hatchery females (jills), 266 age- 4 hatchery males of which 128 were used twice, and 46 age-3 hatchery jacks. Eagle Fish Health Laboratory sampled 305 of the 434 females spawned and detected elevated bacterial kidney disease (BKD) levels (Enzyme-Linked Immunosorbant Assay optical density values $\geq$0.2) in ten fish samples in 2004. As per Fisheries Bureau instructions, these 10 females along with the eggs of four females eggs incubating with them were culled (93,417).

After fertilization, all eggs were rinsed with well water and water-hardened in a 100 part per million (ppm) solution of Argentyne (Povidone Iodine). Eggs were incubated at two females per tray in vertical-stack incubators. The green egg take from the spawning of 434 females was 1,999,254 eggs, yielding 1,752,395 eyed eggs for a percent survival to the eyed-stage of development average of 87.7% and a mean fecundity of 4,912 eggs per female. From these eyed eggs, 1,693,210 fry were ponded which resulted in a smolt release of 1,416,610 smolts from the Sawtooth Fish Hatchery weir. An additional 135,934 smolts were released into the Yankee Fork of the Salmon River near the mouth of Jordan Creek. The total smolt release was 1,552, 544.

INTRODUCTION

Funding Source

Sawtooth Fish Hatchery is part of the Lower Snake River Compensation Plan and has been in operation since 1985. The hatchery and East Fork satellite facility were built by the U.S. Army Corp of Engineers and is funded through the U.S. Fish & Wildlife Service.

Location

Sawtooth Fish Hatchery is located five miles south of Stanley, Idaho. The facility's 71 acres borders the Salmon River to the west, Highway 75 to the east and U.S. Forest Service ground to the south and north. The Sawtooth Fish Hatchery weir is approximately 400 miles from Lower Granite Dam and 950 miles from the mouth of the Columbia River. Chinook salmon *Oncorhynchus tshawytscha* are released directly into the river at the hatchery and above the hatchery in the headwaters of the Salmon. Sawtooth Fish Hatchery steelhead are released at the hatchery and along the upper Salmon River downstream to near Challis, Idaho.

Sawtooth Fish Hatchery has operated a satellite facility on the East Fork of the Salmon River since 1984. The facility is situated eighteen miles upstream on the East Fork Salmon River. The mouth of the East Fork Salmon River is located 42 miles downriver from Sawtooth Fish Hatchery. The property was purchased from the Bureau of Land Management and is surrounded by private land. An access road easement was purchased from a private landowner who has property surrounding the location. The east side of the property borders the East Fork of the Salmon River. Historically, all East Fork fish have been returned to the East Fork River.

Species Reared

Sawtooth Fish Hatchery is involved in trapping, spawning, and rearing spring Chinook salmon to the smolt stage for release. A-run steelhead are also trapped and spawned. The steelhead eggs are incubated to eye-up then transferred to other hatcheries for rearing.

The East Fork facility handles spring Chinook salmon as well as East Fork natural steelhead. The green eggs from fish spawned at the East Fork station are transferred to Sawtooth Fish Hatchery for incubating. The Chinook are reared at Sawtooth Fish Hatchery with the steelhead being transferred as eyed eggs to other hatcheries for rearing.

Broodstock History

Historically, all of the Sawtooth Fish Hatchery and the East Fork trap broodstock have come from the upper Salmon River and the East Fork River respectively. There was some introduction of Rapid River stock at the Sawtooth Fish Hatchery site and in the headwaters of the Salmon River in the late 1970's and early 1980's as fry and smolt plants.

At both facilities, some returning adult fish are released to spawn naturally. At Sawtooth, all unmarked Chinook are released above the hatchery for natural production. Depending on marked Chinook return numbers, supplementation fish are released above the hatchery to supplement natural production. Numbers of fish released depends on marked and unmarked fish returns. The National Marine Fisheries Service (now NOAAF) under permits # 1179 and # 1186 prescribes fish handling for Chinook salmon. At the East Fork, all Chinook salmon trapped were released above the weir for volitional spawning. All unmarked steelhead are released

along with enough marked hatchery fish to ensure equal adult pairings. A historical synopsis of releases and returns is shown in Appendix A and Appendix A.1.

OBJECTIVES

Mitigation Goals

As part of the Lower Snake River Compensation Plan, Sawtooth Fish Hatchery's mitigation goals are expressed in adult returns of 19,000 adult salmon over Lower Granite Dam.

Idaho Department of Fish and Game Objectives

Idaho Department of Fish and Game (Department) objectives are:

1. To produce 1.3 million Chinook smolts for release at SFH.
2. Produce quality fish for supplementation programs.
3. Implement research programs at the hatchery to improve returns to the hatchery.

FACILITY DESCRIPTION

Hatchery Description

The hatchery's main building is 134 ft by 166 ft and consists of an office, meeting room, lab, visitor/interpretive center, wood shop, welding/fabrication shop, intake collection box/chemical room, shop office, incubation and early rearing room, one inside storage room and two outside covered storage areas, generator room, furnace room and a fish food freezer/chemical equipment storage room. The hatchery has four pump houses (each is 14 ft x 11 ft). One is for domestic water and three are production wells. An intake building (15 ft x 37 ft) is located one-half mile upstream from the hatchery and Salmon River water is collected for outside production rearing. The temporary employee dorm and adult spawning facility are located 300 yards downstream of the hatchery building. The dorm (38 ft x 72 ft) has three bedrooms with a bath in each, attached public rest-room facilities, storage and laundry room, living and dining room with an open kitchen. The adult facility consists of three adult ponds and an enclosed spawning shed (35 ft x 52 ft). There are five resident houses at Sawtooth, all about 1,360 square ft with attached single car garages and separate woodsheds.

The East Fork has a roof structure over a 28 ft travel trailer that is used as office space while the trap is in operation. The other building is a combination shop, storage and spawning shed (22 ft x 44 ft).

Production Capabilities

Trapped adult capacity at the East Fork trap consists of two 68 ft x 10 ft x 4.5 ft adult holding ponds (3,060 cubic ft) and a 10 ft x 17 ft fish trap. No fish are reared at this facility. All green eggs are shipped to Sawtooth Fish Hatchery.

Production capacities for Sawtooth Fish Hatchery include 100 stacks of Flex-a-Lite Consolidated Inc. (FAL) incubators containing 800 trays with the potential to incubate five million Chinook eggs or seven million steelhead eggs. Inside rearing consists of ten semi-square tanks with an individual volume of 17 cubic feet and a capacity of 15,000 swim up fry each, 6 semi-square rearing tanks with an individual volume of 50 cubic feet and a capacity for 30,000 fry each, and 14 inside rearing vats with an individual volume of 391 cubic feet and a capacity for 100,000 fry each. Outside rearing consists of 12 fry raceways each with 750 cubic ft of rearing space and 28 production raceways each with 2,700 cubic ft of rearing space. Each production raceway has a capacity to raise 100,000 Chinook to smolt stage for a total capacity of 2.8 million fish. These production raceways are serial reuse that flow from an upper raceway to a lower one.

The adult facility has three concrete adult fish holding ponds with 4,500 cubic ft of holding area. Each pond can hold approximately 1,300 adults.

RECOMMENDATIONS

Recommendations for Sawtooth Fish Hatchery include developing additional wells for disease-free rearing and adult holding water, modifying the river water intake to reduce winter icing problems, and make modifications to the weir for resident fish movement.

East Fork recommendations include modifying the intake screen to exclude fish fry, modifying the velocity barrier to prevent injury to migrating fish, and develop a removal system for debris that accumulates on the weir.

WATER SUPPLY

Source

Sawtooth Fish Hatchery receives fish culture water from the Salmon River and two production wells. Rearing water from the river enters an intake structure located one-half mile upstream from the hatchery building, and flows through a 54-inch pipe to a control box located in the hatchery building for final screening. This water is then distributed to the indoor vats, outside raceways or adult fish facility. Incubation and early-rearing water is provided by two production wells. Excess well water is spilled into the control box for use in the outside raceways. A third well provides tempering water introduced at the river intake to reduce winter icing problems.

The East Fork trapping site receives water from the East Fork of the Salmon River via gravity-flow piping throughout the holding ponds. A well provides domestic water, and pathogen free water, for spawning and egg hardening. No fish are reared at the East Fork trap.

Quantity and Temperature

The Sawtooth Fish Hatchery wells provide approximately 900gpm of pumped water and temperatures range from 39^{o} F (4^{o} C) in the winter to 52^{o} F (11^{o} C) in the summer. The Salmon River provides up to 55 cfs of gravity-flow water and ranges in temperature from 32^{0} F (0^{0} C) in the winter to 68^{0} F (20^{0} C) in the summer. See Appendix 1.

Water Quality

The most recent water quality analysis from the Sawtooth Fish Hatchery collection box at the river, well #1, and well #2 was completed in 2005. Results are shown in Appendix B.

STAFFING

Five permanent personnel are stationed at Sawtooth Fish Hatchery: a Hatchery Manager II; an Assistant Hatchery Manager; a Utility Craftsman; and two Fish Culturists.

The temporary employee staffing includes; 16 months of 2 Fishery Technicians time, 42 months of Biological Aide time, and 27 months of Laborer time.

FISH HEALTH

SAWTOOTH FISH HEALTH SECTION

Diseases Encountered and Treatments. BY' 04 spring Chinook salmon reared at this facility, began to experience elevated mortality due to unknown causes. The Eagle Fish Health Laboratory was not able detect pathogens. *Renibacterium salmoninarum* was detected in routine sampling of brood Chinook. Ichthyophthirius multifilis was detected in BY'04 Chinook salmon and were treated with 170 mg/l formalin for one hour, three times per week. *M. cerebralis* was detected in brood steelhead at Sawtooth Hatchery (1/19+) and steelhead spawned at Squaw Creek ponds (1/20+), and brood Chinook salmon (1/25+). Two prophylactic applications of erythromycin were given to BY'2004 Chinook salmon to reduce the risk of an epizootic of bacterial kidney disease (BKD). In March of 2006, three sockeye salmon were found to be BKD positive by DFAT. These fish were placed on an erythromycin medicated feed treatment for 21 days, with a target dose of 100 mg/kg. This treatment was completed just prior to release.

Acute Losses. Mortality due to unknown causes took over 52,000 BY'04 Chinook salmon during June of 2004.

Other Assessments. An epizootic of Infectious Hematopoietic Necrosis caused extensive mortality in a raceway of BY' 2000 spring Chinook at this facility. In an effort to ascertain the prevalence in the feral and wild fish that inhabit the Salmon River and Sawtooth Fish Hatchery, an extensive sampling effort was implemented. IHNV was not detected from 60 Chinook

carcasses sampled above the Sawtooth Hatchery weir. Also 100 % of the female brood stock has been sampled for IHNV without viral replicating agent detection.

Whirling disease exposure trials in the upper Salmon River, above Sawtooth Hatchery, demonstrated that the parasite has been established in the upper portions of the river above the hatchery water intake.

Organosomatic Index. See Appendix C.

FISH PRODUCTION

Spring Chinook Adult Collection

The Sawtooth Fish Hatchery Chinook-trapping season began on May 25, 2004 and continued through September 15, 2004. The peak of the run occurred the week of July 4, 2004 (Appendix D). A total of 2,018 spring Chinook salmon were trapped including 670 males, 694 females, and 654 jacks (Appendix E, Appendix E.1). Released above the weir were 709 salmon (including 262 unmarked males, 154 unmarked females, 71 marked males and 99 marked females, and 67 unmarked jacks and 56 marked jacks) Appendix F. No fish were scanned for PIT tags in 2003, as per Fisheries Bureau instructions. Sawtooth Hatchery had a male:female ratio of 66% male and 34% female.

A total of 654 three-year old, 1,281 four-year old, and 83 five-year old fish returned to Sawtooth Fish Hatchery.

