



PAHSIMEROI FISH HATCHERY

Brood Year 2005 Summer Chinook Report

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ABSTRACT

The summer Chinook program at Pahsimeroi Fish Hatchery (PFH) is part of Idaho Power Company's (IPC) mitigation requirement for the Hells Canyon Complex on the Snake River. The decision to shift the program's focus from a harvest augmentation program to a supplementation-conservation program was a management decision made by the Idaho Department of Fish and Game (IDFG) and the National Oceanographic and Atmospheric Administration (NOAA). This decision was made in 1992 when Pahsimeroi summer Chinook salmon were listed as threatened under the Federal Endangered Species Act of 1973. The program continues to fulfill IPC's mitigation requirements under its current Federal Energy Regulatory Commission operating license.

On June 14, 2005, PFH staff installed the weir on the Pahsimeroi River and began trapping summer Chinook salmon. The weir was left in place until trapping ceased on September 30, 2005. The first fish was trapped on June 20, 2005 and the last on September 29, 2005.

A total of 2,168 summer Chinook salmon (*Oncorhynchus tshawytscha*) were trapped during the 2005 brood year. This was the second largest summer Chinook run to return to Pahsimeroi Hatchery. The total pre-spawn mortality was 49 (7.0%), which included 38 females and 11 males.

Artificial spawning of summer Chinook salmon commenced on September 6, 2005, and concluded on September 29, 2005. A total of 341 females were spawned of which 53 were culled. A total of 1,335,191 green eggs were collected for production purposes, for an average fecundity of 4,636 eggs per female. The overall eye-up percentage was 80.2%. A total of eight lots were incubated at PFH and then shipped as eyed eggs to Sawtooth Fish Hatchery (SFH) for hatching and early rearing on well water. This transfer limits the exposure of fry to *Myxobolus cerebralis* (*M. cerebralis*), the causative agent of whirling disease, which is present in the PFH water source. In October 2006, BYR 2005 pre-smolts were transferred to two rearing ponds at the PFH upper hatchery. They were raised on river water until being released in April of 2007.

The outlet screens for the secondary rearing ponds were removed in a staggered fashion beginning April 9, 2007 to allow volitional release of Chinook smolts into the Pahsimeroi River. A total of 987,460 smolts were released for a combined weight of 59,955 pounds. The fish averaged 16.47 fish per pound and consisted of one group. These fish were all classified as reserve group listed at the time of release.

Todd Garlie, Hatchery Manager 1
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INTRODUCTION

Pahsimeroi Fish Hatchery, located near the town of Ellis, Idaho, consists of two hatchery facilities. The lower hatchery is located one mile upstream of the confluence of the Pahsimeroi and Salmon Rivers. The upper hatchery is located off Downton Lane seven miles further upstream on the Pahsimeroi River. Both hatcheries were constructed in 1967 by IPC and are owned and funded by IPC. The upper hatchery is under complete renovation. It should be substantially complete by November 2007. Hatchery operations and management are the responsibility of IDFG. The summer Chinook program is part of IPC's mitigation requirement for anadromous fish losses resulting from the construction and operation of the Hells Canyon Complex on the Snake River. However, due to the 1992 listing of Snake River summer Chinook salmon (*Oncorhynchus tshawytscha*) as threatened under the Federal Endangered Species Act of 1973, PFH has shifted from a harvest augmentation program to a supplementation-conservation program. The number of adult summer Chinook salmon released into the Pahsimeroi River for natural spawning, as well as the number of those kept at the hatchery for artificial propagation, depends on marked and unmarked fish returns and their listing status. NOAA Fisheries permits #922 and #903 authorize the direct and incidental take of listed, naturally produced and artificially propagated summer Chinook salmon.

OBJECTIVES

The hatchery's mitigation program goals focus on summer Chinook salmon and A-run Steelhead (*Oncorhynchus mykiss*). The following objectives are designed to help accomplish these goals:

1. Rear one million summer Chinook smolts for release into the Pahsimeroi River.
2. Trap and spawn sufficient numbers of adult summer Chinook returning to PFH to produce 1.5 million green eggs.
3. Trap and spawn sufficient numbers of adult Steelhead returning to PFH to produce 1.5 million steelhead eggs to be shipped to Oxbow Fish Hatchery for later distribution to Niagara Springs Fish Hatchery.
4. Work with IDFG management, research, and IPC to identify the most effective operating procedures and rearing strategies and develop the facility to enhance survival, fish health, and genetic diversity.

HATCHERY FACILITIES

Pahsimeroi Fish Hatchery is comprised of two hatchery facilities. The lower hatchery consists of six buildings, two of which are residences for full-time employees (a 1994 wood-frame home and a 1999 double-wide mobile home). A third building houses a garage, shop, and two-bedroom living quarters for temporary employees.

A fourth building contains the office, public restrooms, and an incubation room. A fifth building is used for storage and has two sections: one for chemical and machinery storage and a second for non-chemical equipment storage. The sixth building is the spawning shed.

The upper hatchery is under complete renovation. When the new upper hatchery is completed, Pahsimeroi Hatchery personnel will have the ability to incubate and rear juvenile Chinook salmon on specific pathogen free (SPF) water until a length of 19.4 cm is attained.

The walk-in freezer, garage/shop, and storage shed previously on site have been removed. The earthen settling basins previously used for secondary rearing pond effluent have been deemed unnecessary under the new NPDES permit and were removed.

The new upper hatchery will feature a new incubation and early rearing facility, chilled water system, aeration structure, shop, vehicle storage area, chemical storage room, hospital grade backup generator, electrical room with programmable logic controller (PLC) to control and monitor operation of production well pumps and chiller, and administration building with office and attached dormitory. These buildings and structures are scheduled for substantial completion by November 2007.

For Brood Year 2005, the fish production facilities included the following:

Lower Hatchery

- Removable adult weir across the Pahsimeroi River.
- Fish ladder and 3 ponds (each pond measures 70 x 16 x 6 ft; the two outside ponds are for adult holding, and the center pond is considered the trap). The carrying capacity is approximately 2,000 adult summer Chinook or 5,000 adult A-run steelhead per pond.
- Incubation room with 20, 16-tray stacks of Heath tray vertical-flow incubators supplied by pumped spring water.

Upper Hatchery

- Two 210 ft x 40 ft x 3.5 ft concrete secondary rearing ponds each supplied with 10 cubic feet per second (cfs) water from the Pahsimeroi River. The carrying capacity of each pond is 500,000 smolts at 15 fish per pound.
- A modified intake structure with a fixed screen and 36 inch ductile iron supply line supplying river water to the concrete secondary rearing ponds.

- A full flow settling basin measuring 95 ft x 32 ft x 4 ft. This basin will receive effluent from the incubation room and early rearing vats.
- Three production wells for incubation and early rearing with a combined output of 12.56 cfs. These wells will be used for incubation of Steelhead and incubation as well as early rearing of summer Chinook salmon beginning with Brood Year 2008.

WATER SUPPLY

Currently, incubation water is supplied at the lower hatchery. This incubation water consists of Specific Pathogen-Free (SPF) spring water, which is pumped to a 10,000-gallon holding tank and gravity-fed to the incubators. The spring source can produce up to 200 gpm of 52 °F to 56 °F water. Three new production wells discussed above will supply SPF well water for incubation and early rearing at the upper hatchery beginning with Brood Year 2008. These wells are capable of supplying up to 12.56 cfs of 48 F to 50 F SPF well water.

The adult trap and holding ponds at the main hatchery are supplied with water from the Pahsimeroi River through a 0.25-mile earthen intake canal. This intake structure is equipped with four NOAA Fisheries-approved rotating drum screens to prevent entrapment of wild Chinook and Steelhead from the river into the hatchery facilities. A water right for 40 cfs held by IPC allows hatchery personnel to divert water from the Pahsimeroi River for operations at the lower hatchery. This intake is equipped with a broad crested weir measuring device. Water temperature varies throughout the year with water temperatures fluctuating from seasonal lows of 33 °F in the winter to seasonal highs of 72 °F in the summer. Daily fluctuations can be as much as 12 °F.

Water for the rearing ponds at the upper hatchery also comes from a diversion in the Pahsimeroi River. IPC's water right for 20 cfs at the upper hatchery allows a flow of 10 cfs per pond. The water flows through two NOAA approved rotating drum screens and then passes through a fixed screen prior to delivery to the ponds via a 36 inch diameter ductile iron pipe. This intake structure will be equipped with a flow meter to measure and record flow into the ductile iron pipe. The water enters the ponds through upwellers in the pond floors, and then flows through the ponds prior to discharge back to the Pahsimeroi River. The Pahsimeroi River has a high organic load during winter, but improves during the summer.

STAFFING

Pahsimeroi Hatchery is staffed by permanent and temporary employees. The permanent staff consists of a Hatchery Manager 1 and an Assistant Hatchery Manager. The temporary employees provide assistance during the Steelhead and summer Chinook trapping and spawning seasons and fish rearing. They include a year-round Fisheries Technician, two Bio-Aides and one Laborer.

At the peak of the Steelhead and Chinook spawning seasons, IDFG regional staff, IDFG volunteers, SFH staff, and a Fisheries Technician from IDFG Nampa Fisheries Research also assist with spawning as well as routine hatchery operations.

ADULT SUMMER CHINOOK TRAPPING

In 2005, the trap was operational from June 14, through September 30, 2005. The first adult summer Chinook arrived on June 20, 2005 and the last adult arrived on September 29, 2005. Summer Chinook returning in 2005 originated from brood years 2000, 2001, and 2002. By definition, supplementation fish (Idaho Supplementation Studies - ISS) are fish that are derived from natural-origin x natural-origin or natural-origin x hatchery crosses. Reserve group fish are derived from hatchery x hatchery crosses. The listing status, mark type, and the number of smolts released from each brood year contributing to the Brood Year 2005 return are as follows:

BY2000-Comprised of two groups of fish.

Group 1-Hatchery-origin reserve unlisted, 100% adipose fin clipped, no coded wire tags. A total of 418,417 smolts were released from this group.

Group 2-Hatchery-origin ISS supplementation listed, 100% coded wire tagged and no fin clips. A total of 89,923 smolts from this group were released from secondary rearing pond 2.

Group 1 and Group 2 release numbers from BY2000 total 508,340. These smolts averaged 10.84 fish per pound for an average length of 16 centimeters (cm). All smolts from Brood Year 2000 were released in April 2002.

BY2001-Comprised of two groups of fish.

Group 1-Hatchery-origin reserve listed, 100% adipose fin clipped, no coded wire tags. A total of 909,926 smolts were released from this group.

Group 2-Hatchery-origin ISS supplementation listed, 100% coded wire tagged and no fin clips. A total of 295,992 smolts were released from this group.

Group 1 and Group 2 release numbers from BY2001 total 1,205,918. These smolts averaged 15.19 fish per pound for an average length of 14.6 cm. All smolts from Brood Year 2001 were released in April 2003.

BY2002-Comprised of three groups of fish.

Group 1-Hatchery-origin reserve listed, 100% adipose fin clipped, no coded wire tags. A total of 885,147 smolts were released from this group.

Group 2-Hatchery-origin ISS supplementation listed, 100% coded wire tagged and no fin clips. A total of 124,185 were released from this group.

Group 3-Hatchery-origin reserve listed study group, 100% adipose fin clipped and coded wire tagged. A total of 98,696 smolts were released from this group. Subtotals equal 67,321 with tag codes denoting early rearing at Pahsimeroi Hatchery, and 31,375 with differential tag codes denoting early rearing at Sawtooth Hatchery.

Smolts from the three BY 2002 release groups averaged 13.77 fish per pound at release for an average length of 14.9 cm.

No Reserve group fish originating from the three groups discussed above were released for natural spawning. All reserve group fish were either retained for spawning or killed for Tribal/Charitable giveaway. Fish with coded wire tags were released above the weir for natural spawning, retained for spawning, or killed for Tribal/Charitable giveaway. Snouts from fish containing coded wire tags that were not released for natural production were collected and sent to the department's lab in Nampa, ID for tag retrieval.

A total of 2,168-summer Chinook were trapped in 2005. This was the second largest summer Chinook run to return to the Pahsimeroi Hatchery. The hatchery origin component consisted of 4 mini-jacks, 65 jacks, and 1,771 adults (700 males and 1,071 females). The natural component consisted of 2 mini-jacks, 9 jacks, and 317 adults (151 males and 165 females). All natural/wild fish were released for natural reproduction. None were retained for spawning. (Tables 1–4; Figure 1–4).

ADULT AGE CLASS DETERMINATION

Two sets of criteria were used to determine age class of summer Chinook salmon that returned in 2005. The age of hatchery-origin summer Chinook was determined by mark type and fork length, while the natural-origin summer Chinook were aged by fork length only. Hatchery-origin summer Chinook with an adipose fin clip or coded wire tag and a fork length of less than 66 cm were classified as three years old (jacks).

Mini-jacks are defined as fish equal to or less than 44 cm in fork length. Dorsal fin ray cross-section analysis determined the absence of salt-water annuli. This suggests these fish remained in fresh water for one year prior to returning to the Pahsimeroi Hatchery.

