

# Annual Report for Dworshak National Fish Hatchery

Orofino, Idaho  
Fiscal Year 2012



*Monica R. Dickson*

Hatchery Manager

3/21/13

Date

CONTENTS

**Fish Culture Operations**.....7

    Summer Steelhead..... 7

        Brood Year 2011..... 7

        Brood Year 2012..... 10

    Spring Chinook Salmon..... 15

        Brood Year 2010..... 15

        Brood Year 2011..... 16

        Brood Year 2012..... 17

    Fall Chinook Salmon..... 20

        Brood Year 2012..... 20

    Coho Salmon..... 20

        Brood Year 2010..... 20

        Brood Year 2011..... 21

**Production Summary FY 2012**..... 21

**Facilities Maintenance**..... 25

**Administration**..... 31

    Meetings..... 31

    Training..... 36

    Safety & Wellness..... 36

    Staffing..... 37

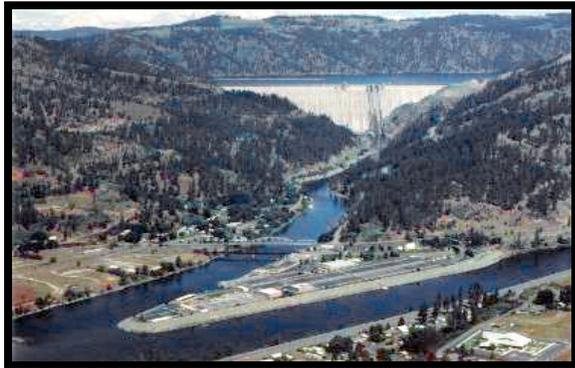
    Personnel..... 38

**Outreach and Visitor Activities**.....41

**Significant Events**..... 44

**Tables**..... 45

## 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 DNFH 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 been modified over the last 40 years and the current release goal is 18,000 pounds of rainbow trout into Dworshak Reservoir. Rainbow trout mitigation for Dworshak Reservoir is achieved with a fish exchange involving Idaho Fish and Game (IDFG) and Hagerman National Fish Hatchery (HNFH). DNFH transfers mitigation dollars (COE) to the 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 were previously reduced (1.05 million smolts) based on fish health recommendations relative to rearing densities. In 2012, densities were increased slightly; however, the hatchery staff also increased flow rates and therefore increased raceway exchange rates to provide quality rearing conditions for the fish. The target releases remained at 1.05 million smolts and these fish were reared in 24 raceways. 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. U.S. vs. Oregon targets identify Dworshak Hatchery production for 1.05 million Chinook smolts.

In 2004, the Snake River Basin Adjudication (SRBA) Settlement Agreement (SRBA Agreement) was ratified by Congress through the Snake River Water Rights Act of 2004 (Public Law 108-447). Through the SRBA Agreement the Nez Perce Tribe (NPT) assumed total management of Kooskia Fish Hatchery and became a joint-manager of hatchery programs at DNFH. In accordance with the SRBA Agreement, the FWS and COE provide funding for joint-management

activities at the DNFH. The LSRCP provides funding for NPT joint-management of the Chinook program and the COE funds joint-management of steelhead production. The COE provides such funding through an Economy Act agreement with the FWS. The NPT, through SRBA also provides funds for the joint management activities. 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 NPT began a Coho salmon reintroduction and restoration program in the Clearwater basin in 1995. The goal of the program is to restore a viable population of these fish following extirpation by the Lewiston Dam built on the Clearwater River in 1927 (since removed in 1976). Hatchery rearing of Coho salmon began at DNFH in 1999. Coho salmon are collected and spawned at DNFH in the fall and after 17 months of rearing on-site are trucked to Kooskia NFH in March/April for acclimation and eventual release into Clear Creek. This program is funded through a combination of NOAA's Pacific Coastal Salmon Recovery Act funds and the Mitchell Act. The Clearwater Coho Restoration (CCR) production goal is presently 850,000 smolts annually. Dworshak produces 300,000 smolts at 20 fish per pound (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. The fish were reared at both Kooskia NFH and the Dworshak NFH in 2012 to meet production goals. The CCR 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).

Beginning in 2008, the Steelhead Kelt Survival research project was set up at DNFH by the NPT. It is a Bonneville Power Administration Remand funded study to enable understanding of factors necessary to enable survival of B-Run 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. On-site work focuses on re-conditioning post-spawn steelhead adults. The study is funded for 10 years.

DNFH produces 2.1 million steelhead smolts at 6 fpp (200 mm in length), 1.4 million yearling Chinook salmon smolts at 18 to 20 fpp (140 to 145 mm in length) and 300,000 Coho pre-smolt to 20 fpp. 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.

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'x80' 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. Unfortunately, the majority of this gravity fed water enters the hatchery via sumps and then must be pumped for use in the incubation area, nursery and in System I. The only gravity fed water to the incubation area and the nursery is through the secondary line which spurs off the main secondary line in the Dworshak parking lot. This is gravity fed to the nursery and incubation; however, there is currently no option for "treating" this water to reduce high gas saturation. 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 bead media systems are no longer used as this outdated style of reuse in Systems I, II and III are no longer used due to the spread of disease and parasites and associated high mortality.

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 84,000 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 and resulting high mortality) far outweighed the advantages (increased fish size). Consequently, the hatchery no longer utilizes the outdated reuse systems.

IHNV 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 IHNV in 2009 and over 1 million fish to IHNV in 2010. Analysis of the virology indicated that the Dworshak fish had been infected with a new genotype/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 virus continues to mutate and over the years has gradually affected fish at larger sizes.

The hatchery took a proactive management strategy in the spring of 2010 to minimize the impact of IHNV 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 have been able to run reservoir water exclusively in System I from May through August and then blend river and reservoir water in System I in September 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 up to 17 (depending on loading rates and flow requirements per pond) of the 25 ponds in System I to delay exposure of the young steelhead to river water and IHNV. 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 up to 75% reuse including mechanical aeration and CO<sub>2</sub> stripping. At this level of reuse, biofiltration is not necessary and all steelhead can be reared on reservoir water throughout their production cycle until release. These plans have been incorporated into the COE's Rehab Project and the design has been reviewed and approved through the Feasibility Study for circular tanks with the understanding

that the existing reservoir line can provide additional water or additional water will be available by adding a bypass water line at the hydro station.

This report covers the period of hatchery activities from October 1, 2011, to September 30, 2012.

# Fish Culture Operations

## *Summer Steelhead*

### Summer Steelhead Brood Year 2011

There were 2.2 million Brood Year 2011 (BY11) summer steelhead (SST) moved from the nursery to outside Burrows ponds (BPs) during the summer of 2011. High mortality occurred in some of the ponds during the summer and fall mostly due to *Infectious Hematopoietic Necrosis Virus* (IHNV). However, the production target release of 2.1 million SST smolts was exceeded. Mortality from ponding SST in the summer of 2011 until release in the spring of 2012 was approximately 5 percent.

Overall mortality from October 1, 2011 through final release was 1.3 percent. All fish were released by April 12, 2012 including six ponds of unmarked SST (209,701 fish) for the Nez Perce Tribe (NPT). Offsite releases were complicated by the bridge load limits imposed in August 2011.

The load restriction is as follows: 17 T for straight Trucks, 26 T for Tractor Trailers, and 38T for Tractor and double trailers. No single axel shall exceed 9 T.

The normal fish distribution Tractor Trailers weigh 35 Tons fully loaded. To meet the 26T restriction, the hatchery reduced the water/fish volume to approximately 1400 gallons from normal capacity of 3500 gallons.

The water reduction was accomplished by hauling partial loads of fish using standard operating procedures. Partial loads were judged and split by the fish crowder operators. Once loaded, the transport trucks were de-watered to 1400 operating gallons and driven over the bridge. When the transport trucks crossed the bridge, the tanks were re-filled to the 3500 gallon mark using a 4-inch submersible pump in the main aeration tower in the visitor parking lot. This process took approximately 5 minutes. A maximum of 2400 lbs were hauled per load.

Because of the weight restrictions, the Army Corps of Engineers trucks also hauled the Lolo Creek release fish. All steelhead smolts were outplanted between April 2-11, 2012. The bridge load restrictions resulted in approximately \$50,000 of additional expenditures of hatchery staff labor, fuel, and materials. Additional equipment was essential to top the trucks off with water once they had crossed the bridge to enable the trucks recirculation systems to function and to minimize surging due to partially full tanks.

Table 1 illustrates the SST on station at the start of FY12 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 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 BY11 SST moved out of the nursery were initially loaded into System I for initial outside rearing. In addition to using reservoir water, flows were increased in each pond. This was done to allow each pond to be loaded more heavily. The SST from Takes 2-8A were later transferred into final rearing ponds when they reached the appropriate size for splitting into System II or III (river water). System I was switched to river water September 26, 2011 when 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 involved approximately 110,000 fish being loaded into each pond utilizing a total of 15 ponds in System I (reservoir water) from Takes 1-7. Final loading of SST included System I receiving SST from Takes 8-8A; System II being stocked with Takes 4-7 (partial); and System III receiving Takes 2.

A total of 2.50 million BY11 SST were moved from the nursery to the BPs beginning with Take 1 on May 25, 2011, and ending with Take 8A on August 31. One pond of SST (84,400 fish, Take 1) in System I broke with IHNV in July, 2011. These fish were killed and removed from the hatchery on July 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 System I on September 26, 2011. Steelhead in Takes 8 in System I broke with IHN by the end of September and suffered chronic moderate mortality for most of the fall, 2011. These fish were kept on station and not destroyed since mortality never reached epidemic proportions.

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

## **System I**

All 2.50 million BY11 SST were initially reared in System I using reservoir water. 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 BY11 SST production. This System had 898,493 SST in it at the start of the fiscal year and 890,429 at release in April, 2012 (Table 2).

Adipose fins were clipped on BY11 SST in System I from June 20-August 29, 2011. Other marking of BY11 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, 2011 until final release in March of 2012 was approximately 0.9 percent.

Off-site releases include 142,208 SST released at Red House Hole on the South Fork of the Clearwater River and 146,721 released at Clear Creek. Truck drivers from the USACE stocked a total of 68,754 BY11 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

141,721 unmarked SST released into Meadow Creek. This was done under the Harvest Settlement agreement with the Columbia River Tribes.

Direct release of 257,493 BY11 SST from System I took place on April 12, 2012 into the mainstem of the Clearwater River. The total release from System I was 890,429 BY11 SST (Final Release Summary, BY11 SST).

## **System II**

Twenty-five Burrows ponds were used in System II for BY11 SST production. This System had 994,717 SST in it at the start of the fiscal year and 985,506 at release in April, 2012 (Table 4).

All BY11 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 27-August 1, 2012. Other marking of BY11 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, 2011 until final release in March of 2012 was approximately 0.9 percent.

Off-site releases included 162,358 SST released at Red House Hole on the South Fork of the Clearwater River and 158,421 released at Clear Creek.

Direct release of 669,826 SST from System II took place on April 12 into the mainstem of the Clearwater River. The total release from System II was 985,506 BY11 SST (Final Release Summary, BY11 SST).