The velocity barrier on the East Fork of the Salmon River (EFSR) was put into operation on June 10, with trapping operations initiated on June 12 and continuing through September 9. The barrier was put into place for the first time since 1998 primarily to access bull trout populations. However, a total of 152 Chinook were trapped in 2004, of which 5 were hatchery produced (marked) fish and 147 were natural (unmarked) fish. All fish trapped at the facility were released above the weir for volitional spawning.

Adult Treatments

Sawtooth Fish Hatchery female adult Chinook were injected with erythromycin phosphate at a rate of 20 mg active per kg body weight. Injections were given posterior to the pelvic fins in the peritoneal cavity. The Sawtooth Fish Hatchery ponded adults were treated three times per week in a one-hour 170 ppm formalin flush. No adults were ponded at the East Fork.

Prespawning Mortality

Sawtooth Fish Hatchery had 15 pre-spawning mortalities (3 jacks, 4 adult males, 8 females) or 1.1%.

Spawning Operations

Spawning activities at Sawtooth Fish Hatchery began August 9, and concluded September 14, 2003. The ten egg takes during this period yielded 1,999,254 green eggs from 434 females for an average fecundity of 4,912 eggs per female. There were 266 males and 46 jacks used for fertilization. Each female's eggs were fertilized using one male and combined with another females' eggs fertilized with a different male, then water hardened for one hour in a 100 ppm titrate-able iodine solution. The eggs were then put into Heath incubator trays, with two females per tray. Spawning crosses were random cross matings 1:1 (f/m). (see Appendix G).

Incubation

Each eight-tray Heath stack had flows set at 5 gpm of well water. Eggs were put away at two females per tray. This averaged 9,824 eggs per tray. All incubated green eggs were treated with a 1,667 ppm formalin bath for 15 minutes starting 3 days after fertilization at three times per week for fungal control until machine picked.

Well temperatures ranged from 50^{o}F to 44^{o}F during the incubation period. The eggs eyed-up at 500 Fahrenheit thermal units (FTUs). Just after eye-up, at about 530 FTUs the eggs were shocked by dropping them from one container to another. The eggs were then picked and enumerated using a Jensorter Fish Egg Sorter with Counters Model JM4C. Any dead eggs were then hand picked and counted until hatch at 1,300 FTUs.

Sawtooth Fish Hatchery green eggs eyed up at a 87.7% rate, yielding 1,752,395 eyed eggs (Appendix H).

In addition to the BY04 Sawtooth eggs, the hatchery incubated 1,156,174 eyed Pahsimeroi Stock Summer Chinook eggs.

Early Rearing

The Sawtooth Fish Hatchery stock swim-up fry were transferred from the Heath trays to vats. The vats contained PVC baffles every four feet. Starting flows for the swim-up fry were set at 20 gpm per vat. As the fish grew, the flows were increased to a maximum of 110 gpm. Early rearing well water varied in temperature from 46^{o}F to 40^{o}F (Appendix I).

All fry were started on Bio Oregon starter #2, and initially fed by hand. Feed amounts and sizes varied according to manufacturer recommendations as the fish grew (Appendix I.1). Automatic belt feeders were used once the fry exhibited a good feed response. All fish were fed a 28-day prophylactic treatment of Bio Oregon erythromycin medicated feed during part of May and June, at a rate of 2.25 grams active/100 lbs of fish for BKD prevention. The fish were

transferred outside for final rearing in April and May. Fish averaged 155 fish per pound (fpp) and 2.9 inches in length when moved to the outside raceways.

Final Rearing

The Sawtooth spring Chinook were placed into one full raceway and 1 upper section of another. Initial densities were 0.11 lbs./cuft., and water flows were 660 gpm.

All outside fish were fed Bio Oregon grower feed. A second 28 day prophylactic Bio Oregon erythromycin medicated feed treatment was fed in September of 2005 at a rate of 2.25 grams active per 100 pounds of fish, to prevent the onset of BKD.

The finish weight of the BY04 Sawtooth Chinook smolts was 71,638 pounds. The fish were fed 97,064 pounds of feed for a conversion of 1.4. A synopsis of feeding regimes can be found in Appendix I.1.

Fish Marking

Fish marking occurred May 19 & 20, 2005 and was suspended until September 6-15, 2005 due to turbid water conditions. All fish were classified as listed reserve and adipose fin clipped, 131,002 were also given a coded wire tag. 500 fish were pit tagged from raceway #1 on March 2, 2006. Another 695 fish were pit tagged from raceway #7 on March 29, 2006. These fish were planted into the Yankee Fork. (Appendix J, Appendix K).

Fish Distribution

Fish releases for Sawtooth stock BY04 smolts occurred on March 30, April 12, and 19, 2006. A total of 1,416,610 fish were released into the Salmon River at the Sawtooth Fish Hatchery weir. The fish were released in the evening through the outside raceway tailrace pipe. River water temperature was 50F at time of release. An additional 135,934 smolts were released into the Yankee Fork of the Salmon River near Jordan Creek April 19, 2006. Production costs for BY04 smolts can be found in Appendix L.1.

PAHSIMEROI CHINOOK

Sawtooth Hatchery reared Pahsimeroi Hatchery's BY04 summer Chinook due to a lack of space and pathogen free water at Pahsimeroi Fish Hatchery. Nine lots of eyed eggs were brought to Sawtooth Hatchery between September 21 and October 20, 2004. A total of 1,156,201 eggs were incubated. Lots 7,8 and 9 swim up fry (276,286) were returned to Pahsimeroi in January 2005 due to limited rearing space and well water at SFH. From eyed egg to ponding after dead eggs and fry were picked off, survival was 96.2%.

The Pahsimeroi Fish Hatchery stock swim-up fry were transferred from the Heath trays to vats. The vats contained PVC baffles every four feet. Starting flows for the swim-up fry were set at 20 gpm per vat. As the fish grew, the flows were increased to a maximum of 110 gpm. All Pahsimeroi fish were moved to outside raceways by buckets on December 12

through January 6, 2005 as weather permitted. The fish averaged 1.4 inches and 1141 fpp at time of moving.

All of the fish were marked from August 29 to September 2, 2005 at SFH. A total of 55,944 reserve fish received a AD/CWT and 742,232 reserve fish received AD only.

On September 7 and 8, 2005 all Pahsimeroi fish were returned to Pahsimeroi Spawn Station rearing ponds. The resulting inventory number of 798,176 fish were returned. Total pounds of fish shipped were 12,279 for an average of 65 fpp. Total feed fed was 15,543 pounds for an overall conversion of 1.27.

BY 2004 SOCKEYE SALMON

Eagle Fish Hatchery (IDFG) and Burley Fish Hatchery (NOAA) shipped an estimated total of 154,969 eyed eggs to Sawtooth Fish Hatchery. A total of 112,304 fish were marked September 14 through September 16, 2005. This is a total difference of 42,665 eggs after pickoff and mortalities while at Sawtooth Fish Hatchery. This summary is based on the marking inventory and mortality records.

The eggs arrived in the three separate shipments between November 23, 2004 and December 7, 2004 totaling 154,969 eyed eggs. The eggs arrived with 662 to 788 FTUs. Ponding began February 9, 2005, and ended March 8, 2005 with about 1800 FTUs.

Eggs were hand picked three times weekly from eyed eggs to ponding. A total 3,940 dead eggs were removed before ponding. An additional 1,078 were lost on arrival due to egg tube malfunction. Total eyed egg to ponding survival was 96.47%. A total of 149,951 fry were ponded. The swim-up fry were ponded into ten semi-square 17 cu. ft. rearing tanks and six 2 meter fiberglass tanks. Initial water flows were set at three to five gallons per minute.

All fry were started on #1 Bio-Oregon BioDiet starter. Feed size was increased in accordance to Bio-Oregon's recommendation with the exception that 20% of the feed was one size smaller to assure smaller fish would get adequate amount of feed. The total amount of feed fed at Sawtooth for the October release BY04 Sockeye was 1,879 pounds with a 1.11 conversion.

As rearing density reached three pounds per gallon per minute, fish were transferred to cement vats with water flows near 100 gpm specific pathogen free well water.

Mortality was recorded daily from ponding to release. A total of 42,665 fish were lost to mortalities and to rearing tank escapement, for a total of 27% loss.

Ad-clipping and CWT marking began September 14, 2005 through September 16, 2005. Pit tagging by Sockeye Research occurred September 27 and 28, 2005. At the time of release, the fish averaged 72 fish per pound.

The BY 04 Sockeye October 5 and 6 releases are as follows:

	Ad-clip	Ad/PIT	Total
Redfish Lake	38,888	1010	39,898
Alturas Lake	15,943	1015	16,958
Pettit Lake	14,280	1015	15,295
Totals	69,111	3040	72,151

All sockeye released were placed into a barge and released into pelagic zone of each lake.

The remaining 39,906 were moved outside to small raceways 5 and 6, October 17, 2005. These fish were 58 fpp when moved to the raceways and over-wintered at the hatchery on river water. During the winter and early spring, the fish were fed an additional 1,435 lbs of Bio-Oregon feed. The fish were fed a prophylactic treatment of 642 lbs BioDiet Medicated Aquamycin at 2.25% for 21 days in April.

On April 12, 2006 1,011 fish from raceway 5 were PIT tagged. Two PIT tag mortalities were recorded.

Mortality was recorded from the time the fish were moved outside to the time they were released. A total of 285 were lost to mortality for an average of .7 % loss.

A total of 39,622 fish were released on May 4, 2006 averaging 23 f/lb. Fish were transferred into tanks and trucked about ¾ of a mile to a release pipe approximately 50 yards below the Sawtooth Hatchery intake on the Salmon River. River water temperature on May 4 was 41 F at time of release.

2005 STEELHEAD

ABSTRACT

In 2005, the Sawtooth Fish Hatchery adult steelhead, *Oncorhynchus mykiss,* weir on the Main Salmon River was installed on March 15, with the adult trap operating from March 25 through May 5. A total of 1,523 adult "A-run" steelhead were trapped in 2005, 1,494 of which (928 males / 566 females) were marked (hatchery-produced) fish and 29 (14 males / 15 females) were unmarked (natural origin) .

Allocation of the 1,494 marked adults ranged from spawn-related activities to charitable giveaways. The 1,084 steelhead used for spawning were either given to the public on a first come, first serve basis on spawn days or distributed to charitable organizations. A total of 680 steelhead were donated to the following organizations: Idaho Falls Food Bank, Rupert Methodist Church, Middleton Food Bank, SMRIST Essentials Food Bank, and Shoshone Paiute Tribe.

All returning unmarked adults (29) were genetic sampled and released upstream of the Hatchery weir for natural spawning.

Age class, gender, length frequency and run timing data for returning Sawtooth adults (marked and unmarked) is provided in Tables 8 through 10, and Figures 1 through 6.

The Sawtooth and East Fork stock eyed eggs were released as smolts by their respective rearing hatcheries during the spring of 2005. Hagerman National Fish Hatchery (HNFH) stocked direct release smolts (5.0 fpp) at the Sawtooth Fish Hatchery weir. HNFH stocked Sawtooth stock smolts into the Yankee Fork of the Salmon River. Magic Valley Fish Hatchery (MVFH) stocked East Fork stock smolts at 4.3 fpp were mixed with Dworshak smolts and released into Squaw Creek Pond. MVFH stocked Sawtooth stock smolts into the Yankee Fork and into Valley Creek and Upper Salmon River B or Squaw Pond stock smolts back into Squaw Pond.

EAST FORK AND SQUAW CREEK STEELHEAD

The East Fork Salmon River (EFSR) trap and velocity barrier were put into operation March 23,2005, and ran through May 17, 2005 A total of 92 adult East Fork steelhead were trapped for the Natural Steelhead Program of which 2 (both males) were marked fish and 90 (67 males and 23 females) were unmarked. Fish released above the weir to spawn naturally included 54 unmarked males and 9 unmarked females. There was no prespawning mortality

East Fork spawning operations began on April 15, 2005, and continued through May 13, 2005. A total of 13 unmarked EFSR females were spawned with 13 males over 8 spawn dates, yielding 61,129 green eggs for an average fecundity of 4,651 eggs per female. These green eggs yielded 56,478 eyed eggs for a 92.4% eye-up rate. These 56,478 eyed eggs were shipped to Magic Valley Hatchery for final incubation and rearing.