Hatchery-origin summer Chinook with an adipose fin clip or coded wire tag and a fork length between 66 cm and 85 cm inclusive are classified as four years old. Hatchery-origin summer Chinook with an adipose fin clip or coded wire tag, and a fork length greater than 85 cm were classified as five years old. The age class criteria for natural-origin (unmarked) fish are as follows:

- Chinook with fork lengths greater than 85 cm were classified as five years old.
- Chinook with fork lengths between 66 cm and 85 cm inclusive were classified as four years old.
- Chinook with a fork length less than 66 cm were classified as jacks.
- Chinook with a fork length up to, and inclusive of, 44 cm were classified as mini-jacks.
-

Table 4 includes a breakdown of age class results, Mini-jacks are included in the jack category.

Upper Salmon River 2005 Salmon Fishing Season

The hatchery origin adult return in 2005 resulted in a harvestable surplus of summer Chinook salmon. The Idaho Fish and Game Commission approved a salmon season on the upper Salmon River for the first time since 1978.

The anglers were allowed to harvest adipose clipped salmon on a 17-mile stretch of the Salmon River from Iron Creek Bridge to a posted boundary near the mouth of the Pahsimeroi River. The season started July 9, 2005 and continued through August 7, 2005. Anglers were limited to one fish per day, three in possession, and ten for the season. Fishing hours were one half hour before sunrise each day, until 7:00 pm. The early daily closure was necessary so that Fish and Game personnel could adequately monitor the harvest while keeping workers safe on the busy highway. Anglers were also required to take any Chinook they caught to a check station by 8:30 pm on the day of harvest. Check stations were set up five miles upstream and downstream from the fishing boundaries. Barbless hooks were required measuring no more than 5/8 inch from the tip to the shank.

A total of 256 salmon were caught during the season, and 152 were harvested. Hatchery personnel recycled a total of 469 salmon back to the fishery. Out of the 469 salmon recycled to the fishery 275 (59%) returned to the Pahsimeroi Hatchery. For a summary of recaptured salmon refer to table 6.

SPECIAL MARKS/TAGS

Of the 2,168 Chinook trapped this year, one fish was found to have a radio transmitter. All fish were scanned for PIT tags and coded wire tags. Fish that contained radio tags were part of a study being conducted by the University of Idaho.

No PIT tags were detected this season. PIT tag recovery data is used to determine downstream survival of juvenile fish through the dams. PIT tags are also used to determine run timing of adults through the Columbia and Snake River corridors and to the hatchery. A total of 117 snouts containing coded wire tags were collected this season from brood year 2005 Chinook by hatchery personnel (Table 5). Snouts collected by Nampa Research personnel during redd count activities are not included in table 5.

Specific information on the radio tagged fish is as follows:

Trap Date	Sex	Fork Length (CM)	Clips or Marks	Origin	Radio Transmitter #
July 16	M	79	CWT	H	CH 21, code 085

H=Hatchery, N=Natural, CWT=Coded Wire Tagged,
AD=Adipose Clipped

ADULT HANDLING PROCEDURES

During the summer Chinook trapping season, the trap was checked daily and all fish were handled in accordance with protocols established by NOAA Fisheries. Most Chinook with an adipose fin (with the exception of surplus ISS adults) were anaesthetized in a solution of MS-222. While anaesthetized, fish were scanned for PIT tags and coded wire tags, measured to the nearest centimeter for fork length, and identified by sex. Each fish was also intraperitoneally injected with erythromycin at a rate of 20 mg/kg body weight for BKD management. All fish were allowed to recover in a freshwater recovery tank before being retained for spawning or released. No natural origin fish were held for spawning. Supplementation group fish (ISS) were released above the weir, held for spawning, or killed as surplus and given to local charities or the Shoshone Bannock tribe. Snouts were removed from these fish prior to distribution.

Adipose clipped Chinook were handled the same as Chinook with adipose fins intact, with the exception that they were not anesthetized prior to handling. Fish recycled to the fishery were neither anesthetized nor injected with erythromycin. It should be noted that as of return year 2005, all Chinook have to be scanned for the presence of coded wire tags (CWT's) as some adipose clipped reserve group Chinook now contain coded wire tags. This was not the case previously. These were classified as reserve study group fish. Surplus reserve group fish containing CWT's were not given away to SBT or local charities until snouts were removed.

All summer Chinook held for spawning were marked with a floy tag. Floy tagging each salmon during trapping makes the tracking of these fish easier during spawning season.

Scales were collected from all natural origin fish released above the weir. This was done in order to identify adults that emigrated to salt water as sub-yearlings (age 0) as well as analyze adult to adult survival among hatchery, wild, and mixed groups.

Peterson disk tags were applied to approximately 50 percent of the fish released above the weir. The tags were applied proportionately by gender and origin.

A small pelvic fin sample was collected from nearly all fish (for DNA purposes) that were released above the weir to spawn naturally. Two fish were accidentally missed during sampling. These DNA samples were collected as part of a study being conducted by IDFG Nampa Fisheries Research Technician, Brian Leth. His goal is to determine what contribution hatchery fish are making to the natural population versus wild fish. Collecting DNA samples from spawning adults and out-migrating juvenile salmon will allow Brian to determine genetically which group of fish makes the most contribution.

ADULT HOLDING POND RECORD

The number of Chinook retained for spawning each year is dictated to hatchery personnel by Idaho Fish and Game Fisheries biologists based on the number and origin of returning adults. Surplus hatchery-origin listed or hatchery-origin unlisted fish were killed and given to the Shoshone-Bannock Tribe (SBT) and local charities. A breakdown of the disposition of all fish and their listing status can be found in Table 4. Fish that were killed and given to the SBT and local charities can be found in Table 6.

Beginning July 1, and continuing through September 15, 2005 both the male and female holding ponds were treated 4 times weekly with a 1-hour, 167 ppm formalin treatment to prevent mortality caused by secondary mycotic infections.

This year's pre-spawn mortality equated to 7% of the 693 fish held for spawning. Female pre-spawn mortality totaled 38 and male pre-spawn mortality totaled 11. No trap mortalities occurred this season. No natural fish were held for spawning.

ADULT RELEASES

All natural origin fish were released to spawn naturally in the Pahsimeroi River. The number of natural origin fish released totaled 328 (166 females, 151 males, 9 jacks and 2 mini-jacks). The total number of ISS fish released for natural reproduction was 281 (165 females, 128 males, 12 jacks and 0 mini-jacks). Table 4 and Table 6 contain breakdowns of disposition summary for this return year.

SUMMER CHINOOK SPAWNING AND INCUBATION

Female Chinook were sorted for ripeness and spawned for the first time on September 6, 2005. Spawning concluded September 29, 2005. Each ripe female was killed and then spawned by incision method. Prior to incision, a 1cc sample of ovarian fluid was collected from sixty fish throughout the spawning season to test for Infectious Hematopoetic Necrosis (IHN) and Infectious Pancreatic Necrosis (IPN). After egg collection and fertilization, kidney samples were collected from all females to test for BKD and 20 head wedges were collected to test for whirling disease. All samples were sent to the Eagle Fish Health Laboratory (EFHL). Eggs from fish that tested high positive for BKD were culled. Normally, PFH culls eggs from fish that have an Enzyme Linked Immunosorbant Assay (ELISA) optical density of 0.25 or greater. A total of 43 females tested high ELISA

All eggs were incubated to eye-up at PFH. The incubator trays were loaded at the rate of one female per tray. From 48 hours after spawning until eye-up, eggs at PFH were treated three times a week with a 1,667-ppm formalin treatment to prevent fungal growth on the eggs, and three times a week with a 100-ppm argentyne treatment to prevent soft shell disease, a disease caused by bacteria that results in increased egg mortality and pre-mature hatching. At eye up (approximately 450 Fahrenheit temperature units (FTUs)), the eggs were shocked twice by dropping them into a bucket of water from a height of approximately 16 inches (41 cm).

Dead eggs were picked and enumerated with a Jensorter electronic counter/picker. The number of dead eggs and eyed-eggs were added together to obtain the total number of green eggs per female. By dividing the number of eyed-eggs by the number of green eggs, the overall eye-up percentage per female was determined (Table 7). Once the eggs reached the eyed stage, they were placed in coolers of water and transported to SFH for final incubation and early rearing. Prior to transport, ice was placed in the coolers to chill the water and eggs. . Due to the presence of whirling disease at PFH, all Chinook eggs are currently sent eyed to SFH for incubation and early rearing. Upon arrival at SFH, all eggs were tempered and disinfected with argentyne before being placed in standard vertical-flow incubators.

A total of 341 females were spawned of which 53 were culled. A total of 1,335,191 green eggs were collected for production purposes, for an average fecundity of 4,636 eggs per female. The overall eye-up percentage was 80.2% (Table 7). All viral samples tested negative for IPN and IHN. Kidney sample test results ranged from negative to high positive for BKD. Eggs from those females testing high positive were destroyed without enumeration. All progeny originating from broodstock retained at Pahsimeroi Hatchery for Brood Year 2005 were classified as reserve group listed.

Each female's eggs were placed into a separate bucket. Males were selected at random and each male was spawned directly into the bucket. Then, well water was added to activate the sperm and allowed to fertilize the eggs for 3 to 5 minutes. Consequently, some males were spawned more than once due to the fact that the males ripened earlier than normal this season and died before hatchery personnel had the chance to spawn them. After fertilization well water was then used to rinse the eggs. The eggs were water hardened in a 100 ppm solution of argentyne and allowed to sit for 60 minutes. Finally, eggs were poured directly into vertical stack incubator trays at PFH. Appendix A provides egg take numbers and smolt release history for the Pahsimeroi to date.

CRYOPRESERVATION

This Year no cryopreservation was conducted.

ADULT CARCASS DISPOSITION

During the spawning season all carcasses not donated to charity were placed into a refrigeration unit and frozen. At the conclusion of the spawning season, the frozen carcasses were transported to a rendering plant in Kuna, ID.

NON-TARGET SPECIES

Below is a list of non-target species that were trapped this season:

Rainbow Trout

Trap Date	Sex	Length (CM)	Disposition
July 6	M	44	Released
August 11	F	36	Released
August 22	F	31	Released
August 22	M	45	Released
August 24	F	34	Released
August 29	M	34	Released
September 2	M	39	Released
September 6	F	40	Released
September 9	M	40	Released
September 9	M	47	Released
September 15	M	35	Released
September 15	M	40	Released
September 19	M	40	Released
September 19	M	43	Released
September 22	M	39	Released

Cutthroat Trout

Trap Date	Sex	Length (CM)	Disposition
July 23	Unknown	30	Released

Bull Trout

Trap Date	Sex	Length (CM)	Disposition
September 22	Unknown	27	Released
September 26	Unknown	30	Released

FISH PRODUCTION

Because Chinook salmon are more susceptible to whirling disease when they are less than 3.5 inches in length, it is recommended that they be reared on Specific Pathogen-Free (SPF) water until attaining that size. Once the salmon have reached 3.5 inches, whirling disease symptoms become less overt, so the fish can be transferred to outside raceways supplied with river water.

At eye-up, all Pahsimeroi Brood Year 2005 summer Chinook eggs were sent to Sawtooth Fish Hatchery for incubation and early rearing. Eight lots of eggs were sent to Sawtooth Hatchery between September 29 and October 25, 2005. A total of 1,070,317 eyed eggs were incubated, with 30,069 dead eggs picked off resulting in a 97.2% survival rate to swim-up fry. Fry were transferred into four vats on well water for 15 to 28 days until the next lots were ready for transfer. The fry were transferred to outdoor raceways containing river water from January 8 through February 16, 2006.

A total of 1,036,660 fry were initially transferred into two raceways and subsequently thinned into six raceways (raceways 3-8) on June 6, 2006.

All Brood Year 2005 Pahsimeroi fingerlings were given their first 28 day prophylactic medicated feed treatment of Bio-Oregon 1.5 mm Aquamycin 2.25% starting June 18, 2006.

River water temperatures near 70 degrees F. caused an outbreak of "Ich" at Sawtooth Hatchery. Pahsimeroi fish were given five formalin treatments in August. An additional three formalin treatments were given in October for external mycosis.

A second 21 day medicated feed treatment was started August 21, 2006. Fish in raceways 3, 4, and 5 were fed Bio-Oregon 2.0 mm Aquamycin 2.25% at 36 fish per pound. Fish in raceways 6, 7, and 8 were fed their regular Skretting Diet.

Marking began September 11 and ended September 19, 2006. All fish were adipose clipped including 55,564 implanted with a CWT-tag code 10-30-80. The marking inventory totaled 990,531 fish.

Brood Year 2005 Pahsimeroi Summer Chinook fingerling were transferred to PFH on October 24, 25, and 26, 2006. Idaho Power Company hired Neil Ring Trucking for the transfer. The transfer was accomplished with a total of six trips. Transfer inventory totaled 933,604 fish with adipose clips only and 55,523 containing CWT's in addition to adipose clips. This results in a transfer inventory of 989,127. The fish averaged 27.6 fish per pound at transfer for a total weight of 35,838 pounds. These fish were fed a total of 38,515 pounds of food while at SFH for a conversion of 1.076.