## **System III**

Nine Burrows ponds were used in System III for BY11 SST production. This System had 307,251 SST at the start of the fiscal year and 295,911 at release in April, 2012 (Table 6).

Adipose fin clipping was done when Take 2 was moved into System 1 from June 14 through June 18, 2011. Other marking of BY11 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, 2011 until final release in April of 2012 was approximately 3.7 percent.

Off-site release included 101,125 SST released at Red House Hole on the South Fork of the Clearwater River and 34,722 released at Clear Creek.

Direct release of 160,064 SST from System III took place on April 12 into the mainstem of the Clearwater River. The total release from System III was 295,911 BY11 SST (Final Release Summary, BY11 SST).

## **Summary of BY11 SST production reared at Dworshak**

The hatchery production summary for all BY11 SST reared at Dworshak is illustrated in Table 8.

### **Distribution Summary**

Release of BY11 SST began April 4 and ended April 12. The final distribution summary is illustrated in Table 9. The Final release summary by egg Take for BY11 SST is illustrated in Table 10.

## **Brood Year 2012 SST**

### **Adult Collection**

Adult summer steelhead (SST) for Brood Year 2012 (BY12) were collected in the fall of 2011 and in the winter and spring of 2012 to represent the entire run. The ladder was opened October 17, 18, 19, 31, November 1, 14, 15, 17, 28, 29 and December 12, 13, 14, 2011, for collection of early-return SST to hold for spawning or testing for *Infectious Hematopoietic Necrosis Virus* (IHNV). During this period there were 1,191 steelhead collected, 588 ponded and 180 killed for IHNV sampling. The rest were outplanted to Hocus boat ramp on the Clearwater River. Incidental collection of adult coho salmon also occurred. These fish were sorted and either returned to the river or transported to the Kooskia NFH to serve as broodstock in conjunction with the coho restoration project.

On February 1, 2012, the ladder was opened to collect ripe females for the Nez Perce Tribe (NPT) kelt program. There were 144 females air-spawned on February 7-8, 2012. A subsample of the eggs and milt were transported to Dr. Nagler's lab at the University of Idaho and assessed for viability. The majority of the eggs will be frozen and used for feeding trials of the kelts.

The ladder was opened again on January 26, 2012, 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 16. During this staggered ladder operation a total of 4,698 adult SST entered the hatchery, including 171 jacks (Idaho Fishery Resource Office final rack return numbers, BY12 SST).

There were a total of 65 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 fish are included in the 4,698 total returns.

The final spawning day for BY12 SST was Take 8 on April 17, 2012. The excess adults were outplanted and the holding ponds drained and sprayed out the same week.

### **Broodstock spawning numbers**

A total of eight egg Takes were spawned over the BY12 season, beginning on January 4, 2012, and ending on April 17. Spawning began approximately three weeks earlier than usual due to 1-2°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 Takes 1-2, and later returning adults (February-April) were spawned during Takes 3-8. Two spawns of 75 females each were planned in January, 66 were spawned on the 4<sup>th</sup> and 90 were spawned on the 17<sup>th</sup>. Only 4 females were culled as over-ripe by this date.

There were 1,789 SST spawned over the BY12 season, 766 males (including 58 jacks) and 1,023 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 1:2.3 for BY12 SST, the spawning ratio was reduced to 1:1.3. Of the 58 jacks spawned during the season, 39 were used for Dworshak National Fish Hatchery (DNFH), 8 were used for Clearwater State Fish Hatchery (CWH), and 11 were used for Magic Valley State Fish Hatchery (MVH).

On December 20, 2011 there were 80 males from the early-returned BY12 SST injected with salmon gonadotropin-releasing hormone analogue (sGnRH $\alpha$ ). 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 21 positive IHNV results from the CWH SST (21/283) of the females from Takes 5, 5A-6. There were 120 females (120/304) of the MVH lot which tested positive for IHNV. These females came out of Takes 6A-7A-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. Dworshak fish were tested from collection in the fall of 2011 through spawning in 2012. There were 53(53/126) females sampled for Dworshak which tested positive for IHNV. The prevalence of IHN from fall sampling throughout the sampling cycle showed 157/664 positive for IHNV. Dworshak does not cull eggs which test positive for IHNV in its production program.

### **Egg Disposition**

Early-returning adults were spawned during Egg-Takes 1-2. There were a total of 117 males and 156 females spawned during these Takes, out of which 640,000 eyed eggs went to Dworshak's production program.

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. Eighteen females from Takes 5A-6 tested positive for IHNV for CWH and were culled. Dworshak incubated an estimated 1.8 million green eggs for CWH before culling. This included 1.2 million for CWH and 600K for the South Fork localized broodstock.

There were an estimated 2.0 million green eggs shipped from Dworshak to CWH for MVH from Takes 6A-7-8. These eggs were shipped to CWH the same day spawning took place. Dworshak also provided approximately 3500 eyed eggs for aquarium-rearing at various elementary schools for the Information and Education program along with approximately 80 broodstock carcasses for dissection.

Overall eye-up for BY12 SST eggs enumerated at Dworshak was 93 percent and the fecundity rate was 6,578 eggs per female.

After shipping eggs for CWH and MVH, Dworshak put 2.56 million eyed eggs into either hatching jars or incubator trays for its production

## **Research**

University of Idaho:

Dworshak provided approximately 10 ml of milt from each of four males and approximately 12,500 unfertilized eggs from one female to Dr. James Nagler from the U of I. These gametes were excess to Dworshak production needs and were for Ichthyology 481 class.

Nez Perce Tribe:

Scott Everett and crew from the NPT air-spawned 111 females on February 7 and 32 on February 8 for a total of 144 females. The majority of the eggs were frozen and used for kelt food.

Approximately 200 eggs from each female were transported to Dr. James Nagler from the University of Idaho for viability testing. Milt from 3 males was also transported with the eggs.

Idaho Fish and Game Department (IDFG):

For the third year Dworshak participated with IDFG in their effort to develop a localized broodstock for the South Fork (SF) of the Clearwater River. Personnel from IDFG collected broodstock from the SF and transported them to Dworshak. A total of 87 females and 72 males were spawned and incubated at Dworshak during Takes 5-5A-6. Personnel from Clearwater Hatchery picked up the eggs after eye-up and transported them to their facility.

Dworshak continued to provide the IDFG with fin clips for their genetic parental-based tagging database. All SST spawned at Dworshak were sampled this year and all male:female crosses were tracked throughout the enumeration of BY12 SST eggs. Nursery tanking and outside ponding strategies were also designed to track genetics of the SST. Matt Campbell from the IDFG is directing this research from Eagle Fish Health Laboratory.

## **Adult Disposition**

There were 2,019 hatchery adults returned to the river from Dworshak during the return of BY12 SST. In years past the excess adults were outplanted using trucks from the NPT. For the fourth 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 228 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. A total of 1,756 fish were distributed to the public. Complete adult disposition is illustrated in Table 11.

## **Nursery and ponding of fingerlings**

The first two spawns were from early-return adults. Eggs were put into hatching jars in the nursery at an average rate of 20,000 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.

This year the fry from the nursery averaged 139 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 240,000 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 BY12 SST were therefore moved out of the nursery and initially loaded into System I for outside rearing.

Steelhead from Takes 1-5 were transferred from System I into the final rearing ponds in Systems II (takes 2-5) and III beginning in July 2012. Steelhead from Takes 6-8 were kept in System I and not split until later in the year. 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.

On August 15, 2012 the main pipeline that supplies reservoir water to Clearwater Hatchery suffered damage and had to be shut off. Due to the loss of primary water System I had to be switched over to river water. The loss of primary reservoir water caused an emergency move of 2.5 million Clearwater BY11 SCS into 25 of Dworshak's System III BPs. To accommodate this move steelhead from Take 1 were consolidated from 8 System III BPs into 5 System III BPs and fish from Take 2 were moved into System II.

Final loading of SST included System I rearing SST from Takes 6-8; System II being stocked with Takes 2-5; and System III receiving Takes 1 (five Burrows ponds). A total of 2.3 million BY12 SST were moved from the nursery to the BPs. Four BPs in system III were used for rearing 300,000 coho and 25 BPs in System III were used to rear 2.5 million Clearwater Hatchery SCS.

## **Feed**

All steelhead in the nursery were fed Bio Vita feed for the seventh straight year with good results.

## **System I**

System I supplied 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 2,325,095 BY12 SST during the summer of 2012. Steelhead in System I were moved out of the nursery beginning with Take 1 on May 21, 2012 and ending with Take 8, on August 23. 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 BY12 SST production in System I from initial ponding until the end of FY12.

There was one pond 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.

Steelhead in BPs 45 and 13 received approximately 240,000 SST which remained unclipped under the U.S. vs. OR Harvest Settlement Agreement. These fish were from Take 8 and were moved from the nursery using a PR Aqua fish pump into a Vaki fish counter and then directly into either pond.

## **System II**

System II received SST which were split from System I from July 19-August 23, 2012. Fish from Takes 2-5 were transferred. Steelhead were transferred using a PR Aqua fish-pump. Table 14 illustrates the BY12 SST production in System II from initial ponding until the end of FY12.

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 15). This tagging is for evaluation of System II SST contribution to the fishery and hatchery returns.

## **System III**

System III received Take 1 and two ponds of Take 2 SST split from System I on July 17 and July 30, respectively. These fish were moved via the PR Aqua fish pump and Vaki fish counter into eight rearing ponds in System III. Steelhead from take 1 were consolidated into five BPs on August 23 where they will remain until release. Steelhead from Take 2 were moved into System II to allow room for the Clearwater SCS. System III received a total of 355,143 SST during this time. Table 16 illustrates the BY12 SST production in System III from initial ponding until the end of FY12.

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 illustrates the steelhead on station at the end of FY2012 and projected release numbers.

### **Spring Chinook Salmon Brood Year 2010**

At the start of Fiscal Year 2012, there were 1,047,916 BY10 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 4-12, 2012, there were a total of 52,000 BY10 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 date of the BY10 SCS was March 28, 2012. There were 1,044,080 BY10 SCS released from Dworshak into the North Fork of the Clearwater River. Monthly summaries of rearing data for BY10 SCS for FY12 are in Table 19. Table 20 provides adult mortality of BY12 SCS held at Dworshak.

Dworshak and Kooskia stock BY10 SCS had an enumerated survival of green to eyed egg of 96.6 percent. Personnel at Dworshak enumerated eggs from both stocks of BY10 SCS eggs. As was done in the past, all BY10 Kooskia stock SCS eyed eggs (737,048) were shipped to Kooskia for incubation and final rearing.

There were 1,125,000 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 2011, 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 similar to BY09 SCS fry. There were 297,942 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 two different initial rearing units. Aluminum troughs and circular fiberglass tanks were lowered into two empty Burrow's Ponds in the spring of 2011. The rearing units were as follows:

20' x 3' x 3' Aluminum troughs (4 total in two BPs)  
6' x 3' Fiberglass circular tanks (7 total in two BPs)

Additionally, 806,437 BY10SCS were moved to the nursery at eye and then ponded into three BP's as fry. 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). All fish 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 2011**

There were 1,244 adult BY11 SCS which returned to Dworshak and 831 returned to Kooskia NFH, 799 of which were transferred to Dworshak for spawning. Adults spawned and eggs produced from BY11 SCS are represented in Table 21.