The Squaw Creek Trap and weir was installed on March 23, 2005, and ran through May 6, 2005. A total of 11 adult “B-run” adults (3 males / 8 females) and 88 “A-run” adults (47 males / 41 females) were trapped. All marked B-run adults were transferred to the East Fork trapping facility for pre-spawn holding. All unmarked and A-run fish were released upstream of the Squaw Creek weir for volitional spawning.

Squaw Creek Trap spawning operations occurred from April 12 through April 29, 2005 over 5 spawn dates. All spawning was conducted at the East Fork Salmon River trap/spawn facility, with spawn activities from the 8 females yielding a total of 50,317 green eggs for a mean fecundity of 6,308 eggs per female. These green eggs yielded 44,009 eyed eggs or a 87.5% eye-up rate. These eggs were shipped to Magic Valley Hatchery for final incubation and rearing.

STEELHEAD PRODUCTION

Spawning Operations

Sawtooth Trap

Sawtooth Fish Hatchery spawning operations occurred from March 28 through May 5 in 2005. A total of 542 females were crossed with 542 males over 16 spawning days to produce 2,458,137 green eggs and a mean fecundity of 4,535 eggs per female. Total green egg take yielded 2,129,319-eyed eggs for a percent survival to the eyed-stage of development average of 86.6% (Table 1).

Eyed egg transfers to Magic Valley Steelhead Hatchery and Hagerman National Fish Hatchery totaled 354,444 and 1,060,590-eyed eggs, respectively (Table 4). Eggs were made available to biologists from the Shoshone-Bannock Tribe totaling 382,066. Eyed egg transfer totaled 1,797,100 (Table 4). All unwanted or remaining eggs were culled as development progressed beyond the window of transport safety, as determined by temperature-unit accumulation. Additional time and effort were expended on three additional spawning days to accommodate the SBT tribe for their experimental study of steelhead in the Yankee Fork. The study includes genetic DNA typing to differentiate steelhead produced from the SBT egg box project from all other steelhead produced naturally or planted artificially in the watershed. Each steelhead used in broodstock crosses at SFH to supply the eyed eggs (test fish) will be genotyped so all progeny will later be identifiable when captured and sampled as F1 juveniles and F1 adults.

East Fork Salmon River Trap

A total of 13 unmarked East Fork Natural females and 13 unmarked East Fork Natural males were retained for natural-production spawn crosses in 2005, with spawning operations occurring from April 15 through May 13 (8 spawn dates). Spawning activities from the 13 unmarked females yielded a total of 61,129 green eggs for a mean fecundity of 4,651 eggs per female. A total of 56,478 eyed eggs were obtained from natural-production crosses, for a percent survival to the eyed-stage of development average of 92.4% (Table ?).

All eyed eggs (56,478) produced from EFSR natural crosses were transferred to the Magic Valley Steelhead Hatchery for final incubation and rearing (Table 4).

Squaw Creek Trap

A total of 8 marked “B-run” females and 3 marked “B-run” males were retained for hatchery-production spawn crosses in 2005, with spawning operations occurring from April 12 through April 29 (5 spawn dates). All spawning was conducted at the East Fork Salmon River trap/spawn facility, with spawn activities from the 8 females yielding a total of 50,317 green eggs for a mean fecundity of 6,308 eggs per female. A total of 44,009 eyed eggs were obtained from hatchery-production crosses, for a percent survival to the eyed-stage of development of 87.5% (Table 3). Males used in hatchery-production crosses included under B-sized returning marked males from the Squaw Creek trap that by real-time, CWT reading indicated that the fish were B-origin fish.

All eyed eggs (44,009) produced from East Fork/Squaw Creek "B-run" hatchery crosses were transferred to the Magic Valley Steelhead Hatchery for final incubation and rearing (Table 4).

Pahsimeroi Stock Egg Incubation

As in past years, Sawtooth Fish Hatchery incubates a portion of the Pahsimeroi Fish Hatchery egg take. Incubating eggs at Sawtooth takes advantage of cooler well-water temperatures to slow development of the eggs. All egg shipments are transferred as "green" eggs in insulated coolers.

In 2005, an estimated 1,219,500 green eggs were transferred to Sawtooth from a total of 271 females (4,498 mean fecundity). Total egg transfers yielded 1,014,420-eyed eggs, for a percent survival to the eyed-stage of development average of 76.4% (Table 4). Eyed egg transfers to Magic Valley Steelhead Hatchery (MVSH) and Hagerman National Fish Hatchery (HNFH) totaled 650,380 and 220,700-eyed eggs, respectively. In addition, 120,600 eggs were provided to the SBT for their egg box program. All Pahsimeroi eggs incubated at Sawtooth were destined for MVSH and HNFH to satisfy production requests. A total of 991,680-eyed eggs were transferred to HNFH, MVSH, and the SBT with all remaining eggs culled after production requests had been met (Table 4). All females spawned for HNFH were viral tested.

Adult Treatments

The returning adults at Sawtooth Fish Hatchery, the East Fork Satellite, and Squaw Creek are not treated or injected with any type of drug or chemicals prior to spawning.

Prespawning Mortality

There were no female pre-spawning mortalities at Sawtooth in 2005.

Incubation

After hardening in the Argentine solution, the green eggs were put away at two females eggs per Heath tray.

All incubated eggs were treated with a 1,667 ppm 15-minute formalin flow-through treatment three times per week for fungal and bacterial control. Well temperatures varied from 40^{o}F at the beginning of incubation to 44^{o}F when the last eyed-eggs were shipped. Ten temperature units (TUs) per day was the average during the incubation period. Eye-up occurred at 360 TUs and the eggs were shocked at 380 TUs.

The eggs were shocked by putting them in a half-full three-gallon bucket of water, then pouring them into a quarter-full bucket of water from about three feet high. One day after shocking, the eggs were machine-picked, using a Jensorter model JM4 machine, which picks and enumerates eggs. A day or two after picking, the eyed eggs are handpicked before transfer to the rearing hatcheries. The eggs were loaded at 50,000 to 100,000 eggs per 48-quart cooler of well water. Then the cooler was strapped shut and shipped.

Release of BY 05

Hagerman NFH released BY05 steelhead smolts directly below the Sawtooth FH weir into the Salmon River. The total BY05 smolt release was 760,848 fish at 5.04 fpp.

Fish Marking

Fish marking was completed in the rearing hatcheries and is available from individual rearing facility reports.

CONCLUSIONS/RECOMMENDATIONS

Sawtooth Fish Hatchery

Due to limited well water, only the number of green eggs required to meet the eyed egg goal should be collected.

APPENDICES

Appendix A. Sawtooth Fish Hatchery Chinook Smolt Releases and Returns (marked and unmarked).

Brood Year	Release Year	Number Released	Adult Returns [a] 3-year	4-year	5-year	Total Returns	Total %
1979	1981	None	-	-	-	291	inc
1980	1982	None	17	66	165	248	inc
1981	1983	185,375	49	1,182	796	2,027	1.08
1982	1984	230,550	292	922	875	2,086	.91
1983	1985	420,060	51	452	1,318	1,821	.43
1984	1986	347,484	17	86	190	293	.08
1985	1987	1,185,060	80	286	164	530	.05
1986	87-88	1,705,500	412	1,212	297	1,921	.11
1987	88-89	2,092,000	112	201	63	376	.02
1988	89-90	1,895,60	68	496	480	1,044	.055
1989	90-91	652,600	45	78	27	150	.023
1990	91-92	1,273,400	29	63	6	98	.008
1991	92-93	774,583	6	15	28	49	.006
1992	93-94	213,830	16	101	96	213	.099
1993	94-95	334,313	27	148	133	308	.092
1994	1996	25,006	10	33	39	82	.032
1995	1997	4,756	4	78	110	192	4.0
1996	1998	43,161	79	500	212	791	1.83
1997	1999	223,240	376	1,664	730	2,770	1.24
1998	2000	123,425	227	958	521	1,706	1.38
1999	2001	57,134	98	193	83	374	.65
2000	2002	385,761	522	1,281	175	1,978	.50
2001	2003	1,105,169	654	1182	(2006)		
2002	2004	821,415	204	(2006)	(2007)		
2003	2005	134,812	(2006)	(2007)	(2008)		
2004	2006	1,552,544*					

*This number includes 135,934 fish released into the Yankee Fork

Appendix A. Continued.

East Fork Chinook Smolt Releases and Returns (marked and unmarked).

Brood Year	Release Year	Number Released	Adult Returns [a] 3-year	4-year	5-year	Total Returns	%
1979	1981	-	-	-	69	69	inc
1980	1982	-	-	26	59	85	inc
1981	1983	-	-	193	102	317	inc
1982	1984	-	-	87	181	268	inc
1983	1985	-	22	90	519	631	inc
1984	1986	108,700	1	23	51	75	.06
1985	1987	195,100	6	55	27	88	.045
1986	1988	249,200	22	106	32	160	.064
1987	1989	305,300	12	23	23	58	.019
1988	1990	514,600	7	27	65	99	.019
1989	1991	98,300	15	18	13	46	.046
1990	1992	79,300	6	2	0	8	.010
1991	1993	35,172	0	0	0	0	.000
1992	1994	12,368	0	7	0	7	.056
1993	1995	48,845	3	7	ND	10	.020

No Trapping Operations 1998-2003 For Chinook

[a] Age classes based upon the following lengths: 3-yr. old: ≤ 64 cm, 4-yr. old: 64 to 82 cm 5-yr. old: >82 cm.
ND means no data, trap not operated.

Appendix A.1 Sawtooth Fish Hatchery Chinook Smolt Releases and Hatchery Returns (marked fish).

Beginning with BY91, all hatchery reserve Chinook smolts released were marked.
(See individual brood year reports for specific mark types)

Sawtooth Chinook Smolt Releases and Hatchery Returns (marked Fish).

Hatchery Adult Returns

Brood Year	Release Year	Number Released	Adult Returns [a] 3-year	4-year	5-year	Total Returns	Total %
1991	92-93	774,583	2	11	7	20	.002
1992	93-94	213,830	8	23	26	57	.026
1993	94-95	334,313	21	72	23	116	.035
1994	1996	25,006	1	3	3	7	.028
1995	1997	4,756	0	12	37	49	1.03
1996	1998	43,161	60	135	32	227	0.53
1997	1999	223,240	279	1,219	327	1,825	0.82
1998	2000	123,425	176	531	131	838	0.68
1999	2001	57,134	65	91	73	229	0.40
2000	2002	385,761	476	926	175	1,577	0.41
2001	2003	1,105,169	407	1182	(2006)	-	inc
2002	2004	821,415	205	(2006)	(2007)	-	inc
2003	2005	134,769	(2006)				
2004	2006	1,552,544					

East Fork Chinook Smolt Releases and Hatchery Returns (marked Fish).

Brood Year	Release Year	Number Released	Adult Returns [a] 3-year	4-year	5-year	Total Returns	Total %
1991	1993	35,172	0	0	0	0	.000
1992	1994	12,368	0	0	0	0	.000
1993	1995	48,845	1	1	ND	2	.004

[a] Age classes based upon the following lengths: 3-yr. old: ≤ 64 cm,
4-yr. old: 64 to 82 cm 5-yr. old: >82 cm.
ND means no data, trap not operated.

Appendix B. Sawtooth Fish Hatchery Water Quality Analysis of the Salmon River.