Upon arrival at Pahsimeroi Hatchery, the fish were transferred into two new concrete lined secondary rearing ponds. Pond 1 received 480,232 adipose clipped only fish, as well as 55,523 fish adipose clipped and CWT tagged fish for an initial inventory of 535,758 fish. Pond 2 received 453,372 fish with adipose clips. Brood Year 2005 smolts were the first fish to complete their rearing cycle in these new ponds.

Brood Year 2005 smolts were fed a total of 59,928 pounds of feed during their rearing cycle, resulting in a conversion of 1.0 (Table 11). The conversion rate was calculated using the original number of summer Chinook minus the number of mortalities observed. It should be noted, however, that predation by river otters and various bird species cannot be quantified.

Feed costs are summarized in Table 8, production costs are summarized in table 9, and survival percentages by life stage are summarized in table 10. Pre-release organosomatic indices can be found in Table 11.

SMOLT RELEASES

Pahsimeroi Brood Year 2005 smolts were released volitionally from the secondary rearing ponds from April 9, 2007 through April 25, 2007. To reduce the chance of large numbers of fish entering the intake canal at the lower facility, the smolt release was staggered, with screens removed on alternating days between ponds for the first week of the release.

One set of dam boards was removed from each pond starting on April 16th. Dam boards were removed in a staggered fashion as per screen removal. The smolt release ended officially on April 25th 2007. On that day, Regional Fisheries personnel assisted Pahsimeroi Hatchery with electro-fishing an estimated 300 remaining smolts from the ponds.

A total of 535,069 smolts were released from pond 1. This release number consisted of 479,602 adipose clipped fish and 55,467 adipose clipped and coded wire tagged fish. Pond 1 smolts averaged 17.3 fish per pound at the time of release. Additionally, 250 fish from pond 1 were PIT tagged.

A total of 452,391 smolts were released from pond 2. All were adipose clipped only. Pond 2 smolts averaged 15.6 fish per pound at the time of release. A total of 248 fish from pond 2 were PIT tagged.

The individual pond release numbers above bring the total Brood Year 2005 smolt release to 987,460. This subtotal includes 931,993 smolts with adipose clips only and 55,467 with CWT's in addition to adipose clips. The fish size for both ponds combined averages 16.48 fish per pound (13.2 cm in length) for a total weight of 59,928 pounds. All fish were classified as Reserve group listed status.

For an overview of the brood stock history and smolt releases throughout PFH's history, see Appendix A

PAHSIMEROI FISH HEALTH SECTION

Diseases Encountered and Treatment. While being early reared at Sawtooth Hatchery, these fish became infested with *Ichthyophthirius multifiliis*, the causative agent of "ICH". These fish were treated 3 times per week with formalin at 167 mg/l until signs of infestation ceased. This infestation was caught and treated successfully before mortalities commenced.

These fish received 2 erythromycin medicated feed treatments as a pre-emptive treatment for BKD. The target dose was 100 mg/kg/day for 28 days. Pre-liberation sampling did not detect pathogens in the 20 fish sampled.

Organosomatic Index. See attachments.

Acute Losses. Neither acute nor chronic losses were experienced by this program at either Sawtooth Hatchery or Pahsimeroi Hatchery.

Other Assessments. A cooperative effort between IDFG and IPC to renovate Pahsimeroi Hatchery is now being realized. This project will reduce exposure of young fish to *Myxobolus cerebralis* during the most susceptible period. At present, the initial construction phase has begun. The hatchery staff of Pahsimeroi and the fisheries office and engineers at Idaho Power should be acknowledged for the job they have done in putting together this renovation project. Brood Year 2005 Chinook salmon completed rearing in the new ponds.

Organosomatic Index See Table 11.

FISH MARKING

Pahsimeroi summer Chinook at SFH were marked by the MATS unit. Marking began September 11 and ended September 19, 2006. A total of 990,531 fish received adipose clips, including 55,564 that received Cat's in addition to adipose clips. The CWT group had the tag code: 10-30-80.

NEW UPPER HATCHERY CONSTRUCTION PROGRESS FOR BROOD YEAR 2005

- Salmon River Electric finalized installation of 3-phase power to the upper hatchery.
- Hatchery Personnel salvaged several items prior to construction including fish feeders, timers, chain link fence, work benches and pond grating.
- IPC engineer Ryan Adelman set up his trailer at the lower hatchery and moved on-site to begin coordinating and monitoring construction efforts.
- The walk in freezer, shop, concrete intake canal, earthen rearing ponds, and earthen settling basins were removed.
- Summit Excavation installed 64 ground water pumps at a depth of 22 feet to dewater the site.
- Ground water drain lines were laid and buried, and new concrete lined ponds for secondary rearing were constructed.
- Fish remaining in Spring Creek (adjacent to the old hatchery intake) and the old hatchery discharge were electro-shocked and released to the Pahsimeroi River.
- Fiber Optic conduit was installed in preparation for DSL connection. The Fiber Optics was subsequently energized and activated for DSL connection.
- The new secondary rearing ponds modified intake structure was completed. The new intake features a fixed screen below two existing roller screens. Debris loads and flows were monitored and recorded.
- A smolt release strategy was developed and implemented for the new upper rearing ponds
- Construction began on the new incubation and early rearing building.

HATCHERY IMPROVEMENTS

- A new fish killing machine was utilized for the first time this Brood Year. This machine works very well, making the killing process much cleaner and more humane.
- Hatchery personnel worked with Nampa Research on the Beta-Version of a new trapping database.
- A new air conditioner was purchased and installed in the hatchery office.
- A new MPC desktop unit was installed in the lower hatchery office.
- IPC Hagerman Shop personnel modified the stop log keyway structure at the upper site to reduce leakage between keyways.
- The Zetron alarm auto-dialer at the lower hatchery malfunctioned and was replaced with a new unit by IPC.
- New property was purchased by IPC for a new residence for the Assistant Manager. Harbor Well Drilling drilled a domestic well on the new property. A mobile home is scheduled for installment on the property in 2007.
- The hatchery 2-Ton was prepared for auction and delivered to the Eagle Truck Shop. A new International diesel unit has been purchased and is awaiting delivery.

RECOMMENDATIONS

Complete renovation of the upper hatchery began in the spring of 2006. Idaho Department of Fish and Game recommendations to develop a (SPF) water source to provide pathogen-free water for use in rearing juvenile fish is now becoming a reality. Due to the presence of whirling disease at PFH, all Chinook eggs are currently sent eyed to SFH for incubation and early rearing. A minimum of 10 cfs of SPF water will be needed to raise one million Chinook to a size of 8.9 cm prior to exposure to river water containing *M. cerebralis*, the causative agent of whirling disease. Brood Year 2008 Chinook salmon are scheduled to be the first generation of Pahsimeroi Summer Chinook to utilize the new incubation and early rearing facility following substantial completion of the new facility.

ACKNOWLEDGEMENTS

We would like to thank Paul Abbott and the staff at IPC for their continued support. We are especially grateful for the IPC's dedication and extra hours invested on-site during the construction phase of the new hatchery renovation. We would also like to thank the crew at SFH for all their help with the incubation and early rearing of our fish.

Table 1. Pahsimeroi Hatchery Brood Year 2005 summer Chinook salmon run timing

Date Trapped	Hatchery Males	Natural Males	Total Males	Hatchery Females	Natural Females	Total Females	Total Trapped
20-Jun	0	0	0	4	1	5	5
21-Jun	3	1	4	3	0	3	7
22-Jun	0	2	2	4	0	4	6
23-Jun	1	0	1	1	0	1	2
24-Jun	1	1	2	6	0	6	8
25-Jun	0	0	0	0	0	0	0
26-Jun	0	0	0	0	0	0	0
27-Jun	25	7	32	31	6	37	69
28-Jun	10	0	10	19	0	19	29
29-Jun	15	3	18	26	5	31	49
30-Jun	17	2	19	34	1	35	54
1-Jul	23	5	28	31	8	39	67
2-Jul	0	0	0	0	0	0	0
3-Jul	33	7	40	61	7	68	108
4-Jul	0	0	0	0	0	0	0
5-Jul	42	8	50	50	11	61	111
6-Jul	23	1	24	34	6	40	64
7-Jul	27	5	32	37	10	47	79
8-Jul	25	5	30	52	9	61	91
9-Jul	16	2	18	33	6	39	57
10-Jul	12	3	15	38	5	43	58
11-Jul	16	5	21	10	5	15	36
12-Jul	13	3	16	15	6	21	37
13-Jul	18	4	22	17	3	20	42
14-Jul	17	2	19	11	6	17	36
15-Jul	23	6	29	27	3	30	59
16-Jul	10	4	14	19	0	19	33
17-Jul	40	5	45	51	6	57	102
18-Jul	35	3	38	47	4	51	89
19-Jul	50	7	57	59	7	66	123
20-Jul	21	4	25	34	6	40	65
21-Jul	18	1	19	26	4	30	49
22-Jul	12	3	15	17	5	22	37
23-Jul	13	3	16	21	1	22	38
24-Jul	13	1	14	9	3	12	26
25-Jul	6	1	7	7	2	9	16
26-Jul	11	1	12	7	5	12	24
27-Jul	3	2	5	8	4	12	17
28-Jul	6	4	10	5	2	7	17
29-Jul	4	2	6	4	0	4	10

Table 1 Continued

30-Jul	0	0	0	0	0	0	0
31-Jul	0	0	0	0	0	0	0
1-Aug	15	3	18	30	1	31	49
2-Aug	8	1	9	6	3	9	18
3-Aug	1	0	1	5	1	6	7
4-Aug	3	0	3	6	1	7	10
5-Aug	0	0	0	0	0	0	0
6-Aug	0	0	0	0	0	0	0
7-Aug	0	0	0	0	0	0	0
8-Aug	14	3	17	12	1	13	30
9-Aug	2	0	2	10	1	11	13
10-Aug	0	0	0	0	0	0	0
11-Aug	5	2	7	3	0	3	10
12-Aug	0	0	0	0	0	0	0
13-Aug	0	0	0	0	0	0	0
14-Aug	0	0	0	0	0	0	0

* Trap not sorted these days

Table 1 Continued.

Date Trapped	Hatchery Males	Natural Males	Total Males	Hatchery Females	Natural Females	Total Females	Total Trapped
15-Aug	6	0	6	7	1	8	14
16-Aug	3	0	3	5	0	5	8
17-Aug	0	0	0	0	0	0	0
18-Aug	4	2	6	2	1	3	9
19-Aug	0	0	0	0	0	0	0
20-Aug	0	0	0	0	0	0	0
21-Aug	0	0	0	0	0	0	0
22-Aug	3	0	3	7	1	8	11
23-Aug	0	0	0	0	0	0	0
24-Aug	4	1	5	4	0	4	9
25-Aug	0	0	0	0	0	0	0
26-Aug	2	0	2	6	0	6	8
27-Aug	0	0	0	0	0	0	0
28-Aug	0	0	0	0	0	0	0
29-Aug	5	4	9	2	0	2	11
30-Aug	7	0	7	1	0	1	8
31-Aug	0	0	0	0	0	0	0
1-Sep	0	0	0	0	0	0	0
2-Sep	9	5	14	2	0	2	16
3-Sep	0	0	0	0	0	0	0
4-Sep	0	0	0	0	0	0	0

Table 1 Continued

5-Sep	0	0	0	0	0	0	0	*
6-Sep	21	3	24	7	1	8	32	
7-Sep	0	0	0	0	0	0	0	*
8-Sep	0	0	0	0	0	0	0	*
9-Sep	10	9	19	16	1	17	36	
10-Sep	0	0	0	0	0	0	0	*
11-Sep	0	0	0	0	0	0	0	*
12-Sep	14	6	20	15	0	15	35	
13-Sep	0	0	0	0	0	0	0	*
14-Sep	0	0	0	0	0	0	0	*
15-Sep	15	3	18	33	3	36	54	
16-Sep	3	2	5	8	0	8	13	
17-Sep	0	0	0	0	0	0	0	*
18-Sep	0	0	0	0	0	0	0	*
19-Sep	7	3	10	18	2	20	30	
20-Sep	0	0	0	0	0	0	0	*
21-Sep	0	0	0	0	0	0	0	*
22-Sep	4	2	6	6	1	7	13	
23-Sep	0	0	0	0	0	0	0	*
24-Sep	0	0	0	0	0	0	0	*
25-Sep	0	0	0	0	0	0	0	*
26-Sep	2	0	2	0	0	0	2	
27-Sep	0	0	0	0	0	0	0	*
28-Sep	0	0	0	0	0	0	0	*
29-Sep	0	0	0	2	0	2	2	
30-Sep	0	0	0	0	0	0	0	Trap Off
1-Oct	0	0	0	0	0	0	0	Trap Off
2-Oct	0	0	0	0	0	0	0	Trap Off
TOTAL:	769	162	931	1,071	166	1,237	2,168	

