Annual Report for

Dworshak National Fish Hatchery

Ahsahka, Idaho
Fiscal Year 2011

5/23/12

Complex Manager **Date**

Contents

Introduction

Dworshak National Fish Hatchery (DNFH) is located in North Central Idaho down river from Dworshak Dam, at the confluence of the North Fork and the mainstem of the Clearwater River. Dworshak Dam was constructed by the Corps of Engineers (COE) between 1966-70. Operation of the hatchery was authorized by a 1969 COE Memorandum of Understanding with the United States Fish & Wildlife Service (USFWS). The hatchery has since served primarily as a mitigation hatchery for steelhead trout (*Oncorhynchus mykiss),* a unique run of the North Fork "B" strain threatened by the construction of Dworshak Dam. The USFWS has endeavored, over the past 40 years, to meet the "mitigation goal" of providing 20,000 adult steelhead to the Clearwater River and maintain the unique genetics of the stock (Appendix 1 & 2). The annual smolt production target is 2.1 million smolt at 5.8 fish per pound (200 mm). Of these fish, 1.2 million are released directly from the hatchery and 900,000 released off-site.

DNFH is also required to meet a resident fish mitigation goal. This goal has modified over the last 40 years and the current release goal is 18,000 lbs. of rainbow trout into Dworshak Reservoir. 45Rainbow mitigation for Dworshak Reservoir is achieved with a fish exchange involving Idaho Fish and Game (IDFG) and Hagerman National Fish Hatchery (HNFH). DNFH pays HNFH to produce rainbow trout for stocking in southern Idaho. In return, the IDFG stock catchable size, sterile rainbow trout in Dworshak Reservoir.

In June, 1982, under the Lower Snake River Compensation Plan (LSRCP), DNFH was expanded from its primary function as a steelhead mitigation facility to include spring Chinook (*Oncorhynchus tshawytscha*) trapping, spawning and rearing. The new facilities were designed to rear 70,000 pounds of spring Chinook to 20 fish per pound (fpp) for a total of 1.4 million smolts. Smolt numbers have since been reduced to 1.05 million fish to reduce densities and rear smolts to a larger size. The adult return goal for DNFH is 9,135 spring Chinook to Lower Granite Dam (calculated using the 18-20 fpp smolt size, total rearing capacity, and 0.87 percent adult return rate guideline). In 2011, the hatchery began a pilot study to increase spring Chinook smolt release numbers back to 1.4 million smolts at 20 fpp. This is a shift away from the larger size smolts that have potentially contributed to increased jacking rates.

Since 2005, DNFH has also come to include other production components and research projects; e.g., Coho, Fall Chinook and Steelhead Kelts on station as well as supporting other agencies research programs; e.g., U.S. Army Corps of Engineers, University of Idaho and Nez Perce Tribe.

The Nez Perce Tribe (NPT) initiated the Clearwater Coho Restoration (CCR) program in 1994. CCR production of Coho smolts became a production component at DNFH in 1997. The CCR production goal is presently 850,000 smolts annually. Dworshak produces 300,000 smolts at 20-23 fpp as a portion of the goal. An additional 550,000 smolt are produced at the Eagle Creek National Fish Hatchery. Coho smolt production at DNFH initially occurred in adult holding

ponds that were converted to raceways. In FY11, BY09 Coho smolts were raised in five Burrows Ponds of System III before being transported to Kooskia NFH for acclimation in March. Release of approximately 322,325 smolts occurred in April into Clear Creek (Table 27). The BY10 Coho parr were returned from Kooskia NFH in May for rearing in the Chinook A/B-bank raceways till the following year. The Clearwater Coho Restoration project is gradually building its smolt production effort to achieve a Clearwater stock adult return goal of 14,000 adults to the Clearwater Basin (Coho Master Plan 2004). While the Coho adult goal has yet to be achieved; the 2010 adult count at Lower Granite dam totaled 1,509 adults and 393 jacks. Larger adult returns occurred in 2008 with 3,458 adults plus 1,312 jacks; and in 2009 with 4,629 adults plus 283 jacks (Website – Columbia River DART 2012). Prior to this restoration effort Coho were extinct in the Snake River basin and its Clearwater subbasin.

Beginning in 2008, the Steelhead Kelt Survival research project was set up at DNFH by the Nez Perce Tribe. It is a Bonneville Power Administration Remand funded study to enable understanding of factors necessary to enable survival of B-type Steelhead adults returning to the Snake River Basin to spawn a second time. The project spawns up to 150 adults returning to DNFH and selects from Lower Granite Dam another 100 or more Kelts emigrating to the ocean. Physiology, nutrition, physical condition and survival are studied to determine if adults migrating above eight dams can survive to spawn a second time. The study is funded for 10 years.

DNFH produces 2.1 million steelhead smolts at 6 fpp (200 mm in length), 1.05 million yearling Chinook salmon smolts at 18 to 20 fpp (140 to 145 mm in length) and 300,000 Coho pre-smolt. The hatchery's annual production capacity exceeds 400,000 pounds. Mitigation goals to the Clearwater River are 20,000 returning adult steelhead, 9,135 adult spring Chinook salmon (SCS) and 14,000 Coho salmon. Steelhead goals are being satisfied in most years and an estimated 17,010 fish returned in 2011. Spring Chinook adult returns before 2000 were well below mitigation, but for three years (2000-2003) were near or over mitigation goals. Estimated adult returns for 2011 were 2,569 – well short of the 9,135 goal for Dworshak NFH.

DNFH was constructed with a water reuse and reconditioning system employing filtration, biological nitrification, alarm system, water chillers, heaters, and numerous pumps. Initial construction at DNFH included 84 Burrow's ponds, 64 nursery tanks, and 9 adult holding ponds. Twenty-five Burrow's ponds (System I) were operated on a heated recycle water flow, for rearing steelhead smolts to the initial target size of 180 mm in only one year. In 1973, System II (25 ponds) and System III (34 ponds) were converted from single-pass, 2-year rearing cycle, to water reuse and heating for accelerated production growth. This second phase construction, with added mechanical systems (biological filters, electric grid, sand filters, U.V. lamps, chillers, and boilers), increased production capacity and allowed all three water systems to be environmentally controlled.

During the mid-1970's, with DNFH not meeting production or mitigation goals, major operational changes were made. Review and studies of the reuse systems, water temperature regime, water quality, and fish culture techniques were done by hatchery staff and university scientists. Corrective measures followed which removed the computerized pneumatic feed system, eliminated the ultraviolet treatment of water reuse, redesigned the water flows to maximize single-pass use, and a return to a more hands-on basic fish culture. Selecting cooler water temperatures from Dworshak Reservoir during the summer, adding minerals (sodium chloride and

potassium chloride) to a soft water supply, removing supersaturated nitrogen gas, along with other designed mechanical changes and more involvement of hatchery staff in monitoring fish culture, all contributed positively towards improving the hatchery's program.

Further construction in the early 1980's added 18,000 square feet of nursery building, doubling the number of inside rearing tanks to 128. A new concept of biological filtration, known as a fluidized sand filter, replaced the oyster shell media in System I. This filtration system proved to be unworkable, and the ability to operate reuse in System I became unavailable. Also in the 1980's, an additional thirty 8'×80' raceways were constructed under the LSRCP to provide production facilities for spring Chinook salmon. Additionally in the 1980's, 5 of the 9 adult holding ponds were converted to raceways for needed rainbow trout mitigation for Dworshak Reservoir.

A new and serious problem arrived in 1982 with an outbreak of *Infectious Hematopoietic Necrosis Virus* (IHNV). The 30-year battle against this virus is ongoing and hatchery operations have been modified many times to combat this severe threat to steelhead production.

Beginning in 1992, the hatchery was supplied with an additional 6400 gpm of gravity flow Dworshak Reservoir water directly by pipeline. This "clean" water, supplying egg incubators and nursery rearing, has afforded disease protection from IHN in the early production stages. During 1998, a water line was completed between Mechanical Building I and the main water line from the large boilers in Mechanical Building II. This line now enables us to heat all the nursery reservoir water for better steelhead production.

In Fiscal Year 03-04 (FY), the COE replaced and upgraded System I biofilters with a new plastic bead media filtration system. This system was operated successfully for a short period (3 months) in 2004 and 2007. The biofilters had to be turned off in 2008 because the bead media escaped the filter screens and was found throughout the hatchery and in the river.

The water systems provide several options for egg incubation and rearing. Several temperature options are available for egg development in the incubators. Different temperature regimes are also available to the nursery tanks. Until 2008 the rearing strategy for the outside steelhead ponds was to furnish single-pass river water from May into November, when desired temperatures could be obtained through selector gates at Dworshak Dam. A pump station on the North Fork Clearwater River, one mile down river from the Dam, is capable of providing 90,000 gpm of river water. In Systems I and II, and III water reuse and heating could be used during the colder months of November through March, enabling the hatchery to get the desired fish growth. During reuse, 10-percent new water entered the system to make up for loss. Temperatures in each of the three outside steelhead rearing systems could be controlled independently when reuse and heated water were available. Rearing of steelhead utilizing the reuse systems was discontinued in 2009. Hatchery staff felt the drawbacks of utilizing reuse (increased parasite load, poor water quality, increased chemical usage, overall fish health decline) far outweighed the advantages (increased fish size). Consequently, the hatchery does not plan to utilize the reuse systems in the future.

IHN had a huge impact on steelhead production at DNFH in 2009 and 2010. Steelhead production goals were not achieved due to the loss of 500,000 fish to IHN in 2009 and over 1 million fish to IHN in 2010. Analysis of the virology indicated that the Dworshak fish had been

infected with a new genotype of the M-clade (M139) which is typically associated with Steelhead Trout. Minimal genotype analysis from previous outbreaks had mostly been from the U-clade (typically associated with Chinook salmon). The M139 genotype appears to be more virulent and affects larger fish than were susceptible to other genotypes of the virus.

The hatchery took a proactive management strategy in the spring of 2010 to minimize the impact of IHN on steelhead production. Changes were made to utilize reservoir water rather than river water for early outside rearing of steelhead. The changes included; fabrication and installation of a vacuum degassing system for the reservoir water to eliminate gas supersaturation which is common in the reservoir water supply line, modification to the System I reuse, a "Hot Tap" connected the reservoir water supply line into the System I reuse line and a variety of plumbing changes The result of these modifications provides reservoir water to the burrows ponds in System I. These efforts hinged heavily on the cooperation of Clearwater State Fish Hatchery staff to communicate and coordinate the water needs and use of both facilities. We were able to run reservoir water exclusively in System I into August and then blended river and reservoir water in System I on September 1st as the Clearwater SFH's water needs increase. Approximately 10,000 GPM of reservoir water can be run in System I for a peak reservoir water flow. This allowed us to utilize 17 of the 25 ponds in System I. Additional discussions are ongoing to increase the volume of reservoir water to Dworshak and not negatively impact the Clearwater SFH's operations. Additional plans have been compiled by PR Aqua to convert all of System I and II to circular tanks with 75% reuse including mechanical aeration and CO_2 stripping. At this level of reuse, biofiltration is not necessary and all steelhead can be reared on reservoir water into the early fall.

This report covers the period of hatchery activities from October 1, 2010, to September 30, 2011.

Fish Culture Operations

Summer Steelhead

Brood Year 2010

Overview

There were 2.5 million Brood Year 2010 (BY10) summer steelhead (SST) moved from the nursery to outside Burrows ponds (BPs) during the summer of 2010. Some ponds that were transferred to river water before 60 fish per pound experienced high mortality in the summer and fall mostly due to *Infectious Hematopoietic Necrosis* Virus (IHNV). However, the IHNV outbreaks were limited and the production target release of 2.1 million SST smolts was met. Survival from ponding SST in the summer of 2010 until release in the spring of 2011 was approximately 90 percent.

Overall mortality from October 1, 2010 through final release was 4.8 percent. All fish were released by March 31, 2011 with the exception of two ponds of unmarked SST (58,235 fish) for the Nez Perce Tribe (NPT). These fish were released into Lolo Creek on April 27. Table 1 summarizes BY10 SST at the start of FY10 until final release.

In recent years, SST at Dworshak have suffered elevated mortality due in large part to IHNV. Adult steelhead and Chinook are suspected to shed the virus in front of Dworshak's river intake. In the spring of 2010, System I water supply was retrofitted to use only Dworshak Reservoir water in many of the Burrows ponds for initial rearing instead of North Fork Clearwater River water. Because no adult steelhead or spring Chinook that can migrate above Dworshak Dam, the reservoir water is relatively clean regarding virus and bacteria shed by the adult fish. Due to this "cleaner" water supply, all BY10 SST moved out of the nursery and placed in System I for initial outside rearing. The SST from Takes 1-7 were later transferred into System II ponds for final rearing (river water) when Takes 8 thru 10 were moved outside or when they reached the appropriate size for splitting into System II or III (river water). Steelhead from Takes 8-10 were reared completely in System I and not introduced to river water until September 1, 2010. At this time the reservoir water supply became inadequate to provide all the water needed for the fish in System I. Dworshak Reservoir water is shared with Idaho Fish and Game's Clearwater Hatchery and close coordination and cooperation from IDFG's staff was vital and much appreciated for the success of this operation.

Initial outside ponding of SST from the nursery included one pond (approximately 32,000 fish) of each of the first four Takes loaded into System III (river water), with the majority of those fish being loaded into System I (reservoir water). This was done to compare survival of SST on both water sources.

Final loading of SST included System I receiving SST from Takes 8-10; System II being stocked with Takes 4 (partial)-6; and System III receiving Takes 1-4 (partial) along with 5 Burrows ponds of coho and one pond of rainbow trout.

A total of 2.52 million BY10 SST were moved from the nursery to the BPs beginning with Take 1 on May 19, 2010, and ending with Take 10 on August 26. Two ponds of SST (60,000 fish) in System III broke with IHNV on the weekend of September 4-5, 2010. These fish were killed and removed from the hatchery on September 7 in an attempt to keep the disease from spreading to other fish. Due to water needs at Clearwater State Fish Hatchery, river water was blended with reservoir water in System1 on September 1, 2010. Steelhead in Takes 9-10 in System I broke with IHNV by the end of September and suffered chronic moderate mortality for most of the fall, 2010. These fish were kept on station and not destroyed since mortality never reached epidemic proportions. On November 16, 2010, the hatchery experienced a power outage for approximately 10 hours. During that time water flow was cut off to SST in two modified Burrows ponds which had the center wall removed. This resulted in total loss of fish in these two ponds. The mortality was 28,848 SST in BP 64 and 28,575 SST in BP66.

Reuse and heated water were not used during the rearing cycle for any outside rearing system.

System I

Because System I could use Dworshak Reservoir water exclusively for rearing SST from May until September, all but 120,000 SST of the 2,52 million were initially reared in this System. These fish were later split into other ponds at final rearing numbers using a Heathro fish pump and Vaki fish counter.

Twenty five Burrows ponds were used in System I for BY10 SST production. This System had 823,039 SST in it at the start of the fiscal year and 772,238 at release in March and April, 2011 (Table 2).

Adipose fins were clipped on BY10 SST in System I from May 19-August 26, 2010. Other marking of BY10 SST in System I is summarized in Table 3.

During the eight months of outside rearing of fish in System I, SST were intermittently treated with formalin for parasites. Mortality for fish in System I from October 1, 2010 until final release in March of 2011 was approximately 6.2 percent.

Off-site releases include 91,610 SST released at Red House Hole on the South Fork of the Clearwater River and 90,310 released at Clear Creek. Truck drivers from the NPT stocked a total of 58,235 BY10 SST from System I into Lolo Creek. These were fish raised and released from System I and received no fin clips to designate them as hatchery fish. There were also 114,473 unmarked SST released in Peasley Creek. This was done under the Harvest Settlement agreement with the Columbia River Tribes.

Direct release of 417,610 BY10 SST from System I took place on March 31, 2011 into the mainstem of the Clearwater River. The total release from System I was 772,238 BY10 SST (Final Release Summary, BY10 SST).

System II

Twenty-five Burrows ponds were used in System II for BY10 SST production. This System had 776,376 SST in it at the start of the fiscal year and 774,078 at release in March, 2011 (Table 4).

All BY10 SST in System II were transferred from System I. Adipose fin clipping was done when Takes 4-5-6-7 were moved into System I from June 26-July 26, 2010. Other marking of BY10 SST in System II is summarized in Table 5.

During the outside rearing of fish in System II, SST were intermittently treated with formalin for parasites. Mortality for fish in System II from October 1, 2010 until final release in March of 2011 was approximately 0.3 percent.

Off-site releases included 165,558 SST released at Red House Hole on the South Fork of the Clearwater River and 178,113 released at Clear Creek.

Direct release of 430,407 SST from System II took place on March 30 into the mainstem of the Clearwater River. The total release from System II was 774,078 BY10 SST (Final Release Summary, BY10 SST).