	2005	2002	1999	1996	1993	1985
Nutrients (mg/L)						
T. Ammonia as N	<0.01	<0.01	0.02	0.027	0.043	0.045
T. NO2 + NO3 as N	NR	NR	NR	0.006	0.073	0.088
T. Kjeldahl Nitrogen as N	0.17	<0.10	<0.10	0.20	<.05	0.26
T. Phosphorus as P	0.017	0.010	0.005	<.05	<.05	0.02
Ortho Phosphate as P	<0.005	0.009	<0.005	NR	0.019	<.003
Minerals (mg/L)						
Sp. Conductance (umhos/cm)	159.0	168.0	159.0	167.0	157.0	135.0
Hardness as CaCO3	78.3	78.0	75.7	80.0	68.0	62.0
T. Alkalinity as CaCO3	79.8	77.5	75.2	79	74	63
Bicarbonate Alk. as CaCO3	79.8	77.5	75.2	79	74	63
Calcium	<26.3	27.9	26.8	27.4	24	20.8
Magnesium	2.11	1.93	2.1	2.9	1.9	1.8
Sodium	4.70	4.69	4.26	5.5	7.0	3.8
Potassium	0.75	0.53	0.48	0.7	0.7	<1
Fluoride	0.82	0.83	0.60	0.29	0.85	0.58
Sulphate as SO4	6.73	5.23	5.50	12	5	<6
Total Metals (ug/L)						
Arsenic, Total	<0.003	<0.003	<0.005	<10	<10	<10
Boron, Total	<0.05	0.01	NR	<10	<80	1
Cadmium, Total	<0.0005	<0.0005	<0.0005	<1	<1	<1
Chromium, +6	<0.05	NR	NR	NR	<10	<50
Chromium, Total	NR	<0.002	<0.002	<2	<10	<50
Copper, Total	<0.01	<0.01	<0.01	<10	<10	<10
Iron, Total	0.02	0.03	0.02	20	20	120
Lead, Total	<0.002	0.004	<0.002	<5	<5	<50
Manganese, Total	<0.01	<0.01	<0.01	1	<10	10
Mercury, Total	<0.0002	<0.0002	<0.0002	<.5	<.5	<.5
Nickel, Total	0.007	<0.003	<0.003	<5	<10	<50
Silver, Total	<0.002	<0.002	<0.002	<1	<1	<1
Zinc, Total	0.004	0.002	<0.001	3	<2	<1
Miscellaneous						
Turbidity (NTU)	0.29	0.36	0.98	0.45	<1	1.8
pH (SU)	7.87	7.94	7.97	8.04	8.0	8.1
Total Cyanide (mg/L)	<0.005	<0.005	<0.005	<.005	<.005	<.005
Total Residue	NR	NR	NR	NR	NR	97

Appendix B. Continued…….

	2005	2002	1999
Nutrients (mg/L)			
Ammonia as N	<0.01	<0.01	0.02
T. Phosphorus as P	0.017	0.012	7.60
Minerals (mg/L)			
Hardness	78.3	81.0	81.3
Alkalinity	79.8	79.0	85.7
Bicarbonate Alk. as CaCO3	79.8	79.0	85.7
Total Metals (ug/L)			
Arsenic	<0.003	0.005	<0.005
Cadmium	<0.0005	<0.0005	<0.0005
Chloride	0.93	0.72	0.56
Cobalt	NR	<0.01	<0.01
Copper	<0.01	<0.01	<0.01
Lead	<0.002	<0.002	<0.002
Mercury	<0.0002	<0.0002	<0.0002
Selenium	<0.005	0.013	<0.005
Miscellaneous			
T. Cyanide (mg/L)	<0.005	<0.005	<0.005

Appendix C. Sawtooth Fish Hatchery Results of Disease Sampling.(only positive results are listed)

BY04 Juvenile Chinook

Case #	Stock	Date	Data
05-173	Saw	05/18/05	VIRO 0/5, DFAT 0/5, Pseudomonas spp. 1/5
05-184	Saw	06/03/05	DFAT 0/10,VIRO 0/10,FUR 0/10, ERM 0/10, CWD 0/10, MAS 9/10

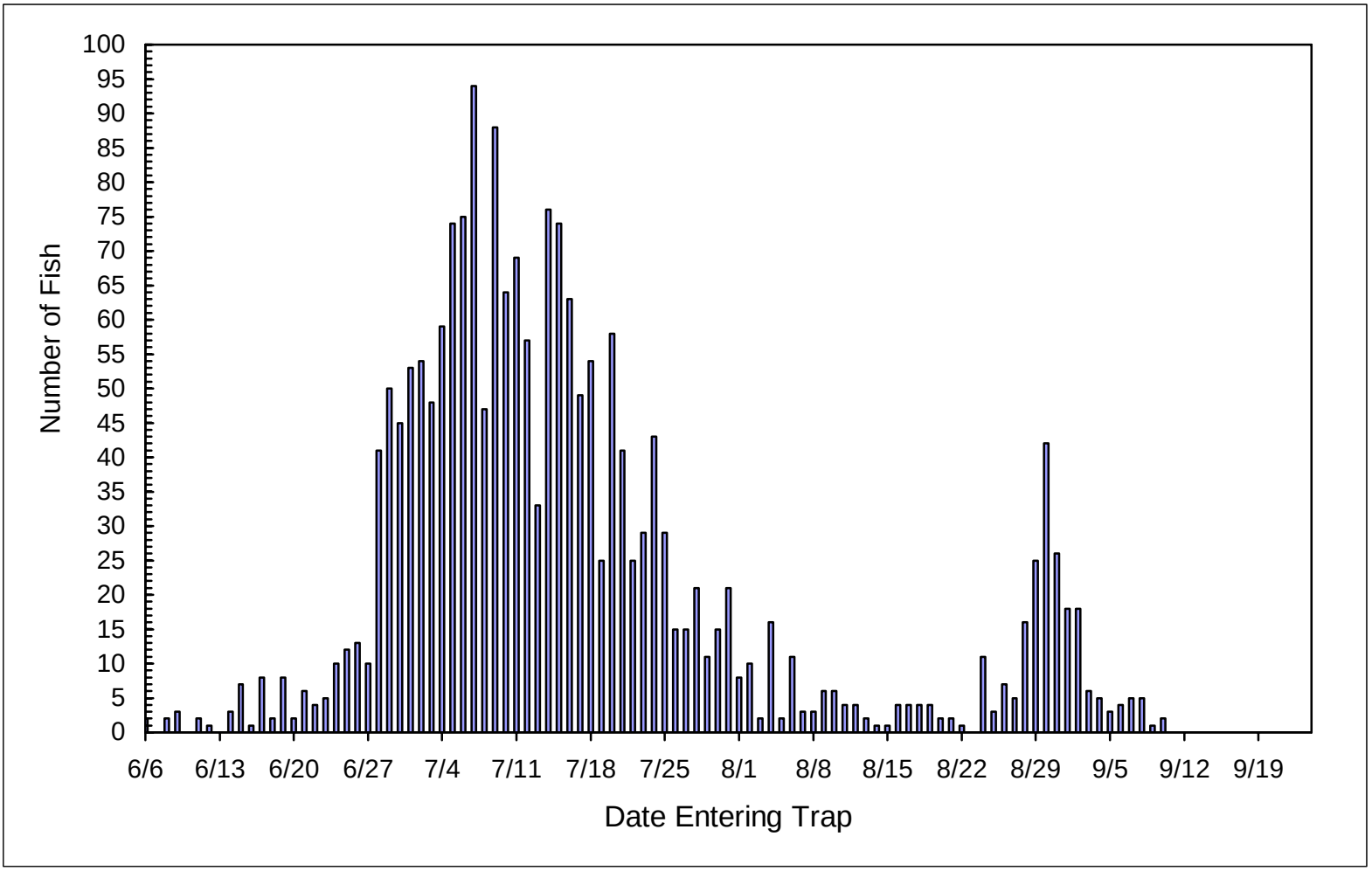
Return Year 2004 Chinook Broodstock

Case #	Stock	Date	Data
04-262	Saw	08/16/04	RS; VIRO 0/7,NAVHS 0/1,ELISA 2/7 (LOW 2)
04-377	Saw	08/19/04	RS; ELISA 2/15 (LOW 2),
04-378	Saw	08/23/04	RS; BKD,ELISA 26/31 (LOW 18, HIGH 8)
04-379	Saw	08/26/04	RS; VIRO 0/28,NAVHS 0/3,ELISA 7/28 (LOW 7)
04-380	Saw	08/30/04	BKD;VIRO 0/102,NAVHS 0/15,ELISA 40/102 LOW 38,HIGH 2
04-394	Saw	09/02/04	RS; VIRO 0/120, NAVHS, ELISA 18/120 (LOW18)
04-399	Saw	09/07/04	BKD;ELISA 17/100 (LOW 16, HIGH1),PTD-MYXOBOLUS CEREBRALIS 1/5(X5)
04-421	Saw	09/10/04	RS; ELISA 2/23 (LOW 2)

Return year 2005 Steelhead Broodstock

Case #	Stock	Date	Data
No positives were found in 2005.			

Appendix D. Sawtooth Fish Hatchery Spring Chinook Run Timing – 2004. All Fish N = 2018



Appendix E. Sawtooth Fish Hatchery Age Class Totals from All Trapped Chinook, Return Year 2004.

Sawtooth	Length (Fk)	Year class	Number
Males	≤ 64 cm	3-year old	654
	64-82 cm	4-year old	628
	> 82 cm	5-year old	42
Subtotal			**1324**
Females	≤ 64 cm	3-year old	2
	64-82 cm	4-year old	651
	> 82 cm	5-year old	41
Subtotal			**694**
Total			**2018**

Appendix E.1. Sawtooth Fish Hatchery Spring Chinook Salmon Length Frequency Distribution for 2004.

MALES

TOTAL TRAPPED		HATCHERY PONDED		HATCHERY RELEASED		UNMARKED PONDED		UNMARKED RELEASED	
FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER
39	1	39	1	39	0	39	0	39	0
40	2	40	2	40	0	40	0	40	0
41	1	41	0	41	1	41	0	41	0
42	4	42	3	42	1	42	0	42	0
43	11	43	8	43	3	43	0	43	0
44	7	44	5	44	1	44	0	44	1
45	20	45	16	45	1	45	0	45	3
46	22	46	19	46	1	46	0	46	2
47	42	47	34	47	3	47	0	47	5
48	55	48	48	48	5	48	0	48	2
49	67	49	52	49	12	49	0	49	3
50	69	50	62	50	4	50	0	50	3
51	43	51	36	51	4	51	0	51	3
52	50	52	37	52	4	52	0	52	9
53	41	53	33	53	5	53	0	53	3
54	46	54	41	54	2	54	0	54	3
55	34	55	27	55	3	55	0	55	4
56	33	56	30	56	0	56	0	56	3
57	30	57	25	57	1	57	0	57	4
58	15	58	15	58	0	58	0	58	0
59	9	59	7	59	1	59	0	59	1
60	19	60	14	60	0	60	0	60	5
61	10	61	7	61	0	61	0	61	3
62	5	62	3	62	2	62	0	62	0
63	12	63	5	63	2	63	0	63	5
64	7	64	2	64	0	64	0	64	5
65	13	65	6	65	3	65	0	65	4
66	16	66	6	66	3	66	0	66	7
67	12	67	3	67	3	67	0	67	6
68	32	68	8	68	2	68	0	68	22
69	26	69	15	69	1	69	0	69	10
70	39	70	19	70	5	70	0	70	15
71	35	71	19	71	5	71	0	71	11
72	36	72	23	72	4	72	0	72	9
73	36	73	18	73	5	73	0	73	13
74	34	74	19	74	3	74	0	74	12
75	53	75	26	75	6	75	0	75	21
76	31	76	17	76	1	76	0	76	13
77	50	77	21	77	2	77	0	77	27
78	35	78	12	78	5	78	0	78	18
79	36	79	17	79	1	79	0	79	18
80	40	80	23	80	5	80	0	80	12
81	28	81	18	81	2	81	0	81	8