Personnel at Dworshak enumerated eggs from the Dworshak stock of BY11 SCS eggs. Unlike previous years, Kooskia stock eggs were shipped green to Kooskia after spawning for incubation and final rearing. There were 1,476,618 Dworshak stock eyed eggs which remained at Dworshak for incubation. No BY11 SCS Dworshak stock eggs were shipped to Kooskia.

Dworshak used an older chiller starting on August 19 for Takes 1-2 and August 24 for Take 3. Temperature averaged 43°F while using this chiller. On October 25, a new chiller was put online and connected to the old chiller. Water temperature averaged 36°F until new plumbing was installed on Dec 14, 2011. The old chiller was taken off-line, new plumbing installed, and by Dec 17 the new chiller provided 35.8°F, which slowed growth enough to allow direct ponding into the raceways. BY11 SCS were ponded into 12 A-bank RWs on March 30, 2012 for early takes, and April 12-13, 2012 for the later takes.

In an effort to increase SCS adult returns the Hatchery Evaluation Team agreed to increase production of BY11 SCS to 1.35 million smolts at release. In order to increase production, raceway densities had to be increased by 70% (from 35,000 SCS/RW to 45,000 SCS/RW). The FRO put together a study proposal to evaluate the effects of this increase in density. More details on this study can be found in the IDFRO annual report.

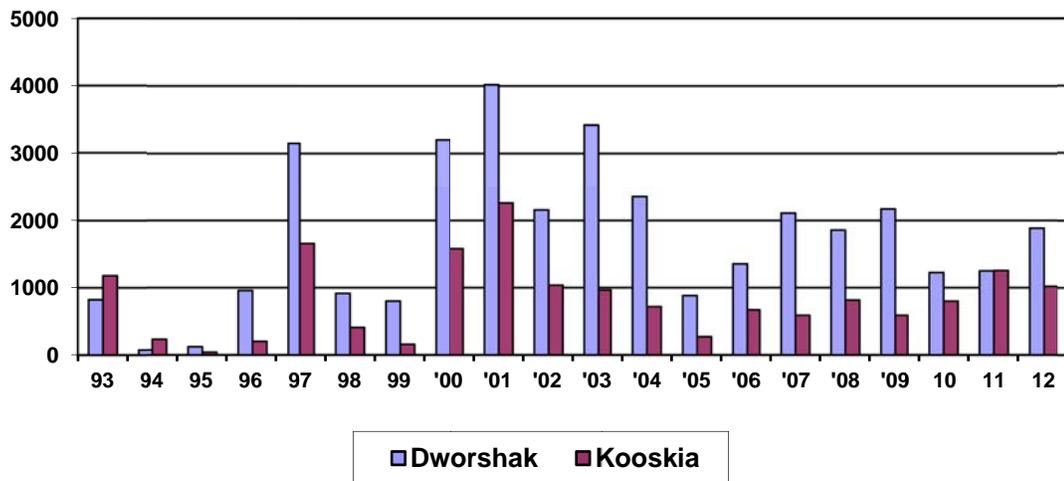
The USFWS fish marking trailer from the Columbia River Fishery Program Office (CRFPO) coded wire tagged (CWT) the BY11 SCS from August 6-20, 2012. There were 120,090 tagged for contribution research. Personnel from the marking trailer also inventoried and clipped adipose (AD) fins on all BY11 SCS and split fish into all 30 raceways during the marking/tagging operation. Monthly summaries of rearing data for BY11 SCS in FY12 are illustrated in Table 22.

By the end of FY 2012, there were 1,382,047 BY11 SCS at Dworshak. Table 23 illustrates the size and number of BY11 SCS on station at the end of the fiscal year and projected release numbers.

### Brood Year 2012

Fish traps at both Dworshak and Kooskia were operated to collect BY11 SCS. The Dworshak fish ladder was opened June 25, 2012 and closed September 3. The total Chinook returning in 2012 to Dworshak and Kooskia were 1,883 and 1,020 fish, respectively (Table 24). This includes 50 one-ocean fish returning to Dworshak and 82 to Kooskia. There were 822 fish transported from Kooskia to Dworshak for spawning.

Figure 1 displays the SCS returns to the Dworshak Complex for the past two decades.



**Figure 1. SCS returns to Dworshak/Kooskia 1993-2012**

Source: IFRO - SCS rack returns

Adult returns for BY12 SCS were enough to meet the production requirements for Dworshak and to assist Rapid River Hatchery meet their production needs. A sport fishery took place in the Clearwater River in the spring and summer of 2012. 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 822 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 on a weekly basis in order to impede fungus infection. On July 24 personnel from Idaho Fish Health Center (IFHC) injected Dworshak and Kooskia stock females with erythromycin. The females were injected at a dosage of 20 mg/kg body weight as a preventative against vertical transmission of Bacterial Kidney Disease to the egg.

## **Adult Mortality**

There were 15 adult SCS of Dworshak stock and 51 of Kooskia stock which died before spawning began on August 14 (prespawning mortalities). Table 20 depicts the mortality for adult BY12 SCS held at Dworshak.

## **Adult Disposition**

Table 25 illustrates BY12 SCS adult disposition from both Dworshak and Kooskia stock held at Dworshak. Dworshak also provided the Nez Perce Tribal Hatchery with 72 SCS (36 females and 36 males) to use for broodstock. These fish are not included in the total returns or adult disposition numbers.

## **Spawning Season**

The BY12 SCS spawning season began August 14 and ended on September 18 for Dworshak and Kooskia stock egg collection. There were 462 males (including 19 jacks) and 962 females (1:2.08 ratio) of Dworshak stock spawned during the season. There were also 261 males (including 10 jacks) and 440 females (1:1.69 ratio) of Kooskia stock spawned for Kooskia NFH during the season. This included Takes 1-5 for Kooskia.

Dworshak NFH also collected eggs for the Clearwater State Fish Hatchery (CWH) from 76 Kooskia stock females; 32 females on August 21 from Kooskia's second take and 44 females on August 28 from Kooskia's third take. These are for Clear Creek releases. Dworshak NFH also collected eggs for Rapid River State Fish Hatcher (RRH). Eggs were collected from 412 Dworshak stock females during takes 1-4 and take 6 and 96 Kooskia stock females during takes 5 and 6. It was decided that all eggs from Kooskia Take 2 and 3 would be transferred to IDFG for their Clear Creek program. This included eggs from a total of 76 females spawned, 59 being transferred and 17 testing positive for IHN and subsequently being culled. In addition there were also 64 Kooskia females spawned on September 11 and 32 females spawned on September 18 for RRH. Dworshak spawned a total of 412 females for RRH: 47 females spawned on August 21, 163 females spawned on August 28, 189 females spawned on September 4, and 13 females spawned on September 18. Fish from each HP were sorted and spawned once each week along with new fish coming up the ladder into HP9.

The BY12 SCS averaged 3,726 eggs/female for Dworshak stock (Table 26). Dworshak put 2,620,680 million eyed eggs into its program and will incubate all of them at Dworshak over the winter.

## **Idaho Fish Health Center (IFHC)**

On July 24 and August 7, personnel from IFHC injected all Dworshak and Kooskia stock females with erythromycin. This was done to help prevent vertical disease transmission of Bacterial Kidney Disease (BKD) to the egg.

During spawning personnel from the IFHC took ovarian fluid for viral inspection from both Dworshak and Kooskia stock females. They also took spleen samples from Dworshak and Kooskia males for viral inspection (see IFHC Broodstock Assessment report for results). Kidneys were also sampled for BKD from all females spawned. As in 2011, 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 1.4 percent (7/504) greater than 0.250 ELISA for Dworshak stock and 4.5 percent (12/264) for Kooskia stock. Eggs from females which tested above 0.250 were culled for Dworshak and Kooskia stocks.

## **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**

BY12 SCS adult return numbers were adequate to fulfill both Dworshak's and Kooskia's production goals. Projected release of BY12 smolts in the year 2014 at Dworshak NFH is approximately 2.47 million smolts of Dworshak stock.

### **Selway Spring Chinook Salmon Brood Year 2012**

On August 6 and 9, 2012 Dworshak received green eggs from 105 females coming from the IDFG Clearwater Hatchery Powell satellite facility. Females were spawned at Powell and green eggs were delivered in egg tubes to Dworshak on the same day as spawning. The eggs were placed into Heath style incubators, one female per tray in 38°F chilled water. Eggs will be incubated and reared to parr at Dworshak. Parr will be released to the Selway River in early August, 2013 prior to the marking and splitting of Dworshak BY12 SCS.

The Selway program is a Nez Perce Tribe production program under LSRCP that has been reared at Clearwater Hatchery for several years. During the 2011 AOP meeting, the co-managers shifted this 300,000 unmarked parr program to Dworshak. Dworshak was chosen as the rearing facility because of their ample incubation space, chiller capacity to produce parr (100 fish per pound) later in the summer, and early rearing space in the Chinook Raceways. With the extra rearing space from parr program shift, Clearwater Hatchery is expanding their summer Chinook program by 200,000 smolts.

The BY12 Selway SCS averaged 4,268 eggs/female for Powell stock (Table 27). There were 313,642 eyed eggs put into the Selway program and all of which will be incubated and reared at Dworshak.

### **Clearwater Hatchery Spring Chinook Salmon Brood Year 2011**

On August 15, 2012 the main pipeline that supplies reservoir water to Clearwater Hatchery suffered damage and had to be shut off. The loss of primary reservoir water caused an emergency move of 2,534,518 Clearwater BY11 SCS into 25 of Dworshak's System III BPs. Spring Chinook from Clearwater Hatchery were trucked to Dworshak August 27-30. Fish averaged 53 fpp and 96 mm (3.8 inches) at their time of transfer.

At the end of FY12 there were 2,513,618 SCS averaging 44 fpp and 102 mm (4.0 inches). Mortality was 0.35% from the time of transfer to the end of the fiscal year. Water temperature averaged 46.3°F and flow was 700 gpm.

### **Fall Chinook Salmon Brood Year 2012**

The Idaho Fishery Research Office 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 17, 2012 there was an estimated 222,245 BY11 FCS transferred from Umatilla to Dworshak. An additional estimated number of 113,938 FCS was transferred on April 18, 2012. From May 21, 2012 until July 6, a total of 319,750 FCS were PIT tagged and released. There were 4,082 FCS too small to tag and were released untagged. There were 226,786 tagged and 33 untagged FCS released at Couse Creek on the Snake River and 92,964 tagged and 4,049 untagged FCS released at Kayler's Landing on the Clearwater River. There were no substantial mortality events during rearing, thus the estimated number of FCS transferred to Dworshak was too high. The final day for release of FCS was July 6, 2012. This was the final year of the study.

### **Coho Salmon Brood Year 2010**

In May 2010, 340,000 BY09 coho salmon (COS) were transferred from Kooskia NFH to Dworshak for rearing. On February 22-23, 2011 there were 301,377 BY09 coho salmon (COS) transferred from Dworshak to Kooskia NFH for final acclimation before release. 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 28 illustrates BY09 COS production at Dworshak.