System III

Twenty four Burrows ponds were used in System III for BY10 SST production. This System had 780,843 SST at the start of the fiscal year and 719,089 at release in March, 2011 (Table 6).

Adipose fin clipping was done when Takes 1-2-3-4 were moved into System 1 from May 19 through June 29, 2010. Other marking of BY10 SST in System III is summarized in Table 7.

During the outside rearing of fish in System III, SST were intermittently treated with formalin for parasites. Mortality for fish in System III from October 1, 2010 until final release in March of 2011 was approximately 7.9 percent.

Off-site release included 181,225 SST released at Red House Hole on the South Fork of the Clearwater River and 121,372 released at Clear Creek.

Direct release of 416,492 SST from System III took place on March 28 into the mainstem of the Clearwater River. The total release from System III was 719,089 BY10 SST (Final Release Summary, BY10 SST).

Summary of BY10 SST production reared at Dworshak

The BY10 SST hatchery production smolt summary is summarized in Table 8.

Distribution Summary

Release of BY10 SST began March 21 and ended March 31, 2011 with the exception of 58,235 released in Lolo Creek on April 27. The final distribution summary is illustrated in Table 9. The Final release summary by egg Take for BY10 SST is illustrated in Table 10.

Brood Year 2011

Adult Returns

Historical Adult steelhead returns are listed in Appendix 1.

Adult Collection

Adult summer steelhead (SST) for Brood Year 2011 (BY11) were collected in the fall of 2010 and in the winter and spring of 2011 to represent the entire run. The ladder was opened from October 5, 6, and 25, 2010 for collection of early-return SST. During this period there were 684 steelhead collected. On October 14, 2010 the charging cord for a large crowder was pulled apart and several SST were electrocuted. No staff were injured. By the time delayed mortality from the shock was over, approximately 150-200 SST adults died. Additional adults were trapped and used to replace the fish lost to the electrocution, with excess adults being outplanted to the Clearwater River. A total of 720 early return SST adults were collected in holding pond 1 with 185 mortalities in addition to the electrocuted adults before spawning began on January 11, 2011. Fall and winter sampling of SST adults for *Infectious Hematopoietic Necrosis Virus* (IHNV) took place approximately every two weeks from November through the winter. Incidental collection of adult Coho salmon also occurred. The Coho were sorted and transported to the Kooskia hatchery to serve as broodstock in conjunction with the Clearwater Coho Restoration project.

On January 28, 2011, the ladder was opened to collect ripe females for the NPT Kelt program. There were 77 females spawned, with eggs from 74 females going into D-bank incubators at Dworshak until the eggs eyed up. At this point, the eggs were enumerated. On March 5, there were 424,332 eyed eggs shipped and planted in the Lochsa River by personnel from the NPT.

The ladder was opened again on February 17 to begin collecting winter and spring returning SST. The ladder was opened intermittently throughout the spring to limit the number of SST entering the hatchery and closed for the final time on April 15. During this staggered ladder operation, along with the fall collection, a total of 4,404 adult SST entered the hatchery, including 131 jacks. There were a total of 39 natural SST trapped during the fall and spring season. These fish were released back into the mainstem of the Clearwater River the day they were examined. These SST are included in the 4,404 total return number.

Broodstock spawning numbers

A total of eight egg Takes were spawned over the BY11 season, beginning on January 11, 2011, and ending on April 19. Spawning began approximately three weeks earlier than usual due to 1-2^{o}F higher than average water temperatures in the North Fork of the Clearwater River. This elevated water temperature appeared to accelerate gamete maturation. Early-returning adults (October) were spawned in Take 1, and later returning adults (February-April) were spawned

during Takes 2-8. Two spawns of 75 females each were planned in January, but due to the large number of ripe and over-ripe females, 149 were spawned on the 11th. Another 25 females were culled as over-ripe by this date.

Eggs from the first spawn were incubated at 42ºF until going on feed in February. The temperature in the nursery was lowered during the spring due to spring Chinook salmon being placed into the nursery because of a chiller malfunction. This slowed down development of the early spawned SST.

There were 1,964 SST spawned over the BY11 season, 838 males (including 25 jacks) and 1,126 females. These numbers do not include the NPT kelt project. Females have always outnumbered males in returns to Dworshak, so the goal of a 1:1 male:female spawning ratio is difficult to achieve. While the male:female return ratio was 1:2.1 for BY11 SST, the spawning ratio was reduced to 1:1.3. Of the 25 jacks spawned during the season, 16 were used for Dworshak National Fish Hatchery (DNFH) and 5 were used for Clearwater State Fish Hatchery (CWH) and 4 were used for Magic Valley State Fish Hatchery (MVH).

On December 29, 2010 there were 72 males from the early-returned BY11 SST injected with salmon gonadotropin-releasing hormone analogue (sGnRHa). This was done to induce gamete maturation for spawning the following two weeks. These fish were tagged and transferred from HP1 into HP2 after injection. All tagged carcasses from injected males, whether spawned or mortalities before spawning were disposed of in the landfill.

Disease testing on eggs for CWH was done by the IDFG Eagle Fish Health Laboratory. There were 55 positive IHNV results from the CWH SST (55/212) of the females from Takes 4-5-6. There were 109 females (109/287) of the MVH lot which tested positive for IHNV. These females came out of Takes 6-7-8 and this testing was done by personnel from the Idaho Fish Health Center (IFHC). All eggs taken for either CWH or MVH which tested positive for IHNV were discarded. There were 53 (53/126) females sampled for Dworshak which tested positive for IHNV. Dworshak does not cull eggs which test positive for IHNV in its production program.

Egg Disposition

In years past the SST eggs were incubated at 54ºF in Heath incubator trays. For BY11 SST, Take 1 eggs were initially incubated on 42ºF water from initial spawning January 11 until February 22. Because these fish were spawned earlier than usual, the egg development was slowed to allow for mid-May ponding out of the nursery.

As was done in recent years, Dworshak incubated the CWH eggs until eye-up, at which time personnel from CWH shocked and transported the eggs for enumeration at the CWH facility. An estimated 1.4 million eyed-eggs were incubated for CWH.

There were an estimated 1.9 million green eggs shipped from Dworshak to CWH for MVH from Takes 6-7-8A. These eggs were shipped to CWH the same day spawning took place. Dworshak also provided approximately 2,000 eyed eggs for aquarium-rearing at various elementary schools for its Information and Education program.

After shipping eggs for CWH and MVH, Dworshak put 3.08 million eyed eggs into either hatching jars or incubator trays for its production. Take 1 suffered high mortality from IHNV so Take 8 was increased to make up for the loss of numbers. Eye-up for the BY11 SST eggs numerated at Dworshak was 94 percent and the fecundity rate was 6,616 eggs per female.

Research

Dworshak provided research opportunities for the University of Idaho and Nez Perce Tribe during BY11 SST spawning. A summary of their research is in the BY11 Steelhead Spawning Report.

Dworshak Production staff also coordinated with IDFG on several research projects. In an effort to establish a localized broodstock for the South Fork of the Clearwater River, adults from this location collected by IDFG personnel and transported to Dworshak. Forty seven females and 47 males were spawned and eggs kept isolated until eye-up and transport from Dworshak to the Clearwater Hatchery. Dworshak also provided genetic sampling of all spawned BY11 SST for IDFG.

Adult Disposition

There were 1,700 hatchery adults outplanted from Dworshak during the spring return of BY11 SST. In years past the excess adults were outplanted using trucks from the NPT. For the third year excess fish were loaded on to a USFWS truck instead. The majority of these fish were transported to Hocus boat ramp in Ahsahka, Idaho on the main stem of the Clearwater River. There were 152 of the outplanted fish which returned to the hatchery.

There was no food processor available this year for the SST carcasses. However carcasses were made available to the public via a local food bank beginning with Take 2. A total of 1,541 fish were distributed to the public. Complete adult disposition is illustrated in Table 11.

Nursery and ponding of fingerlings

The first spawn was from early-return adults. Eggs were put into hatching jars in the nursery at an average rate of 16,000 eggs/tank. All eggs/fry were loaded at final rearing numbers in the nursery. This loading method maximized growth and reduced stress on the fish by eliminating the need to split and handle fish while being reared in the nursery. When approximately 70 percent of the fry had hatched in the jar, the remaining fry were poured into the tank. Due to lack of nursery space, Takes 8-8A were hatched in Heath trays (6,000 eggs per tray). These were moved as fry from the incubation trays into tanks vacated once Takes 1-2 were transferred outside.

This year the fry from the nursery averaged 121 fish per pound (fpp) when moved out of the nursery directly to a manual marking trailer operated by the USFWS Columbia River Fisheries Program Office (CRFPO). Adipose (AD) fins were clipped to designate them as a hatchery fish on all but approximately 219,500 SST. The unclipped fish are under the U.S. vs. OR. Harvest Settlement Agreement.

In recent years, SST at Dworshak have suffered elevated mortality due in large part to *Infectious Hematopoietic Necrosis Virus* (IHNV). Adult steelhead and Chinook are suspected to shed the virus in front of Dworshak's river intake. In 2010, System I water supply was retrofitted to use only Dworshak Reservoir water in many of the Burrows ponds instead of North Fork Clearwater River water. Because no adult steelhead or spring Chinook migrate above Dworshak Dam, the reservoir water is relatively clean regarding virus and bacteria shed by the adult fish. All BY11 SST were therefore moved out of the nursery and initially loaded into System I for outside rearing.

There were 15 out of 28 tanks of Take 1 which tested positive for IHNV in the nursery and were destroyed. Once outside, the fish from the remaining ponds of Take 1 tested positive and were destroyed. The hatchery staff noted a higher than normal sediment load occurred this spring and temperature was held colder than normal as BY10 SCS fry were also loaded into the nursery. The hatchery staff also speculated that the river water emergency valves in the nursery may have been inadvertently opened during tank cleaning operations in Take 1. These valves and waterlines were covered with insulation and not relabeled after the Nursery roof project completion. Generally the river water supply line should never be used for nursery rearing. Its inadvertent use in 2011 essentially signed an IHNV death warrant for Take 1. To prevent nursery outbreaks of IHNV in the future, the staff relabeled these valves and developed an emergency water loss Standard Operating Procedure for operation of the river water supply lines.

Steelhead from Takes 2-6 and one pond of Take 7 were later transferred from System I into the final rearing ponds in Systems II and III. Steelhead from five ponds of Take 7 and all of Takes 8 and 8A were reared in System I and not introduced to river water until September 26, 2011. At that time the reservoir water supply became inadequate to provide all the water needed for the fish in System I. Dworshak Reservoir water is shared with Idaho Fish and Game's Clearwater Hatchery. Close coordination and cooperation from IDFG's staff was vital and much appreciated for the success of this operation.

Final loading of SST included System I rearing SST from Takes 7-8A; System II being stocked with Takes 3-6 and one pond of Take 7; and System III receiving Takes 2 (nine Burrows ponds). A total of 2.5 million BY11 SST were moved from the nursery to the BPs. No Coho or rainbow trout were reared in Burrows ponds this year.

Feed

All steelhead in the nursery were fed Bio Vita feed for the sixth straight year with good results. Starter feed size #3 was omitted from the regime again this year, as it clogged the nursery tank screens in previous years. There appeared to be no detrimental effects by skipping this feed size.

System I

System I water supply has been retrofitted to supply only water from Dworshak Reservoir rather than river water for the early rearing months for SST. This was done to avoid or reduce the impact of IHNV on the fish. Personnel from the marking trailer hand-clipped AD fins on the SST and

then transferred the fish into System I at a rate ranging from approximately 60,000-135,000 fish/Burrows pond.

System I initially received 2,503,198 BY11 SST during the summer of 2011. Steelhead in System I were moved out of the nursery beginning with Take 1 on May 25, 2011 and ending with Take 8A, on August 25. The SST were transferred from the nursery to the marking trailer for AD clipping using a PR Aqua fish-pump. Once the SST reached approximately 50-60 fpp, they were then split into the appropriate ponds in Systems II or III. Table 12 illustrates the BY11 SST production in System I from initial ponding until the end of FY11.

There were four ponds of SST in System I that received coded wire tags (CWTs). These fish were pumped from BPs and moved to the marking trailer for tagging (Table 13). The SST were tagged for evaluation of System I contribution to the fishery and hatchery returns.

BPs 45 and 13 received a total of 219,478 SST which remained unclipped under the U.S. vs. OR Harvest Settlement Agreement. These fish are from Takes 8 and 8A and were moved from the nursery using a PR Aqua fish pump into a Vaki fish counter and then directly into either pond. They were split in September into nearby ponds in System I when they reached approximately 50 fpp.

System II

System II received SST which were split from System I from August 10-September 27, 2011. Fish from Takes 3-4-5-6 and one pond of Take 7 were transferred. Steelhead were transferred using a PR Aqua fish-pump. The BY11 SST production in System II from initial ponding until the end of FY11 is listed in Table 14.

There were four ponds of SST in System II that received CWTs. These fish were pumped from BPs and moved to the marking trailer and tagged (Table 5). This tagging is for evaluation of System II SST contribution to the fishery and hatchery returns.

System III

System III received Take 2 SST split from System I on July 28. These fish were moved via the PR Aqua fish pump and Vaki fish counter into final rearing ponds in System III. System III received a total of 309,691 SST during this time. Table 16 illustrates the BY11 SST production in System III from initial ponding until the end of FY11.

There was one pond of SST in System III that received CWTs. These fish were pumped from BPs and moved to the marking trailer and tagged (Table 17). This tagging is for evaluation of System III SST contribution to the fishery and hatchery returns.

Projected Release

Table 18 lists steelhead on station at the end of FY2011 and projected release numbers.

Spring Chinook Salmon

Brood Year 2009

At the start of Fiscal Year 2011, there were 1,087,455 BY09 spring Chinook salmon (SCS) on station at Dworshak. All of these fish were progeny from females with low Bacterial kidney disease (BKD) ELISA status.

On January 4-10, 2011, there were a total of 51,753 BY09 SCS which received PIT tags. This study is to help evaluate the survival comparison of barging, trucking, and river-run smolts along with the adult survival rates of these fish in the Columbia Basin. Dworshak Production staff also coordinated with several outside researchers concerning sampling of various brood-years of Dworshak SCS. Details of the research can be found in the Idaho Fishery Resource Office Annual Report.

The release dates of the BY09 SCS were March 23-24, 2011. There were 1,078,250 BY09 SCS released from Dworshak into the North Fork of the Clearwater River. Monthly summaries of rearing data for BY09 SCS for FY11 are in Table 19.

Dworshak and Kooskia stock BY09 SCS had an enumerated survival of green to eyed egg of 97.4 percent. Personnel at Dworshak enumerated eggs from both stocks of BY09 SCS eggs. As was done in the past, all BY09 Kooskia stock SCS eyed eggs (733,000) were shipped to Kooskia for incubation and final rearing. There were also 575,000 Dworshak stock eyed eggs shipped to Kooskia for incubation and rearing over the winter.

There were 582,000 Dworshak stock SCS eyed eggs which remained at Dworshak for incubation and rearing. Once the eggs at Dworshak hatched and the fry were ready to go on feed in April of 2010, they were placed directly from the incubation trays into either outside raceways or experimental circular or rectangular tanks. Chinook fry have been transferred from incubation trays directly into 8’ x 80’ concrete raceways (RWs) for several years at Dworshak. Care of these fry has been problematic due to the excessive amount of time needed to clean the concrete bottom of the RWs and the fragile condition of the fry. In an effort to alleviate this situation, different early-rearing strategies were examined using a portion of Dworshak BY08 SCS fry. The 582,000 Dworshak stock eyed eggs were put back into B- bank incubators at Dworshak for this purpose. The subsequent fry from these eggs were stocked into one of three different initial rearing units. Aluminum troughs and circular fiberglass tanks were lowered into three empty A-bank RWs in the spring of 2010. The rearing units were as follows:

20’ x 3’ x 3’ Aluminum troughs (4 total in two RWs)
6’ x 3’ Fiberglass circular tanks (7 total in one RW)
8’ x 80’ concrete RW (2 total in B-bank RWs)

Chinook in the troughs and circular tanks were fed and cleaned similarly in all rearing units throughout the early-rearing cycle. Evaluations of the rearing units consisted of both visual observation from the staff and various measured parameters before the fry reached 500 fish per pound (fpp) and were transferred into empty 8’ x 80’ RWs. Preliminary findings by IFRO showed little difference between rearing units concerning overall feed conversion, mortalities, or

environmental conditions. Although no rigorous statistical analyses were calculated, the differences and the variability observed between the parameters measured did not appear to be significant. However, a very clear preference for circular tanks was expressed by all the Animal Caretakers involved in the project.

Brood Year 2010

Adult Returns

Historical SCS returns to the Dworshak Complex are listed in Appendix 2.