Appendix E1. Continued

82	71	82	62	82	3	82	0	82	6
83	12	83	2	83	4	83	0	83	6
84	5	84	1	84	1	84	0	84	3
85	6	85	1	85	2	85	0	85	3
86	4	86	0	86	2	86	0	86	2
87	4	87	0	87	1	87	0	87	3
88	4	88	0	88	0	88	0	88	4
89	1	89	0	89	0	89	0	89	1
90	2	90	0	90	1	90	0	90	1
91	1	91	0	91	0	91	0	91	1
92	0	92	0	92	0	92	0	92	0
93	0	93	0	93	0	93	0	93	0
94	1	94	0	94	0	94	0	94	1
95	0	95	0	95	0	95	0	95	0
96	0	96	0	96	0	96	0	96	0
97	1	97	0	97	0	97	0	97	1
98	0	98	0	98	0	98	0	98	0
99	3	99	0	99	0	99	0	99	3
100	0	100	0	100	0	100	0	100	0
101	2	101	0	101	1	101	0	101	1
102	0	102	0	102	0	102	0	102	0
103	0	103	0	103	0	103	0	103	0
104	0	104	0	104	0	104	0	104	0
105	0	105	0	105	0	105	0	105	0
106	0	106	0	106	0	106	0	106	0
107	0	107	0	107	0	107	0	107	0
108	0	108	0	108	0	108	0	108	0
109	0	109	0	109	0	109	0	109	0
TOTALS	1324		868		127		0		329

AGE 3 HATCHERY MALES RELEASED:	56	AGE 3 NATURAL MALES RELEASED:	67
AGE 4 HATCHERY MALES RELEASED:	59	AGE 4 NATURAL MALES RELEASED:	232
AGE 5 HATCHERY MALES RELEASED:	12	AGE 5 NATURAL MALES RELEASED:	30
TOTAL HATCHERY MALES RELEASED:	127	TOTAL NATURAL MALES RELEASED:	329

AGE 3 HATCHERY MALES PONDED:	532	AGE 3 NATURAL MALES PONDED:	0
AGE 4 HATCHERY MALES PONDED:	332	AGE 4 NATURAL MALES PONDED:	0
AGE 5 HATCHERY MALES PONDED:	4	AGE 5 NATURAL MALES PONDED:	0
TOTAL HATCHERY MALES PONDED:	868	TOTAL NATURAL MALES PONDED:	0

Appendix E 1. Continued

FEMALES

TOTAL TRAPPED		HATCHERY PONDED		HATCHERY RELEASED		UNMARKED PONDED		UNMARKED RELEASED	
FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER	FL(CM)	NUMBER
55	0	55	0	55	0	55	0	55	0
56	0	56	0	56	0	56	0	56	0
57	0	57	0	57	0	57	0	57	0
58	0	58	0	58	0	58	0	58	0
59	0	59	0	59	0	59	0	59	0
60	0	60	0	60	0	60	0	60	0
61	0	61	0	61	0	61	0	61	0
62	0	62	0	62	0	62	0	62	0
63	0	63	0	63	0	63	0	63	0
64	0	64	0	64	0	64	0	64	0
65	2	65	2	65	0	65	0	65	0
66	3	66	0	66	2	66	0	66	1
67	3	67	1	67	1	67	0	67	1
68	3	68	2	68	0	68	0	68	1
69	6	69	1	69	0	69	0	69	5
70	8	70	4	70	3	70	0	70	1
71	8	71	0	71	1	71	0	71	7
72	10	72	2	72	3	72	0	72	5
73	27	73	16	73	4	73	0	73	7
74	43	74	26	74	7	74	0	74	10
75	42	75	29	75	11	75	0	75	2
76	55	76	38	76	6	76	0	76	11
77	73	77	44	77	17	77	0	77	12
78	51	78	35	78	8	78	0	78	8
79	71	79	55	79	4	79	0	79	12
80	85	80	61	80	11	80	0	80	13
81	51	81	38	81	3	81	0	81	10
82	111	82	86	82	8	82	0	82	17
83	5	83	0	83	1	83	0	83	4
84	3	84	0	84	2	84	0	84	1
85	4	85	1	85	1	85	0	85	2
86	1	86	0	86	1	86	0	86	0
87	1	87	0	87	0	87	0	87	1
88	1	88	0	88	0	88	0	88	1
89	2	89	0	89	1	89	0	89	1
90	4	90	0	90	0	90	0	90	4
91	1	91	0	91	0	91	0	91	1
92	4	92	0	92	1	92	0	92	3
93	3	93	0	93	2	93	0	93	1
94	2	94	0	94	0	94	0	94	2
95	3	95	0	95	0	95	0	95	3
96	0	96	0	96	0	96	0	96	0
97	3	97	0	97	0	97	0	97	3

Appendix E1. Continued.

98	1	98	0	98	0	98	0	98	1
99	2	99	0	99	1	99	0	99	1
100	0	100	0	100	0	100	0	100	0
101	0	101	0	101	0	101	0	101	0
102	2	102	0	102	0	102	0	102	2
103	0	103	0	103	0	103	0	103	0
104	0	104	0	104	0	104	0	104	0
105	0	105	0	105	0	105	0	105	0
106	0	106	0	106	0	106	0	106	0
107	0	107	0	107	0	107	0	107	0
108	0	108	0	108	0	108	0	108	0
109	0	109	0	109	0	109	0	109	0
110	0	110	0	110	0	110	0	110	0
TOTALS:	694		441		99		0		154

AGE 4 HATCHERY FEMALES RELEASED:	89	AGE 4 NATURAL FEMALES RELEASED:	123
AGE 5 HATCHERY FEMALES RELEASED:	10	AGE 5 NATURAL FEMALES RELEASED:	31
TOTAL HATCHERY FEMALES RELEASED:	99	TOTAL NATURAL FEMALES RELEASED:	154

AGE 4 HATCHERY FEMALES PONDED:	440	AGE 4 NATURAL FEMALES PONDED:	0
AGE 5 HATCHERY FEMALES PONDED:	1	AGE 5 NATURAL FEMALES PONDED:	0
TOTAL HATCHERY FEMALES PONDED:	441	TOTAL NATURAL FEMALES PONDED:	0

Appendix F. Sawtooth Fish Hatchery Age Class Breakdown by Released Chinook, Return Year 2004.

Sawtooth	Length (Fk)	Age Class	Number
Males	≤ 64 cm	3-year old	123
	64-82 cm	4-year old	291
	> 82 cm	5-year old	42
Total Males			456
Females	≤ 82 cm	4-year old	212
	> 82 cm	5-year old	41
Total Females			**253**
Total released			**709**

Appendix G. Sawtooth Fish Hatchery Spring Chinook Spawning Matrix, 2004 return year.

Group	Sex	Number in Group
All Fish Combined	Male	266 (46 jacks)
	Female	434

Appendix H. Survival Table for Chinook (BY04) and Steelhead (BY05) from Green Eggs to Released Smolts, at Sawtooth Fish Hatchery and East Fork Sites.

CHINOOK

	Green Egg Number	Eyed Egg Number	Percent Survival	Released Smolts
Sawtooth Fish Hatchery	1,999,254*	1,752,395	87.7	1,552,544

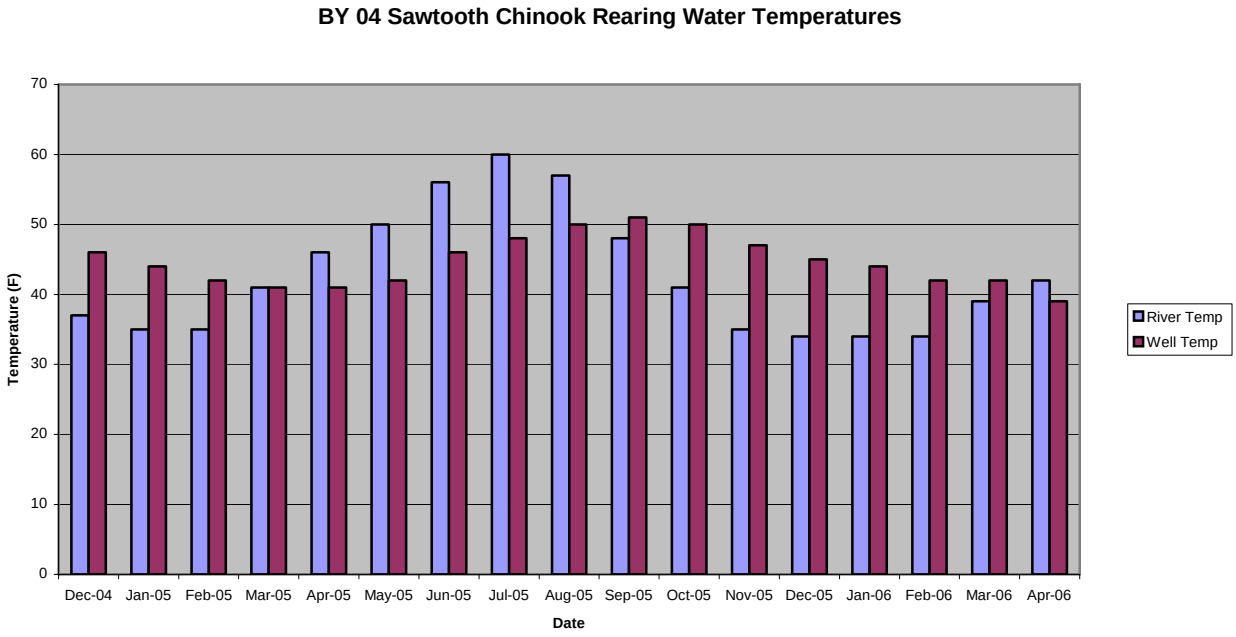
STEELHEAD

	Green egg Number	Eyed Egg Number	Percent Survival	
Sawtooth Fish Hatchery			Distributed as Follows	:
2,458,137	2,129,319	86.6	1,060,590 Hagerman NFH 382,066Shoshone-Bannock Streamside Incubators 354,444 Magic Valley FH	
East Fork eggs			Distributed as Follows:	
26,405	15,918	60.2	15,918 to Magic Valley FH	
Squaw Creek eggs			Distributed as Follows:	
120,105	54,337	45.2	54,337 to Magic Valley FH	
Pahsimeroi FH eggs			Distributed as Follows:	
1,219,500	1,014,420	76.4	220,700 to Hagerman NFH 650,380 to Magic Valley FH 120,600 to Shoshone Bannock Tribe	

All steelhead raised at other hatcheries.

*Numbers do not include 93,417 culled eggs from twenty females. Females were paired in incubation trays and culled because of high ELISA results for eleven females.

Appendix I. Rearing Water Monthly Average Temperatures, BY04 Spring Chinook at Sawtooth Fish Hatchery.



Appendix I.1. Feed Schedule for Sawtooth/ Pahsimeroi Chinook, BY04.

Fpp	% BW Fed	Feed Size	Timing	
1816---825		.035	str #2	11/04 – 01/05
1816---825		.035	str #2	01/05 - 02/05
825-----189		.035	str #3/1.0/1.3mm	02/05 - 03/05
324-----189		.023	1.3mm	03/05 - 04/05
189-----91		.024	1.5mm	04/05 – 05/05
189-----91		.024	1.5mm	05/05 – 06/05
189-----91		.024	1.5mm	06/05 – 06/05
91-------53		.022	1.5/2.0mm	07/05 – 08/05
53------36		.020	2.0/2.5mm	08/05 – 09/05
36------23		.020	2.5mm	9/05 – 10/05
<23		Maintenance	2.5/3.0	10/04 release

Appendix J. Summary of Marked Spring Chinook Released, Brood Year 2004.