There were also 453 female coho from the Clearwater Basin which were 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 at Dworshak. 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 in Orofino, Idaho on July 22, 2010.

### **Brood Year 2011**

Brood Year 2010 COS were trapped at Dworshak and Kooskia hatcheries. As with BY09, all spawning of BY10 COS was done at Kooskia NFH instead of Dworshak. Spawning took place October 26 - November 23, 2010. There were 236 female and 224 male COS from the Clearwater Basin spawned and subsequent progeny reared at Dworshak NFH. These fish produced an estimated 472,000 green eggs. These eggs were incubated at Kooskia NFH.

On April 18-19, 2011, 293,272 BY10 COS were transferred from Kooskia NFH to two Burrows ponds at Dworshak NFH. These fish were 220 fpp and 60 mm (2.3 inches) total length at time of transfer. On May 17 there were 280,000 fry transferred from Kooskia to Dworshak due to inclement weather preventing these eggs from getting to Eagle Creek NFH as in 2009. These fish were outplanted on June 21 and 28, 2011 to Lolo Creek (Table 29).

### **Dworshak Hatchery Production Summary FY 2011**

#### Steelhead Brood Year 2011

There were 2.17 million steelhead smolts released from Dworshak in April, 2012. The steelhead at release averaged 6.1 fpp and 197 mm in total length. The majority of these smolts were released April 6-12, 2012. Under the Harvest Settlement Agreement with the Columbia River Tribes and included in the final release numbers were 209,701 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 Meadow or Lolo Creek. There were a total of 354,745 pounds of steelhead produced from BY10 SST.

#### Steelhead Brood Year 2012

There were 4,698 adult steelhead returned to Dworshak NFH in the fall of 2011 and spring of 2012. A total of 2.56 million eyed eggs went into Dworshak's production program. Dworshak provided 1.8 million eyed eggs for the Clearwater Hatchery and 2.0 million green eggs were taken for Magic Valley Hatchery. As in 2011, SST spawning began in January. Spawning of mid and late returning adults ended on April 17. At the end of FY12 there were 2,204,250 BY12 SST on station.

There will be approximately 200,000 BY12 SST released in 2013 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 2010

Dworshak NFH released 1.04 million BY10 spring Chinook salmon weighing 52,442 lbs. These SCS averaged 20 fpp and 140 mm total length and were released on March 28, 2012.

#### Spring Chinook Salmon Brood Year 2011

At the beginning of FY2011, BY11 SCS eggs of both were incubating at Dworshak. Kooskia eggs were shipped to Kooskai at spawning and incubated there. There were no BY11 Dworshak stock SCS eggs shipped to Kooskia. Dworshak incubated 1,426,771 Dworshak stock SCS over the winter. At the end of FY12 there were 1,382,047 BY11 SCS of Dworshak stock on station, averaging 54 fpp and 100 mm (4.0 inches) total length.

#### Spring Chinook Salmon Brood Year 2012

Adult returns of BY12 SCS produced 1,883 Chinook adults to Dworshak. Kooskia trapped 1,020 adult fish, transferring 822 to Dworshak for spawning. There were a total of 962 Dworshak stock females spawned: 551 for Dworshak, and 412 for Rapid River State Fish Hatchery. There were a total of 440 Kooskia stock females spawned during the season; 259 for Kooskia NFH and 85 for Clearwater State Fish Hatchery, and 96 for Rapid River State Fish Hatchery. Eye-up survival for Dworshak stock eggs was 96.7 percent. All BY12 SCS eggs were incubating at Dworshak at the end of FY12.

#### Selway Spring Chinook Salmon Brood Year 2012

Dworshak received green eggs from 105 females coming from the IDFG Clearwater Hatchery Powell satellite facility. Females were spawned at Powell and green eggs were delivered in egg tubes to Dworshak on the same day as spawning. The eggs were placed into Heath style incubators, one female per tray in 38°F chilled water. Eggs will be incubated and reared to parr at Dworshak. There were 313,642 eyed eggs put into the Selway program, all of which will be incubated and reared at Dworshak.

#### Clearwater Spring Chinook Salmon Brood Year 2011

Clearwater moved 2.53 million BY11 SCS into 25 of Dworshak's System III BPs. Fish averaged 53 fpp and 96 mm (3.8 inches) at their time of transfer. At the end of FY12 there were 2,513,618 SCS averaging 44 fpp and 102 mm (4.0 inches). Mortality was 0.35% from the time of transfer to the end of the fiscal year. Water temperature averaged 46.3°F and flow was 700 gpm.

#### Fall Chinook Salmon Brood Year 2011

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 21 until July 6, 2012, a total of 319,750 FCS were PIT tagged and released; 226,786 tagged and 33 untagged released at Couse Creek on the Snake River and 92,964 tagged and 4,049 untagged released at Kayler's Landing on the Clearwater River.

#### Coho Salmon Brood Year 2010

On February 22-23, there were 301,000 BY09 coho salmon (COS) transferred from Dworshak to Kooskia NFH. On March 30 there were 20,000 BY09 COS transferred to Clear Creek. There were also 760,000 eyed eggs transferred to Eagle Creek NFH in Estacada, Oregon during December, 2010 along with 30,000 transferred to Potlatch Corporation in Lewiston, Idaho.

### Coho Salmon Brood Year 2011

Adult COS were trapped at Dworshak and Kooskia hatcheries and spawned at Kooskia NFH. There were a total of 236 female COS from the Clearwater Basin which were spawned, producing 472,000 green eggs for rearing at Dworshak. These eggs were incubated at Kooskia NFH and the coho were transferred from Kooskia to Dworshak on April 18-19, 2012. At the end of FY12 there were 333,619 BY11 COS on station at 54 fpp. Inclement weather prevented eggs from being shipped to Eagle Creek NFH as in 2010. The extra eggs were reared at Dworshak and 245,000 fry released at Lolo Creek in June, 2012.

# PRODUCTION PHOTOS, FY2012

The Production Staff at Dworshak National Fish Hatchery worked successfully to spawn, incubate, rear and release over 2 million summer steelhead trout and 1.04 million spring Chinook salmon as part of the annual hatchery production cycle. Additionally, 300,000 Coho salmon were reared at Dworshak and acclimated at Kooskia.



Production photo highlights include: **Top Left:** Steelhead smolts being pumped onto COE transport trucks. **Top Right:** Animal Caretaker, Rob Bohn with a female steelhead. **Center:** Mike Bisbee, NPT and Roger Meyers, volunteer sort adult Chinook salmon. **Left Bottom:** staff from Clearwater State Hatchery transfer 2 million SCS when their primary water line was damaged. **Right Bottom:** Steelhead being released into Lolo creek.

# Facilities Maintenance

## *October, 2011*

On Oct. 13<sup>th</sup> the area experienced a power outage which of course affected Dworshak. The 500KW backup generator adjacent to the main pump house started up; however, the transfer switch to close the circuit for emergency power did not function. Ben Greene, promptly diagnosed the problem and was able to manually close the circuit and provide power to two of the main pumps (we were operating off four pumps to provide critical life support to the steelhead, Chinook and Coho prior to the outage). Commercial power was restored approximately 1 hour after the outage. Additional investigations have been conducted by the USACE for long-term solutions (electrical upgrades) for maximum reliability as well as procedures developed for manual transfer.

- Completed plumbing and electrical in new chiller; factory start-up performed.
- Completed new nursery supply pipeline in Mechanical II
- Installed VFD in main pump house pump #5.
- Serviced maintenance shop air compressor, portable welder #1, new battery charger in a cart and replaced pressure washer #4 muffler.
- Replaced C bank nursery supply valve.
- Fabricated mounting frame for chiller electrical components; baffle for settling pond to catch media; baskets for fish pump suction end fittings; pipe stands for chiller plumbing; nets for fish culture and gasket hanger for pipe chase.

## *November, 2011*

This month Metal Benders mobilized to the Mechanical II building to begin installation of the new boiler controls. This project will continue through December. This project will enhance the safety of the boilers and provide for more consistent temperature control in the Nursery system. In the coming months we will be looking at replacing the old pneumatic transducers with new electromagnetic valve positioners and digital controllers to control the heat exchanger valves and supply sump valves. These changes will increase the accuracy and reliability of those systems.

This month also saw completion of repairs on rotating screen #3. The foot cog and bushings on rotating screen #3 in the main pump house had worn to the point that failure was imminent. A dive team from Siemens industrial performed the repairs underwater, getting the job done in less than three days, once the parts arrived.

Other activities included:

- Electrical: installed new formalin drip system plumbing in incubation; repaired spawning and incubation room area heaters; new flow meter in Mech II nursery supply line; new heater in shop bathroom; flow meter in Sys III effluent line; repaired area lighting at housing area and visitor lot.
- Replaced lift cables on small channel crowders.
- Installed UHMW leading edge on front small crowder fish basket.
- Rebuilt net and broom handles.
- Fabricated wrenches for main pump castle nut adjustment.
- PM Service performed on Mechanical I air compressors and main pumps.
- New steering tires installed on the Hyster Forklift, new tires on Chevy Blazer and Caravan.

- Replaced Nursery C bank water supply butterfly valve.
- Replaced sump pump in pipe vault.

### *December, 2011*

This month Metal Benders continued with the installation of the new boiler controls. It was a busy month with work being completed on the incubation project and many smaller electrical jobs being tackled. Temporary repairs were made to the Fish Health roof to stop leaks while the COE pursues moisture surveys and complete roof replacement in the coming budget cycle.

- Other activities included:
  - Completed new incubation headers chilled and cold lines and formalin lines.
  - Electrical: installed Chiller Circulation pump VFD, wiring for Sys I exhaust fan, main aeration heat tape permanent wiring; new Warehouse West freezer outlets; sump pump in pipe vault; housing area light and Mech I air compressor #2 preventative maintenance and replaced breaker panel in Fish Health.
  - Installed flow meter on chilled incubation line.
  - Installed new chiller condenser circulation pump.
  - Repair Chinook crowders with SS ¼” mesh.
  - Pulled out and repaired small channel crowders.
  - Repaired Large Crowder 480 SO Cord.
  - Repaired leaking roof drain in Fish Health Building and temporary repairs to their roof.

### *January, 2012*

This month Metal Benders finished the boiler control project. Operational training for hatchery staff was held by Wes Ketcham of Infinium Engineering. So far the system appears to be intuitive and fairly easy to operate. The maintenance crew also attended Lock out tag out training at Dworshak Dam in an effort to coordinate the two facilities lock out tag out clearance program.

On January 12th at approximately 2 am, the hatchery experienced a partial power outage. Power was out for approximately 8 hours. Quick response and action from hatchery personnel along with power to the main pumphouse provided for a No-Fish loss event.