* Trap not sorted these days

Table 2. Length frequency of male summer Chinook for Pahsimeroi Fish Hatchery, 2005

MALES										
FORK LENGTH (CM)	AD-CLIP PONDED	AD-CLIP RELEASED	ADCWT PONDED	ADCWT RELEASED	CWT PONDED	CWT RELEASED	UNMARKED PONDED	UNMARKED RELEASED	RECYCLED (FISHERY)	TOTAL TRAPPED
41	0	0	0	0	2	0	0	0	0	2
42	0	0	0	0	1	0	0	1	0	2
43	0	0	0	0	1	0	0	1	0	2
44	0	0	0	0	0	0	0	1	0	1
45	0	0	0	0	2	0	0	0	0	2
46	1	0	0	0	0	0	0	0	0	1
47	0	0	0	0	1	0	0	1	0	2
48	1	0	0	0	0	0	0	0	0	1
49	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	1	0	0	0	1
52	0	0	0	0	0	0	0	1	0	1
53	0	0	0	0	0	0	0	0	0	0
54	2	0	0	0	0	0	0	1	1	4
55	3	0	0	0	0	0	0	1	1	5
56	1	0	1	0	1	0	0	0	1	4
57	0	0	0	0	1	0	0	0	0	1
58	0	0	0	0	1	2	0	1	1	5
59	1	0	0	0	0	1	0	0	1	3
60	3	0	0	0	1	3	0	0	2	9
61	4	0	0	0	0	1	0	1	2	8
62	4	0	0	0	0	1	0	0	1	6
63	1	0	0	0	0	0	0	1	1	3
64	2	0	0	0	0	1	0	1	1	5
65	6	0	0	0	0	2	0	0	4	12
66	6	0	0	0	0	0	0	3	3	12
67	5	0	0	0	19	1	0	1	3	10

68	5	0	0	0	0	4	0	4	3	16
69	8	0	0	0	0	3	0	2	1	14
70	13	0	0	0	0	1	0	3	4	21
71	12	0	0	0	0	3	0	2	4	21
72	12	0	0	0	0	10	0	5	7	34
73	21	0	0	0	0	9	0	4	4	38
74	25	0	0	0	1	5	0	5	4	40
75	18	0	0	0	1	8	0	8	7	
76	22	0	0	0	1	13	0	7	19	
77	14	0	0	0	0	10	0	13	21	58
78	30	0	0	19	0	9	0	13	13	65
79	24	0	0	0	0	14	0	7	6	51
80	36	0	0	0	0	6	0	5	8	55
81	29	0	0	0	1	7	0	13	8	58
82	25	0	0	0	0	4	0	11	8	48
83	24	0	0	0	1	5	0	8	7	45
84	20	0	0	0	0	5	0	4	10	39
85	13	0	0	0	1	1	0	7	6	28
86	12	0	0	0	0	0	0	7	7	26
87	4	0	0	0	0	1	0	6	1	12
88	13	0	0	0	0	2	0	3	2	20
89	1	0	0	0	0	1	0	1	2	5
90	1	0	0	0	0	1	0	1	1	4
91	2	0	0	0	0	0	0	1	0	3
92	2	0	0	0	0	0	0	3	0	5
93	1	0	0	0	0	1	0	0	2	4
94	2	0	0	0		0	0	0	1	3
95	2	0	0	0	0	2	0	0	0	4
96	2	0	0	0	0	0	0	0	0	2
97	0	0	0	0	0	2	0	1	0	3
98	0	0	0	0	0	0	0	1	0	1

99	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	1	0	1
101	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	1	0	1
TOTALS:	433	0	1	0	0	140	0	162	178	931

Table 3. Length frequency of female summer Chinook for Pahsimeroi Fish Hatchery, 2005

TOTAL TRAPPED		AD-CLIP PONDED		AD-CLIP RELEASED		CWT PONDED		CWT RELEASED		UNMARKED PONDED		UNMARKED RELEASED	
FL(CM)	NUMBER	FL(CM)	NUMBER	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	55	0	55	0
56	0	56	0	56	0	56	0	56	0	56	0	56	0
57	0	57	0	57	0	57	0	57	0	57	0	57	0
58	1	58	1	58	0	58	0	58	0	58	0	58	0
59	0	59	0	59	0	59	0	59	0	59	0	59	0
60	1	60	1	60	0	60	0	60	0	60	0	60	0
61	0	61	0	61	0	61	0	61	0	61	0	61	0
62	0	62	0	62	0	62	0	62	0	62	0	62	0
63	1	63	0	63	0	63	0	63	0	63	0	63	1
64	0	64	0	64	0	64	0	64	0	64	0	64	0
65	0	65	0	65	0	65	0	65	0	65	0	65	0
66	1	66	0	66	0	66	1	66	0	66	0	66	0
67	5	67	3	67	0	67	0	67	0	67	0	67	1
68	9	68	2	68	0	68	3	68	3	68	0	68	0
69	14	69	6	69	0	69	1	69	2	69	0	69	3
70	21	70	11	70	0	70	1	70	5	70	0	70	0
71	29	71	14	71	0	71	4	71	7	71	0	71	0
72	40	72	23	72	0	72	4	72	7	72	0	72	4
73	51	73	20	73	0	73	10	73	6	73	0	73	5
74	94	74	39	74	0	74	9	74	16	74	0	74	12
75	88	75	35	75	0	75	13	75	11	75	0	75	9
76	123	76	49	76	0	76	7	76	9	76	0	76	27
77	138	77	61	77	0	77	11	77	21	77	0	77	13
78	132	78	50	78	0	78	11	78	15	78	0	78	16
79	106	79	34	79	0	79	13	79	14	79	0	79	16
80	98	80	38	80	0	80	10	80	12	80	0	80	16
81	78	81	31	81	0	81	5	81	12	81	0	81	11
82	54	82	18	82	0	82	3	82	12	82	0	82	6
83	31	83	14	83	0	83	3	83	3	83	0	83	7

84	20	84	8	84	0	84	1	84	0	84	0	84	4
85	15	85	3	85	0	85	1	85	4	85	0	85	2
86	15	86	6	86	0	86	1	86	1	86	0	86	1
87	10	87	4	87	0	87	1	87	2	87	0	87	2
88	14	88	4	88	0	88	2	88	1	88	0	88	3
89	10	89	4	89	0	89	1	89	1	89	0	89	1
90	13	90	8	90	0	90	0	90	0	90	0	90	3
91	8	91	6	91	0	91	0	91	0	91	0	91	0
92	7	92	3	92	0	92	0	92	0	92	0	92	2
93	7	93	1	93	21	93	0	93	1	93	0	93	1
94	2	94	2	94	0	94	0	94	0	94	0	94	0
95	0	95	0	95	0	95	0	95	0	95	0	95	0
96	0	96	0	96	0	96	0	96	0	96	0	96	0
97	1	97	0	97	0	97	0	97	0	97	0	97	0
98	0	98	0	98	0	98	0	98	0	98	0	98	0
99	0	99	0	99	0	99	0	99	0	99	0	99	0
100	0	100	0	100	0	100	0	100	0	100	0	100	0
101	0	101	0	101	0	101	0	101	0	101	0	101	0
102	0	102	0	102	0	102	0	102	0	102	0	102	0
103	0	103	0	103	0	103	0	103	0	103	0	103	0
104	0	104	0	104	0	104	0	104	0	104	0	104	0
105	0	105	0	105	0	105	0	105	0	105	0	105	0
106	0	106	0	106	0	106	0	106	0	106	0	106	0
107	0	107	0	107	0	107	0	107	0	107	0	107	0
108	0	108	0	108	0	108	0	108	0	108	0	108	0
TOTALS:	1,237		499		0		116		165		0		166

Table 4. Pahsimeroi Fish Hatchery summer Chinook disposition summary, Brood Year 2005

Released For Natural Spawning																
Hatchery Origin Adult Males				Hatchery Origin Adult Females				Natural Origin Adult Males		Natural Origin Adult Females		Natural Jacks	Hatchery Origin Jacks*			
Age 4 Males Ad-Clipped (L)	Age 4 Males CWT (L)	Age 5 Males Ad-Clipped (L)	Age 5 Males CWT (L)	Age 4 Females Ad-Clipped (L)	Age 4 Females CWT (L)	Age 5 Females Ad-Clipped (L)	Age 5 Females CWT (L)	Age 4 Males Unmarked (L)	Age 5 Males Unmarked(L)	Age 4 Females Unmarked (L)	Age 5 Females Unmarked (L)	Jacks Unmarked (L)	Jacks CWT (L)	Jacks Ad-Clipped (L)	Jacks ADCWT (L)	
Total	0	118	0	10	0	159	0	6	125	26	153	13	11	12	0	0
% of Total Rel.	0.0%	95.2%	0.0%	100.0%	0.0%	58.9%	0.0%	54.5%	100.0%	100.0%	100.0%	100.0%	100.0%	52.2%	0.0%	0.0%
Ponded For Hatchery Production-Includes Pre-Spawn Mortality and Fish Killed for Tribal/Charitable Giveaway																
Hatchery Origin Adult Males				Hatchery Origin Adult Females				Natural Origin Adult Males		Natural Origin Adult Females		Natural Jacks	Hatchery Origin Jacks*			
Age 4 Males Ad-Clipped (L)	Age 4 Males CWT (L)	Age 5 Males Ad-Clipped (L)	Age 5 Males CWT (L)	Age 4 Females Ad-Clipped (L)	Age 4 Females CWT (L)	Age 5 Females Ad-Clipped (L)	Age 5 Females CWT (L)	Age 4 Males Unmarked (L)	Age 5 Males Unmarked(L)	Age 4 Females Unmarked (L)	Age 5 Females Unmarked (L)	Jacks Unmarked (L)	Jacks CWT (L)	Jacks Ad-Clipped (L)	Jacks ADCWT (L)	
Total	362	6	42	0	461	111	38	5	0	0	0	0	0	11	29	1
% of Total Pnd.	71.3%	4.8%	72.4%	0.0%	63.4%	41.1%	60.3%	45.5%	0.0%	0.0%	0.0%	0.0%	0.0%	47.8%	64.4%	100.0%
Recycled to Fishery																
Hatchery Origin Adult Males				Hatchery Origin Adult Females				Natural Origin Adult Males		Natural Origin Adult Females		Natural Jacks	Hatchery Origin Jacks*			
Age 4 Males Ad-Clipped (L)	Age 4 Males CWT (L)	Age 5 Males Ad-Clipped (L)	Age 5 Males CWT (L)	Age 4 Females Ad-Clipped (L)	Age 4 Females CWT (L)	Age 5 Females Ad-Clipped (L)	Age 5 Females CWT (L)	Age 4 Males Unmarked (L)	Age 5 Males Unmarked(L)	Age 4 Females Unmarked (L)	Age 5 Females Unmarked (L)	Jacks Unmarked (L)	Jacks CWT (L)	Jacks Ad-Clipped (L)	Jacks ADCWT (L)	
Total	146	0	16	0	266	0	25	0	0	0	0	0	0	16	0	
% of Total Rec.	28.7%	0.0%	27.6%	0.0%	36.6%	0.0%	39.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.6%	0.0%	
Trapping Totals by Gender, Year Class, and Origin for Brood Year 2005																
Hatchery Origin Adult Males				Hatchery Origin Adult Females				Natural Origin Adult Males		Natural Origin Adult Females		Natural Jacks	Hatchery Origin Jacks*			
Age 4 Males Ad-Clipped (L)	Age 4 Males CWT (L)	Age 5 Males Ad-Clipped (L)	Age 5 Males CWT (L)	Age 4 Females Ad-Clipped (L)	Age 4 Females CWT (L)	Age 5 Females Ad-Clipped (L)	Age 5 Females CWT (L)	Age 4 Males Unmarked (L)	Age 5 Males Unmarked(L)	Age 4 Females Unmarked (L)	Age 5 Females Unmarked (L)	Jacks Unmarked (L)	Jacks CWT (L)	Jacks Ad-Clipped (L)	Jacks ADCWT (L)	
Total	508	124	58	10	727	270	63	11	125	26	153	13	11	23	45	1
% of Total Trpd.	23.4%	5.7%	2.7%	0.5%	33.5%	12.5%	2.9%	0.5%	5.8%	1.2%	7.1%	0.6%	0.5%	1.1%	2.1%	0.0%

Table 5. Pahsimeroi summer Chinook coded wire tag summary, Brood Year 2005.