Mark	Number Released	Location
Sawtooth Fish Hatchery Stock		
Adipose Clip	136,849 (Reserve)	SFH Weir (3/30/06)
Adipose Clip	501,072 (Reserve)	SFH Weir (4/12/06)
Adipose Clip	648,177	(Reserve) SFH Weir (4/19/06)
AD/CWT	130,512	(Reserve) SFH Weir (4/12/06)
Total Weir Release (PIT)	**1,416,610(500)**	
Adipose Clip (PIT)	135,934(695)	Yankee Fork (4/19/06)
Pahsimeroi Stock		
Adipose Clip	742,232 (Reserve)	
Ad Clip/CWT	55,944 (Reserve)	
All 798,176 transferred to Pahsimeroi FH September 7 and 8, 2005		

Appendix K. Summary of Sawtooth Fish Hatchery Spring Chinook Smolt Releases, Brood Year 2004

Raceway	Number	Tag Code	Fish per Pound	Pounds	Designation//Mark
***L1	137,369	500 PIT	19.4	7081	Reserve AD
*L2	136,849		28.7	4768	Reserve AD
***L5	139,648		23.4	5968	Reserve AD
***L6	137,153		20.6	6658	Reserve AD
****L7	135,934	695 PIT	21.3	6382	Reserve AD
***L8	109,678		19.0	5773	Reserve AD
***L9	124,329		20.1	6186	Reserve AD
**L10	65,412	10/90/77	20.8	3145	Reserve AD/CWT
**L10	65,100	10/91/77	20.8	3130	Reserve AD/CWT
**L11	107,368		20.6	5212	Reserve AD
**L12	130,166		22.7	5734	Reserve AD
**L13	131,143		23.2	5665	Reserve AD
**L14	132,395		22.3	5937	Reserve AD
Total	**1,552,544**		**21.7**	**71,638**	

*Released 3/30/06 Sawtooth Fish Hatchery Weir
**Released 4/12/06 "
***Released 4/19/06 "
****Released 4/21/06 Yankee Fork of the Salmon River at Jordan Cr.

Appendix L. Sawtooth Fish Hatchery Summary of BY05 Steelhead Smolt Releases and Marks.

Date	Stock	Plant Site	Number Released	Mark	CWT	PIT	Rearing Hatchery
4/10/06	Sawtooth A	Sawtooth Weir	20,788	AD	---	295	Hagerman National
4/10-13/06	Sawtooth A	Sawtooth Weir	92,714	AD	92,714	---	Hagerman National
4/10-26/06	Sawtooth A	Sawtooth Weir	647,346	AD	---	---	Hagerman National
5/01-04/06	Sawtooth A	Yankee Fork	130,517	---	---	295	Hagerman National
5/01/06	Sawtooth A	Yankee Fork	32,075	---	---	298	Magic Valley
5/01-02/06	Sawtooth A	Yankee Fork	63,525	AD and AD/CWT	31,761	---	Magic Valley
5/02/06	Sawtooth A	Valley Creek	30,599	---	---	300	Magic Valley
4/24-26/06	Sawtooth A	Tunnel Rock	41,004	AD	---	---	Magic Valley
4/20-24/06	Sawtooth A	McNabb Point	137,098	AD and AD/CWT	30,970	299	Magic Valley
		TOTALS	1,195,666		155,445	1,487	

Date	Stock	Plant Site	Number Released	Mark	CWT	PIT	Rearing Hatchery
4/27-28/06	Dworshak B	East Fork Salmon River	100,457	AD	---	297	Hagerman National
4/10-12/06	Dworshak B	Squaw Creek Acclimation Pond	62,457	AD/CWT	62,457	500	Magic Valley
4/18-22/06	Dworshak B	Squaw Creek Direct Release	244,237	100% AD, 26,682 AD/RV	---	499	Magic Valley
4/24-27/06	Dworshak B	East Fork Salmon River (lower)	237,711	AD	---	---	Magic Valley
		TOTALS	632,865		51,660	1,270	
5/01/06	Natural B	East Fork Salmon River (above E.F. weir)	31,073	---	31,073	---	Magic Valley
4/10-12/06	USB	Squaw Creek Acclimation Pond	31,015	AD/CWT	31,015	500	Magic Valley
		TOTAL STEELHEAD SMOLT RELEASE	**1,424,956**		**215,477**	**30,927**	

** number PIT tagged available from IDFG, marking supervisor

Appendix L.1. Sawtooth Fish Hatchery Production Cost Table (Includes Chinook BY04, Steelhead BY05, and Sockeye BY04).

Chinook BY 04

Smolt Number	Lbs. Feed	Cost Feed	Lbs of Smolts	Total Cost	Cost per 1,000	Cost per lb.
Sawtooth						
1,554,544	97,064	$95,697.24	71,638	$218,191	$140.36	$3.05
Pahsimeroi						
798,176	**15,543**	$0*	12,280**	$71,397	$89.45	$5.81

East Fork

No BY04 East Fork spring Chinook salmon were reared.

Steelhead BY 05

Stock	Green Eggs	Eyed Eggs	Total Cost	Cost per 1,000 eyed eggs
Sawtooth	2,458,137	2,129,319	$88,234	$24.13
Squaw Cr/EF	111,446	100,487	$33,936	$296.10
Pahsimeroi	1,327,962	1,014,420	$13,574	$74.73
Totals	3,897,545	3,244,226	$135,744	$394.96

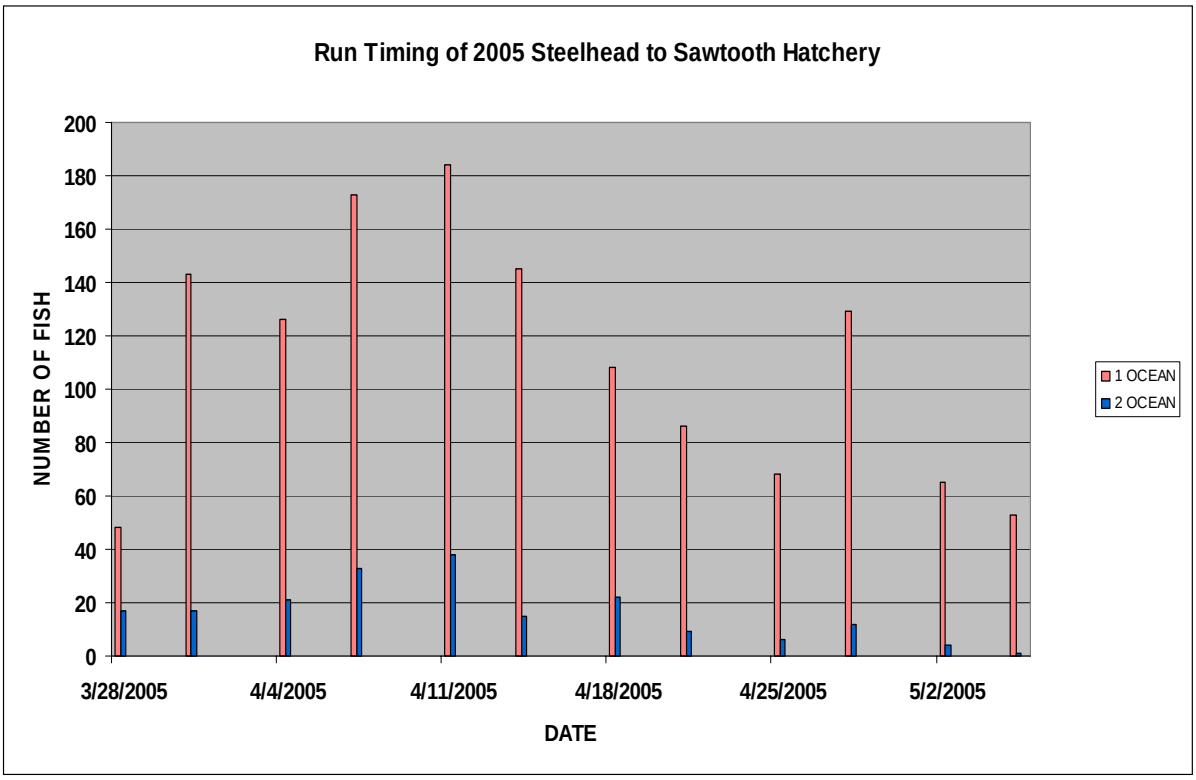
Sockeye BY 04

Smolt Number	Lbs Smolts	Total Cost	Cost per 1,000	Cost per lb.
111,806	2,686	$27,148	$242.81	$10.11 .....

Note: Total costs less capital outlay. Costs include operating East Fork fish trap and running wells for entire rearing period. Costs are proportional species and stock.

* PFH purchased feed
** presmolts

Appendix M. Run Timing Graph for 2005 Steelhead Trapped at Sawtooth.



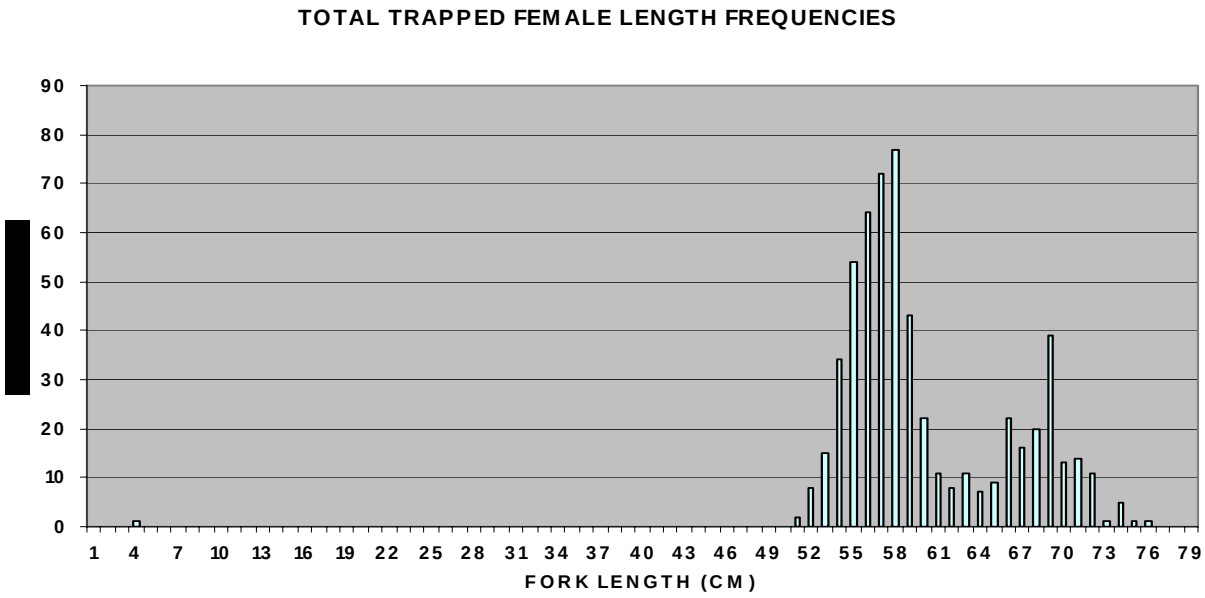
Appendix. N. Sawtooth Fish Hatchery Steelhead Length Frequency Distribution.