Hatchery Returns

There were 1,225 adult BY10 SCS which returned to Dworshak and 807 returned to Kooskia NFH, 799 of which were transferred to Dworshak for spawning. Adults spawned and eggs produced from BY10 SCS are represented in Table 20.

Personnel at Dworshak enumerated eggs from both stocks of BY10 SCS eggs. As was done for BY99-09, all BY10 Kooskia stock SCS eyed eggs (737,000) were shipped to Kooskia for incubation and final rearing. There were 1,125,000 Dworshak stock eyed eggs which remained at Dworshak for incubation. No BY10 SCS Dworshak stock eggs were shipped to Kooskia.

On January 2, 2011, a compressor went out on the chiller unit for the SCS eggs. This led to higher than normal temperatures which accelerated the egg development. Subsequently, 814,000 BY10 SCS fry were transferred to the nursery to begin feeding on March 31. Also on this date, the outside water for the hatchery was turned off after BY09 SCS smolts were released. The following week, a major leaking valve was inspected and adjusted. Concurrently, Dworshak Dam began spilling a tremendous amount of water to alleviate spring run-off. This spill created Total Dissolved Gas levels above 110% as measured at the raceways. As such, the BY10 SCS were not ponded directly from incubation into in the raceways (river water supply). Instead, during April, all 1.1 million BY 10 SCS were moved either from the nursery or incubation room into Burrows ponds in System I (reservoir water supply). The early rearing of SCS in Burrows Ponds was not desirable. The screens for the Burrows Ponds had to be modified and cleaning operations were difficult at best. Fortunately, on May 10-11, 2011, the SCS were transferred from the Burrows ponds to raceways.

The USFWS fish marking trailer from the Columbia River Fishery Program Office (CRFPO) coded wire tagged (CWT) the BY10 SCS from August 4, 2011 to August 9. There were 126,106 tagged for contribution research. Personnel from the marking trailer also inventoried and clipped adipose (AD) fins on all BY10 SCS and split fish into several raceways during the marking/tagging operation. Monthly summaries of rearing data for BY10 SCS in FY11 are illustrated in Table 21.

By the end of FY 2011, there were 1,047,916 BY10 SCS at Dworshak. Table 22 lists the size and number of BY10 SCS on station at the end of the fiscal year and projected release numbers.

Brood Year 2011

Fish traps at both Dworshak and Kooskia were operated to collect BY11 SCS. The Dworshak fish ladder was opened July 5, 2011 and closed August 5. The total Chinook returning in 2011 to Dworshak and Kooskia were 1,250 and 1,255 fish, respectively (Table 23). This includes 325 one-ocean fish returning to Dworshak and 472 to Kooskia. There were 831 fish transported from Kooskia to Dworshak for spawning.

Historical SCS returns to the Dworshak Complex are listed in Appendix 2.

Adult returns for BY11 SCS were enough to meet the production requirements for Dworshak. A sport fishery took place in the Clearwater River in the spring and summer of 2011. A tribal harvest also took place along the Clearwater River and Clear Creek below Kooskia Hatchery during the spring and summer.

Adult Holding

Dworshak broodstock SCS were kept in holding ponds (HPs) 1, 2, and 9. The 831 Kooskia stock transfers were held in HP3. Kooskia stock received a right opercule punch in order to distinguish between the two stocks. Formalin treatments were administered to the adults in order to impede fungus infection. On July 19 personnel from Idaho Fish Health Center (IFHC) injected Dworshak and Kooskia stock females with erythromycin. The females were injected at a dosage of *2*0 mg/kg body weight as a preventative against vertical transmission of Bacterial Kidney Disease to the egg**.**

Adult Mortality

There were 7 adult SCS of Dworshak stock and 19 of Kooskia stock which died before spawning began on August 9 (prespawning mortalities). Table 24 depicts the mortality for adult BY11 SCS held at Dworshak.

Adult Disposition

Table 25 illustrates BY11 SCS adult disposition from both Dworshak and Kooskia stock held at Dworshak.

Spawning Season

The BY11 SCS spawning season began August 9 and ended on August 30 for Dworshak and Kooskia stock egg collection. There were 354 males and 410 females (1:1.16 ratio) of Dworshak stock spawned during the season. There were also 225 males and 256 females (1:1.14 ratio) of Kooskia stock spawned for Kooskia NFH during the season. This included Takes 1-4 for Kooskia.

After spawning, Take 4 on August 30, it was decided that all eggs from Kooskia Take 1 would be transferred to IDFG for their Clear Creek program. This included eggs from a total of 33 females spawned, 28 being transferred and 5 testing positive for IHN and subsequently being culled.

Kooskia eggs from Takes 2-3-4 (223 females) were transferred to Kooskia NFH the day of spawning. In addition there were also 81 Kooskia females and 65 males spawned on August 30 for IDFG. The total BY11 SCS of Kooskia stock spawned at Dworshak was 290 males and 337 females. Eggs from the 81 fish spawned for CWH were incubated at Dworshak in 2011 rather than CWH as in 2010. Fish from each HP were sorted and spawned once each week along with new fish coming up the ladder into HP9.

The BY11 SCS fecundity averaged 4,195 eggs/female for Dworshak stock (Table 26). Dworshak put 1.42 million eyed eggs into its program and will incubate all of them at Dworshak over the winter.

Idaho Fish Health Center (IFHC)

During spawning personnel from the IFHC took ovarian fluid from both Dworshak and Kooskia stock females and spleen samples from males for viral inspection. Kidneys were also sampled for BKD from all females spawned. As in 2010, Dworshak used an ELISA test for BKD which employed a base-line test to compare all samples to a given ELISA reading. The results of the testing for adult females were 3.1 percent (13/410) greater than 0.250 ELISA for Dworshak stock and 9.0 percent (23/256) for Kooskia stock. Eggs from females which tested above 0.175 were culled for Dworshak stock. Kooskia eggs were incubated at Kooskia NFH this year and all BKD culling was done at that facility.

Research

Dworshak NFH continued to coordinate with outside researchers. Matt Campbell from the Idaho Department of Fish and Game is creating a parental genotype database at various hatcheries in the Snake River Basin. This research involves tracking the male x female crosses using a fin-clip sample from each fish spawned.

Spawning Summary

BY11 SCS adult return numbers were adequate to fulfill both Dworshak's and Kooskia's production goals. Projected release of BY11 smolts in the year 2013 at Dworshak NFH is approximately 1.35 million smolts of Dworshak stock.

Fall Chinook Salmon

Brood Year 2010

The Idaho Fishery Research Office (IFRO) is participating in a study conducted to understand the response of fall Chinook salmon (FCS) to dam passage strategies. This study is being conducted with Lyons Ferry Hatchery stock and the fish are referred to as either Snake or Clearwater River surrogates depending on their release location. The Snake and Clearwater River surrogates for the transportation study were initially incubated and reared at the Umatilla State Fish Hatchery in Umatilla, Oregon. Both groups of surrogates were transferred to Dworshak where cool water

temperatures allow date and size at release to be controlled to match rearing timing and size of fish in the wild.

On April 12-13, 2011 there were 328,000 BY10 FCS transferred from Umatilla to Dworshak. From May 25, 2011 until July 8, a total of 312,340 FCS were PIT tagged and released. There were 3,395 fish too small to tag and were released untagged. There were 200,754 tagged and 854 untagged at Couse Creek on the Snake River and 111,586 tagged and 2,541 untagged at Kayler's Landing on the Clearwater River. The final day for release of FCS was July 8, 2011.

Coho Salmon

Brood Year 2009

In May 2010, 340,000 BY09 Coho salmon were transferred from Kooskia NFH to Dworshak for rearing. On February 22-23, 2011 the resulting 301,377 BY09 Coho smolts were returned to Kooskia NFH for final acclimation prior to release (Bisbee 2012, personal communication). These fish averaged 16.4 fpp and 14.2 mm (5.6 inches) total length at the time of transfer. On March 30 there were 20,054 BY09 COS transferred to Clear Creek. These fish averaged 15 fpp and 146 mm (5.8 inches) total length at release. Table 27 illustrates BY09 Coho smolt production at Dworshak.

There were 453 BY09 female Coho that returned to the Clearwater Basin and spawned at Kooskia for egg transfers to Eagle Creek NFH in Estacada, Oregon. Green eggs and milt were transferred from Kooskia to Dworshak on November 4, 5, and 9, 2009, where the eggs were fertilized and incubated. The total number of eggs transferred to Dworshak was 943,520. On December 10 and 18, 2009, there were a total of 759,445 eyed eggs transferred from Dworshak NFH to Eagle Creek NFH. On December 17 there were also 30,524 eyed eggs transferred from Dworshak to Potlatch Corporation in Lewiston, Idaho. These eggs were then incubated and the parr released in Orofino Creek near Orofino, Idaho on July 22, 2010.

Brood Year 2010

BY10 Coho adults were trapped at Dworshak (132) and Kooskia (420) hatcheries and Lapwai Creek weir (384) for broodstock between October 1st and November 30th. Broodstock composition was 573 adult and 363 jacks. An additional 409 adults were trapped and outplanted to tributary streams. Overall 1,345 Coho were recruited from 1,902 passing Lower Granite Dam (Bisbee, 2012 personal communication).

The 2010 broodstock were transported to and spawned at Kooskia NFH. Five spawns occurred each week between October 26th and November 23rd, 2010. The broodstock produced an estimated 692,072 green eggs from 218 females; the fecundity estimate is 3,175 per female. A total of 236 females, 224 males and 4 jacks were used for broodstock; culling occurred for disease purposes; all were of Clearwater origin. Estimated egg eye-up was 616,805 with survival of 89.12% from green egg. Spawning, incubation and early rearing occurred at Kooskia NFH. In April – 293,272 parr ((220 fpp and 60 mm (2.3 inches)) and in May – 283,147 parr were returned to DNFH. In July these parr were enumerated; 56,219 were coded wire tagged and combined with

282,747 totaling 338,966; these were kept to produce smolts for the 300,000 release goal in 2011(Table 28). The remaining 256,655 parr/fingerlings were outplanted to Lolo Creek during June 2011so as to not exceed production goals. Their release into Lolo Creek is an attempt to create a naturally producing population. Originally these fish as eggs were to be transferred to Eagle Creek NFH for rearing the prior December but weather closed road access and prohibited transfer.

Rainbow Trout

Brood Year 2010

At the start of FY11 there were a total of 8,826 BY10 RBT in Burrows pond 59. These were triploid RBT from Trout Lodge, Washington. Table 29 illustrates the production of BY10 RBT at Dworshak.

Dworshak held its annual Kid's Fishing Day on May 14, 2011 at the Tunnel Pond in Orofino, Idaho. Approximately 300 RBT were caught by the 58 kids 12 years of age and under who took part in the activities. Table 30 illustrates outplanting of BY10 RBT from Dworshak.

The RBT rearing program at Dworshak was discontinued after BY10.

Production Summary FY 2011

Steelhead Brood Year 2010
There were 2.26 million steelhead smolts released from Dworshak in March, 2011. The steelhead at release averaged 7.0 fpp and 188 mm in total length. The majority of these smolts were released March 21-31, 2011. Under the Harvest Settlement Agreement with the Columbia River Tribes and included in the final release numbers were 172,708 unmarked smolts. These SST were released without an adipose fin clip or mark/tag to designate them as a hatchery fish and released in either Peasley or Lolo Creek. There were a total of 323,275 pounds of steelhead produced from BY10 SST.

Steelhead Brood Year 2011
There were 4,404 adult steelhead returned to Dworshak NFH in the fall of 2010 and spring of 2011. A total of 3.08 million eyed eggs went into Dworshak production program. Dworshak provided 1.4 million eyed eggs for the Clearwater Hatchery and 1.9 million green eggs were taken for Magic Valley Hatchery. As in 2010, SST spawning began in January. Spawning of mid and late returning adults ended on April 19. At the end of FY11 there were 2,200,000 BY11 SST on station.

There will be approximately 200,000 BY11 SST released in 2012 for the Nez Perce Tribe which will have no external mark designating them as a hatchery fish. These fish will be counted in the Dworshak SST production program.

Spring Chinook Salmon Brood Year 2009

Dworshak NFH released 1.08 million BY09 spring Chinook salmon weighing 51,032 lbs. These SCS averaged 21 fpp and 137 mm total length and were released on March 23-24, 2011.

Spring Chinook Salmon Brood Year 2010

At the beginning of FY2011, BY10 SCS eggs of both Dworshak and Kooskia stock were incubating at Dworshak. During October of 2010 there were 737,000 eyed-eggs of Kooskia stock shipped to Kooskia for final incubation. There were no BY10 Dworshak stock SCS eggs shipped to Kooskia. Dworshak incubated 1,125,000 Dworshak stock SCS over the winter. At the end of FY11 there were 1,048,000 BY10 SCS of Dworshak stock on station, averaging 49 fpp and 103 mm (4.0 inches) total length.

Spring Chinook Salmon Brood Year 2011

Adult returns of BY11SCS produced 1,250 Chinook adults to Dworshak. Kooskia trapped 1,225 adult fish, transferring 831 to Dworshak for spawning. There were a total of 410 Dworshak stock and 337 Kooskia stock females spawned during the season, 223 for Kooskia NFH and 114 for Clearwater State Fish Hatchery. Eye-up survival for Dworshak stock eggs was 96.6 percent. All BY11 SCS eggs were incubating at Dworshak at the end of FY11.

Fall Chinook Salmon Brood Year 2010

The Idaho Fishery Research Office (IFRO) is participating in a study conducted to understand the response of fall Chinook salmon (FCS) to dam passage strategies. This study is being conducted with Lyons Ferry Hatchery stock. From May 25 until July 8, 2011, a total of 312,000 FCS were PIT tagged and released; 201,000 tagged at Couse Creek on the Snake River and 111,000 tagged at Kayler's Landing on the Clearwater River.

Coho Salmon Brood Year 2009

On February 22-23, there were 301,000 BY09 Coho salmon transferred from Dworshak to Kooskia NFH for acclimation and release (Table 27). On March 30 there were 20,000 BY09 smolt transferred to Clear Creek. There were also 760,000 eyed eggs transferred to Eagle Creek NFH in Estacada, Oregon during December, 2009; another 30,000 transferred to Potlatch Corporation in Lewiston, Idaho.

Coho Salmon Brood Year 2010

Adult Coho broodstock were trapped at three locations; Dworshak and Kooskia hatcheries and Lapwai Creek weir; all were spawned at Kooskia NFH (Bisbee 2012, personal communication). There were a total of 236 females spawned; the eggs of 218 females produced 692,072 green eggs. Eggs were incubated at Kooskia NFH; after early rearing, an estimated 576,419 fry were transferred to Dworshak in April and May 2011. They were enumerated in June and 56,219 coded wire tagged. Surplus parr totaling 256,655 were outplanted to Lolo Creek watershed in June 2011 because transfer to Eagle Creek NFH as eggs the prior December was blocked by inclement weather. On September 1st of FY11, there were 334,310 BY10 parr remaining on station at 54 fpp. The 2012 smolt release goal is 300,000 at 20-23 fpp.

Rainbow Trout Brood Year 2010

Dworshak received approximately 9,000 triploid RBT eggs from Trout Lodge, Washington in February 2010. There were 4,300 of these RBT stocked into Tunnel Pond in Orofino, Idaho for Kids Fishing Day. There were 58 participants fishing at the event on May 14, 2011. Approximately 4,400 10-inch RBT were stocked from Dworshak into state fishing lakes in the spring and summer of 2011.

PRODUCTION PHOTOS, FY2011

The Production Staff at Dworshak national Fish Hatchery worked successfully to spawn, incubate, rear and release over 2 million summer steelhead trout and nearly 1 million spring Chinook salmon as part of the annual hatchery production cycle. Additionally, they raised over 10,000 rainbow trout averaging 1 lb. and 15" long, for the annual Kids' Fishing Day event and assisted the NPT with Coho salmon spawning in the fall.

Production photo highlights include: **Top Left**: **Animal Caretaker Supervisor, John Vargas** places fertilized eggs in incubation trays. **Top Right**: **Animal Caretaker, Ben Wright** collects eggs from female Chinook salmon. Center: **Gia Paul, NPT** working on a compost pile for morts as an natural alternative to past procedures**. Left Bottom**: **Fisheries Biologist, Jill Olson** lends a hand to help clean up dead fish in the wake of a severe windstorm that struck Ahsahka, Nov. 16, 2010 with winds exceeding 70 mph. **Right Bottom**: Windstorm destruction caused by roof being ripped off Feed Building.