DATE COLLECTED	SEX	FLOY TAG	FL(CM)	CLIPS OR MARKS	SNOUT BAG NUMBER	COMMENTS
11-Aug	f	n/a	80	cwt	05ic1	not spawned:pre-spawn mortality
11-Aug	f	n/a	77	cwt	05ic2	not spawned:pre-spawn mortality
15-Aug	m	n/a	74	cwt	05ic3	not spawned:pre-spawn mortality
18-Aug	f	n/a	79	cwt	05ic4	not spawned:pre-spawn mortality
30-Aug	f	744	87	cwt	05ic5	not spawned:pre-spawn mortality
30-Aug	f	n/a	68	cwt	05ic6	not spawned:pre-spawn mortality
2-Sep	f	n/a	74	cwt	05ic7	not spawned:pre-spawn mortality
6-Sep	f	195	83	cwt	05ic8	
6-Sep	f	457	75	cwt	05ic9	
6-Sep	f	456	75	cwt	05ic10	
6-Sep	f	739	58	cwt	05ic11	
6-Sep	f	860	76	cwt	05ic12	
6-Sep	f	480	77	cwt	05ic13	
6-Sep	f	missing	85	cwt	05ic14	
6-Sep	f	635	75	cwt	05ic15	
9-Sep	f	985	74	cwt	05ic16	
9-Sep	f	missing	75	cwt	05ic17	
9-Sep	f	34	75	cwt	05ic18	
9-Sep	f	754	76	cwt	05ic19	
9-Sep	m	795	43	cwt	05ic20	
9-Sep	m	680	74	cwt	05ic21	
9-Sep	f	592	72	cwt	05ic22	
9-Sep	f	698	78	cwt	05ic23	
9-Sep	f	980	75	cwt	05ic24	
9-Sep	f	710	72	cwt	05ic25	
12-Sep	f	181	74	cwt	05ic26	
12-Sep	f	734	82	cwt	05ic27	
12-Sep	f	277	78	cwt	05ic28	
12-Sep	f	219	75	cwt	05ic29	
12-Sep	f	missing	78	cwt	05ic30	
12-Sep	f	missing	79	cwt	05ic31	
12-Sep	f	118	85	cwt	05ic32	
12-Sep	m	n/a	57	cwt	05ic33	
12-Sep	f	missing	88	cwt	05ic34	
12-Sep	f	missing	79	cwt	05ic35	
12-Sep	f	missing	80	cwt	05ic36	
12-Sep	f	982	81	cwt	05ic37	
12-Sep	m	missing	85	cwt	05ic38	
12-Sep	f	713	80	cwt	05ic39	
12-Sep	f	619	80	cwt	05ic40	
15-Sep	f	309	79	cwt	05ic41	
15-Sep	m	missing	76	cwt	05ic42	
15-Sep	f	971	73	cwt	05ic43	
15-Sep	f	115	75	cwt	05ic45	
15-Sep	f	989	78	cwt	05ic46	
15-Sep	f	726	73	cwt	05ic47	
15-Sep	f	779	77	cwt	05ic48	
15-Sep	m	616	56	adcwt	05ic49	
15-Sep	f	998	75	cwt	05ic50	
15-Sep	m	747	60	cwt	05ic51	
15-Sep	f	174	78	cwt	05ic52	

Table 5 Continued

15-Sep	f	463	74	cwt	05ic53	
15-Sep	f	697	81	cwt	05ic54	
15-Sep	m	802	42	Cwt	05ic55	
15-Sep	f	838	80	cwt	05ic56	
15-Sep	m	333	58	cwt	05ic57	
15-Sep	f	missing	77	cwt	05ic58	
15-Sep	f	840	68	cwt	05ic59	
15-Sep	f	987	77	cwt	05ic61	
15-Sep	f	missing	78	cwt	05ic62	
15-Sep	f	988	80	cwt	05ic63	

Table 6. Pahsimeroi summer Chinook disposition summary, Brood Year 2005.

Disposition	Males	Females
Trap Mortality	0	0
Ponded-Pre-Spawn Mortality	11	38
Recycled fo Fishery	178	291
Surplus-Killed for Charities and Tribes*	54	77
Surplus Females in Holding-Killed Without Spawning	0	159
Females Spawmed-Eyed Eggs Shipped to Sawtooth Hatchery	0	288
Females Spawmed-Eggs Rejected or Culled Later	0	53
Released Above Weir	302	331
Mini-Jacks- Killed	6	0
Males Spawmed and Killed	352	0
Males- Died in Holding After 30 percent Spawning Completed	28	0
Total Chinook Trapped Brood Year 2005 Pahsimeroi Hatchery	931	1,237

* All other carcasses stored in refrigerated trailer and taken to rendering plant.

* Does not include recaptures-recapture summary below.

Recaptures	Males	Females
Killed for Charities and Tribes	18	19
Killed-Non Edible Carcasses in Refrigerated Trailer	53	79
Spawmed	25	15
Trucked back to Salmon River	28	38
Total Chinook Recaptured Brood Year 2005 Pahsimeroi Hatchery	124	151

Table 7. Brood Year 2005 Pahsimeroi summer Chinook spawning summary.

LOT NO.	SPAWN DATE	TOTAL FEMALES SPAWNED	FEMALES-EGGS REJECTED (BKD)	FEMALES-EGGS REJECTED (QUALITY)	EYED EGGS	BAD EGGS	TOTAL EGGS	PERCENT EYE-UP	AVERAGE FECUNDITY
1	9/6/05	34	2	1	98,808	39,508	138,316	71.4%	4,462
2	9/9/05	29	2	0	70,357	45,653	116,010	60.6%	4,297
3	9/12/05	49	1	0	157,035	56,180	213,215	73.7%	4,442
4	9/15/05	73	6	4	249,038	33,577	282,615	88.1%	4,486
5	9/19/05	48	7	3	151,254	33,037	184,291	82.1%	4,850
6	9/22/05	49	12	1	156,788	24,409	181,197	86.5%	5,033
7	9/26/05	39	6	0	136,425	25,486	161,911	84.3%	4,906
8	9/29/05	20	7	1	50,612	7,024	57,636	87.8%	4,803
TOTALS		341	43	10	1,070,317	264,874	1,335,191	80.2%	4,636

** Estimated by multiplying females rejected by average lot fecundity.

Table 8. Brood Year 2005 feed summary for Pahsimeroi Fish Hatchery.

Feed Type/Size	Pounds Fed To Date	Cost per Pound	Total Feed Cost
Skretting #0 Crumble	924	\$0.99	\$914.76
Skretting #1 Crumble	1,698.00	\$0.99	\$1,681.02
Skretting #2 Crumble	4,326.0	\$0.99	\$4,282.74
Skretting Nutra Fry ProActive 1.2 mm	2,112.0	\$0.91	\$1,921.92
Bio-Diet 1.5 mm 2.25% AQM-100	5,896.0	\$2.12	\$12,499.52
Skretting Nutra Fry ProActive 1.5 mm	5,368.0	\$0.76	\$4,079.68
Skretting Nutra Fry ProActive 2.0 mm	35,816.0	\$0.82	\$29,369.12
Bio-Diet 2.5 mm 2.25% AQM-100	4,311.0	\$2.10	\$9,053.10
Totals:	60,451.0		\$63,801.86

Table 9. Pahsimeroi Hatchery Brood Year 2005 production costs.

Number of fish	Pounds of feed	Cost of Feed	Pounds of Fish	Conversion	Total Budget	Cost per Thousand Fish	Cost per Pound of Fish
987,460	60,451	\$63,801.86	59,928	1.0	\$884,150.68	\$895.38	\$14.63

*Does not include capital outlay

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Table10. Pahsimeroi Hatchery Brood Year 2005 smolt survival by life stage.

Life Stages		Numbers		Survival Percentages
Green Eggs		1,335,191		
Egg Pickoff		264,874		
Eyed Eggs		1,070,317		80.2%
Alevin Pickoff		30,069		
Fry Poned		1,040,248		97.2%
Fry Mortality		51,121		
Fingerling Poned		989,127		92.4%
Fingerling Mortality		1,667		
Smolts Released		987,460		92.3%

Table 11. Pathology fish health report, Pahsimeroi Hatchery pre-liberation Brood Year 2005

SUMMARY OF FISH AUTOPSY

ACCESSION NO:		LOCATION:	Pahsimeroi Hatchery
SPECIES:	Chinook Summer	AUTOPSY DATE:	
STRAIN:	Pahsimeroi	AGE:	Juv
UNIT:	P1 and P2	SAMPLE SIZE:	
REASON FOR AUTOPSY:	prelib.		
INVESTIGATOR(S):	Munson		
REMARKS:			

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	MEAN	STANDARD DEVIATION
LENGTH	0.00	0.00
WEIGHT	0.00	0.00
KTL*:	0.00	0.00
CTL:**	0.00	0.00
HEMATOCRIT:	49.2	4.12
LEUCOCRIT:	0.00	0.00
SERUM PROTEIN:		

*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

**CONVERTED FROM KTL,EXPRESSED AS CTL TIMES 10 TO THE FOURTH POWER

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EYES		GILLS		PSEUDO BRANCHES		THYMUS		MESEN. FAT		SPLEEN		HIND	GUT
N	20	N	20	N	20	0	20	0	7	B	2		0
B1	0	F	0	S	0	1	0	1	12	R	18		1
B2	0	C	0	L	0	2	0	2	1	G	0		2
E1	0	M	0	S&L	0			3	0	NO	0		
E2	0	P	0	I	0			4	0	E	0		
H1	0	OT	0	OT	0	Mean=0.00				OT	0		Mean=0.00
H2	0			O	0			Mean=2.85 3.2					
M1	0												
M2	0			29									
OT	0												

SUMMARY OF NORMALS

20

20

20

20

20

20

SEX

M:0

F:0

U:0

GENERAL REMARKS

FIGURES

Figure 1. Brood Year 2005 summer Chinook salmon run timing for Pahsimeroi Fish Hatchery.

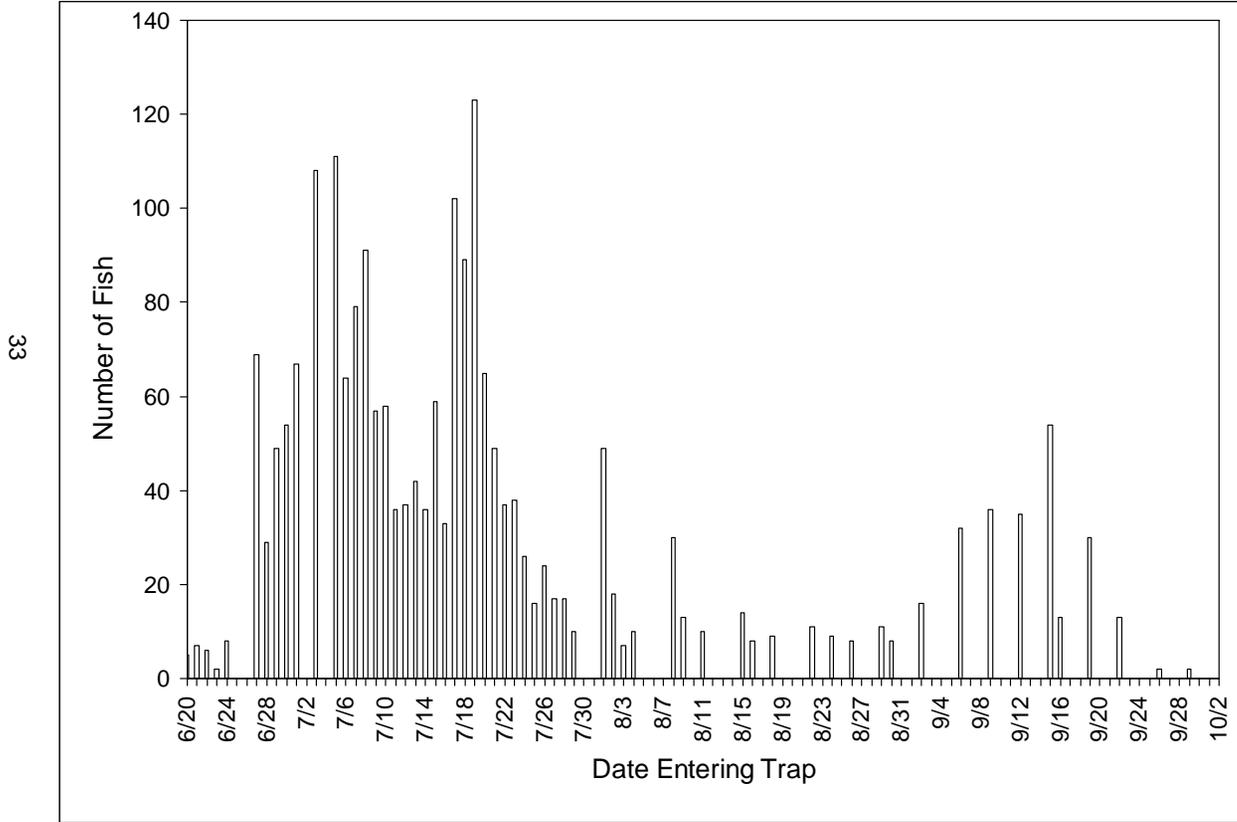


Figure 1-A. Brood Year 2005 natural origin male summer Chinook run timing for Pahsimeroi Hatchery.