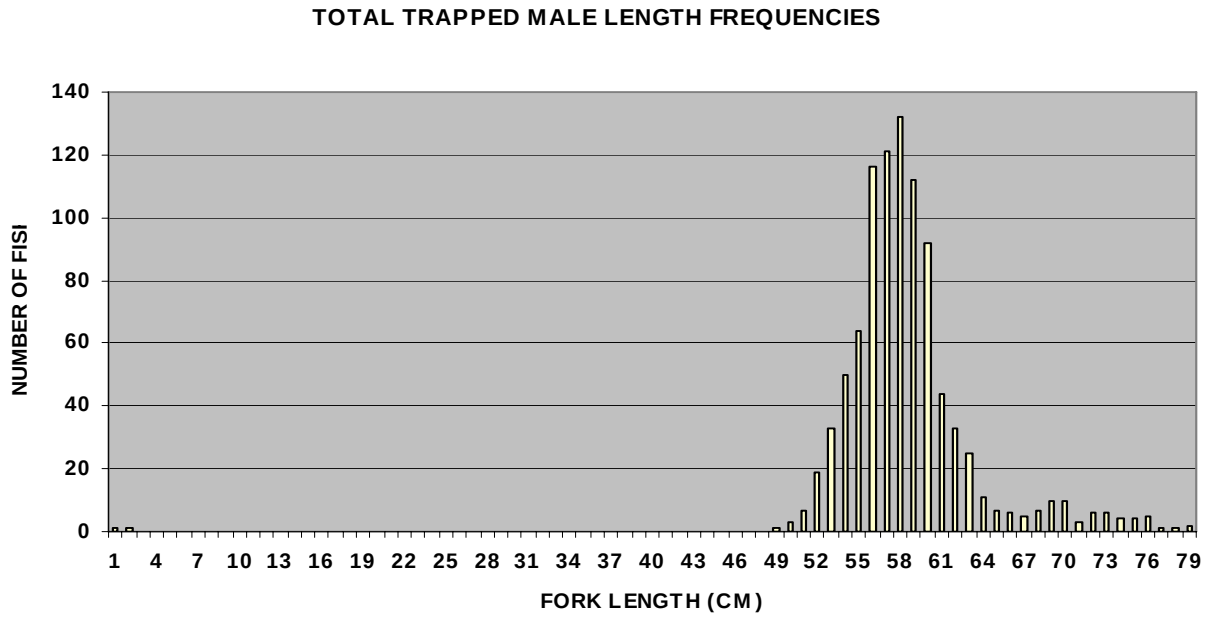
F.L.	HATCHERY		NATURAL		TOTAL TRAPPED			F.L.
(cm)	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	TOTAL	(in)
50	4	0	0	0	4	0	4	19.7
51	7	2	0	0	7	2	9	20.1
52	20	8	0	0	20	8	28	20.5
53	32	15	1	0	33	15	48	20.9
54	50	35	0	0	50	35	85	21.3
55	63	53	1	1	64	54	118	21.7
56	116	64	0	0	116	64	180	22.0
57	120	72	1	0	121	72	193	22.4
58	132	77	0	0	132	77	209	22.8
59	112	39	0	4	112	43	155	23.2
60	92	21	0	1	92	22	114	23.6
61	43	11	2	0	45	11	56	24.0
62	33	8	0	0	33	8	41	24.4
63	24	10	1	1	25	11	36	24.8
64	11	7	0	0	11	7	18	25.2
65	7	9	0	0	7	9	16	25.6
66	6	21	0	1	6	22	28	26.0
67	5	14	0	2	5	16	21	26.4
68	7	20	0	0	7	20	27	26.8
69	9	35	1	4	10	39	49	27.2
70	10	13	0	0	10	13	23	27.6
71	3	13	0	1	3	14	17	28.0
72	6	11	0	0	6	11	17	28.3
73	5	1	1	0	6	1	7	28.7
74	3	5	1	0	4	5	9	29.1
75	2	1	2	0	4	1	5	29.5
76	3	1	2	0	5	1	6	29.9
77	0	0	1	0	1	0	1	30.3
78	1	0	0	0	1	0	1	30.7
79	2	0	0	0	2	0	2	31.1
Totals:	**928**	**566**	**14**	**15**	**942**	**581**	**1523**	

Total Fish Trapped: 1523

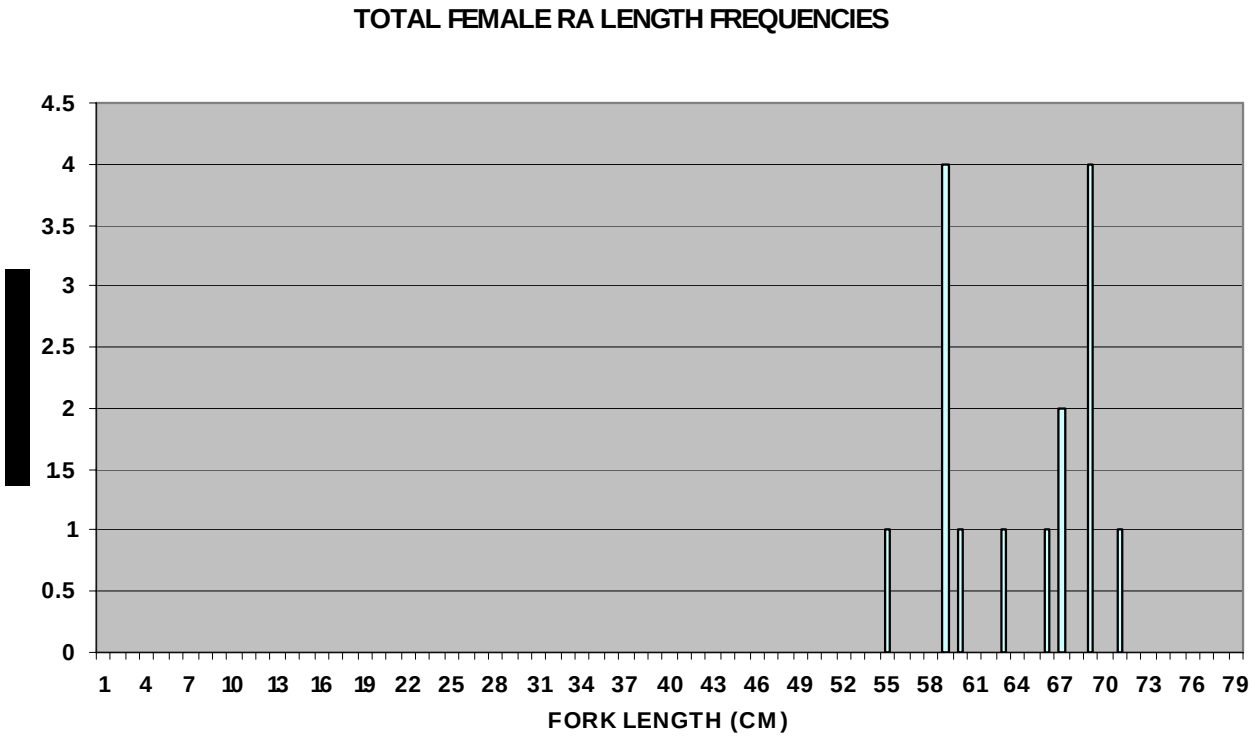
928	Hatchery Males	14	Natural Males	942	Total Males
566	Hatchery Females	15	Natural Females	581	Total Females
1494	Hatchery Fish	29	Natural Fish	1523	Total Fish

Appendix O. Run timing Graphs for Male and Female Steelhead at East Fork Trap.





Appendix O. Continued.



East Fork steelhead females released above the trap, 2005.

Appendix O. Continued. East Fork Steelhead Returns by Year Class and Sex.

Age Class of Adults	MALES		FEMALES		TOTAL	
	No.	%	No.	%	No.	%
Hatchery 1-Oceans	3	100	0	0	3	100
Hatchery 2-Oceans	0	0	0	0	0	0
Natural 1-Oceans	66	74.16	23	25.84	89	100
Natural 2-Oceans	0	0	0	0	0	0
Total 1-Oceans	69	75.00	23	25.00	92	100
Total 2-Oceans	0	0	0	0	0	0

East Fork Steelhead Aging Criteria.

Males	<=79 cm - 2-year old	1-Ocean
	>79 cm - 3 or 4 year old	2-Ocean
Females	<=75 cm - 2-year old	1-Ocean
	>75 cm - 3 or 4 year old	2-Ocean

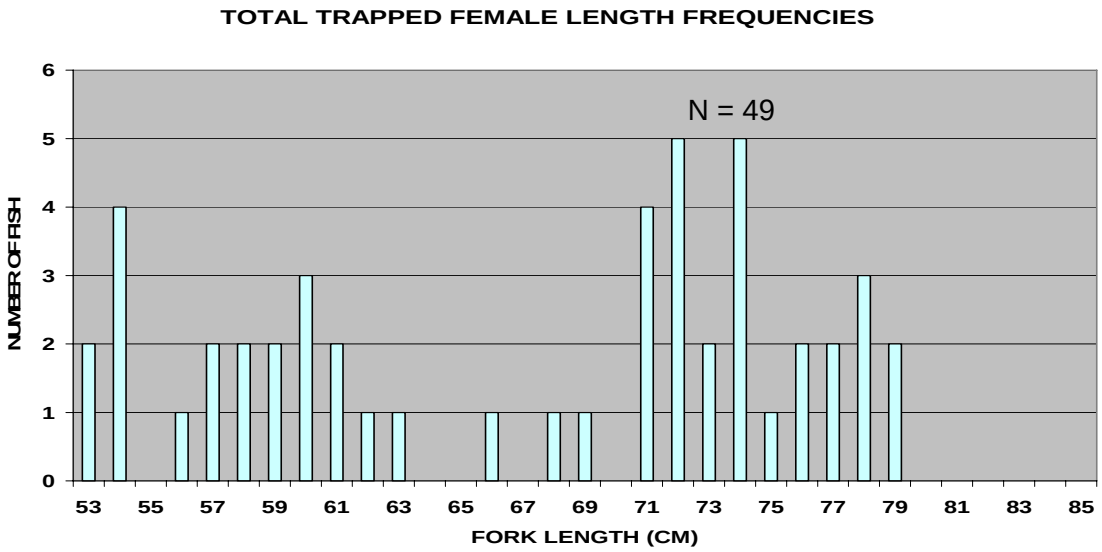
Appendix P. East Fork Steelhead Length Frequency Distribution, Return Year 2005.

F.L. (cm)	HATCHERY MALE	HATCHERY FEMALE	NATURAL MALE	NATURAL FEMALE	TOTAL TRAPPED MALE	TOTAL TRAPPED FEMALE	TOTAL TRAPPED TOTAL	F.L. (in)
53	1	1	0	1	1	2	3	20.9
54	2	2	0	2	2	4	6	21.3
55	1	0	1	0	2	0	2	21.7
56	0	0	2	1	2	1	3	22.0
57	1	2	0	0	1	2	3	22.4
58	3	2	0	0	3	2	5	22.8
59	4	2	0	0	4	2	6	23.2
60	4	3	0	0	4	3	7	23.6
61	1	2	2	0	3	2	5	24.0
62	2	0	0	1	2	1	3	24.4
63	3	1	1	0	4	1	5	24.8
64	3	0	0	0	3	0	3	25.2
65	1	0	0	0	1	0	1	25.6
66	1	0	0	1	1	1	2	26.0
67	2	0	0	0	2	0	2	26.4
68	2	0	0	1	2	1	3	26.8
69	0	1	1	0	1	1	2	27.2
70	1	0	1	0	2	0	2	27.6
71	0	3	0	1	0	4	4	28.0
72	0	5	0	0	0	5	5	28.3
73	0	2	1	0	1	2	3	28.7
74	1	5	0	0	1	5	6	29.1
75	0	1	0	0	0	1	1	29.5
76	1	1	0	1	1	2	3	29.9
77	0	1	0	1	0	2	2	30.3
78	0	3	1	0	1	3	4	30.7
79	2	2	0	0	2	2	4	31.1
80	2	0	0	0	2	0	2	31.5
81	0	0	0	0	0	0	0	31.9
82	0	0	0	0	0	0	0	32.3
83	0	0	1	0	1	0	1	32.7
84	0	0	0	0	0	0	0	33.1
85	1	0	0	0	1	0	1	33.5
Totals:	**39**	**39**	**11**	**10**	**50**	**49**	**99**	

Total Fish Trapped: 99

39	Hatchery Males	11	Natural Males	50	Total Males
39	Hatchery Females	10	Natural Females	49	Total Females
78	Hatchery Fish	21	Natural Fish	99	Total Fish

Appendix Q. Run Timing for Steelhead, Return Year 2005. Squaw Creek Trap.