Facilities Maintenance

October, 2010

- Electrical projects: repaired damaged power cord on pond crowder; repaired all electrical OSHA citations on complex; locked out all reuse pumps not being used and replaced broken lift cable on back gate of channel crowder.
- Fabrication projects included repairing nets and hoop frames; lid for float level tank in Mech I and a portable egg removable table for the NPT.
- Hauled freezer from the Idaho Fish Health Lab to Moscow for repair.
- Repaired intake trash rake at the Main Pump Hose.
- Installed oil deflection boom at Main Pump House and guards around pump shafts in Main Pump House and Mech I & II.
- Repaired valve operator on RW A-8.
- Pumped down System II filter beds for cleaning.
- Installed new screens around fans in Generator room and exhaust fan in Chemical Bldg.
- Hauled steelhead adults to Ahsahka boat ramp

November, 2010

- Electrical projects: installed interlocking relay and equipment for safety purposes on pond crowder; tested a block heater on the fish truck; repaired floor lighting in several offices; relocated boiler control for Mech II boilers; worked with Clearwater Power during unscheduled power outage due to severe windstorm; repaired Mech II boiler #2 and repaired damage from #4 boiler in Mech II.
- Repaired damage from severe wind storm – removed bird netting and wire in System III and removal of Feed Building roof from System III ponds and hauled to dump, cut loaded and hauled tree limbs from the street.
- Plowed and removed snow on hatchery grounds.
- Unloaded pipe and aluminum supports for new piping job at aeration chamber.
- Replaced cooling lines on hot water umps in Mech II.
- Adjusted flows in System I, II, III & A&B bank during power outage.
- Ran scrapers and pumped sludge from System I clarifiers to System I digesters.

December, 2010

- New metal pond crowders were welded and constructed.
- Electrical conduit was installed to facilitate the moving of the boiler control panels outside the blast zone in Mech II.
- A “drop-out” switch was installed on the Holding Pond (HP) crowder to ensure staff safety in conjunction with the 480-volt electrical charging system and a standard operating procedure developed for the HP crowder developed.
- Bird netting repairs were ongoing throughout the month following the severe wind storm and damage that occurred on November 16, 2010.
- Welded and installed a support arm for water sampling for main pump intake.

January, 2011

- Electrical: Pump #3 in the main pump house was pulled and sent for repairs; permanent projector and screen were installed in the Conference room; lighting replaced in Mech I and one of the two compressors failed on the chiller which required maintenance during the month.
- Fabrication: metal frame stand to replace the wood stand for holding adult males during spawning operations and bracket fabricated for a camera mount for installation in downstream dam.
- External site tubes installed on four of the degassing towers for the nursery to monitor flow levels during nursery operations.

February, 2011

- Electrical: Gauges for the 4 boilers relocated in Mech II to a safe area in accordance with OSHA recommendations; "back-up" alarms on all equipment requiring these devices now have functional alarms; ice machine in IFHC repaired; outlet converted from 220-V to 110-V for a freezer in IFHC and rotation for all high voltage outlets at the hatchery were evaluated and corrected to ensure consistent rotation for safety of the crew and equipment. Various equipment items such as the Heathro Fish Pumps were also corrected to ensure we aren't binding impellors, etc. due to reverse rotation.
- Packing was added or replaced on all three System I pumps. These pumps had been throwing excess water which resulted in a safety hazard with the adjacent 48-V power. This was one of our OSHA violations.

March, 2011

- Pump steelhead for distribution upstream in the South Fork Clearwater River.
- Virtually all of the vehicles were inspected and received basic servicing during the month.
- Electric carts were maintained and on the shelf inventories were improved for cost-effective and efficient repairs.
- The hatchery was dewatered on March 31st after the smolt releases were completed to inspect and adjust a leaky valve that has not been seen in 25 years. The leak is approximately 80% reduced from what it was.
- Spring landscaping projects including cleanup and replacement of woodchips in beds were completed during the month.
- Boiler controls in Mechanical II building were relocated and stairwells to enable staff to gain access to work areas were installed to ensure safe access and keep staff out of arc flash blast areas.
- Ecoblocks at the Clear Creek intake were repositioned for the Kooskia Hatchery.
- Mechanical II lighting was replaced.
- A new sump pump was installed in Mechanical I.
- The rotation in the 480 volt receptacles in the nursery was reversed to be compatible with the Heathro Fish Pump and all other receptacles on site.
- Repairs were made to the channel crowders.
- Lifting "ears" were fabricated to the experimental vacuum degasser in the nursery.

- Completion of the 20 aluminum pond crowders for the burrows ponds to eliminate the use of the wooden crowders and reduce the potential for disease transmission.
- Installed two solid safety rails for the grate cleanout grate for the traveling screen discharge.
- Cut and fabricate aluminum plates for the construction of a Praffle. What the heck is a Praffle? It is a moving baffle for a raceway that was invented by Chuck Pratt!
- Fabricated a stand to support a chemical storage cabinet in the maintenance building.
- Initiated fabrication to mount the Vaki Micro Fish Counter on a trailer with discharge hoses.

April, 2011

- Cushman cart tires were repaired and additional tires were purchased for inventory-contractor; tires on Caravan; batteries in carts.
- Oil drain plugs for the main pump were purchased and installed.
- All of the batteries were replaced for the backup generator for the main pump house.
- The Detroit Diesel Genset #3 generator was serviced by contractor.
- Oil changes were performed on all three traveling screens in the main pump house.
- Replaced Pond Scrubber Hydraulic Pump-contractor.
- An air dryer for the incubation compressor was purchased and installed.
- A "Taskmaster Valve" was purchased and installed for the fish diverter in the spawning room.
- The starter cord for concrete saw was replaced.
- The fire maintenance PVC line adjacent to the main aeration building was excavated and repaired.

May, 2011

- Electrical: new battery charger was installed (contractor) for the backup generator (i.e. Genset #3) for the main pumps providing water from the North Fork Clearwater River; pressure gauges replaced for pumps; garbage disposal repaired in Quarters #1; electrical outlets in the nursery were completed for safe use of scales and for the irrigation system; Rebuilt system III channel pump installed.
- Pressure gauges were replaced for pumps.
- Engine oil was changed in the Davey Fire Pump.
- Preventative maintenance: PW-4 Pressure Washer Honda; on the all three System I pumps (sump); the 1996 Ford L8000; electric Cushman carts; replaced 4 tires and air filter for the circulation pump on the 1992 Ford LT9000.
- Monthly inspections on all fire extinguishers completed.
- The off-line settling basin was vacuumed out and the solids transferred to the drying beds.
- The annual power outage was conducted on May 19th and commercial circuit breaker maintenance occurred on the 19th and 20th.
- Fabrication: two ea. ½ X 3 X 6 inch lifting eyes to lift channel pump, continued work on the FRO trailer and Fabricate fish moving hoses (20 ft.) with male/female ends.

- Straightened the damaged/bent air cleaner frame for new compressor, mounted a bulletin board in Admin Office and repaired broken parts on a saw
- Threaded and constructed 4 inch threads on aluminum pipe for water seals at end of "B" Bank raceways. Water seals installed at A and B bank.

June, 2011

- Electrical projects: installed new incubation room air compressor and air dryer assembly; system III channel pump probe electronics replaced; Mech I boiler preventative maintenance performed and mounted gas fire pump to FRO trailer.
- Repaired Fire Maintenance line leak in front of Quarters #1 and Maintenance shop and serviced and repaired pressure washer.
- Hatchery Quarters repairs of downspout drains, torn window screens and new lights and faucets.
- Domestic water line leak found and repaired.
- Mech II piping flow restrictors removed.
- Formalin room cleaned out, hose rack fabricated and installed.
- Daily checked Main Pump House and Fire Maintenance Pump House, grounds and building maintenance.

July, 2011

- Fabrication projects: guard on nursery fish pump to keep suction pipe off the tank bottoms; fabricate and install slide gate in System III north side channel.
- Lawn sprinklers repaired and put into operation.
- John Deere Gator PM performed and toolbox installed on shop truck
- PM performed on Mechanical I boiler circulation pumps.
- Pre-construction meeting with U.S. Army Corps of Engineers (COE) and Metal Benders staff in preparation for boiler control project.
- New Bird netting installed over Burrows Ponds.
- Manlift taken to Coast Crane in Spokane for repairs.

August, 2011

- Modified B-bank standpipes for serial reuse.
- Repaired cable on large pond crowder.
- Replaced battery in maintenance cart.
- Trane Air handlers on Nursery building maintenance performed.
- Repaired sump pump in Mech I and installed Main Pump #5
- Removed flow orifices in Mech II piping.
- Annual maintenance performed on John Deere backhoe; Komatsu forklift & 1999 Dodge Caravan

September ,2011

- Electrical projects: Ran a 208-volt circuit for freezer in Feed Bldg. basement; troubleshot H20 cooling problem on Trane furnace in Feed Bldg; researched second pump on emergency power in System I reuse pump house; repaired floor drying fan and troubleshot overload and trip problems on pressure switches on Mech I air compressors and checked, adjusted and started incubator chillers;
- Cleaned and cycled System I digesters; cleaned system II clarifiers and pumped sludge to drying beds.
- Fabrication projects: net frames, brackets & handles; cut and welded aluminum pipe fitting for fish counter; rolls for pond scrubber and broom handle brackets; stanchions for oil boom trolleys to carry oil boom sections during rise and fall of river levels.
- Removed and hauled trees to burn pile.
- Building maintenance and grounds maintenance daily; checked main pumps, traveling water screens and cleaning moss trap in Main Pump House daily.
- Hauled aluminum and metal to COE bone yard.
- Assisted with water in System I.
- Maintenance performed on several hatchery vehicles and equipment.
- Trained staff members in fecal water removal in System II.
- Repaired broken stairs.

Energy Efficiency Projects FY11

While improving infrastructure and operational flexibility at Dworshak Hatchery, the staff identified projects that could reduce energy consumption at DNFH. As a result, hatchery staff provided a proposal outlining subsequent energy reductions and capital cost requirements to Bonneville Power Administration (BPA)in June 2011. Although it was already late in the fiscal year, the fact that the Dworshak Hatchery efforts represented the largest energy savings project for BPA in FY11 (over 6,900,000 kWh/year of green-hydroelectric produced power is now available to the grid with an annual cost avoidance of $345,000/year, and an additional 840,000 kWh/yr savings is yet to be recognized), staff from both agencies worked closely together to identify funding sources and quickly procure the equipment and labor necessary to implement these measures. Staff at BPA successfully identified and transferred to the hatchery over $600,000 for the requested projects. All project identification, scope development, engineering, procurement, and installation of all components with the exception of the new Nursery pipeline was accomplished by a collective effort of the Dworshak Hatchery staff. Knight Construction of Deer Park, Washington was contracted to install the new nursery pipeline. While they did an outstanding job, however due to the compressed performance window additional support by the Dworshak maintenance team was needed to complete the project within the window of time allowed per the requirements of the funding program. Energy efficiency projects performed at the Dworshak Hatchery in FY2011 include:

- Incubation and Nursery Expansion and Operational Modifications – Because the hatchery had a limited number of vertical incubator stacks available, influent temperatures to the incubator stacks had to be increased to accelerate the development of the steelhead eggs so

that the incubators could be used multiple times during a single season. Not only did this make the logistics of the incubation program more difficult, the need to increase the temperature of the incubation influent water resulted in a huge electrical demand on the hatchery boiler system. An in-house operational program review by Dworshak Hatchery staff identified that a different temperature profile could be used advantageously throughout incubation and the nursery rearing phase from both a fish culture and energy efficiency perspective if the hatchery could procure and install 58 new double-stacks of vertical incubators. The cost of the incubators was approximately $130,000 plus the plumbing modifications necessary to support the installation. The Dworshak Hatchery staff installed all plumbing components and all of the new incubators. As a result of these planning and installation efforts the electrical demand of the Dworshak Hatchery boiler system has been reduced by over 5,500,000 kWh/year.

- Replacement of Nursery Water Pipeline and Modifications to Original Infrastructure – The original nursery water delivery pipelines were installed almost 4 decades ago. Since this time the flow requirements of the system to meet hatchery production demands have significantly increased while corrosion of the steel piping has reduced the interior diameter of the piping and further increased the pumping energy requirements of the system. The result of the piping being undersized by design and corrosion was an almost 3-fold increase in the energy necessary to deliver the amount of water needed by the program across the hatchery campus when compared to a properly sized piping distribution system. The heavy pipe corrosion levels also placed the hatchery nursery water supply at risk of failure. A new HDPE pipe was installed to replace the original steel pipes. Modifications to remove components of the original system that added additional pumping power demands were also performed at this time by the hatchery maintenance staff. The anticipated reduction in energy demand for these efforts is approximately 600,000 kWh/year.

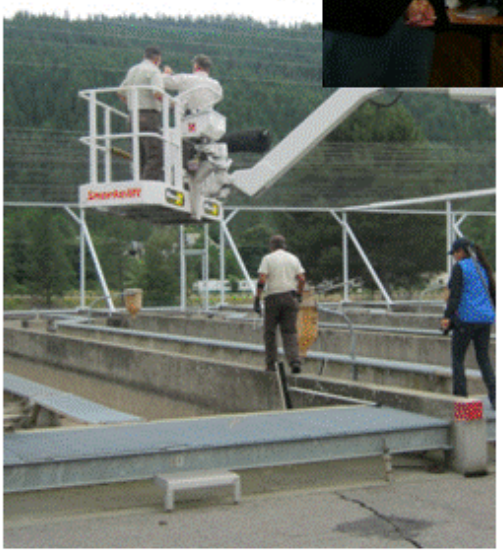
- Installation of Variable Frequency Drives on Hatchery Pumps – Several systems at the Dworshak Hatchery provided opportunities to reduce pumping costs through the installation of Variable Frequency Drives (VFD's) to reduce electrical demand when the full output of the pump was not required. The first VFD was installed on a new 200 hp river water pump at the Dworshak Hatchery. While three VFD units have been purchased, it is estimated that this first installation alone will save almost 700,000 kWh/year and have a payback per of approximately 6 months. The VFD for nursery water delivery pump in Mechanical II will be installed by hatchery maintenance staff next month. The third VFD will be installed on the 16" System 1 reservoir water supply pump following its resizing for optimization in May.

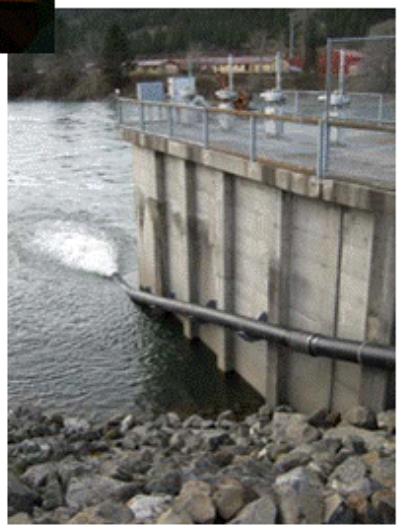
- The estimated delivery date for the new pump bowl assembly for the 16" System 1 reservoir water supply pump is the last week of April. Once the new assembly arrives, Dworshak maintenance staff will remove the existing pump and perform all necessary modifications. The original pump utilized a 125 hp motor and was sized to deliver a flow rate of almost 5,000 gallons per minute to the System 1 biofilter system. Because the biofilter is no longer in use and the piping has been re-routed to the vacuum degassing system that was installed in 2010, the head requirements of the pump have been decreased by almost ½. As a result of this pumping head reduction, an optimization of the pump bowl components will allow the rebuilt pump to deliver up to 10,000 gallons per minute of reservoir water. The pump will utilize a new VFD rated 150 hp motor to do so. The new VFD on the pump will allow staff to more easily adjust the System 1 reservoir flow rates to desired levels. It is estimated that this project will reduce Dworshak Hatchery electrical consumption by an additional 840,000 kWh/yr once completed.

While the opportunity to improve operational efficiency and infrastructure has been an exciting and rewarding undertaking by Dworshak Hatchery staff, it is recognized that this would not have been possible without the assistance of many others. Staff from BPA that included Curt Nichols, Tom Osborne, Jeff Hurt, and Scott Bettin invested considerable time and effort assisting with the review and approval of each project and their subsequent funding. Staff from the USACE Walla Wall office that included Chuck Palmer, Nick Ivy, and Jared Frank assisted Dworshak Staff with planning efforts. And finally, USF&WS in Portland helped with the end of year transfer of funds and substantial procurements in a very compressed time period. These staff members include Kim Hubbard, Dan Guffey, and Lorrie Gleghorn.

Facilities Maintenance Photos, FY2011

The Maintenance department assisted contractors in major ongoing construction well into FY11 : Chinook release pipe, bird netting installation after severe windstorm in Nov., 2010 and new pipeline to transfer heated reservoir water from Mech II to the nursery. They also oversee all electrical projects; fabricate new and safer equipment for hatchery work; haul fish, daily repairs on buildings, grounds and vehicles.





Facilities Photo highlights: **Top Left** : Pipeline for heated nursery water **Top Right:** staff working on bird netting installation. **Center: Hubert Sims, Supervisor** accepting his plaque at his retirement after 25 years of service at DNFH as his wife, **Lupe,** looks on. **Lower Left :** Staff installing bird netting. **Lower Right:** Chinook release pipe.