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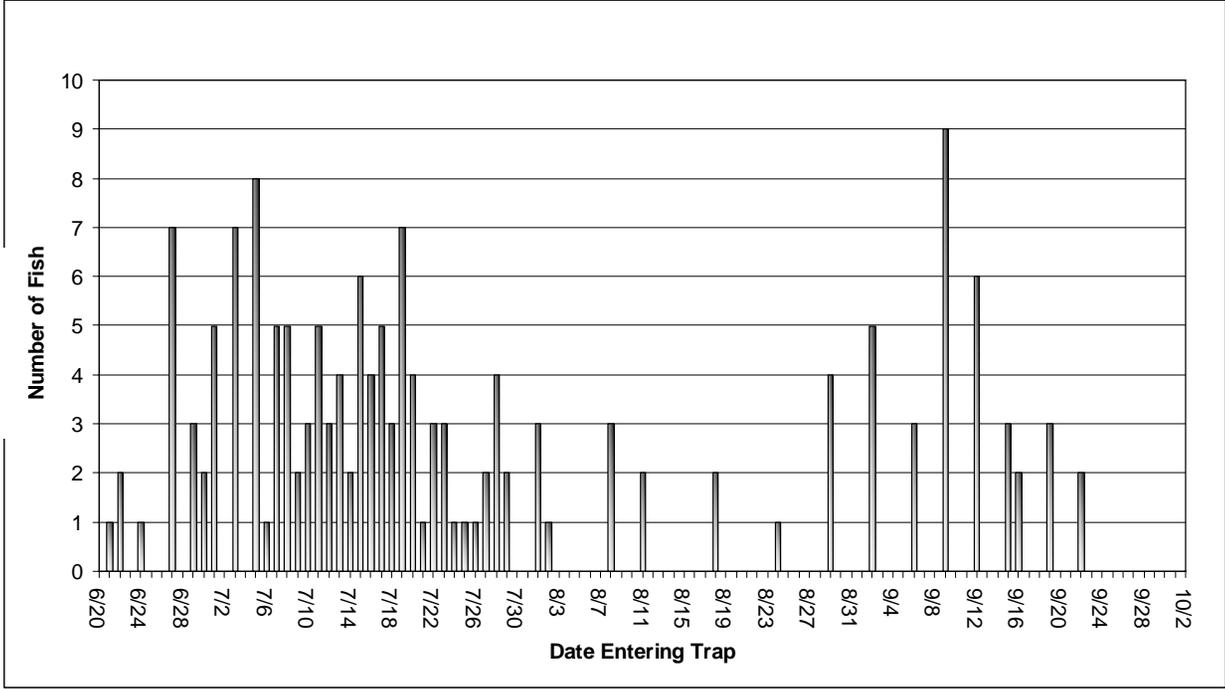
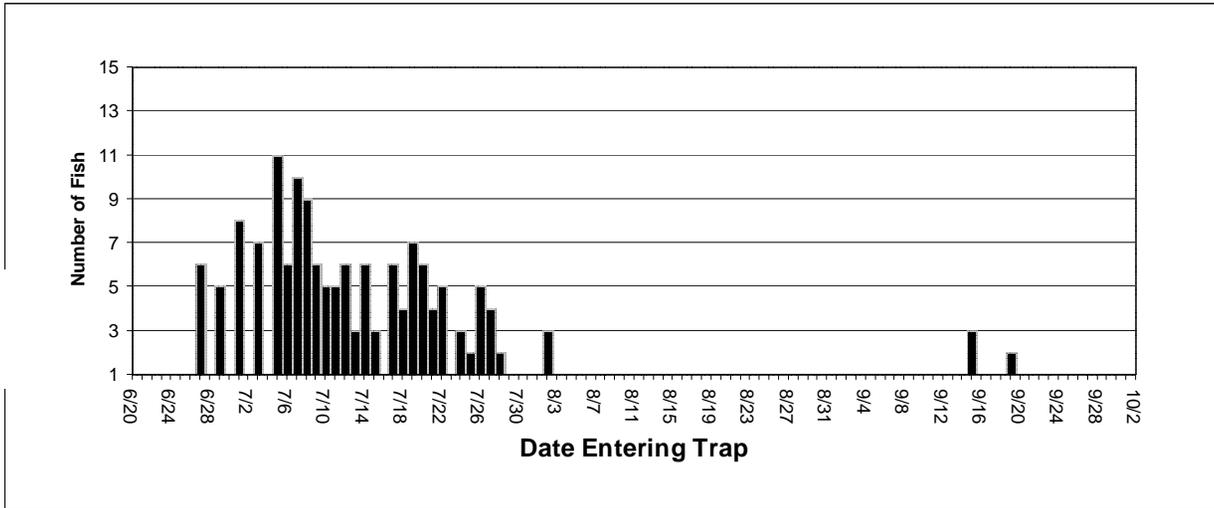
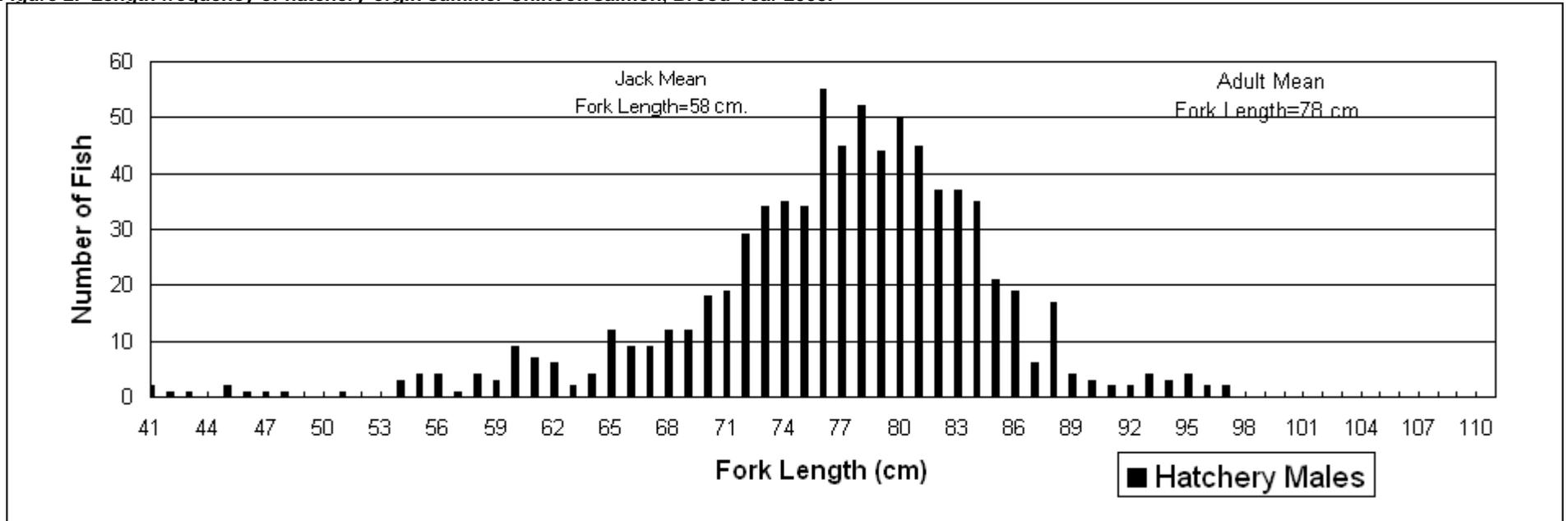


Figure 1-B. Brood Year 2005 natural origin female summer Chinook run timing for Pahsimeroi Hatchery.



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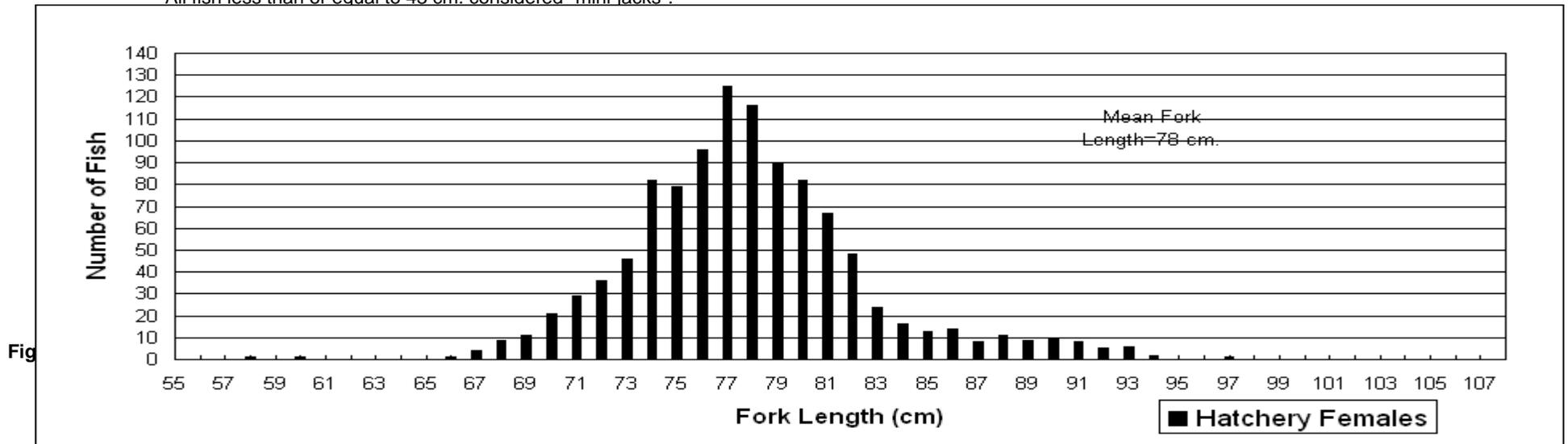
Figure 2. Length frequency of hatchery-origin summer Chinook salmon, Brood Year 2005.



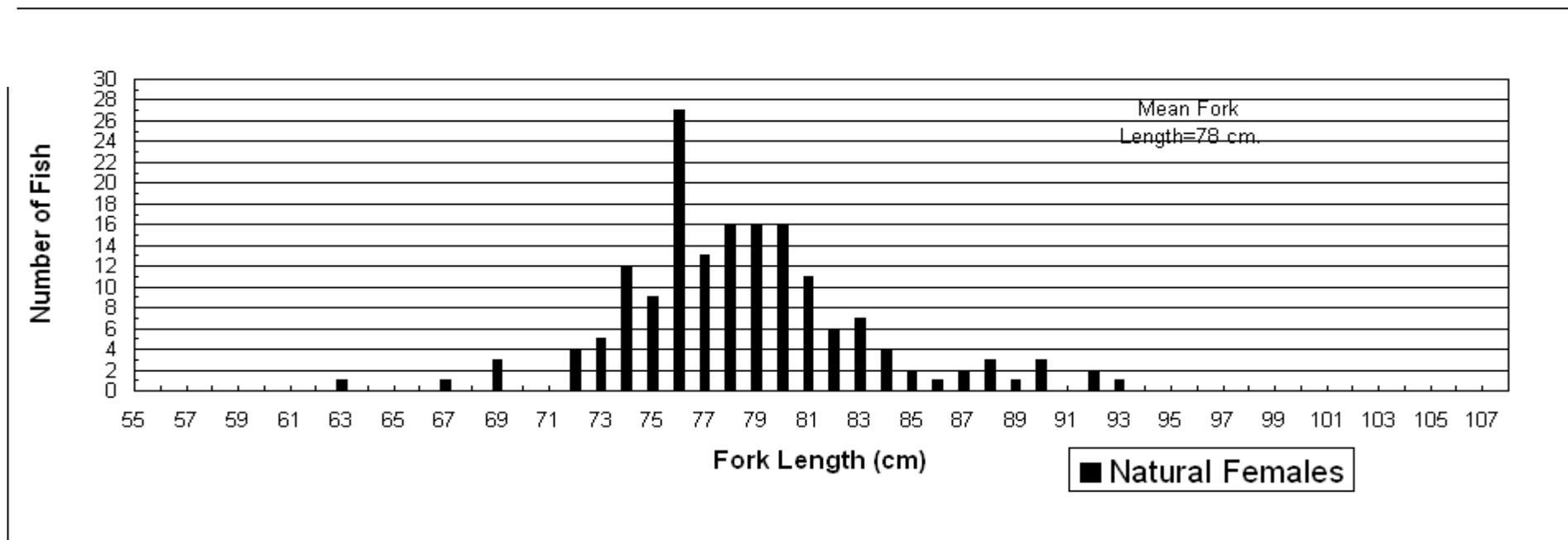
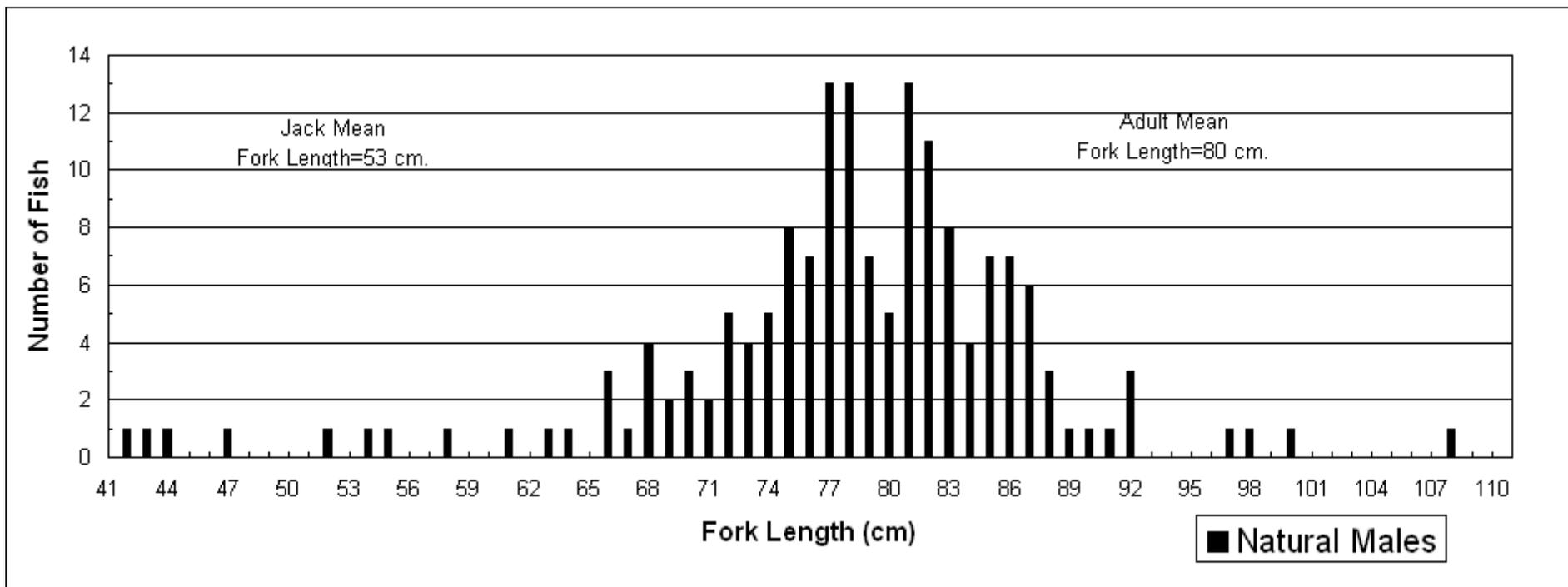
* 41 cm. length category includes one 39 cm and one 40 cm mini-jack