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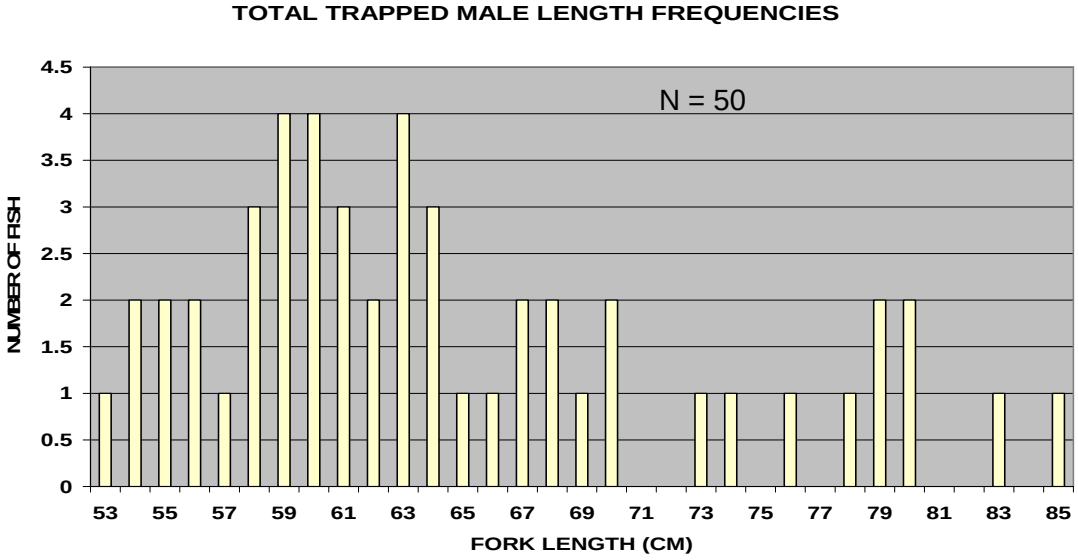

Appendix. R. Squaw Creek Trap Length Distribution, Return Year 2005.

F.L. (cm)	HATCHERY MALES	HATCHERY FEMALES	NATURAL MALES	NATURAL FEMALES	TOTAL TRAPPED MALES	TOTAL TRAPPED FEMALES	TOTAL TRAPPED TOTAL	F.L. (in)
52	0	0	1	0	1	0	1	20.5
53	0	0	0	0	0	0	0	20.9
54	0	0	5	0	5	0	5	21.3
55	0	0	3	3	3	3	6	21.7
56	2	0	9	2	11	2	13	22.0
57	1	0	10	2	11	2	13	22.4
58	0	0	13	3	13	3	16	22.8
59	0	0	8	0	8	0	8	23.2
60	0	0	9	2	9	2	11	23.6
61	0	0	2	0	2	0	2	24.0
62	0	0	3	0	3	0	3	24.4
63	0	0	0	0	0	0	0	24.8
64	0	0	1	0	1	0	1	25.2
65	0	0	0	1	0	1	1	25.6
66	0	0	0	0	0	0	0	26.0
67	0	0	0	2	0	2	2	26.4
68	0	0	0	0	0	0	0	26.8
69	0	0	0	1	0	1	1	27.2
70	0	0	0	1	0	1	1	27.6
71	0	0	1	2	1	2	3	28.0
72	0	0	0	0	0	0	0	28.3
73	0	0	1	0	1	0	1	28.7
74	0	0	0	2	0	2	2	29.1
75	0	0	0	1	0	1	1	29.5
76	0	0	0	0	0	0	0	29.9
77	0	0	0	1	0	1	1	30.3
Totals:	3	0	66	23	69	23	92	
		92						

Total Fish Trapped:

3	Hatchery Males	66	Natural Males	69	Total Males
0	Hatchery Females	23	Natural Females	23	Total Females
3	Hatchery Fish	89	Natural Fish	92	Total Fish

Appendix S. Fish Health Autopsy Results, Chinook BY 2004

ACCESSION NO:				06-067							LOCATION:			Sawtooth					
SPECIES:				sc							AUTOPSY DATE:			3/8/2006					
STRAIN:				saw							AGE:			juv					
UNIT:											SAMPLE SIZE:			20					
RIVER FOR AUTOPSY:				Prelib.															
INVESTIGATOR(S):				Munson															
REMARKS:																			

							STANDARD			**COEFFICIENT**									
				MEAN			**DEVIATION**			**OF VARIATION**									
LENGTH					0.00			0.00			0.00								
WEIGHT					0.00			0.00			0.00								
KTL*					0.00			0.00			0.00								
CTL*					0.00			0.00			0.00								
HEMATOCRIT					44.50			3.18			0.07								
LEUCOCRIT					0.00			0.00			0.00								
SERUM PROTEIN					7.73			1.19			0.15								

*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

**CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOUTH POWER

				PSEUDO-						**MESEN.**				**HIND**					
EYES		**GILLS**		**BRANCHS**		**THYMUS**		**FAT**		**SPLEEN**		**GUT**		**KIDNEY**		**LIVER**		**BILE**	
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	0	0	20
B1	0	F	0	S	0	1	0	1	6	R	0	1	0	S	0	B	20	1	0
B2	0	C	0	L	0	2	0	2	8	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	5	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	1	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=2.05								OT	0		
M1	0																		
OT	0																		

SUMMARY OF NORMALS

	20		20		20		20		20		20		20		20		20		20
SEX			M: 0				F: 0				U: 0								

GENERAL REMARKS:

FINS:							GONADS:												
SKIN:							OTHER:		Fish at 22 FPP										

Appendix S. Continued.

LENGTH					0.00			0.00			0.00								
WEIGHT					0.00			0.00			0.00								
KTL*					0.00			0.00			0.00								
CTL*					0.00			0.00			0.00								
HEMATOCRIT					42.55			2.37			0.06								
LEUCOCRIT					0.00			0.00			0.00								
SERUM PROTEIN					8.48			0.39			0.05								
*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER																			
**CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOUTH POWER																			
				PSEUDO-						**MESEN.**				**HIND**					
EYES		**GILLS**		**BRANCHS**		**THYMUS**		**FAT**		**SPLEEN**		**GUT**		**KIDNEY**		**LIVER**		**BILE**	
N	18	N	20	N	20	0	20	0	4	B	20	0	20	N	20	A	0	0	20
B1	0	F	0	S	0	1	0	1	3	R	0	1	0	S	0	B	19	1	0
B2	0	C	0	L	0	2	0	2	7	G	0	2	0	M	0	C	1	2	0
E1	2	M	0	S&L	0			3	4	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	2	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=1.85								OT	0		
M1	0																		
OT	0																		
SUMMARY OF NORMALS																			
	18		20		20		20		20		20		20		20		20		20
SEX			M: 0				F: 0				U: 0								
GENERAL REMARKS:																			
FINS:							GONADS:												
SKIN:							OTHER:		Fish at 22 FPP										

Appendix S. Continued.

Summary of Fish Autopsy

ACCESSION NO:	04-126	LOCATION:	Sawtooth
SPECIES:	sc	AUTOPSY DATE:	3/16/2004
STRAIN:	saw	AGE:	juv
UNIT:		SAMPLE SIZE:	20
RIVER FOR AUTOPSY:	Prelib.		
INVESTIGATOR(S):	Munson		
REMARKS:			

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
HEMATOCRIT	41.90	3.40	0.08
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	5.71	1.30	0.02

*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER
**CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOUTH POWER

EYES		GILLS		PSEUDO-BRANCHS		THYMUS		FAT		MESEN. SPLEEN		GUT		HIND KIDNEY		LIVER		BILE	
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	0	0	20
B1	0	F	0	S	0	1	0	1	4	R	0	1	0	S	0	B	19	1	0
B2	0	C	0	L	0	2	0	2	9	G	0	2	0	M	0	C	1	2	0
E1	0	M	0	S&L	0			3	7	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	0	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=2.15								OT	0		
M1	0																		
OT	0																		

SUMMARY OF NORMALS

	20	20	20	20	20	20	20	20	20	20
SEX		M: 0		F: 0		U: 0				

GENERAL REMARKS:

FINS: GONADS:

SKIN: OTHER: Fish at 22 FPP

TABLES

Table 1. 2005 Sawtooth Steelhead Spawn Data.

Fish Disposition		**Males**	**Females**
Pre-Spawning Mortality		0	0
Spawned		542	542
Killed: Not Used		0	0
Released Above Weir		14	15
Other		386	410
	Totals:	**942**	**581**

Males Spawned	Females Spawned	Eggs Per Female	Number of Green Eggs	Number of Eyed Eggs	Percent Eye-up
542	542	4,535	2,458,137	2,129,319	86.6

Age Class of Adults	MALES		FEMALES		TOTAL	
	No.	%	No.	%	No.	%
Hatchery 1-Oceans	884	67.22	431	32.78	1315	88.02
Hatchery 2-Oceans	44	24.58	135	75.42	179	11.98
Natural 1-Oceans	6	46.15	7	53.85	13	44.83
Natural 2-Oceans	8	50.0	8	50.0	16	55.17
Total 1-Oceans	890	67.02	438	32.98	1328	87.20
Total 2-Oceans	52	26.67	143	73.33	195	12.80

Table 2. East Fork Salmon River Steelhead Spawn Data.

Males Spawned	Females Spawned	Eggs Per Female	Number of Green Eggs	Number of Eyed Eggs	Percent Eye-up
4	13	4,651	61,129	56,478	92.4

Disposition at East Fork.

Fish Disposition		**Males**	**Females**
Pre-Spawning Mortality		0	0
Spawned		4	13
Killed: Not Used		9	1
Released Above Weir		36	9
Other		20	0
	Totals:	69	23

Table 3. 2005 Squaw Creek Steelhead Spawn Data.

Fish Disposition	**Males**	**Females**
Pre-Spawning Mortality	0	0
Spawned	8	8
Killed: Not Used	0	12
Released Above Weir	26	29
Other	24	8
Totals:	50	49

Males Spawned	Females Spawned	Eggs Per Female	Number of Green Eggs	Number of Eyed Eggs	Percent Eye-up
8	8	6,290	50,317	44,009	87.5

Note that one of these females produced 0 eyed eggs either because her eggs were bad, or the male was bad. That 0% eye-up is not included in the percent eye-up.

Age Class of Adults	MALES		FEMALES		TOTAL	
	No.	%	No.	%	No.	%
Hatchery 1-Oceans	36	52.94	32	47.06	68	87.18
Hatchery 2-Oceans	3	30.0	7	70.0	10	12.82
Natural 1-Oceans	10	55.56	8	44.44	18	85.71
Natural 2-Oceans	1	33.33	2	66.67	3	14.29
Total 1-Oceans	46	53.49	40	46.51	86	86.87
Total 2-Oceans	4	30.77	9	69.23	13	13.13

Table 4. BY05 Steelhead Eyed Egg or Fry Shipments .

HATCHERY or OFF-SITE LOCATION	NUMBER SHIPPED	STOCK
Shoshone-Bannock Tribe	382,066 120,600	Sawtooth Pahsimeroi
Hagerman National Fish Hatchery	1,060,590 220,700	Sawtooth Pahsimeroi
Magic Valley Fish Hatchery	354,444 56,478 44,009 650,380	Sawtooth East Fork Squaw Creek Pahsimeroi
Total Eggs Shipped	991,680	Pahsimeroi
Total Eggs Shipped	1,797,100	Sawtooth
Total Eggs Shipped	56,478 44,009	East Fork Squaw Creek
Total Eggs Shipped	2,889,267	All Stocks

All unwanted or remaining eggs were culled as development progressed beyond the window of transport safety, as determined by temperature-unit accumulation.

Table 5. Sawtooth Steelhead Aging Criteria.

Males	<=68 cm - 2-year old	1-Ocean
	>68 cm - 3 or 4 year old	2-Ocean
Females	<=65 cm - 2-year old	1-Ocean
	>65 cm - 3 or 4 year old	2-Ocean

Submitted by:

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