Other activities included:

- PM performed on Cushman Titans, Dodge Caravans, Fish Truck and Gator.
- Manlift repairs were completed and returned to service.
- Repaired Portable Honda generator.
- Replaced vacuum pump on Nielsen fish pump.
- Performed Main Pump PM and rotating screen as well as Mech II air compressors..
- Repaired stripped stud bolt on Komatsu forklift.
- New belts and PM service on Mech II air compressors.
- Repaired visitor lot lighting.
- Replaced plywood beds with diamond plate on all production Cushman Carts.
- Retrofitted all 80 upwelling jars with new hose thread fittings and replaced the 10-year old Tyvex tubing. This will reduce the risk of a catastrophic water loss during steelhead egg incubation.

### ***February, 2012***

The access bridge to the hatchery was downgraded regarding its weight rating from 30 tons to 26 tons. The new rating is not sufficient to utilize the USACE trucks under normal operation to haul the 900K steelhead slated for off-site releases in the South Fork Clearwater River. Logistical plans are underway to ensure we are successful in releasing these fish in a healthy condition at the appropriate release sites.

- PM performed on Cushman Carts, Ford Ranger.
- Replaced failed A and C bank nursery tower fan FVD drives.
- Built O2 bottle holder for fish transport unit.
- Built new panel for boiler #2 enclosure.
- Replaced spawning water supply pump.
- Installed 110 V transformer on Nielson Pump.
- Readied Magic Valley and Nielson Pumps for SST out planting next month.
- Replaced hydrant near Maintenance Shop.
- Constructed egg incubation jars.
- Pumped out manholes.
- Installed automatic drain valves on air compressors.
- Repaired lift cables on 1989 Dodge flatbed lift gate.
- Serviced Mechanical II air compressors, boiler circulation pump.
- Checked batteries on backup generators.

### ***March, 2012***

- Repaired rooftop exhaust units on hatchery building.
- Changed gearbox oil in the main pump trash rake.
- Serviced 1999 Dodge Caravan, 1989 Dodge flatbed, 2004 Ford Ranger, Nursery cart.
- Installed VFD in Mech II on pump #1.
- Installed 480V plugs on System I.
- Set up pump at main aeration chamber to water up fish trucks.
- Repaired egg jars.
- Pumped out manhole vaults.
- Installed mounts on A bank degassing towers.
- Repaired air compressor #1 in Mech I.
- Repaired outflow chute on Magic Valley pump.

### ***April, 2012***

- Replaced trash rake motor and brake assembly.
- Repaired Cushman cart tires, Gator seats and body panels, batteries filled for other vehicles.
- Electrical: Main pump #1 Electric motor in for rebuild, began repairing ground loop currents on boilers, installed UPS on the boiler PLC, installed system III new effluent pump, replaced motor in Mech I air compressor.
- Repaired quarters hearths in all four quarters, CO detectors installed and sliding glass door in #3.
- Chiller condenser loop moved to reservoir supply.
- Chiller evaporator canister filter installed.
- Pressure washers repaired.
- Signs installed on bridge.

- Repaired counter top and live wells at Fish Health Lab.
- 480 plugs for fish pumps completed on sys I & II.

### *May, 2012*

- Replaced battery chargers on generators I and II.
- Replaced radiator coolant hoses on generators I and II.
- Replaced fire and maintenance pumps #2 and #3.
- Installed new check valves on fire and maintenance pumps #2 and #3.
- Annual PM performed on portable Davey fire pump.
- Service performed on Chevy Trailblazer, engine oil and transmission service, 2001 Dodge Ram.
- Replaced broken light globes in the hatchery building.
- Completed System I pump house ATS installation.
- Replaced fuel gauges on fuel storage tanks.
- Installed mechanical seal filter on sys III effluent pump.
- Repaired fire and maintenance water system leaks.
- Installed new pump #6 in the main pump house.
- Repaired blown hydraulic hose on manlift.
- Annual PM performed on pressure washers.
- Quarterly PM performed on rotating screens.
- PM performed on sys I supply pumps.
- Installed load limit signs on bridge

### *June, 2012*

- Quarterly PM on traveling water screens 1-3.
- PM on Mechanical I boiler circulation pumps.
- Pressure washer #3 PM service and muffler repairs performed.
- Effluent pump filter and pressure regulator installed.
- Installed new Chinook raceway sump pump control panel.
- Cleaned up Fire and Maint Pumphouse electrical issues.
- Pulled Chinook Sump pump for repairs.

### *July, 2012*

- Installing rebuilt Floway pumps in the main pump house.
- Repaired broken window in public restroom.
- Main pump house VFD moved outside of cabinet and water level probe installed.
- Repaired lawn sprinklers at quarters 1 & 2.
- Replacing visitor restroom stall dividers.
- Repaired Chinook sump pump and reinstalled and new control panel.
- Performed incubation room air compressor PM.
- Performed annual service on trash pumps.
- Service on 2003 Dodge Caravan and carts.

### *August, 2012*

- Pump #3 delay timer repaired.
- Rebuilt pump #2 installed.
- Built standpipes for Clearwater Fish Hatchery.
- Took asbestos samples for Lab Roof.
- Repaired Magic Valley pump for use to move CFH Fish.
- Began installing leased emergency generator.
- Performed PM on Air compressors and incubation air filter dryers.
- Annual Service performed on backup generator #3.
- Installed level probe on main pump #5 VFD.
- Installed new incubation formalin pump and GFCI.

### *September, 2012*

- Built walkways for system III portal valves.
- Installed System II Clarifier supernatant pump.
- Repaired System III cleaning gate winch.
- Installed new kelt effluent line to Sys III clarifier.
- Began working on electro pneumatic controllers in Mech II.
- Repaired leaking Fire and maint lines.
- Repaired Cushman cart #4.
- Removed 8 nursery tanks in preparation for new tank install.

# Facilities Maintenance Photos, FY2012

The Maintenance department assisted contractors in major ongoing construction well into FY12: new boiler controls, bird netting installation in Chinook raceways, and installation of a new chiller in Mechanical 1. They also oversee all electrical projects; fabricate new and safer equipment for hatchery work; haul fish, make daily repairs on buildings, grounds and vehicles.



Facilities Photo highlights: **Top Left** : New boiler control panel **Top Right**: new crowding screens for raceways **Middle Left**:staff working on bird netting installation. **Middle Right**: Construction for pipeline connection for Systems outflow. **Lower Left** : New chiller for incubation. **Lower Right**: Traveling screen #3 repairs.

# Administration

## *Meetings*

### *October, 2011*

- Rhett Madsen, University of Idaho (UI) student along with Christine Moffitt, UI faculty met with the fisheries staff at Dworshak to develop plans for implementation of total dissolved gas monitoring for the hatchery.
- Tom Osborne, Bonneville Power Administration (BPA) visited the hatchery to review the progress of various energy savings projects funded by BPA. Jack Christiansen provided an update of each project during the site inspection.
- Nate Wiese, Asst. hatchery Manager, Larry Peltz, Complex Manager and Howard Burge, FRO Project Leader, traveled to Lewiston for the Lower Snake River Compensation Planning meeting to discuss collective options for increasing Chinook salmon production for meeting adult return goals in the future.
- Larry Peltz, Adam Izbicki, Maintenance Supervisor and Mark Drobish, Hatchery Manager traveled to Walla Walla, WA to meet with the USACE Rehabilitation team. The team has completed the condition assessment for the facility and has 11 months to develop and select a path forward. The team will meet twice per month through September, 2012.

### *November, 2011*

- The monthly Snake River Basin Adjudication (SRBA) coordination meeting was held at the Nez Perce Tribal (NPT) Fisheries office in Lapwai. Larry Peltz, Mark Drobish, Nate Wiese attended the meeting along with Becky Johnson, Ed Larson, SRBA Coordinator, Kent Hills, Kooskia NFH Manager and Bruce McLeod of the NPT Fisheries on Nov. 1.
- Larry Peltz, Mark Drobish and Adam Izbicki participated in a conference call with the COE Rehab Team on Nov. 28.

### *December, 2011*

- Larry Peltz, Mark Drobish and Nate Wiese participated in a COE Rehab Team economics meeting; Larry Peltz and Ed Larson met with COE officials and railroad officials to discuss the feasibility of an at grade crossing for the hatchery in lieu of the bridge on Dec. 1.
- Several staff participated in an AOP meeting on Dec. 14<sup>th</sup>.
- The monthly Snake River Basin Adjudication (SRBA) coordination meeting was held at the Nez Perce Tribal Fisheries Office in Lapwai on Dec. 22<sup>nd</sup> attended by Larry Peltz, Mark Drobish & Nate Wiese.

### *January, 2012*

- Larry Peltz, Mark Drobish and Nate Wiese participated in a COE Rehab Team brainstorming session on Jan. 9, 2012.
- Nate Wiese, Howard Burge, Marilyn Blair, Veterinarian for Idaho Fish Health Center, Kent Hills and Mark Drobish attended the Pre-Annual Operating Plan meeting for the Clearwater Basin on Jan. 19 held at the Clearwater State Fish Hatchery.
- January 20 Angela Feldmann participated in a Social Media development and strategy session with Region 1 Fisheries, External Affairs and I&E personnel.
- Larry Peltz and Ed Larson attended a COE Rehab Team public hearing on January 24 in Lewiston, ID.
- Larry Peltz, Mark Drobish, Jack Christiansen, Engineer and Adam Izbicki attended a COE Rehab Team meeting in Walla Walla, WA on Jan. 31, 2012. Critical criteria and measures to address various issues were discussed. The initiation of a quantitative rating system is now underway.

### *February, 2012*

- Larry Peltz, Mark Drobish and Ed Larson met with Lt. Colonel Caldwell on Feb. 7 to discuss Hatchery improvements.
- Mark Drobish, Nate Wiese, and Angela Feldmann met with Tod Sween, Elmer Crow and Ed Larson to discuss fish acquisition for Kids' Fishing Day on Feb. 8.
- Larry Peltz, Mark Drobish and Nate Wiese attended a SRBA meeting with the NPT on Feb. 9.
- Nate Wiese and Mark Drobish attended the Clearwater River Annual Operating Plan meeting at the Clearwater Fish Hatchery on Feb. 16.
- Ann Setter and Ken Fone, USACE biologists visited the hatchery to discuss various facility assets and update information in their Asset Management Requirements Identification and Prioritization (AMRIP) system on Feb. 17.
- Scott Carlton, Regional Director for Raul Labrador (House) and Mike Hanna, Regional Director James Risch (Senate) met with Mark Drobish and Ed Larson on Feb. 28 to discuss the hatcheries needs. Scott and Mike are advocates for the hatchery in support of a new reservoir water line for the Clearwater Hatchery resulting in Dworshak taking over the existing reservoir as well as upgrading the hatchery to state of the art technology with circular tanks with reuse while also addressing/correcting the facilities violations relative to the Clean Water Act.
- On Feb. 28 Thomas Trock, Biologist and Angela Feldmann met with the Hatchery Evaluation Team (HET) to discuss SCS and SST release operations.
- On Feb. 29 Angela Feldmann and Ed Larson met with Tod Sween and Elmer Crow for a Kid's Fishing Day planning meeting.