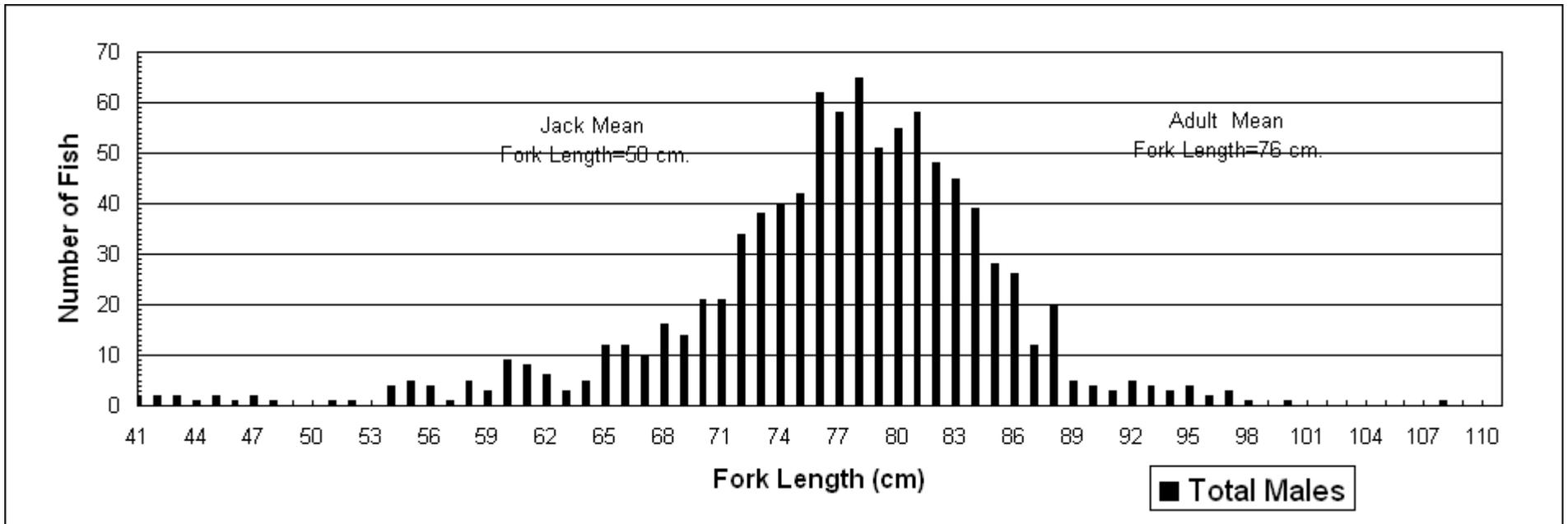
** All fish less than or equal to 43 cm. considered "mini-jacks".

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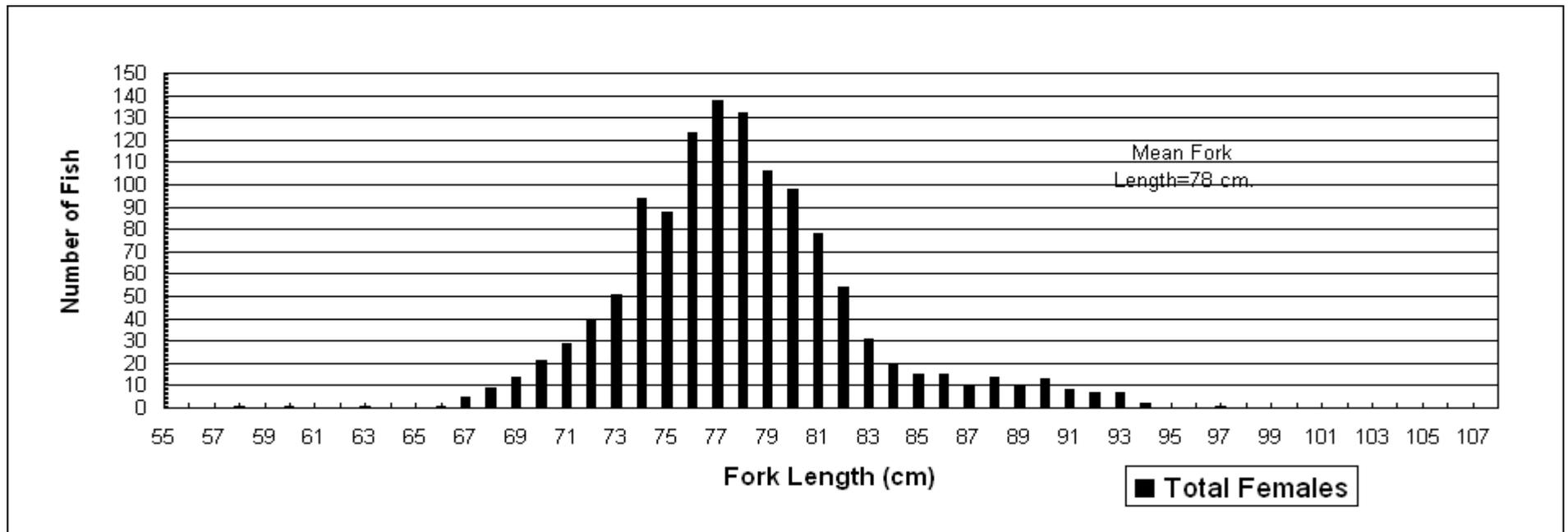
Fig





* 41 cm. length category includes one 39 cm and one 40 cm mini-jack

** All fish less than or equal to 43 cm. considered "mini-jacks".



APPENDICES

Appendix A. Pahsimeroi Fish Hatchery Chinook salmon stock history.

Brood Year	Egg Source	No. Eggs	Genetic Stock	Release Year	Smolts Released	Release Site
1981	Hayden Creek	<500,000	Spring Chinook	1983	437,332	Pahsimeroi River
1981	Pahsimeroi	<25,000	Summer Chinook	1983	13,700	Pahsimeroi River
1982	Pahsimeroi	75,402	Summer Chinook	1984	55,800	Pahsimeroi River
1982	Hayden Creek	107,234	Spring Chinook	1984	99,750	Pahsimeroi River
1982	Sawtooth	451,902	Spring Chinook	1984	420,400	Pahsimeroi River
1982	Rapid River	669,500	Spring Chinook	1984	622,850	Pahsimeroi River
1983	Pahsimeroi	261,188	Summer Chinook	1985	209,105	Pahsimeroi River
1983	Hayden Creek	279,398	Spring Chinook	1985	178,800	Pahsimeroi River
1984	Pahsimeroi	23,999	Summer Chinook	1986	12,100	Pahsimeroi River
1984	Hayden Creek	145,341	Spring Chinook	1986	81,000	Pahsimeroi River
1985	Pahsimeroi	2,602,404	Spring Chinook	1987	1,200,000	Hayden Creek and Yankee Fork
1985	Pahsimeroi	200,448	Summer Chinook	1987	158,007	Pahsimeroi River
1985	Pahsimeroi	127,332	Summer Chinook	1987	100,593	Pahsimeroi River
1987	Pahsimeroi	2,128,750	Spring Chinook	1989	1,128,750	Sawtooth Hatchery
1987	Pahsimeroi	696,004	Summer Chinook	1989	536,500	Pahsimeroi River
1987	McCall	605,091	Summer Chinook	1989	479,800	Pahsimeroi River
1988	Pahsimeroi	1,053,536	Summer Chinook	1990	808,536	Pahsimeroi River
1988	McCall	317,272	Summer Chinook	1990	245,000	Pahsimeroi River
1989	Pahsimeroi	294,893	Summer Chinook	1991	227,500	Pahsimeroi River
1990	Pahsimeroi	662,641	Summer Chinook	1992	605,900	Pahsimeroi River
1991	Pahsimeroi	22,235	Spring Chinook	1993	15,000	Rapid River
1991	Pahsimeroi	437,157	Summer Chinook	1993	375,000	Pahsimeroi River
1992	Pahsimeroi	172,139	Summer Chinook	1994	130,510	Pahsimeroi River
1993	Pahsimeroi	167,200	Summer Chinook	1995	147,429	Pahsimeroi River
1994	Pahsimeroi	0	Summer Chinook	1996	0	Pahsimeroi River
1995	Pahsimeroi	157,938	Summer Chinook	1997	122,017	Pahsimeroi River
1996	Pahsimeroi	85,660	Summer Chinook	1998	65,648	Pahsimeroi River
1997	Pahsimeroi	171,836	Summer Chinook	1999	135,669	Pahsimeroi River
1998	Pahsimeroi	74,105	Summer Chinook	2000	53,837	Pahsimeroi River
1999	Pahsimeroi	371,354	Summer Chinook	2001	283,063	Pahsimeroi River
2000	Pahsimeroi	633,906	Summer Chinook	2002	508,340	Pahsimeroi River
2001	Pahsimeroi	1,700,097	Summer Chinook	2003	1,205,918	Pahsimeroi River
2002	Pahsimeroi	1,293,123	Summer Chinook	2004*	1,108,028	Pahsimeroi River
2003	Pahsimeroi	1,587,310	Summer Chinook	2005	975,252	Pahsimeroi River
2004	Pahsimeroi	1,620,513	Summer Chinook	2006	1,073,951	Pahsimeroi River
2005	Pahsimeroi	1,587,310	Summer Chinook	2007	987,460	Pahsimeroi River

*Smolt Release Is an Estimated number Due to Fish kill during out migration

Appendix B. Pahsimeroi Fish Hatchery summer Chinook smolt release and adult return information.