Administration

Meetings

October, 2010

- Ian Race, PR Aqua visited the hatchery and Oct. 5 and provided a brief presentation to the crew on the various technology, projects and services they provide to the "fish culture world." He also provided an overview and troubleshooting training on the Vaki Micro Fish Counter. We provided a tour of the facility for Ian and have plans to work with them in the future as a third party consultant relative to rehabilitation and renovation of the hatchery.
- Larry Peltz, Complex Manager, traveled to Moscow for a University of Idaho Cooperators meeting.
- Larry Peltz, Mark Drobish, Hatchery Manager, Jill Olson, Fisheries Biologist and Jack Christiansen, Aquatics Engineer met with Chris Gebhardt and Dave Terpening of the EPA and Chad Chorney of Idaho DEQ to discuss the National Pollutant Discharge Elimination System (NPDES) violation. Tour and inspection followed the meeting.
- CFC kick-off was held in the Main Bldg. Conference Room with a Chili Feed/Bake Sale. Dean Crandell from Spokane CFC was on hand with giveaway prizes. Representatives from non-profit groups, Northwest Children's Home and Palouse-Clearwater Environmental Institute spoke to the staff about their organizations.

November, 2010

- Rachel Life, USGS, University of Washington gave an update to the staff on current research on IHN genomes on Nov. 1.
- Hatchery Manager's Workshop held in Richland, WA, Nov. 3-5 attended by Larry Peltz, Complex Manager, Mark Drobish, Hatchery Manager and Adam Izbicki, Biologist. Mark gave a presentation to the group on the conversions made to the facility to utilize reservoir water in a portion of the outside BPs from May-August to minimize exposure to IHNV from river water. Adam & Mark also took a tour of the Pacific Northwest National Lab in Richland, WA.
- Cindy Boen, U.S. Army Corps of Engineers (COE) and rehab team (13 people total) spent a day at the facility Nov. 9 to begin the process to assess and develop need strategies for modifications to improve the facility and put the facility into compliance relative to the EPA standards and laws.
- Hatchery Evaluation Team (HET) held in Conference Room on Nov. 18.

December, 2010

- Larry Peltz and Jack Christiansen attended the LSRCP Chinook salmon review meeting in Boise.

- Larry Peltz, Complex Manager along with animal caretakers, Rob Bohn and Rick Allain, and Tribal staff William Coomer and Gia Paul attended the Northwest Fish Culture Conference in Portland, OR, Dec. 7-9.
- K.C. Hosler, Engineer from PR Aqua visited the facility to evaluate current fish culture operations and compile a report providing recommendations for aquaculture configuration and water reuse at Dworshak if we had an additional 10K gallons per minute of reservoir water.
- Jack Christiansen, Jill Olson, Ed Larson and Mark Drobish participated in the Federal Facility Compliance Agreement conference call with the COE and the U.S. EPA on Dec. 8.
- Larry Peltz and Jack Christiansen met with COE and CH2MHill engineers to discuss NPDES project Dec. 13-14.
- Pete Summerton, Dworshak Project Safety Officer (COE) and Mike Remington, Walla Walla District Safety Manager (COE) visited the hatchery enabling Mike to review the existing safety issues related to the electrical circuitry for the boilers in Mech II. These electrical components have "blown" several times over the years and are a serious health and safety risk to staff. This issue was included in our OSHA violations from June, 2010. Safety provisions will be finalized and incorporated before the boilers go into use in February and permanent corrections are slated for the summer of 2011.

January, 2011

- Larry Peltz, and Mark Drobish, had a monthly meeting on January 12 with NPT staff to discuss Snake River Basin Adjudication (SRBA) issues.
- Larry Peltz, Jill Olson, Mark Drobish and Ed Larson participated in the Federal Facilities Compliance Agreement conference call with the EPA, COE, NPT and U.S. FWS. Each agency had legal representation on the call as well. This effort is directed at moving Dworshak into compliance relative to Clean Water Act Standards and is directly tied to the station's NPDES permit.
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February, 2011

- Larry Peltz participated in interviews for new SRBA Coordinator in Lapwai, Feb. 2-3, 2011.
- Larry Peltz, Mark Drobish and Adam Izbicki, attended SRBA coordination meeting in Lapwai on Feb. 7.
- Larry Peltz met with Becky Johnson, NPT and Sam Sharr, Idaho Fish & Game (IDFG) to discuss potential issues at Annual Operating Plan (AOP) meeting on Feb. 15.
- AOP meeting held at Dworshak on Feb. 16.
- Larry Peltz, Mark Drobish, Jack Christiansen, Adam Izbicki and Jill Olson travled to Walla Walla, WA on Feb. 22 to meet with staff from Bonneville Power Administration (NPA) and COE to discuss Dworshak Hatchery issues.
- Chris Good, Freshwater Institute visited the hatchery on Feb. 24 and then gave a presentation on "recirculation/reuse systems" and also on biosecurity with recommendations for DNFH.

- Larry Peltz, Howard Burge, FRO Project Leader and Dr. Marilyn Blair, Idaho Fish Health (IFHC) Veterinary Officer, participated in a regional call on Aquatic Invasive Species in Idaho on Feb. 28.

March, 2011

- Larry Peltz, Mark Drobish and Adam Izbicki attended a SRBA coordination meeting at Kooskia NFH on March 2.
- Larry Peltz and other staff attended the spring Chinook Salmon Program Review Meeting at DNFH.
- Rick King, Maintenance, attended the Maintenance Professionals Workshop at NCTC in West Virginia, March 7-11.
- Larry Peltz and Jack Christiansen attended the LSRCP hatchery Review Meeting in Boise, March 16-17.
- Kelly Stockton, University of Idaho (U of I) Master's student along with a Risk Assessment Panel toured the hatchery to apply their evaluation plan to Dworshak. The team has developed the risk assessment plan and focused on invasive species, disease and parasite access points for the Dworshak Hatchery. They will provide us with a report which will tie in with biosecurity and overall protection of the hatchery relative to disease and parasites.
- Jason Achziger, COE fishery biologist spent the week of March 21 here with the crew to better understand hatchery operations. Jason is one of several members on the Corps' Rehabilitation Team that are developing plans to upgrade the facility.
- Larry Peltz, Mark Drobish, Jill Olson and Nate Wiese, Assistant Hatchery Manager shared a conference FFCA conference call with COE and EPA on March 24.
- Joan George, Admin Officer, Penny Hasenoehrl, Budget Tech and Steve Bradbury, Fisheries Biologist, attended an FBMS implementation conference in Portland, OR March 29-31.
- Larry Peltz and Jack Christiansen met with BPA and COE staff to discuss future improvements for DNFH on March 30.
- Eric Willet, Hagerman NFH spent a week work with the crew as part of his Individual Development Plan. Eric participated in steelhead spawning, various fish culture activities.

April, 2011

- Larry Peltz and Jack Christiansen, attended a NPDES meeting in Walla Walla on April 5th with the COE and CH2MHill engineers.
- Larry Peltz, Mark Drobish, Adam Izbicki and Nate Wiese attended a SRBA coordination meeting with the NPT on April 6.
- Larry traveled to Lapwai on April 14 to meet with NPT representatives and discuss future plans for DNFH.
- Larry Peltz and Jack Christiansen met with CH2MHill engineers to discuss DNFH plans on April 21.

- Larry Peltz and Jack Christiansen met with COE staff in Walla Walla, WA to discuss future plans for DNFH on April 27.
- Larry Peltz met with Mike Hannah and Mike Roach from U.S. Senator James Risch office to discuss recent happenings at DNFH.
- Annual reservoir water valve exercise was conducted in cooperation with the Clearwater Fish Hatchery. Procedural changes were developed and implemented and as a result we avoided the typical temperature spikes to the nursery tanks and incubation stacks this year.

May, 2011

- Michael Ren, Mechanical Engineer from MWH Americas, Inc. and Shantanu Shah, Electrical Engineer from MWH Canada, Inc. were on site May 2-11 inspecting and reviewing electrical components at the hatchery. Part of the focus of their visit was on the Arcflash study stemming from our history of electronic malfunction and "blowups" associated with the boilers in Mech II.
- Larry Peltz, Jill Olson, and Mark Drobish met with Idaho Dpt. of water Resources Staff to dsicuss water measurement and water rights issues associated with hatchery operations.
- Nate Wiese attended a Database meeting in McCall on May 9. The development of this database is to move all hatcheries into a standardized data collection and reporting system.
- Larry Peltz, Mark Drobish, Nate Wiese and Adam Izbicki met with NPT to discuss SRBA issues on May 10.
- Larry Peltz, Mark Drobish and Jack Christiansen met with BPA staff to discuss hatchery issues on May 11. Same day they also met with COE, NPT, EPA and USFWS to participate in a conference call regarding changes to the Federal Facility Compliance Agreement.
- Larry Peltz, Mark Drobish and Jack Christiansen met with IDFG Commissioners and staff to discuss hatchery programs and issues on May 18.
- Larry Peltz attended a Clearwater County Commissioners hearing on the Dworshak Reservoir nutrient enrichment project and a public meeting later that same day hosted by IDFG.
- Larry Peltz, Mark Drobish, Jack Christiansen, Adam Izbicki, Nate Wiese and Jill Olson met with BPA staff to discuss potential energy conservation projects on May 24.
- Larry Peltz and Jack Christiansen traveled to Spokane, WA and met with EPA staff to discuss NPDES issue on May 25.
- Larry Peltz and Jack Christiansen had teleconference with BPA to discuss energy conservation projects on May 27. BPA is interested in funding approximately $1 million in projects.

June, 2011

- Larry Peltz, Mark Drobish and Jack Christiansen participated in a conference call on June 27 with EPA and COE to discuss draft Federal Facility Compliance agreement.

- Nate Wiese attended a meeting in McCall to assist in the development of a standardize database to be used for all hatcheries in Idaho.

July, 2011

- Larry Peltz, Mark Drobish and Jack Christiansen participated in a conference call with BPA on July 7 to discuss energy conservation projects.
- Larry Peltz, Mark Drobish and Nate Wiese participated in a SRBA meeting with NPT staff on July 12.
- The COE Rehab Team met with numerous staff July 12-14 to discuss hatchery infrastructure.
- Larry Peltz led a tour of the complex and discussed hatchery operations with COE staff and Department of Justice staff.
- Larry Peltz, Mark Drobish, Nate Wiese and Adam Izbicki participated in a conference call on July 25 with EPA to finalize the Federal Facility Compliance Agreement.

August, 2011

- Fred Peterson, OSHA conducted an inspection of the facility on August 3 offering corrective actions for multiple items to improve safety.
- Mike Carrier, Assistant Regional Director for Fisheries and Rich Johnson, Fisheries Supervisor visited DNFH and KNFH on Aug. 24-25, also met with the NPT regarding goals associated with the SRBA.

September, 2010

- LouAnn Lasswell and Steve Coomer, NPT Fisheries Technicians collected flow data and Jill Olson and Mark Drobish collected water samples for the NPDES monthly and quarterly reporting, respectively.
- Larry Peltz and Mark Drobish met with members of the NPT over tribal access on hatchery grounds to further discuss trail improvements to historic tribal fishing areas and "drive-on," access. Legal representatives are now participating in this matter and long-term solutions will lie in their hands.
- Larry Peltz and Jack Christiansen, toured Hagerman and Magic Valley Fish Hatcheries, Sept. 20-22.
- Larry Peltz, Jack Christiansen & Mark Drobish met with Tim Dykstra and Ken Fone from USACE regarding IHNV mortality and the Annual Work Plan FY11 budget on Sept. 30.
- Volunteer Appreciation/Going Away party for Megan Wandag held on Sept. 23. Certificates and water bottles were given to the volunteers in appreciation of their hard work during 2010. Megan was presented with a painting as a going-away gift from the staff.

Training

- Mark Drobish attended "*Championing Diversity*" and "*Diversity at the Speed of Trust*" in the Regional Office, Portland, OR, Feb. 9-10.
- Jill Olson attended CISPUS training Feb. 28-March 4.
- Adam Izbicki attended a COE training session at the Walla Walla District office on FEMS which is the COE preventative maintenance program.
- Terry Weeks and Rick King traveled to Spokane and completed their certification for safe operation of articulating cranes April 27-29.
- Retirement training at Dworshak Dam, hosted by COE was held May 4-5, most of the staff attending one day or the other.
- Mark Drobish attended a one-day training in Boise, "*Recruiting Diverse Talent*." in June, 2011.
- Cross-cultural training was provided to staff on June 30.

Safety & Wellness

- Oxarc was on site April 13 and conducted Respirator Fit Testing for all staff requiring respirators.
- The Boise Speech and Hearing Center conducted hearing tests for all required hatchery staff on April 27.
- Staff completing CPR/AED/First Aid/Bloodborne Pathogens on May 16: Laura Sprague, LouAnn Lasswell, A.J. Sisto, Ed Larson, Terry Weeks, Rick King, Ben Greene, Tui Moliga, Luke Gauthier & Frank Mullins.
- Dave Hechtner from Oxarc gave a presentation May 18 on fire extinguishers with staff viewing a video and hands on training outside.
- Don Gardner, Orofino Fire Department Chief provided a training meeting to staff on Hazardous Materials, June 7.

Staffing

DNFH Employees, FY 2011.

Name	Position Title	Period of Employment	Status
Allain, Richard E.	Animal Caretaker	10/01/10–09/30/11	Permanent
Bohn, Rob	Animal Caretaker	10/01/10-09/30/11	Permanent
Bright, Mark	Fishery Biologist	10/01/10-09/30/11	Permanent
Christiansen, Jack	Aquatic Engineer	10/01/10-09/30/11	Permanent
Drobish, Mark	Hatchery Manager	10/01/10-09/30/11	Permanent
Feldmann, Angela	Fisheries Biologist/I/E Coordinator	07/05/11-09/30/11	Permanent
George,Joan	Admin. Officer	10/01/10-09/30/11	Permanent
Goosen, Brent	Maintenance Worker	08/14/11-09/30/11	Permanent
Greene, Benny C	Electronics Mechanic	10/01/10-09/30/11	Permanent
Hamilton, William W	Animal Caretaker	10/01/10-09/30/11	Permanent
Hardy, Thomas	Intermittent Animal Caretaker	12/20/10-04/1/11	Temporary
Hasenoehrl, Penny	Budget Tech	10/01/10-09/30/11	Permanent
Izbicki, Adam	Fisheries Biologist	01/16/11-09/30/11	Permanent
Kellar, Robbie D	Animal Caretaker	10/01/10-09/30/11	Permanent
King, Rick	Maintenance Worker	10/01/10-09/30/11	Permanent
Langford, Will	Intermittent Animal Caretaker	12/28/10-04/1/11	Temporary
Peltz, Larry	Complex Manager	10/01/10-09/30/11	Permanent
Sims, Hubert M	Maintenance Mechanic	10/01/10-01/1/11	Permanent
Stamper, Monique	Office Clerk/STEP Student	09/30/10-08/?/11	Temporary
Stretsbery, Gerald	Laborer	10/01/10–09/30/11	Permanent
Trainor, David A	Maintenance Worker	10/01/10–09/30/11	Permanent
Trock, Thomas J.	Fishery Biologist	10/01/10–09/30/11	Permanent
Vargas, John J	Animal Caretaker Leader	10/01/10–09/30/11	Permanent
Weeks, Terry C.	Maintenance Worker	10/01/10–09/30/11	Permanent
Wiese, Nathaniel	Assistant Hatchery Manager	03/03/11-09/30/11	Permanent
Wright, Benjamin A	Animal Caretaker	10/01/10–09/30/11	Permanent

FY11 Nez Perce Tribe Employees at Dworshak NFH

Name	Position/Title	Employment Period	Status
Bisbee Jr., Michael	Coho Project Leader /Biologist, NPT	10/01/10–09/30/11	Permanent
Coomer, William	Fish Culturist III/Coho Project	10/01/10–09/30/11	Permanent
Paul, Gia	Fish Culturist II/LSRCP-DNFH	10/01/10–09/30/11	Permanent
Larson, Ed	SRBA Coordinator,/LSRCP/DNFH	10/01/10–09/30/11	Permanent
Lasswell, Lou Ann	Fish Culturist II/LSRCP-DNFH	10/01/10–09/30/11	Permanent
Moliga, Tuiana	M&E Biologist, Coho Project, NPT	07/01/11 –09/30/11	Permanent
Sisto, Ambrose J.	Fish Culturist I/LSRCP-DNFH	02/14/11 –09/30/11	Permanent

Personnel

- Penny Hasenoehrl promoted to Budget Tech on 12/5.
- Tom Hardy EOD as Intermittent Animal Caretaker on Dec. 20.
- Will Langford EOB as Intermittent Animal Caretaker on Dec. 28.
- Retirement party in conjunction with the Christmas Potluck for DNFH & KNFH staff. We gave best wishes to Hubert Sims, Maintenance Supervisor, leaving after 25 years at DNFH.
- Adam Izbicki was re-assigned from KNFH to DNFH on January 16 with the recent hiring of Kent Hills as the new KNFH Manager. The addition of Kent rounds out the staffing transition of the KNFH to 100 percent Nez Perce Tribal Fisheries.
- Nate Wiese, officially started as the Assistant Hatchery Manager on March 3, moving here with his wife and child from Hagerman NFH.
- Rick King, Maintenance, promoted to WG8 on March 13.
- Wayne Hamilton, Animal Caretaker, worked at the Hagerman NFH April 11-May 6 to assist during Hagerman's fish distribution season.
- Angela Feldmann EOD July 5 in a hybrid position as Fishery Biologist/Information/Education Coordinator.
- Brent Goosen EOD August 14 as a Maintenance Worker.
- Monique Stamper resigned as STEP student in August, to attend college in the fall

Outreach and Visitor Activities

FY 11 was a year of transition for Dworshak's outreach program. The half time Information/Education (I/E) position remained vacant until July when Angela Feldmann was hired on to fill the half time fishery biologist/half time I/E position. Since time dedicated towards I/E has been decreased by half the Hatchery is focusing on three outreach areas: visitor services, the volunteer program, and Hatchery in the Classroom.