### *March, 2012*

- Scott Carlson and Mike Hanna met with Dworshak Complex staff to discuss opportunities for both the Dworshak and Clearwater hatcheries relative to infrastructure, water supply and improvement potential for both on March 2.
- Larry Peltz, Mark Drobish, LouAnn Lasswell, Animal Caretaker attended the Idaho Chapter of the American Fisheries Society annual meeting on March 7-9, 2012 in Coeur d'Alene, ID.
- Larry Peltz, Mark Drobish and Nate Wiese attended a SRBA meeting with the NPT on March 15.
- Larry Peltz, Mark Drobish, Adam Izbicki and Nate Wiese met with Greg Parker at Dworshak Dam to discuss capital improvement needs on March 29.

### *April, 2012*

- Larry Peltz and Jack Christiansen traveled to Boise and met with LSRCP staff and then onto American Falls and met with Shoshone-Bannock Tribal staff concerning their new hatchery.
- Larry Peltz, Mark Drobish, Jack Christiansen, Howard Burge, Mike Faler, Marilyn Blair and Nate Wiese attended Project Leaders meeting in Boise April 18 and 19.
- Larry Peltz, Mark Drobish, Adam Izbicki, Steve Bradbury and Ed Larson attended a budget meeting with Ann Setter, Ken Fone and Greg Parker from USACE at the Walla Walla District Office April 26 to discuss the current fiscal year budget and future budgets.

### *May, 2012*

- Larry Peltz traveled to Walla Walla, WA for a Rehab team meeting on May 4<sup>th</sup> with the USACE.
- Marilyn Blair, Angela Feldmann and Nate Wiese attended the LSRCP Chinook meeting in Boise, ID May 15 & 16, 2012.
- Rachel Life gave a webinar talk to staff about IHNV.
- Larry Peltz, Mark Drobish, Jack Christiansen traveled to Walla Walla, WA on May 21 for a Rehab Team meeting with USACE.
- Becky Johnson, Ed Larson, Kent Hills, NPT met with Mark Drobish, Nate Wiese and Larry Peltz on May 30 for the monthly SRBA meeting.
- Julie Davin, Project Manager for the main aeration degassing project scheduled for FY13 met with Adam Izbicki, Larry Peltz and Jack Christiansen to lay out schedules and plans for this project on May 31.

### *June, 2012*

- Dworshak Working Group met in Lewiston, ID to review budgets by project on June 5. Participants at the meeting with Becky Johnson (NPT), Scott Marshall (LSRCP), Rich Johnson (USFWS), Ann Setter and Greg Parker (USACE), Howard Burge, Marilyn Blair and Mark Drobish, DNFH.

- Complex staff visited and provided a tour to Regional Director Robyn Thorson, Deputy Rich Hannan, and Assistant Regional Director Mike Carrier. During their visit, Robyn personally thanked and recognized Larry Peltz and Ed Larson, SRBA Coordinator, NPT for their work at Dworshak and for their career accomplishments. Robyn presented a “Letter of Appreciation” on the behalf of the USFWS to Ed for all his work for our Fishery Resources on June 14.
- On June 19 a meeting was hosted to discuss USACE Rehab process. Representatives from the USACE, BPA, IDF&G, NPT and staff representing U.S. Senator Risch and U.S. Representative Labrador to discuss the status and direction of the USACE-NWW Dworshak Hatchery Rehab project. Immediately following Cindy Boen’s (Rehab Project Team Project Manager) presentation, a discussion that included process and funding methods for projects at DNFH and Clearwater Hatchery. The Rehab Tam will tentatively meet again on August 7 in Walla Walla to discuss the findings of the CH2MHill report.
- Adam Izbicki gave a tour on June 19 to a group of engineering interns from the Walla Walla District, USACE. These interns undergo a series of rotations to better understand the various components of the USACE and how they interrelate with water management and the various components of system operations.
- Larry Peltz, Nate Wiese, Angela Feldmann, Jack Christiansen and Marilyn Blair attended a LSRCP Steelehead Production meeting in Clarkston, WA on June 20-21, 2012.
- The Dworshak Working Group met via conference call to review budgets and discuss materials in preparation for the briefing for Lt. Colonel David Caldwell, Walla Walla District, USACE and his successor, Lt. Colonel Andrew Kelly on June 26.
- Hatchery staff attended a Fish Nutrition Workshop held at Clearwater hatchery June 26-28.

### *July, 2012*

- Dworshak Working Group conference on July 3 to discuss budgets and expenditures.
- Members of the Dworshak Rehab Team met with Jack Christiansen to review plans for nursery water and degassing on July 17.
- Lt. Colonel Kelly, Commander of the Walla Walla USACE District, Rick Werner, Chief of Operations, USACE and Greg Parker, Operations Manager-Dworshak Project visited the hatchery on July 19.
- 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, 2012*

- Jack Christiansen and Mark Drobish participated in the Rehab Team meeting with CH2MHill and the USACE in Walla Walla, WA on Aug. 7. The meeting focused on reviewing the existing options and providing biological criteria for modeling for System I and II utilizing circular tank and modern reuse technology.
- The Dworshak Working Group met to review maintenance costs for the year and better identify needs for the future. Greg Parker and Ann Setter, USACE, Mark Drobish and Adam Izbicki participated. The group will be developing a formula for cost allocations for joint costs and identify separable costs unique to each program.
- The Hatchery was notified by Clearwater Hatchery that the main water supply line in the reservoir had collapsed on Aug. 15. Water flow was not interrupted, however, the pipe has broken off and fallen into about 300 plus feet of water. The hatcheries are working together along with LSRCP, USACE, NPT and EPA to provide space and water for these fish.
- Jack Christiansen provided an overview to Darren Porter, a DC staffer from Senator Risch's office on Aug. 22. The focus of the visit was information gathering relative to rehab/upgrading of the facility.
- Staff from the NPT spent Aug. 23 and 24<sup>th</sup> working with DNFH staff to move steelhead on station and prepare BP's for Chinook coming from the Clearwater Hatchery due to the need for repairs of the Primary Reservoir Pipeline.
- The Dworshak staff worked August 25 & 26 through the weekend to finish pond preparation and disinfection prior to the Clearwater Hatchery Chinook being transferred here.
- Greg Parker and Ann Setter, USACE, Mark Drobish and Adam Izbicki met with Rich Johnson in the Regional Office to discuss maintenance costs as part of the Dworshak Working Group. Steve Yundt, Acting LSCRP Coordinator and Becky Johnson, NPT participated in the meeting via teleconference. Jim Fredericks, Economist from the Portland Division Office gave a presentation and provided insight to developing a mechanism for cost allocations.
- Steve Yundt, Kent Hills, Mark Drobish met to discuss costs and cost allocations by program on August 31, Becky Johnson participated via telephone.

## *September, 2012*

- The Dworshak Working Group met to compile data and discuss cost allocation for the various entities utilizing the hatchery to produce fish. A draft document will be reviewed next month and hopefully a final document will be submitted shortly thereafter.
- Steve Rodgers, NPT Hatchery Manager met with Kent Hills, Adam Izbicki, Nate Wiese and Mark Drobish to discuss opportunities for training between electrician staff to better address the needs of the hatcheries in the future.
- Nate Wiese and Kent Hills participated in a conference call on Sept. 26 to review the Kelt MOU for the ongoing Kelt reconditioning efforts at DNFH.

## ***Training***

- Brent Goosen, Maintenance Worker traveled to Lewiston for the Northwest Safety Fest Feb. 27 and took a course on “*Confined Spaces.*”
- Angela Feldmann, Fisheries Biologist/Information & Education Specialist traveled to Lewiston for the Northwest Safety Fest on Feb. 25 and took a course on “*Ergonomics and Combustible Dust.*”
- Angela Feldmann traveled to NCTC for the FWS “*Employee Foundations.*”
- Penny Hasenoehrl attended FBMS PRISM training in Portland, OR Nov. 28-Dec. 1, 2011.
- Adam Izbicki attended FBMS training in Portland, OR on Jan. 9-13, 2012.
- Angela Feldmann attended the “*Social Media and Digital Content Development*” course at NCTC Jan. 9-13, 2012.
- Boiler training for the staff was conducted by Wes Ketcham, Infinium Engineering and the COE on January 24. This provided staff with an overview of how the boilers would function in complimentary (team) fashion and also included set up and operation from the Personal Computer “touch screen.”
- Adam Izbicki, Terry Weeks, Ben Greene, Rob Kellar, Brent Goosen, Rick King, Maintenance Dpt and Jim Oatman, Electrician, Mark Drobish attended Phase I Lockout/Tagout training hosted on Jan. 26 and presented by the COE.
- Penny Hasenoehrl attended FBMS training in Boise, ID Jan. 31 to Feb. 1, 2012.
- Nate Weise, Angela Feldmann, Jack Christiansen, Mark Drobish, Jill Olson, Laura Sprague & Marilyn Blair attended the “*Recirculating Aquaculture Systems*” workshop in Boise, ID July 24 & 25.
- Jamie Henderson traveled to NCTC Sept. 9-14, 2012 to attend the Wage Grade Academy.
- Angela Feldmann traveled to NCTC to attend, “*Cutting Edge Trends in Visitor Services,*” training Sept. 10-14, 2012.

## ***Safety & Wellness***

- Penny Hasenoehrl, Budget Tech provided CPR/AED/Basic First Aid and Bloodborne Pathogen refresher training on January 24 to fourteen Dworshak Complex staff members and USGS personnel.
- Annual fire extinguisher on March 21, 2012. All safety audits and inspections for the facilities completed during March.
- Hatchery worked with the Clearwater State Hatchery staff to complete the Annual Valve Exercise for reservoir water on April 25. Boilers for incubation (Mech I) and nursery (Mech II) were shut down prior to the exercise and brought back on line after completion. Water temperatures were taken down and back up gradually to minimize the stress associated with the exercise.
- May 2, Dr. Kim Campbell, Clearwater Valley Hospital & Clinic provided hearing education to staff.

- Respirator fit testing was completed for staff utilizing respirators by Oxarc on May 10.
- Annual hearing testing was conducted for staff on-site by Dawn Enlow, Federal Occupational Health nurse out of Pasco, WA.