RELEASE DATE	NUMBER	3-YRS	4-YRS	5-YRS	TOTAL	RETURN YEARS	% RETURN
May-70	300,000	89	N/A	101	N/A	71,72,73	N/A
May-71	250,000	40	425	14	479	72,73,74	0.192%
May-72	250,000	20	138	76	234	73,74,75	0.094%
May-73	347,000	1	5	32	38	74,75,76	0.011%
May-74	330,000	8	189	436	633	75,76,77	0.192%
May-75	114,000	53	115	X	X	76,77,78	N/A
May-76	121,000	7	X	32	X	77,78,79	N/A
May-77	235,000	X	O	4	X	78,79,80	N/A
May-78	218,000	1	29	13	43	79,80,81	0.020%
Mar-83	13,690	11	72	30	113	84,85,86	0.825%
Apr-84	55,800	27	278	52	357	85,86,87	0.640%
Apr-85	209,155	37	408	716	1,161	86,87,88	0.555%
Mar-86	12,095	13	47	31	91	87,88,89	0.752%
Mar-87	258,600	75	180	42	297	88,89,90	0.115%
Mar-88	598,500	135	389	79	603	89,90,91	0.101%
Mar-89	1,016,300	39	139	27	205	90,91,92	0.020%
Mar-90	1,058,000	20	98	119	237	91,92,93	0.022%
Mar-91	227,500	6	37	1	44	92,93,94	0.019%
Mar-92	605,900	13	26	0	39	93,94,95	0.006%
Apr-93	375,000	7	73	8	88	94,95,96	0.023%
Apr-94	130,510	7	27	9	43	95,96,97	0.033%
Apr-95	147,429	5	60	34	99	96,97,98	0.067%
Apr-96	0	n/a	n/a	n/a	n/a	97,98,99	n/a
Apr-97	122,017	18	207	32	257	98,99,00	0.210%
Apr-98	65,648	78	259	308	645	99,00,01	0.980%
Apr-99	135,669	73	515	256	844	00,01,02	0.622%
Apr-00	53,837	28	360	403	791	01,02,03	1.47%
Apr-01	283,063	308	1,072	284	1,664	02,03,04	0.59%
Apr-02	508,340	1,030	2,668	142	3,840	03,04,05	0.757%
Mar-03	1,205,918	369	1,629	n/a	n/a	04,05,06	n/a
Apr-04	1,108,028	65	n/a	n/a	n/a	05,06,07	n/a
Mar-05	975,252	n/a	n/a	n/a	n/a	06,07,08	n/a

Appendix C. Pahsimeroi Brood Year 2005 hatchery origin summer Chinook genetic sampling.

SAMPLE NUMBER	VIAL NUMBER	SAMPLE DATE	FORK LENGTH	SEX	FLOY TAG NUMBER	COMMENTS	MARK TYPE
1	pah1	9-Sep	74	f	985		CWT
2	pah2	9-Sep	72	f	missing		AD
3	pah3	9-Sep	83	f	missing		CWT
4	pah4	9-Sep	75	f	missing		CWT
5	pah5	9-Sep	75	f	34		CWT
6	pah6	9-Sep	80	f	965		AD
7	pah7	9-Sep	73	f	961		AD
8	pah8	9-Sep	74	f	275		AD
9	pah9	9-Sep	77	f	353		AD
10	pah10	9-Sep	74	f	131		AD
11	pah11	9-Sep	80	f	983		AD
12	pah12	9-Sep	79	f	770		AD
13	pah13	9-Sep	75	f	235		AD
14	pah14	9-Sep	76	f	754		CWT
15	pah15	9-Sep	77	f	969		AD
16	pah16	9-Sep	80	f	123		AD
17	pah17	9-Sep	78	f	missing		AD
18	pah18	9-Sep	78	f	295		AD
19	pah19	9-Sep	79	f	293		AD
20	pah20	9-Sep	78	f	920		AD
21	pah21	9-Sep	79	f	187		CWT
22	pah22	9-Sep	72	f	592		CWT
23	pah23	9-Sep	60	f	recap		AD
24	pah24	9-Sep	77	f	922		AD
25	pah25	9-Sep	70	f	410		AD
26	pah26	9-Sep	70	f	426		AD
27	pah27	9-Sep	78	f	698		CWT
28	pah28	9-Sep	75	f	980		CWT
29	pah29	9-Sep	72	f	recap		AD
30	pah30	12-Sep	79	f	261		AD
31	pah31	12-Sep	71	f	594		AD
32	pah32	12-Sep	78	f	297		AD
33	pah33	12-Sep	74	f	181		CWT
34	pah34	12-Sep	76	f	369		AD
35	pah35	12-Sep	82	f	734		cwt
36	pah36	12-Sep	70	f	24		AD
37	pah37	12-Sep	#N/A	f	missing		AD
38	pah38	12-Sep	82	f	n/a		AD

Appendix C. Continued

39	pah39	12-Sep	76	f	n/a		AD
40	pah40	12-Sep	90	f	20		AD
41	pah41	12-Sep	75	f	219		CWT
42	pah42	12-Sep	74	f	112		AD
43	pah43	12-Sep	86	f	396		AD
44	pah44	12-Sep	72	f	660		AD
45	pah45	12-Sep	90	f	977		AD
46	pah46	12-Sep	79	f	416		AD
47	pah47	12-Sep	78	f	missing		CWT
48	pah48	12-Sep	72	f	237		AD
49	pah49	12-Sep	70	f	447		AD
50	pah50	12-Sep	79	f	n/a		CWT

Appendix C. Continued

SAMPLE NUMBER	VIAL NUMBER	SAMPLE DATE	FORK LENGTH	SEX	FLOY TAG NUMBER	COMMENTS	Mark Type
51	pah51	12-Sep	79	f	n/a		AD
52	pah52	12-Sep	76	f	125		AD
53	pah53	12-Sep	78	f	109		AD
54	pah54	12-Sep	69	f	510		AD
55	pah55	12-Sep	80	f	232		AD
56	pah56	12-Sep	91	f	n/a		AD
57	pah57	12-Sep	79	f	720		AD
58	pah58	12-Sep	74	f	139		AD
59	pah59	12-Sep	78	f	614		AD
60	pah60	15-Sep	75	f	22		AD
61	pah61	15-Sep	76	f	56		AD
62	pah62	15-Sep	73	f	47		AD
63	pah63	15-Sep	73	f	726		CWT
64	pah64	15-Sep	76	f	640		AD
65	pah65	15-Sep	77	f	367		AD
66	pah66	15-Sep	79	f	790		AD
67	pah67	15-Sep	74	f	431		AD
68	pah68	15-Sep	75	f	missing		AD
69	pah69	15-Sep	78	f	76		AD
70	pah70	15-Sep	74	f	missing		AD
71	pah71	15-Sep	77	f	257		AD
72	pah72	15-Sep	74	f	1051		AD
73	pah73	15-Sep	76	f	532		AD
74	pah74	15-Sep	77	f	428		AD
75	pah75	15-Sep	79	f	745		AD
76	pah76	15-Sep	75	f	1041		AD
77	pah77	15-Sep	74	f	439		AD
78	pah78	15-Sep	78	f	missing		AD
79	pah79	15-Sep	78	f	552		AD
80	pah80	15-Sep	81	f	missing		AD
81	pah81	15-Sep	74	f	463		CWT
82	pah82	15-Sep	76	f	998		CWT
83	pah83	15-Sep	75	f	115		CWT
84	pah84	15-Sep	77	f	missing		AD
85	pah85	15-Sep	73	f	971		CWT

Appendix C. Continued

86	pah86	15-Sep	84	f	865		AD
87	pah87	15-Sep	85	f	531		AD
88	pah88	15-Sep	76	f	958		AD
89	pah89	15-Sep	74	f	missing		AD
90	pah90	15-Sep	79	f	missing		AD
91	pah91	15-Sep	72	f	612		AD
92	pah92	15-Sep	77	f	425		AD
93	pah93	15-Sep	72	f	336		AD
94	pah94	15-Sep	82	f	1050		AD
95	pah95	15-Sep	79	f	600		AD
96	pah96	15-Sep	76	f	270		AD
97	pah97	15-Sep	71	f	389		AD
98	pah98	15-Sep	79	f	1048		AD
99	pah99	15-Sep	74	f	851		AD
100	pah100	15-Sep	77	f	1019		CWT

Appendix C. Continued

SAMPLE NUMBER	VIAL NUMBER	SAMPLE DATE	FORK LENGTH	SEX	FLOY TAG NUMBER	COMMENTS	MARK TYPE
101	pah101	19-Sep	82	m	393		AD
102	pah102	19-Sep	62	m	595		AD
103	pah103	19-Sep	71	m	340		AD
104	pah104	19-Sep	85	m	1065		AD
105	pah105	19-Sep	75	m	363		AD
106	pah106	19-Sep	80	m	394		AD
107	pah107	19-Sep	75	m	106		AD
108	pah108	19-Sep	75	m	180		AD
109	pah109	19-Sep	84	m	missing		AD
110	pah110	19-Sep	80	m	300		AD
111	pah111	19-Sep	93	m	930		AD
112	pah112	19-Sep	75	m	440		AD
113	pah113	19-Sep	74	m	667		AD
114	pah114	19-Sep	64	m	213		AD
115	pah115	19-Sep	82	m	64		AD
116	pah116	19-Sep	81	m	161		AD
117	pah117	19-Sep	69	m	missing		AD
118	pah118	19-Sep	83	m	362		AD
119	pah119	19-Sep	94	m	missing		AD
120	pah120	19-Sep	61	m	missing		AD
121	pah121	19-Sep	79	m	missing		AD
122	pah122	19-Sep	86	m	643		AD
123	pah123	19-Sep	67	m	1014		AD
124	pah124	19-Sep	84	m	560		AD
125	pah125	19-Sep	n/a	m	missing		AD
126	pah126	19-Sep	85	m	672		AD
127	pah127	19-Sep	85	m	433		ad
128	pah128	19-Sep	84	m	missing		CWT
129	pah129	19-Sep	76	m	173		AD
130	pah130	19-Sep	78	m	missing		AD
131	pah131	19-Sep	84	m	missing		AD
132	pah132	19-Sep	69	m	339		AD
133	pah133	19-Sep	68	m	38		AD
134	pah134	19-Sep	83	m	1091		AD
135	pah135	19-Sep	74	m	330		AD
136	pah136	19-Sep	45	m	684		CWT

Appendix C. Continued

137	pah137	19-Sep	88	m	875		AD
138	pah138	19-Sep	86	m	529		AD
139	pah139	19-Sep	81	m	913		AD
140	pah140	19-Sep	78	m	missing		AD
141	pah141	22-Sep	84	m	11		AD
142	pah142	22-Sep	77	m	473		AD
143	pah143	22-Sep	89	m	MISSING		AD
144	pah144	22-Sep	73	m	MISSING		AD
145	pah145	22-Sep	72	m	MISSING		AD
146	pah146	22-Sep	74	m	MISSING		AD
147	pah147	22-Sep	78	m	1103		AD
148	pah148	22-Sep	74	m	381		AD
149	pah149	22-Sep	83	m	652		AD
150	pah150	22-Sep	87	m	MISSING		AD

Appendix C. Continued

SAMPLE NUMBER	VIAL NUMBER	SAMPLE DATE	FORK LENGTH	SEX	FLOY TAG NUMBER	COMMENTS	MARK TYPE
151	pah151	22-Sep	82	m	missing		AD
152	pah152	22-Sep	83	m	missing		AD
153	pah153	22-Sep	85	85	missing		AD
154	pah154	22-Sep	77	m	942		AD
155	pah155	22-Sep	86	m	missing		AD
156	pah156	22-Sep	91	m	1110		AD
157	pah157	22-Sep	83	m	1039		AD
158	pah158	22-Sep	80	m	1111		AD
159	pah159	22-Sep	84	m	missing		AD
160	pah160	22-Sep	85	m	613		AD
161	pah161	22-Sep	78	m	missing		AD
162	pah162	22-Sep	78	m	209		AD
163	pah163	22-Sep	n/a	m	missing		AD
164	pah164	22-Sep	74	m	missing		AD
165	pah165	22-Sep	80	m	383		AD
166	pah166	22-Sep	78	m	1023		AD
167	pah167	22-Sep	62	M	missing		AD
168	pah168	22-Sep	80	M	missing		AD
169	pah169	22-Sep	84	M	539		AD
170	pah170	22-Sep	76	M	598		AD
171	pah171	26-Sep	79	m	MISSING		AD

172	pah172	26-Sep	84	m	MISSING		AD
173	pah173	26-Sep	78	m	MISSING		AD
174	pah174	26-Sep	80	m	MISSING		AD
175	pah175	26-Sep	76	m	MISSING		AD
176	pah176	26-Sep	87	m	1071		AD
177	pah177	26-Sep	84	m	388		AD
178	pah178	26-Sep	80	m	604		AD
179	pah179	26-Sep	82	m	245		AD
180	pah180	26-Sep	69	m	MISSING		AD
181	pah181	26-Sep	90	m	MISSING		AD
182	pah182	26-Sep	95	m	1020		AD
183	pah183	26-Sep	81	m	1101		AD
184	pah184	26-Sep	72	m	MISSING		AD
185	pah185	26-Sep	73	m	MISSING		AD
186	pah186	26-Sep	76	m	MISSING		AD
187	pah187	26-Sep	81	m	MISSING		AD
188	pah188	26-Sep	70	m	MISSING		AD
189	pah189	26-Sep	78	m	MISSING		AD
190	pah190	26-Sep	75	m	901		AD
191	pah191	26-Sep	82	m	MISSING		AD
192	pah192	26-Sep	76	m	748		CWT
193	pah193	26-Sep	85	m	1079		AD
194	pah194	26-Sep	83	m	1076		AD
195	pah195	26-Sep	73	m	MISSING		AD
196	pah196	26-Sep	55	m	MISSING		AD
197	pah197	26-Sep	69	m	15		AD
198	pah198	26-Sep	73	m	MISSING		AD
199	pah199	26-Sep	85	m	MISSING		AD
200	pah200	26-Sep	72	m	MISSING		AD