Hatchery visitation (as measured by on-site visitor log and self-guided tours) was steady with a total of 1298 contacts signing the register. Guided tours and school groups were hosted by

hatchery staff and a full complement of well-trained Hatchery Volunteers. There were a total of 17 guided tours in FY11.

The Volunteer program saw a decrease in total volunteers and in the hours worked on a variety of hatchery projects. A total of **13 volunteers contributed 244.5 hours** of service towards spawning, field work, outreach events and public contact duties, under the guidance of Mark Drobish in the absence of an I/E Specialist for most of FY11.

The 21th annual Kids Fishing Day was held off-site again this year with continued success. The USFWS partnered with the Nez Perce Tribe (NPT) to hold the event at the Tunnel Pond fishing site, owned by the NPT. The hatchery provided the rainbow trout, all equipment, volunteers, and other activities for 59 kids 12 years and under who registered (approx. 120 non-fishing guests also attended). Transportation was coordinated with the local school district to provide a shuttle bus from a parking area in Orofino to the pond. Although total numbers were down from previous years due to weather reports, everyone that made the event had fun!

Once again, virtual visitors were included in the on-site contact total. The Complex website continues to be an important way for "visitors" to learn about the hatchery and plan their actual trips. Teachers also use the website to access information about resources and field trips available to them. Unfortunately, web site traffic was only measured for part of FY11 so there are no good metrics to track whether there was an increase or decrease in web visitors. I/E staff are investigating alternative methods for tracking web traffic such as using Google Analytics or Bitly.com analytics.

As the use of social media has become a more important avenue for getting information about the Hatchery out to a diverse audience, I/E staff have begun creating short video clips to be posted on the FWS YouTube channel and in the Complex visitor's center. These videos should completed and on-line in FY12.

The number of off-site programs and contacts decreased significantly this year, due largely to the I/E position vacancy and funding constraints. I/E staff Feldmann did provided outdoor learning stations at the County Extension/Soil Conservation Districts' 6th grade Forestry Tour for 50 students, and provided informational and educational material at the Clearwater County Fair booth making **1,004 contacts** in 3 days.

Grant projects currently managed by the Friends of Northwest Hatcheries, Inc:
$29,994 remains in the Friends account for the interior visitor balcony exhibit project. This project will include updates to the interior displays, flat screen monitors, and a new series of short informational videos, which will be produced at the Hatchery.

Hatchery in the Classroom: 6 schools received hatchery-supplied eggs, feed and technical support. Due to the I/E Specialist position being vacant during the school year classrooms did not receive the level of support they have in past years. Some teachers reported their projects went well this year and commented about the great educational benefits the HIC program has on their students. All schools had post-project release activities for students, which hatchery staff participated in and facilitated. Most schools had a variety of partners and sponsors who

supported the field activities, and assisted with classroom and outdoor environmental lessons. A few schools have contacted the hatchery with interest in obtaining their own classroom incubation systems or applying for the HIC project.

Dworshak NFH Visitor Use Statistics, FY2011

Program/Contact Type	# of Contacts
On-site Hatchery Visitors (Visitor Register and self-guided tour)	**1298**
Guided Tours	**17**
Tour Visitors	**556**
Web Visitors (virtual contacts from all sources)	**4880***
Total On-Site Contacts	**6734**
Off-site Programs/Displays/Events	**7**
Off-Site Contacts	**1066**
Total FY11 Programs	**24**
Total FY11 Contacts (total on + offsite)	**7800**

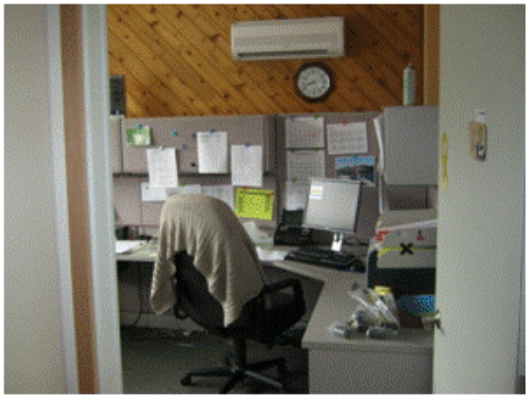
**Web data from individual monthly visitors (not hits) to DNFH website, via Weblog Expert, an internet access log analyzer, which was only operational Oct-Feb during FY11.*

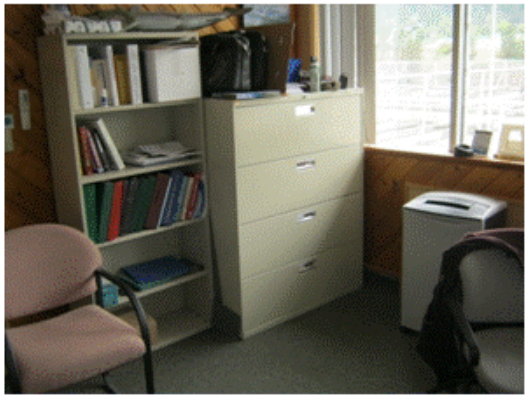
Outreach Program Photos, FY2010

Top Left: Volunteers were honored in September with a luncheon for all their hard work during FY10. **Top Right**: Long-time volunteer **Joe Davis** gives tours to large school groups during the spawning **season. Bottom Left**: Volunteer, **Cynthia Tewes** rinses eggs during spawning season. **Bottom Right**: Volunteer, **Amber McClendon** provides information to school groups touring the hatchery during the spawning season.

Administration/Complex Photos, FY2011

Dworshak Fisheries Complex Administration under the guidance of Larry Peltz, Complex Manager assisted staff in getting paperwork, etc., in place to complete projects around the complex. Whether it's assisting staff in purchasing, payroll, travel, conducting staff training, setting up Awards dinners or participating in the Combined Federal Campaign Drive , the staff demonstrates a great work ethic and teamwork.





Top Left: Christmas Potluck celebrated by the staff. This was also a farewell to Hubert Sims, Maintenance Supervisor, leaving after 25 years at DNFH. Hubert's family, past employees, and current staff all joined the celebration.. **Top Right**, **Bottom Left and Right**: Remodeling office space was the top story for the Admin Offices . All the sounds of destruction of old spaces, sawing, nailing and dust were worth it when three new office spaces were created for the NPT SRBA liaison, Hatchery Manager and Admin Officer… **Center: Hubert Sims retirement (Hubert is 2nd from left)**.

Significant Events

Numerous energy efficiency projects were initiated in FY11. This new partnership program with BPA proved to be a winner for both the hatchery and BPA. The hatchery received funds for much needed infrastructure improvements and BPA received energy savings that provided more power for sale and increased agency revenues. Hopefully this partnership will continue in the future.

The hatchery successfully produced and released over 2.2 million steelhead smolts in FY11. The new fish production strategy of keeping juvenile fish on reservoir water for as long as possible was successful in combating IHNV and meeting fish production goals.

The hatchery experienced an incidence of IHNV in the nursery for the second year in a row. The nursery is on reservoir water which should be IHNV free. After much sleuthing, the IHNV contamination was traced back to an unmarked hose valve that actually contains river water. This valve was not correctly marked following the nursery roof project and this water source is believed to have contaminated several raceways of fish which ultimately were destroyed to contain the outbreak. Despite these fish losses, the hatchery is on track to meet production goals for FY12.

The COE initiated a Rehab study for Dworshak Hatchery. The study is a comprehensive look at hatchery infrastructure. Deficiencies in the infrastructure will be determined and a plan to fix and improve the hatchery will be developed. The plan is scheduled to be completed in FY12.

The consulting firm CH2MHill completed design work for an effluent system that would bring the existing hatchery configuration into compliance with NPDES discharge requirements. Components of this design will be incorporated into the Rehab study. The configuration of the hatchery will likely change as a result of the Rehab study so the original CH2MHill design will need to be modified to address the changes to the existing hatchery.

A Federal Facility Compliance Agreement (FFCA) was developed with the EPA and COE. This agreement lays out a plan for the hatchery to eventually come into compliance with NPDES discharge requirements. The agreement accepts a modified version of the CH2MHill design as a solution to the effluent problem.

Table 1. Fish inventory summary for BY10 SST on October 1, 2010 and release in March, 2011.

	October 1, 2010				Oct 1 - March 31 % loss	Final Release March 21-31, 2011**			
Location	Number*	Wt (lbs)	Lgth in	Lgth mm		Number	Wt (lbs)	Lgth in	Lgth mm
Syst I*	823,039	27,527	4.6	116	6.2	772,238	96,960	7.1	180
Syst II	776,376	30,383	4.8	122	0.3	774,078	110,375	7.4	188
Syst III *	780,843	48,802	5.6	143	7.9	719,089	115,940	7.7	196
Tot/Ave	2,380,258	106,712	5.0	128	4.8	2,265,405	323,275	7.4	188

* System 1 and 3 – Oct 1 numbers adjusted from Oct marking inventory numbers and reconciled to Nov 1 Monthly Inventory Summary
** Includes 58,235 SST released into Lolo Creek on April 27 by the NPT
Source: DNFH - Final Release Summary, May 2011
Monthly Inventory Summary, Oct 1, 2010
Monthly Activity Report, May, 2011

Table 2. System I BP production, BY10 SST, FY2010/11.

BY 10 SST	Fish on Feed End of Month				Fish Transfer	Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incre inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Number	Wt	Wt	lbs FY	Cost FY	lbs Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Comments
May-10	476,219	6,100	78.1	3.3		239	239	244	339	244	339	1	1	34	42.9	0.32	0.12	0.61	
Jun-10	915,507	14,396	63.6	3.6		3,440	3,201	2,421	3,365	2,177	3,025	0.70	0.68	71	48.6	0.23	0.15	0.75	
Jul-10	1,344,149	19,895	67.6	3.5	455,653	13,475	10,035	8,948	12,220	6,527	8,856	0.66	0.65	66	48.6	0.25	0.17	0.87	Trans
Aug-10	962,353	17,612	54.6	3.7	718,935	20,369	6,894	17,195	24,452	8,247	12,232	0.84	1.20	73	50.6	0.26	0.17	0.87	to Sys
Sep-10	823,039	27,527	29.9	4.6	133,012	30,284	9,915	25,546	36,749	8,351	12,297	0.84	0.84	22	50.7	0.83	0.08	0.40	2 & 3
Oct-10	786,134	40,141	19.6	5.3		42,898	12,614	39,577	55,986	14,031	19,238	0.92	1.11	27	50.4	0.69	0.10	0.51	
Nov-10	777,464	52,284	14.9	5.8		55,041	12,143	52,503	64,970	12,926	8,984	0.95	1.06	34	49.2	0.51	0.12	0.60	
Dec-10	775,090	64,043	12.1	6.2		66,800	11,759	65,561	73,454	13,058	8,484	0.98	1.11	32	45.3	0.41	0.14	0.69	
Jan-11	774,065	76,086	10.2	6.5		78,843	12,043	78,357	82,201	12,796	8,747	0.99	1.06	27	42	0.37	0.15	0.77	
Feb-11	773,383	86,510	8.9	6.8		89,267	10,424	90,889	90,859	12,532	8,658	1.02	1.20	31	40.8	0.29	0.17	0.84	
Mar-11	58,536	6,505	9.0	6.8	714,003	99,443	10,176	100,966	97,723	10,077	6,864	1.02	0.99	31	40.1	0.26	0.16	0.79	
Apr-11					58,235	99,717	274	101,904	97,767	938	44	1.02	3.42	97	41.7	0.10			NPT

Number reduction in August, September, and March reflects fish moved out of system, not mortality.

Source: DNFH – Monthly Inventory Summary, Sept 2010 - May 2011
Final Release summary, BY10 SST
Monthly Activity Report, Sept 2010 - May 2011
Daily Water Temperature Records, May 2010 - Mar 2011

Table 3. Marking and tagging of BY10 SST, System I.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 15	09/03/10	30,085		AD LV or RV	System I Contribution	Dworshak
BP 25	09/07/10	30,096		AD LV or RV	System I Contribution	Dworshak
BP 35	01/06/11		5,847	AD	Comparative Survival/ Hatchery Evaluation/ Smolt monitoring FPC	Dworshak
BP 39	09/08/10	30,114		AD LV or RV	System I Contribution	Clear Creek
BP 45	01/05/11		1,484	None	Smolt Monitoring at Fish Passage Ctr	Peasley Creek
BP 49	01/05/11		755	None	Comparative Survival/ Hatchery Evaluation	Lolo Creek
Total		90,295	8,086			

Fin Clips = AD-Adipose fin; LV-Left ventral fin; RV-Right ventral fin
FPC = Fish Passage Center
Source: DNFH- Monthly Inventory Summary, System I, Oct 2010, Jan 2011
CRFPO marking summary, Jan 2011
IFRO marking strategy schematic BY2010 SST

Table 4. System II production, BY10 SST, FY2010/11.

BY 10 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incre inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	lbs FY	Cost FY	lbs Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Com ments
Aug-10	649,131	16,026	40.5	4.1	2,288	2,288	2,292	3,399	2,292	3,399	1.00	1.00	22	45.9	0.63	0.06	0.31	Added from
Sep-10	776,376	30,383	25.6	4.8	13,765	11,477	13,441	16,785	11,149	13,386	0.98	0.97	23	47.8	0.69	0.08	0.42	Syst I
Oct-10	775,730	48,128	16.1	5.6	31,510	17,745	32,245	29,542	18,804	12,757	1.02	1.06	22	49.5	0.80	0.11	0.57	
Nov-10	775,228	63,822	12.1	6.2	47,204	15,694	48,045	38,358	15,800	8,816	1.02	1.01	30	48.4	0.56	0.14	0.69	
Dec-10	774,833	81,436	9.5	6.7	64,818	17,614	67,565	49,251	19,520	10,892	1.04	1.11	26	45.4	0.52	0.16	0.81	
Jan-11	774,648	91,612	8.5	7.0	74,994	10,176	81,265	56,893	13,700	7,642	1.08	1.35	37	42	0.27	0.18	0.88	All
Feb-11	774,428	100,365	7.7	7.2	83,747	8,753	95,025	64,406	13,760	7,513	1.13	1.57	39	40.4	0.22	0.19	0.93	Rel by
Mar-11	774,078	110,375	7.0	7.4	93,757	10,010	105,035	69,871	10,010	5,465	1.12	1.00	34	39.9	0.23	0.20	0.99	3/30

Source: DNFH - Monthly Inventory Summary, Sept 2010, April 2011
Final Release summary, BY10 SST
Monthly Activity Report Aug 2010 - Apr 2011
Daily Water Temperature Records, Aug 2010 - Mar 2011

Table 5. Marking and tagging of BY10 SST, System II.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 10	1/10/11		5,966	AD	Comparative Survival/ Hatchery Evaluation/ Smolt monitoring FPC	Dworshak
BP 12	1/12/11		2,113	AD	Comparative Survival/ Hatchery Evaluation	Red House
BP 14	1/12/11		2,276	AD	Comparative Survival/ Hatchery Evaluation	Clear Creek
BP 16	9/1/10	30,159		AD LV or RV	System II Contribution	Dworshak
BP 20	9/1/10	30,056		AD LV or RV	System II Contribution	Dworshak
BP 26	8/31/10	30,069		AD LV or RV	System II Contribution	Red House
Total		90,284	10,355			

Fin Clips = AD-Adipose fin; LV-Left ventral fin; RV- Right ventral fin

Source: DNFH- Monthly Inventory Summary System II, Oct 2010, Jan 2011
CRFPO marking summary Jan, 2011
IFRO marking strategy schematic BY2010 SST

Table 6. System III production, BY10 SST, FY2010/11.