## *Staffing*

### **DNFH Employees, FY 2012.**

<b>Name</b>	<b>Position Title</b>	<b>Period of Employment</b>	<b>Status</b>
Allain, Richard E.	Animal Caretaker	10/01/11–09/30/12	Permanent
Alverson, Katie	Clerk	10/07/11 – 08/01/12	Temporary
Bohn, Rob	Animal Caretaker	10/01/11- 09/30/12	Permanent
Bradbury, Steve	Administrative Officer	07/01/12 – 09/30/12	Permanent
Bright, Mark	Fishery Biologist	10/01/11- 09/30/12	Permanent
Christiansen, Jack	Aquatic Engineer	10/01/11- 09/30/12	Permanent
Drobish, Mark	Hatchery Manager	10/01/11- 09/30/12	Permanent
Feldmann, Angela	Fisheries Biologist/I/E Coordinator	10/01/11- 09/30/12	Permanent
George,Joan	Admin. Officer	10/01/11- 03/13/12	Permanent
Goosen, Brent	Maintenance Worker	10/01/11- 05/24/12	Permanent
Greene, Benny C	Electronics Mechanic	10/01/11- 09/30/12	Permanent
Hamilton, William W	Animal Caretaker	10/01/11- 09/30/12	Permanent
Hasenoehrl, Penny	Budget Tech	10/01/11- 09/30/12	Permanent
Henderson, Jamie	Electrician	03/01/2012 – 09/30/12	Permanent
Izbicki, Adam	Fisheries Biologist	10/01/11- 09/30/12	Permanent
Kellar, Robbie D	Animal Caretaker	10/01/11- 09/30/12	Permanent
King, Rick	Maintenance Worker	10/01/11- 09/30/12	Permanent
Peltz, Larry	Complex Manager	10/01/11- 06/29/12	Permanent
Stretsbery, Gerald	Laborer	10/01/11- 07/27/12	Permanent
Tighe, Tom	Fisheries Biologist	08/27/12- 09/30/12	Permanent

Trainor, David A	Maintenance Worker	10/01/10–12/31/12	Permanent
Trock, Thomas J.	Fishery Biologist	10/01/11– 04/30/12	Permanent
Vargas, John J	Animal Caretaker Leader	10/01/11– 07/27/12	Permanent
Weeks, Terry C.	Maintenance Worker	10/01/11– 09/30/12	Permanent
Wiese, Nathaniel	Assistant Hatchery Manager	10/01/11 -09/30/12	Permanent
Wright, Benjamin A	Animal Caretaker	10/01/11– 09/30/12	Permanent

**FY12 Nez Perce Tribe Employees at Dworshak NFH**

<b>Name</b>	<b>Position/Title</b>	<b>Employment Period</b>	<b>Status</b>
Bisbee Jr., Michael	Coho Project Leader /Biologist, NPT	10/01/11–09/30/12	Permanent
Coomer, William	Fish Culturist III/Coho Project	10/01/11–09/30/12	Permanent
Eneas, Paul	Fish Culturist	10/01/11- 01/20/12	Temporary
Hills, Kent	Kooskia NFH Manager/Acting SRBA Coordinator	07/01/12 – 09/30/12	Permanent
Lopez, Carter	Fish Culturist II/LSRCP-DNFH	08/06/12- 09/30/12	Temporary
Larson, Ed	SRBA Coordinator,/LSRCP/DNFH	10/01/11– 06/29/12	Permanent
Lasswell, Lou Ann	Fish Culturist II/LSRCP-DNFH	10/01/11– 09/30/12	Permanent
Oatman, Jim	Electrician	02/21/12- 9/30/12	Permanent
Moliga, Tuiana	M&E Biologist, Coho Project, NPT	10/01/11– 09/30/12	Permanent
Sisto, Ambrose J.	Fish Culturist I/LSRCP-DNFH	02/14/11 –09/30/12	Permanent
Sommer, Jeremy	Fisheries Biologist	08/27/12 – 09/30/12	Permanent

***Personnel***

- Katherine Alverson, Orofino High School student EOD as a Clerk in the Admin Office/Production Dpt. Back-up on 10/7/11.
- Clarice Holt EOD Oct. 11<sup>th</sup> as a USFWS employee. She is also a member of the Nez Perce Tribe and will continue to work with the Dworshak crew in this Intermittent appointment. Clarice is also taking classes with a goal of receiving a degree in Biology one day.
- Dave Trainor, Maintenance Worker retired in December, 2011.
- Clarice Holt resigned her position here January 20 and officially started her position as a Fisheries Tech II here as a NPT employee.
- Paul Eneas, NPT employee finished up his assignment here at the hatchery as a Fish Culturist January 20. Paul started a new assignment with the NPT working on the Steelhead Kelt project.
- Steve Bradbury is transitioning into a 3-month temporary assignment taking over the duties of the Administrator Officer, Joan George who will be retiring shortly.
- Joan George retired on March 13, 2012.
- Thomas Trock's last day was April 30.

- Jim Oatman, NPT electrician officially joined the Dworshak Team on Feb. 21<sup>st</sup>.
- Brent Goosen's last day was May 24<sup>th</sup>, he accepted a position with the USACE.
- Katie Alverson began working full time at the end of May.
- Larry Peltz and Ed Larson retired June 29, 2012.
- John Vargas, Supervisory Animal Caretaker and Gerald "Scooter" Stretsbery, Maintenance worker retired on July 27, 2012.
- Production Biologists Tom Tighe, USFWS and Jeremy Sommer, NPT reported for duty on 8/27/12.
- Carter Lopez, NPT reported for duty on 8/6/12 as a temporary Fish Tech.
- Howard Burge, Project Leader for Idaho Fisheries Resource Office retired with 32 years of federal service (23 of them were at Dworshak). His institutional knowledge will be irreplaceable.

## Administration/Complex Photos, FY2012

Dworshak Fisheries Complex Administration 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.



Numerous retirements in 2012. **Top Left: Thomas Trock, Fisheries Biologist** and his wife Jenni, retired in April. **Top Center: Joan George, Admin Officer** and her husband Bob, retired in March. **Top Right: Ed Larson, Nez Perce Tribe SRBA Coordinator** retired in June. **Center Left: Scooter Stretsbery, Maintenance Worker** retired in July. **Center: Larry Peltz, Complex Manager** retired in June. **Center Right: John Vargas, Supervisory Animal Caretaker** retired in July. **Bottom left: Dave Trainor, Maintenance**, fabricated many pieces of equipment which will be used in the years to come retired in December. **Bottom Center: Howard Burge, FRO Project Leader** retired in September. **Right Bottom: Steve Bradbury** EOD on Admin Officer.

## Outreach and Visitor Activities

### Statistics

#### Dworshak NFH Visitor Use Statistics, FY2012

Program/Contact Type	# of Contacts
<b>On-site</b> Hatchery Visitors (Visitor Register and self-guided tour)	<b>1963</b>
Guided Tours	<b>23</b>
Tour Visitors	<b>842</b>
Web Visitors (virtual contacts from all sources)	<b>4274*</b>
Blog Visitors	<b>3399</b>
<b>Total On-Site Contacts</b>	<b>10478</b>
<b>Off-site</b> Programs/Displays/Events	<b>11</b>
<b>Off-Site Contacts</b>	<b>2103</b>
<b>Total FY12 Programs</b>	<b>34</b>
<b>Total FY12 Contacts (total on + offsite)</b>	<b>12581</b>

\*Web data from individual monthly hits to DNFH website, via Stat Counter, an internet access log analyzer.

#### *FY12 Outreach Program Summary*

The I/E program saw increases in all program areas in FY 12. Total contacts were up 62%, educational programs were up 71%, and volunteerism was up 59% from FY11. The addition of social media, from a hatchery blog and a facebook page, greatly increased visitor contacts.

Hatchery visitation (as measured by on-site visitor log and self-guided tours) increased with a total of 1963 contacts signing the register, up 66% from FY11. Guided tours and school groups were hosted by hatchery staff and well-trained Hatchery Volunteers. There were a total of 23 guided tours in FY12; this was an increase of 74% from FY11.

The Volunteer program got a boost this year with a volunteer training being held in February and a volunteer appreciation potluck being held after steelhead spawning in April. A total of 22 volunteers contributed 497.5 hours of service towards spawning, field work, outreach events and public contact duties. Volunteerism was up 59% and volunteer hours were up 49% from FY11.

The 22<sup>nd</sup> 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 purchased the rainbow trout from Trout Lodge, and provided all equipment for 98 kids 12 years and under who registered (approx. 120 non-fishing guests also attended). Attendance was up 60% from last year. Volunteers were on hand to help kids make artful fishing flies, create Japanese fish prints, and color origami fish. The Idaho Department of Fish and Game (IDFG) brought out their macro invertebrate collection and gave children insect nets to investigate aquatic life in Tunnel Pond. Nez Perce National Forest (USFS) staff taught kids about local fish and their life cycles. Clearwater County Sheriff deputies brought out their jet skis and taught the kids about water safety. The Nez Perce Tribe put up a teepee and the Ess-kah-po Powwow committee served a delicious breakfast and lunch. Transportation was coordinated with the local school district to provide a shuttle bus from a parking area in Orofino to the pond.

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 FY12 so there are no good metrics to track whether there was an increase or decrease in web visitors. In November we began using Stat Counter, a web based tracking system to monitor web visitors and anticipate continuing the used of this tracking service for FY13.

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. Our goal was to have some of these videos on-line by the end of FY12, but due to staffing shortages in production, I/E staff duties were re-directed to cover those shortfalls. I/E staff Feldmann created a Blog, [The Fish Ladder](#), where articles about Hatchery activities are reported. Positive accolades have been given by R1, field office staff, Dworshak volunteers, and local teachers. Additionally, a Complex [facebook](#) page was created. Posts are being made several times a week and the page continues to grow in popularity.

The number of off-site programs and contacts increased significantly this year. I/E staff Feldmann provided: outdoor learning stations at the County Extension/Soil Conservation Districts’ 6<sup>th</sup> grade Forestry Tour for 56 students; informational and educational material at the Clearwater County Fair booth making 1,100 contacts in 3 days; Hatchery in the Classroom (HIC) programs at 4 schools and assisted HIC programs at 12 additional schools.

**Hatchery in the Classroom:** 16 schools received hatchery-supplied equipment and/or full levels of support; 12 received just the eggs, feed and technical support. All projects went well this year, with an average egg-to-fry survival rate of 90%. All schools had post-project release activities for students, which hatchery staff participated. 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. Evaluations from participating teachers showed satisfaction with the program, and included notes on the great educational benefits to students.

## Outreach Program Photos, FY2012



**Top Left:** Volunteer, Gerry Berger, leads a tour on spawning day. **Top Right:** Student dissecting fish in the classroom as part of Hatchery in the Classroom project. **Center Left:** Veteran's are assisted in fishing at Tunnel Pond by FWS personnel. **Right Center and Bottom Left:** Kids' Fishing Day is always a popular event. **Bottom Right:** After the fish are caught, other activities are available such as Gyotaku at Kid's Fishing Day.

## Significant Events

On August 15, 2012, the water temperature coming from the reservoir dropped in an instant. In short order, we were notified by our neighboring hatchery of the failure of the water supply line from Dworshak Reservoir. A genuine crisis unfolded. Although the water continued to flow, there was great concern over the water supply's reliability, integrity of the damaged infrastructure and available expertise to repair it. Very quickly, the Dworshak Hatchery staff, Clearwater Hatchery staff, Nez Perce Tribal Hatchery staff, Corps of Engineers, and Environmental Protection Agency (EPA) put plans in place to move 2.5 million Spring Chinook Salmon from the Clearwater Hatchery to the Dworshak Hatchery. The fish were moved successfully and reared until distribution/release in March, 2013.

As a result of this crisis, hatchery operations were changed and infrastructure modifications were made resulting in the hatchery's ability to "treat" all cleaning waste from System III. This effort included a piping interconnect, removal of plastic media in System II and the installation of submersible pumps. These efforts resulted in the EPA review and support for the increased production and long-term increase in production based on water quality samples.

The hatchery successfully produced and released over 2.1 million steelhead smolts again in FY12. The new fish production strategy of keeping juvenile fish on reservoir water for as long as possible was successful for the 3<sup>rd</sup> consecutive year in managing around IHNV and meeting fish production goals.