BY 10 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	WT	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Comments
May-10	65,508	850	77.1	3.3	63	63	64	89	64	89	1.02	1.02	46	42.9	0.23	0.04	0.21	
Jun-10	131,326	2,083	63.0	3.6	572	509	421	585	357	496	0.74	0.70	54	44.5	0.23	0.05	0.24	
Jul-10	585,076	20,420	28.7	4.6	3,038	2,466	1,971	2,687	1,550	2,103	0.65	0.63	35	45.6	1.07	0.08	0.39	
Aug-10	850,066	37,286	22.8	5.0	14,570	11,532	14,865	14,891	12,894	12,204	1.02	1.12	38	45.9	0.37	0.09	0.44	
Sep-10	780,843	48,802	16.0	5.6	26,086	11,516	29,948	24,933	15,083	10,041	1.15	1.31	25	47.8	0.63	0.11	0.56	
Oct-10	779,378	65,512	11.9	6.2	42,796	16,710	49,842	37,177	19,894	12,244	1.16	1.19	30	49.5	0.58	0.14	0.68	
Nov-10	721,178	74,060	9.7	6.6	51,344	8,548	64,842	45,547	15,000	8,370	1.26	1.75	38	48.4	0.43	0.15	0.77	
Dec-10	720,650	88,587	8.1	7.1	65,871	14,527	82,482	55,390	17,640	9,843	1.25	1.21	33	45.4	0.41	0.17	0.87	
Jan-11	720,073	97,149	7.4	7.3	74,433	8,562	94,662	62,185	12,180	6,794	1.27	1.42	45	42	0.22	0.19	0.93	All
Feb-11	719,519	106,900	6.7	7.5	84,184	9,751	107,102	68,977	12,440	6,792	1.27	1.28	35	40.4	0.24	0.20	0.99	Rel by
Mar-11	719,089	115,940	6.2	7.7	93,194	9,010	116,112	73,897	9,010	4,919	1.25	1.00	37	39.8	0.21	0.21	1.04	3/31

In May there was one pond of SST from Takes 1 and 2 added; In June there was one pond of SST from Takes 3 and 4 added
In July there were 10 ponds of SST from Take 1 and five ponds from Take 2 added:
In August there were five ponds of SST from Take 3 and three ponds from Take 4 added
SST in two BPs culled in Aug 2010 due to IHN
SST in two modified BPs lost during power outage in Nov 2010
Source: DNFH - Monthly Inventory Summary, May 2010 - Apr 2011
Final Release summary, BY10 SST
Monthly Activity Reports, May 2010 – Apr 2011
Daily Water Temperature Records May 2010 – Mar 2011

Table 7. Marking and tagging of BY10 SST, System III.

Released from BP #	Date	CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 52	8/30/10	30,146		AD LV or RV	System III Contribution	Dworshak
BP 69	8/26/10	28,658		AD LV or RV	System III Contribution	Dworshak
BP 70	8/28/10	31,456		AD LV or RV	System III Contribution	Culled IHN
BP 75	1/3/11		1,557	AD	Comparative Survival/ Hatchery Evaluation	Clear Creek
BP 77	1/3/11		2,315	AD	Comparative Survival/ Hatchery Evaluation	Red House
BP 81	1/4/11		5,826	AD	Comparative Survival/ Hatchery Evaluation/ Smolt Monitoring FPC	Dworshak
Total		90,260	9,698			

Fin Clips = AD-Adipose fin; LV-Left ventral fin; RV-Right ventral fin

Source: DNFH- Monthly Inventory Summary System III, Oct 2010 - Jan 2011
CRFPO marking summary Jan 2011
IFRO marking strategy schematic BY2010 SST

Table 8. All outside rearing systems, BY10 SST production, FY2010/11.

BY 10 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Comments
May-10	541,727	6,950	77.9	3.3	302	302	308	428	308	428	1.02	1.02	49	42.9	0.22	0.10	0.50	
Jun-10	1,046,833	16,479	63.5	3.6	4,012	3,710	2,842	3,949	2,534	3,521	0.71	0.68	62	46.6	0.23	0.12	0.59	
Jul-10	1,929,225	40,315	47.9	3.9	16,513	12,501	10,919	14,908	8,077	10,958	0.66	0.65	43	47.1	0.35	0.11	0.57	
Aug-10	2,461,550	70,924	34.7	4.4	37,227	20,714	34,352	42,743	23,433	27,835	0.92	1.13	37	48.3	0.44	0.12	0.59	
Sep-10	2,380,258	106,712	22.3	5.0	70,135	32,908	68,935	78,466	34,583	35,724	0.98	1.05	25	49.3	0.69	0.09	0.46	
Oct-10	2,341,242	153,781	15.2	5.7	117,204	47,069	121,664	122,706	52,729	44,240	1.04	1.12	26	50.0	0.68	0.12	0.59	
Nov-10	2,273,870	190,166	12.0	6.2	153,589	36,385	165,390	148,876	43,726	26,170	1.08	1.20	35	48.8	0.48	0.14	0.69	
Dec-10	2,270,573	234,066	9.7	6.7	197,489	43,900	215,608	178,095	50,218	29,219	1.09	1.14	30	45.4	0.45	0.16	0.79	
Jan-11	2,268,786	264,847	8.6	6.9	228,270	30,781	254,284	201,278	38,676	23,184	1.11	1.26	36	42.0	0.28	0.17	0.84	
Feb-11	2,267,330	293,775	7.7	7.2	257,198	28,928	293,016	224,241	38,732	22,963	1.14	1.34	35	40.6	0.25	0.18	0.90	
Mar-11	58,536	6,505	9.0	6.8	286,394	29,196	322,113	241,491	29,097	17,249	1.12	1.00	33	40.0	0.24	0.00	0.02	*Rel 3/31

*All BY10 SST released by Mar 31, 2011 except for 58,235 released by the NPT in Lolo Creek on Apr 27, 2011

Source: DNFH - Monthly Inventory Summary, May 2010 – Apr 2011
Final Release summary BY10 SST
Monthly Activity Reports May 2010 - Apr 2011
Daily Water Temperature Records May 2010 – Mar 2011

Table 9. Fish distribution summary by site, BY10 SST, March 21-31, 2011*.

Site				Length	
Outplants 3/21 - 3/24*	Number	Weight	fpp	in	mm
Lolo Ck Unmarked SST	58,235	6,780	8.6	6.9	176
Red House Hole	438,393	64,927	6.8	7.5	191
Clear Creek	389,795	55,197	7.1	7.4	188
Peasley Ck - Unmarked SST	114,473	11,747	9.7	6.6	169
Subtotal	1,000,896	138,651	7.2	7.3	186
Direct Release 3/28 -3/30					
Main Stem of the Clearwater River	1,264,509	184,624	6.8	7.5	190
Totals/Averages	**2,265,405**	**323,275**	**7.0**	**7.4**	**188**

*All *BY10 SST released by Mar 31, 2011 except for 58,235 released by the NPT in Lolo Creek on Apr 27, 2011 Source: Final Release Summary, BY10 SST

Table 10. Final Release Summary by Egg Take BY10 SST.

				Length	
Take	Number	Weight	fpp	in	mm
1	319,927	53,502	6.0	7.8	199
2	191,226	30,678	6.2	7.7	196
3	140,660	21,793	6.5	7.6	194
4	222,295	32,259	6.9	7.5	189
5	254,201	35,987	7.1	7.4	188
6	235,724	35,663	6.6	7.6	192
7	265,014	35,485	7.5	7.3	184
8	253,109	36,255	7.0	7.4	189
9	237,417	27,126	8.8	6.9	175
10	145,832	14,527	10.0	6.6	167
Totals/Averages	2,265,405	323,275	7.0	7.4	188

Source: Final Release Summaries, Systems 1-II-III BY10 SST

Table 11. Adult disposition of BY2011 SST from Dworshak.

Destination	Number	Comments
Foodbank, Orofino area	1,541	Spawned out carcasses
Ahsahka ID, Hocus boat ramp, Clearwater R	1,700	Excess Broodstock -live outplanted
Landfill, Clearwater County	482	Died in trap, holding morts, etc
Landfill, Clearwater County	153	IHN research
Greer Bridge, Middle Fork Clearwater R	474	Carcass nutrient enhancement
Ahsahka ID, Hocus boat ramp, Clearwater R	39	Natural fish - unclipped - live outplant
*Kelts	15	Jan 11 spawn, some eggs into DW production
Total Returns	**4,404**	

* Dworshak also trapped SST for kelt spawning on Feb 1, 2011. Eggs from 74 females were incubated at Dworshak. These eggs did not go into Dworshak production and broodstock were not counted in the rack return

Source: DNFH-Final Spawning Activity Report BY2011 SST
Spawning and Run Summary BY2011 SST

Table 12. System I production, BY11 SST, FY2011.

BY 11 SST	Fish on Feed End of Month				Fish Transfer	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Number	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Comments
May-11	185,187	899	206	2.4	0	123	128	223	128	223	1.04	1.04		49.8		0.06	0.31	Take 1 added in May
Jun-11	909,819	7,418	123	2.9	0	1,902	1,494	2,878	1,366	2,655	0.74	0.72	43	51.3	0.45	0.11	0.54	Takes 2-4 added in June
Jul-11	1,231,356	16,291	76	3.4	309,691	7,307	8,008	13,754	6,514	10,876	0.86	0.89	40	52.2	0.50	0.16	0.81	Takes 5-6-7 added July
*Aug-11	992,590	13,000	76	3.3	960,878	4,030	11,143	19,056	3,135	5,302	0.86	0.78	62	50.5	0.30	0.14	0.72	Takes 8-8A added Aug
*Sep-11	898,493	19,640	46	4.0	228,082	7,353	18,749	31,946	7,606	12,890	0.95	1.03	31	51.3	0.62	0.07	0.33	End FY11

*August and September fish numbers reduced due to earlier Takes being moved into other Systems and not mortality

Source: DNFH - Monthly Inventory Summary, May 2011 - Oct 2011
Monthly Activity Reports-May, 2011 - Oct 2011
Daily Water Temperature Records, May - Oct 2011

Table 13. BY11 SST Coded wire tagging System 1.

Released from BP #	Date	CWT	Fin Clips	Study	Release Site
BP 9	09/20/11	19,508	AD	Contribution	Dworshak
BP 25	09/20/11	30,026	AD	Contribution	Dworshak
BP 35	09/21/11	20,112	AD	Contribution	Dworshak
BP 37	09/21/11	20,005	AD	Contribution	Clear Creek
Total		89,651			

Source: IFRO BY11 SST CWT data FY11

Table 14. System II production, BY11 SST, FY2011.

EoM	Number	Wt lbs	FPP	Lgth in	Gain this FY Wt	Gain this Mo Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	FY Feed Conv	Mo Feed Conv	TU per inch	Ave Temp for Mo	Lgth Incr inch 30 day	Den Index	Flow Index	Comment
Aug-11	958,205	22,371	42.8	4.1	3,501	3,501	6,680	10,287	6,680	10,287	1.91	1.91	28	47.4	0.56	0.08	0.38	Tks 3-4-5-6 added from Syst 1
Sep-11	994,717	45,931	21.7	5.1	25,958	22,457	27,127	31,773	20,447	21,486	1.05	0.91	16	48.9	1.04	0.12	0.60	Tk 7 added from Syst 1

Source: DNFH - Monthly Inventory Summary, Aug – Oct 2011
Monthly Activity Reports-Aug - Oct 2011
Daily Water Temperature Records, Aug - Sept 2011

Table 15. BY11 SST Coded wire tagging System II FY2011.

Released From BP #	Date	CWT	Fin Clips	Study	Release Site
BP 14	08/31/11	20,792	AD	Contribution	Dworshak
BP 16	08/31/11	18,016	AD	Contribution	Dworshak
BP 38	08/30/11	18,481	AD	Contribution	Dworshak
BP 40	08/30/11	21,313	AD	Contribution	Red House
Total		78,602			

Source: IFRO BY11 SST CWT data FY11

Table 16. System III production, BY11 SST, FY2011.

BY 11 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	for Mo	30 day	Index	Index	Comments
Jul-11	309,520	4,919	62.9	3.6	180	180	180	277	180	277	1.00	1.00	20	48.2	0.05	0.05	0.26	Add 9 ponds Tk 2
Aug-11	308,258	9,935	31.0	4.5	5,196	5,016	4,320	6,652	4,140	6,375	0.83	0.83	16	47.4	0.95	0.08	0.41	

Source: DNFH - Monthly Inventory Summary, Jul – Oct 2011
Monthly Activity Reports Jul - Oct 2011
Daily Water Temperature Records Jul - Oct 2011

Table 17. BY11 SST Coded wire tagging System III, FY2011.

Released from BP #	Date	CWT	Fin Clips	Study	Release Site
BP 60	08/29/11	34,065	AD	Contribution	Dworshak

Source: IFRO BY11 SST CWT data FY11

Table 18. BY11 SST on station and projected release summary from 10/01/2011.

As of October 1, 2011					Projected to Release - April 2012		
System	Number	Weight (lbs)	fpp	L mm	Proj % Mortality until Release	Projected Release Number	Proj Release size mm
System I	898,493	19,640	45.7	101	3	871,538	176
System II	994,717	45,931	21.7	129	3	964,875	204
System III	307,251	17,944	17.1	140	3	298,033	215
Total/Ave	2,200,461	83,515	26.3	121	3.0	2,134,447	194

Source: DNFH - Monthly Inventory Summary, Oct 1, 2011
DNFH – Monthly Activity Report, Sept, 2011

Table 19. BY09 SCS in Raceways, April 2010 through March 23-24, 2011.

BY 09 SCS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	TU	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	in	FY	for Mo	30 day	Index	Index	Comments
Apr-10	1,136,556	2,053	554	1.8	2,053	422	486	758	486	758	0.24	1.15	65	65	41	0.14	0.07	0.21	Stock Apr 15 2010
May-10	1,124,431	4,317	260	2.3	4,317	2,264	2,175	3,450	1,689	2,692	0.50	0.75	21	86	43	0.52	0.11	0.31	
Jun-10	1,121,694	8,890	126	3.0	8,890	4,573	4,826	7,666	2,651	4,216	0.54	0.58	20	106	44.5	0.64	0.20	0.60	
Jul-10	1,120,256	12,088	92.7	3.3	12,088	3,198	7,815	12,163	2,989	4,497	0.65	0.93	42	148	45.6	0.32	0.25	0.73	
Aug-10	1,089,523	16,909	64.4	3.7	16,909	4,821	13,423	21,084	5,608	8,921	0.79	1.16	33	181	45.9	0.43	0.11	0.31	AD clip
Sep-10	1,087,455	21,272	51.1	4.0	21,272	4,363	21,427	31,596	8,004	10,512	1.01	1.83	53	234	47.8	0.30	0.12	0.40	
Oct-10	1,086,579	27,646	39.3	4.4	27,646	6,374	29,596	42,001	8,169	10,405	1.07	1.28	47	281	49.5	0.37	0.15	0.48	
Nov-10	1,084,749	37,563	28.9	4.9	37,563	9,917	37,681	51,945	8,085	9,945	1.00	0.82	34	316	48.4	0.48	0.18	0.53	
Dec-10	1,082,942	41,504	26.1	5.0	41,504	3,941	40,634	55,578	2,953	3,632	0.98	0.75	80	396	45.4	0.17	0.19	0.63	Feed Reduc
Jan-11	1,081,814	40,043	27.0	5.0	40,043	-1,461	43,587	59,210	2,953	3,632	1.09	-0.76	-172	224	42	-0.06	0.19	0.62	Fasted
Feb-11	1,080,659	44,372	24.4	5.2	44,372	4,329	44,702	60,581	1,115	1,371	1.01	0.98	48	272	40.4	0.18	0.20	0.66	
Mar-11	1,078,250	51,032	21.1	5.4	51,032	6,660	48,926	65,789	4,224	5,208	0.90	0.73	32	304	39.9	0.25	0.22	0.70	Rel Mar 23-24 2011

Source: DNFH- Monthly Inventory Summary, Apr 2010 – Mar 2011
Monthly Activity Reports, Apr 2010 – Mar 2011
Final Release Summary, BY09 SCS

Table 20. Dworshak and Kooskia Chinook broodstock - both green & eyed-egg numbers, BY10 SCS.

Location of Adult Returns	Males Spawned	Females Spawned	# Eggs/ Female	Total Eggs Enumerated	# Eyed Eggs Enumerated	% Surv Enum Eye-up
Dworshak	319	345	4,400	1,218,933	1,174,860	96.4
Kooskia	150	222	3,741	759,372	737,048	97.1
Total/ Average	469	567	4,121	1,978,305	1,911,908	96.6

Source: DNFH - Final BY10 SCS Enumeration and % Survival of Eggs.
BY10 SCS Spawning Report

Table 21. Raceway production, BY10 SCS, FY2011.

BY 10 SCS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	TU	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	FY	for Mo	30 day	Index	Index	Com ments
Mar-11	808,038	367	2,200	1.1															Trans from incub to nursery 3/31
Apr-11	1,104,379	1,237	893	1.6	732	732	411	713	411	713	0.56	0.56	22	22	41.0	0.40	0.09	1.59	Trans from incub and nurs to BPs
May-11	840,889	2,004	419.6	2.0	1,499	767	1,348	2,350	937	1,638	0.90	1.22	28	50	44.3	0.44	0.08	0.30	Trans from BPs to Rcwys
Jun-11	837,279	4,706	177.9	2.7	4,201	2,702	3,152	5,489	1,804	3,138	0.75	0.67	19	69	44.5	0.66	0.12	0.35	
Jul-11	833,819	7,548	110.5	3.1	7,043	2,842	6,309	11,203	3,157	5,714	0.90	1.11	30	99	45.9	0.46	0.18	0.54	
Aug-11	1,049,764	13,467	78.0	3.5	12,962	5,919	10,828	18,955	4,519	7,752	0.84	0.76	41	140	47.6	0.38	0.11	0.31	SCS AD clipped, CWTs, split, inventoried
Sep-11	1,047,916	21,247	49.3	4.1	20,742	7,780	16,306	27,959	5,478	9,005	0.79	0.70	29	169	48.9	0.58	0.15	0.30	End of FY11

August numbers reflect inventory from marking crew
Source: DNFH - Monthly Inventory Summary, Mar - Oct 2011
Monthly Activity Reports-Mar - Sept 2011
Daily Water Temperature Records, Mar - Sept 2011

Table 22. BY10 SCS at the end of the FY and projected release from Dworshak, April 2012.

As of October 1, 2011					Projected to Release - April 2012		
Stock	Number	Weight (lbs)	fpp	L mm	Proj % Loss to Release	Projected Release Number	Proj Size at Release mm
Dworshak	1,047,916	21,247	49	103	1	1,037,437	145

Source: DNFH - Monthly Inventory Summary, Oct 2011; DNFH – Monthly Activity Report, September 2011.

Table 23. Adult returns BY11 SCS, 09/30/11.

Age	Number/Dworshak	Number/Kooskia*	Total
I - Ocean	325	472	797
II - Ocean	700	628	1,328
III - Ocean	225	155	380
Total	1,250	1,255	2,505

*11 of these fish were passed over weir into Clear Creek - ISS fish

Source: DNFH - Spawning Activity Report BY2011 SCS
IFRO - Dworshak/Kooskia Complex SCS News – Sept 14, 2011 Edition

Table 24. Mortality of adult BY11 SCS held at Dworshak.

	Dworshak		Kooskia	
Mortality	Number	Percent of total return at Dworshak	Number	Percent of Kooskia return transferred to Dworshak
Prespawning	7	0.6	19	2.3
During Spawning	43	3.4	43	5.2
Total	**50**	**4.0**	**62**	**7.5**

Source: DNFH - Spawning Activity Report, BY11 SCS - Includes 6 trap morts

Table 25. Adult disposition of BY11 SCS held at Dworshak.

Destination	Dworshak Stock	Kooskia Stock	Comments
Outside Research Info/Education	4	0	Elementary School Programs
Washington State University Pullman WA	270	86	Captive Bear Program
Mainstem Clearwater River	4	0	Adult return to river four natural
Foodbank	218	0	Orofino Idaho
Clearwater River Greer Bridge	284	426	Stream nutrification
Landfill	470	319	Majority female carcasses injected with antibiotic
Total	**1,250**	**831**	

Source: BY11 SCS Spawning Activity Report

Table 26. Dworshak stock; both green and eyed egg numbers, BY11 SCS.

Location of Adult Return	Males Spawned	Females Spawned	Eggs/ Female	Total Eggs Enumerated	Eyed Eggs Enumerated	Percent Enumerated Eye-up
Dworshak	354	410	4,195	1,476,618	1,426,771	96.6

Source: DNFH - Spawning Activity Report BY11 SCS
DNFH – BY11 SCS Spawning Report

Table 27. BY09 Coho production, May 2010 until transfer to Kooskia NFH and Clear Creek in February/March 2011.

BY09 COS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	TU	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	FY	for Mo	30 day	Index	Index	Comments
May-10	340,083	2,012	169.0	2.6	601	601	352	570	352	570	0.59	0.59	38	38	42.9	0.29	0.13	0.71	From KK 5/18-19
Jun-10	338,968	3,336	101.6	3.0	1,925	1,324	1,386	1,999	1,034	1,429	0.72	0.78	26	64	44.5	0.47	0.18	1.00	
Jul-10	323,700	4,744	68.2	3.5	3,333	1,408	2,442	3,408	1,056	1,409	0.73	0.75	32	95	45.6	0.43	0.09	0.55	
Aug-10	323,307	5,978	54.1	3.8	4,567	1,234	3,828	5,048	1,386	1,640	0.84	1.12	50	145	45.9	0.28	0.11	0.64	
Sep-10	322,963	8,330	38.8	4.2	6,919	2,352	5,500	10,080	1,672	5,033	0.79	0.71	36	181	47.8	0.44	0.13	0.72	
Oct-10	322,783	11,084	29.1	4.6	9,673	2,754	7,568	12,327	2,068	2,247	0.78	0.75	42	223	49.5	0.42	0.16	0.83	
Nov-10	322,610	14,463	22.3	5.0	13,052	3,379	9,944	14,403	2,376	2,076	0.76	0.70	38	261	48.4	0.43	0.19	0.95	
Dec-10	322,466	17,430	18.5	5.4	16,019	2,967	12,364	16,518	2,420	2,115	0.77	0.82	41	302	45.4	0.32	0.22	1.30	
Jan-11	322,325	19,172	16.8	5.5	17,761	1,742	15,136	18,942	2,772	2,424	0.85	1.59	58	360	42	0.17	0.23	1.38	
Feb-11	20,432	1,258	16.2	5.6	18,585	824	16,192	19,866	1,056	924	0.87	1.28	131	491	40.4	0.06	0.07	0.39	300K To KK 2/22
Mar-11	20,054	1,341	15.0	5.8	18,668	83	16,324	19,982	132	115	0.87	1.59	50	541	39.8	0.16	0.08	0.47	To Clear Ck 3/30

Source: DNFH - Monthly Inventory Summary, May 2010 – Mar 2011
Monthly Activity Reports, May 2010 - Mar 2011
Daily Water Temperature Records, May 2010 - Mar 2011

Table 28. BY10 Coho production from April 18-19, 2011 transfer from Kooskia until end of FY11.

BY 09 COS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	TU	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	FY	for Mo	30 day	Index	Index	Comments
Apr-11	293,049	1,490	196.7	2.4	327	327	308	441	308	441	0.94	0.94	51	49	41.6	0.19	0.21	3.05	Transfer from KK Apr 18/19
May-11	575,427	4,355	132.1	2.8	1,603	1,276	1,496	1,822	1,188	1,381	0.93	0.93	34	83	43.7	0.35	0.27	2.15	280 K transfer from KK May 17
Jun-11	329,908	3,932	83.9	3.2	1,180	-423	1,496	1,822	0	0	1.27	0.00	27	110	44.5	0.46	0.27	0.54	245K outplant 6/21,28 Lolo Ck
Jul-11	336,237	4,112	81.8	3.3	1,360	180	2,068	2,615	572	794	1.52	3.18	19	129	47.4	0.03	0.14	0.35	Split Jul
Aug-11	334,310	4,977	67.2	3.5	2,225	865	2,838	3,580	770	964	1.28	0.89	70	200	47.6	0.22	0.16	0.40	
Sep-11	333,619	6,202	53.8	3.8	3,450	1,225	3,618	4,598	780	1,018	1.05	0.64	63	263	48.9	0.27	0.19	0.46	End of FY11

Source: DNFH - Monthly Inventory Summary, April – Oct 2011
Monthly Activity Reports, Apr 2011-Sept 2011
Daily Water Temperature Records, Apr – Sept 2011

Table 29. BY10 RBT production, February 2010 until off-station transfers in March 2011.

BY10 RBT	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	TU	Ave Temp	Lgth Incr inch	Den	Flow	
EoM	Number	Wt lbs	FPP	Lgth in	Wt	Wt	LBS FY	Cost FY	LBS Mo	Cost Mo	Conv	Conv	inch	FY	for Mo	30 day	Index	Index	Comments
Feb-10	5,000	2	2,500	1.0	2	2	0	0	0	0	0.00	0.00	0	0	0	0.00	0.01	0.07	Eggs
Mar-10	4,439	5	942.5	1.4	5	3	4	6	4	6	0.85	1.48	48	48	50.6	0.38	0.02	0.11	
Apr-10	4,367	13	329.0	2.0	13	9	13	20	9	14	0.98	1.05	33	81	51.4	0.58	0.05	0.23	
May-10	4,354	35	123.0	2.7	35	22	35	54	22	35	0.99	0.99	25	107	51.2	0.76	0.09	0.32	
Jun-10	8,663	152	57.0	3.5	152	117	80	125	45	71	0.53	0.39	19	126	47.2	0.80	0.15	0.43	Invent
Jul-10	8,892	172	51.7	3.6	172	20	114	181	34	56	0.66	1.70	20	146	43	0.12	0.02	0.09	
Aug-10	8,854	380	23.3	4.8	380	208	211	295	97	114	0.56	0.47	13	158	45.9	1.11	0.03	0.16	
Sep-10	8,826	751	11.8	6.0	751	371	376	431	165	136	0.50	0.44	12	170	46.9	1.22	0.04	0.25	
Oct-10	8,808	975	9.0	6.5	975	224	727	719	351	288	0.75	1.57	32	202	49.5	0.55	0.05	0.32	
Nov-10	8,766	1,568	5.6	7.6	1,568	593	1,079	1,007	352	289	0.69	0.59	15	217	48.4	1.13	0.07	0.44	
Dec-10	8,738	2,111	4.1	8.5	2,111	543	1,510	1,361	431	353	0.72	0.79	17	233	45.4	0.81	0.08	0.62	
Jan-11	8,725	2,718	3.2	9.2	2,718	607	2,067	1,817	557	456	0.76	0.92	13	247	42	0.75	0.10	0.59	
Feb-11	8,712	3,215	2.7	9.7	3,215	497	2,727	2,357	660	541	0.85	1.33	16	263	40.4	0.53	0.11	0.66	
Mar-11	8,691				3,809	594	3,229	2,764	502	407	0.85	0.85	14	276	39.8	0.57	0.12	0.77	All RBT off station by Mar 30

Source: DNFH - Monthly Inventory Summary, Feb 2010 – Mar 2011
Monthly Activity Reports-Feb 2010-Mar 2011
Daily Water Temperature Records, Feb 2011 – Mar 2011

Table 30. Fish Distribution Summary BY10 RBT from Dworshak NFH.

Date 2011	Number	Wt (lbs)	fpp	L in	L mm	Location
3/17/2011	1,500	575	2.6	9.9	250	Snake River Levee Pond
3/17/2011	2,913	1,300	2.6	9.9	251	Mann's Lake
3/30/2011	4,278	1,900	2.3	10.4	263	Tunnel Pond
Total/Ave	8,691	3,775	2.3	10.3	261	

Source: Monthly Inventory Summary BY10 RBT Apr 1, 2011.

Appendix 1. Number of steelhead returning to Dworshak NFH, estimates of hatchery fish harvested, and total hatchery returns to the Clearwater River, Idaho, 1972-2008 (1972-73 to 1983-84 data based on Pettit (1985)).

Return year[1]	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest[2]	Estimated North Fork Tribal Harvest[3]	Unharvested Dworshak Hatchery Fish[4]	Total Returning to Clearwater River
1972-73	9,938	2,068	-	0	12,006
1973-74	7,910	2,320	-	0	10,230
1974-75	1,698	N.S.[5]	290	0	1,988
1975-76	1,858	N.S.[5]	430	0	2,288
1976-77	3,100	N.S.[5]	410	0	3,510
1978-79	4,939	4,610	(500)[6]	0	10,049
1977-78	12,272	14,000	(1,000)[6]	0	27,272
1979-80	2,519	N.S.[5]	1,250	300	4,069
1980-81	1,968	4,510	(1,000)[6]	500	7,978
1981-82	3,054	1,665	(1,000)[6]	0	5,719
1982-83	7,672	13,967[7]	(1,500)[6]	0	23,139
1983-84	3,284	6,500	(500)[6]	100	11,384
1984-85	14,018	19,410	(1,500)[6]	2,700	37,628
1985-86	4,462	7,240	1,471	1,800	15,002
1986-87	5,286[8]	15,679	4,210	3,000	28,175
1987-88	3,764	8,766	1,478	2,000	16,008
1988-89	6,041	11,332	1,242	3,700	22,315
1989-90	10,630	27,953	1,710	3,650	43,944[9]
1990-91	7,876	12,974	1,211	2,250	24,311
1991-92	3,700	10,415	1,326	1,650	17,091
1992-93	7,900	19,351	1,184	3,368	31,803
1993-94	3,757	11,538	675	1,457	17,427
1994-95	1,394	5,954	730	1,307	9,385
1995-96	4,480	2,319	992	1,315	9,106
1996-97	2,980	4,926	513	779	9,198
1997-98	3,601	7,611	145	479	11,836
1998-99	5,419	8,774	1,007	1,137	16,337

Appendix 1. Continued.

Return year[1]	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest[2]	Estimated North Fork Tribal Harvest[3]	Unharvested Dworshak Hatchery Fish[4]	Total Returning to Clearwater River
1999-00	2,882	7,177	1,000	720	11,779
2000-01	6,411	12,230	(1,000)[6]	513	20,154
2001-02	7,733	22,774[10]	(1,000)[6]	774	32,281[10]
2002-03	5,244[8]	25,030	1,118	830	32,222
2003-04	3,767[8]	20,806	(1,336)[6]	855	26,764
2004-05	4,362[8]	19,252	1,331	280	25,225
2005-06	3,243[8]	14,916	1,470	457	20,086
2006-07	3,514[8]	13,301	(1,000)[6]	840	18,655
2007-08	3,374[8]	13,289	(1,470)[6]	71	18,204
2008-09	4,350[8]	27,772	(1,470)[6]	473	34,065
2009-10	3,615[8]	15,841	(1,470)[6]	381	21,307

Table 1. Footnotes;
[1]Return year is from October through May.
[2]Estimates of sport harvest in the Clearwater River provided by Idaho Department of Fish and Game.
[3]Estimates of tribal harvest in the Clearwater River provided by Nez Perce Tribe Department of Fishery, except as noted by Footnote 6.
[4]Estimated by using the return percentage to Kooskia NFH, applied to returning II-oceans from offsite releases.
[5]N.S. = no sport fishing season.
[6]( ) guesstimate on tribal harvest by authors.
[7]Pettit, IDFG, Lewiston, Idaho (personal communication) included an additional 2,000 fish in harvest from Snake River for a total of 15,967.
[8]Ladder was operated intermittently for broodstock management.
[9]We believe the sport estimate of 27,953 is about 8,000 too high and the total number of Dworshak steelhead to the Clearwater River was in the range of 32,000 to 35,000.
[10]Sport harvest estimates from this point on was modified to account for only Dworshak's contribution to the steelhead harvest in the Clearwater River.
Source: Idaho Fisheries Resource Office

Appendix 2. Adult Returns of Dworshak NFH adult spring Chinook salmon to the Clearwater River from 1987-2011.

Return Year	Rack Return	Sport Harvest	Tribal Harvest	Escapement[1]	Total Run
1987	2017	0	160	na	2177
1988	1972	0	240	na	2212
1989	1700	0	346	na	2046
1990	2042	0	514	na	2556
1991	165	0	0	na	165
1992	370	0	160	na	530
1993	823	0	43	na	866
1994	74	0	0	na	74
1995	125	0	0	na	125
1996	963	0	24	na	987
1997	3150	693	835	na	4678
1998	915	99	182	na	1196
1999	800	0	36	na	836
2000	3202	4095	1173	na	8470
2001	4018	8355	531	na	12904
2002	2157	3542	794	na	6493
2003	3422	2228	1445	na	7095
2004	2356	3608	419	na	6383
2005	882	606	102	na	1590
2006	1354	589	392	na	2335
2007	2110	256	198	na	2564
2008	1857	1109	159 [2]	na	3125
2009	2171	1373	354	848	4746
2010	1225	1476	1077	3177	6950
2011	1075	2381	943	4378	8777

[1] Estimates of escapement are not available for years 1987 to 2008

[2] Total number based on angler interview and is not an expanded estimate