There hatchery did NOT experience IHNV in the nursery in 2012! In 2011, due to what we believe was cross-contamination between the reservoir and river water supply lines in the nursery, IHNV wiped out take 1 in 2011.

The COE's Rehab study continued 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. Although the plan has experienced delays, the effort has provided much more detailed insight to the facility and the Rehab Report will be completed in FY13.

Table 1. Fish inventory summary for BY11 SST on October 1, 2011 and release in April, 2012.

Location	October 1, 2011				Oct 1 - April 31 % loss	Final Release April 2-12, 2012**			
	Number*	Wt (lbs)	Lgth in	Lgth mm		Number	Wt (lbs)	Lgth in	Lgth mm
Syst I*	898,493	19,640	4.0	101	0.9	890,429	135,118	7.6	192
Syst II	994,717	45,931	5.1	129	0.9	985,506	166,603	7.8	199
Syst III *	307,251	17,944	5.5	140	3.7	295,911	53,024	8.0	203
Tot/Ave	2,200,461	83,515	4.8	121	1.3	2,171,846	354,745	7.8	197

\* System 1 and 3 – Oct 1 numbers adjusted from Oct marking inventory numbers and reconciled to Nov 1 Monthly Inventory Summary

\*\* Includes 209,701 SST released into Lolo and Meadow Creeks on April 12 by the NPT

Source: DNFH - Final Release Summary, April 24 2012  
 Monthly Inventory Summary, Oct 1, 2011  
 Monthly Activity Report, May, 2012

Table 2. System I BP production, BY11 SST, FY2011/12.

BY 11 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								
May-11	185,187	899	206	2.4			123	128	222	128	222	1	1	0	49.8	0.00	0.12	0.31	
Jun-11	909,819	7,418	122	2.9	99,916	899	1,902	1,494	2,877	1,366	2,655	0.86	0.72	42	51.3	0.46	0.12	0.54	
Jul-11	1,231,356	16,291	75.6	3.4	411,020	7,418	7,307	8,008	13,752	6,514	10,875	0.88	0.89	41	52.2	0.50	0.18	0.81	T
Aug-11	992,590	13,000	76.4	3.3		8,970	4,030	11,143	19,053	3,135	5,301	0.83	0.78	63	50.5	0.30	0.16	0.72	to
Sep-11	994,140	17,437	57.0	3.7	40,135	13,000	3,501	18,749	31,943	7,606	12,890	0.93	1.03	31	51.3	0.62	0.07	0.33	2
Oct-11	898,493	19,640	45.7	4.0		19,640	7,353	29,288	49,149	10,539	17,206	0.87	0.82	24	49.8	0.73	0.10	0.46	
Nov-11	894,146	32,425	27.6	4.7		32,425	12,785	44,531	68,707	15,243	19,558	0.98	1.09	27	48.5	0.60	0.13	0.58	
Dec-11	892,746	46,452	19.2	5.3		46,452	14,026	65,157	87,212	20,626	18,505	0.97	0.97	19	45.3	0.71	0.15	0.75	
Jan-12	982,057	67,638	13.2	6.0		67,638	21,187	85,825	100,265	20,668	13,053	1.01	1.05	20	42.7	0.54	0.18	0.89	
Feb-12	891,322	87,350	10.2	6.5		87,350	19,712	104,878	112,479	19,053	12,214	0.97	0.93	20	41.4	0.48	0.20	1.02	
Mar-12	890,899	107,840	8.3	7.0		107,840	20,490	126,970	127,320	22,092	14,841	0.93	0.90	19	41.2	0.50	0.23	1.17	
Apr-12	890,521	132,318	6.7	7.5	890,429	132,318	24,478	129,770	129,207	2,800	1,887	0.96	1.00	19	41.2	0.05	0.24	1.19	

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

Source: DNFH – Monthly Inventory Summary, Sept 2011 - May 2012  
 Final Release summary, BY11 SST  
 Monthly Activity Report, Sept 2011 - May 2012  
 Daily Water Temperature Records, May 2011 - Mar 2012

Table 3. Marking and tagging of BY11 SST, System I.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 9	09/20/11	19,508		AD	System I Contribution	Dworshak
BP 25	09/20/11	30,026		AD	System I Contribution	Dworshak
BP 35	09/21/11	20,112		AD	Comparative Survival/ Hatchery Evaluation/ Smolt monitoring FPC	Dworshak
BP 37	09/21/11	20,005		AD	System I Contribution	Clear Creek
BP 13	01/18/12		1,870	UNM	Comparative Survival/ Hatchery Evaluation	Meadow Creek
BP 15	01/18/12		911	UNM	Comparative Survival/ Hatchery Evaluation	Lolo Creek
BP 19	01/23/12		1,950	AD	Comparative Survival/ Hatchery Evaluation	Clear Creek
<b>Total</b>		<b>89,651</b>	<b>4,731</b>			

Fin Clips = AD-Adipose fin; UNM-Unmarked

FPC = Fish Passage Center

Source: DNFH- Monthly Inventory Summary, System I, Oct 2011, Jan 2012

CRFPO marking summary, Jan 2012

IFRO marking strategy schematic BY2011 SST

Table 4. System II production, BY11 SST, FY2011/12.

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 Incre	Den	Flow	Coments
	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	
Sep-11	994,717	45,931	21.7	5.1	31.356	22,457	27,127	31,773	20,447	21,486	0.83	0.91	16	48.9	1.04	0.14	0.60	
Oct-11	993,160	71,651	13.9	5.9	57.077	25,721	52,550	47,431	25,423	15,658	0.91	0.99	21	49	0.82	0.18	0.81	
Nov-11	991,521	94,790	10.5	6.5	80.216	23,139	75,611	60,654	23,061	13,223	0.95	1.00	28	48.1	0.58	0.22	0.97	
Dec-11	990,605	120,504	8.2	7.0	105.930	25,714	101,171	75,223	25,560	14,569	0.97	0.99	24	45.1	0.54	0.23	1.14	
Jan-12	989,230	131,628	7.5	7.2	117.054	11,124	117,504	84,455	16,333	9,232	1.22	1.47	49	42.5	0.21	0.24	1.21	
Feb-12	987,892	148,749	6.6	7.6	134.175	17,121	138,074	95,974	20,570	11,519	1.21	1.20	30	41.3	0.30	0.26	1.31	
Mar-12	986,033	163,803	6.0	7.8	149.230	15,055	158,174	107,230	20,100	11,256	1.27	1.34	36	41.1	0.25	0.28	1.40	
Apr-12	985,506	166,603	5.9	7.9	152.030	2,800	160,974	110,030	2,800	1,887	1.13	1.00	200	41.1	0.05	0.28	1.42	

Source: DNFH - Monthly Inventory Summary, Sept 2011, April 2012

Final Release summary, BY11 SST

Monthly Activity Report Aug 2011 - Apr 2012  
Daily Water Temperature Records, Aug 2011 - Mar 2012

Table 5. Marking and tagging of BY11 SST, System II.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 14	8/31/12	20,792		AD	Comparative Survival/ Hatchery Evaluation/ Smolt monitoring FPC	Dworshak
BP 16	8/31/12	18,016		AD	Comparative Survival/ Hatchery Evaluation	Dworshak
BP 38	8/30/12	18,481		AD	Comparative Survival/ Hatchery Evaluation	Dworshak
BP 40	8/30/12	21,313		AD	System II Contribution	Red House Hole
BP 20	1/24/12		2,097	AD	Comparative Survival/ Hatchery Evaluation	Clear Creak
BP 22	1/24/12		2,148	AD	Comparative Survival/ Hatchery Evaluation	Red House Hole
BP 24,26			9365	AD	Comparative Survival/ Hatchery Evaluation/ Smolt monitoring FPC	Dworshak
Total		78,602	13,610			

Fin Clips = AD-Adipose fin

Source: DNFH- Monthly Inventory Summary System II, Oct 2011, Jan 2012

CRFPO marking summary Jan, 2012

IFRO marking strategy schematic BY2011 SST

Table 6. System III production, BY11 SST, FY2011/12.

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	Com ments
	EoM	Number	Wt lbs	FPP			Lgth in	Wt	WT	LBS FY								
Aug-11	309,520	4,919	63.0	3.6	180	180	180	277	180	277	1.00	1.00	324	48.2	0.05	0.06	0.26	
Sep-11	308,258	9,935	31.0	4.5	5,196	5,016	4,320	6,652	4,140	6,375	0.91	0.83	16	47.4	0.95	0.09	0.41	
Oct-11	307,251	17,944	17.1	5.5	13,205	8,009	11,950	12,285	7,630	5,633	0.93	0.95	17	48.9	0.99	0.14	0.60	
Nov-11	305,672	24,189	12.6	6.1	19,449	6,244	19,558	17,929	7,608	5,644	1.07	1.22	29	49	0.59	0.17	0.74	
Dec-11	303,658	32,089	9.5	6.7	27,349	7,900	26,174	22,724	6,616	4,795	0.96	0.84	26	48.1	0.62	0.20	0.89	
Jan-12	302,439	38,380	7.9	7.1	33,640	6,291	33,580	28,231	7,406	5,507	1.07	1.18	31	45.1	0.42	0.20	1.00	
Feb-12	300,146	42,060	7.1	7.4	37,319	3,679	39,103	31,737	5,523	3,506	1.28	1.50	44	42.5	0.24	0.21	1.06	
Mar-12	298,382	47,708	6.3	7.7	42,967	5,648	45,878	35,922	6,775	4,185	1.24	1.20	28	41.3	0.33	0.23	1.15	
Apr-12	293,948	51,911	5.7	7.9	47,170	4,203	53,012	40,659	7,134	4,737	1.47	1.70	39	41.1	0.23	0.24	1.21	

Source: DNFH - Monthly Inventory Summary, Aug 2011 - Apr 2012  
 Final Release summary, BY11 SST  
 Monthly Activity Reports, Aug 2011 – Apr 2012  
 Daily Water Temperature Records May 2011 – Mar 2012

Table 7. Marking and tagging of BY11 SST, System III.

Released from BP #	Date	CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 60	8/29/12	34,065		AD	System III Contribution	Dworshak
BP 58	1/30/12		2,710	AD	Comparative Survival/ Hatchery Evaluation/ Smolt Monitoring Plan	Dworshak
BP 59	2/1/12		941	AD	Comparative Survival/ Hatchery Evaluation	Clear Creek
BP 57	2/1/12		899	AD	Comparative Survival/ Hatchery Evaluation	Red House Hole
<b>Total</b>		<b>34,065</b>	<b>4,550</b>			

Fin Clips = AD-Adipose fin

Source: DNFH- Monthly Inventory Summary System III, Oct 2011 - Jan 2012

CRFPO marking summary Jan 2012

IFRO marking strategy schematic BY2011 SST

Table 8. All outside rearing systems, BY11 SST production, FY2011/12.

BY 11 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed Conv	Mo Feed Conv	TU per inch	Ave Temp for Mo	Lgth Incr inch 30 day	Den Index	Flow Index	Com ments
	EoM	Number	Wt lbs	FPP			Lgth in	Wt	Wt	LBS FY								
May-11	185,187	899	206	2.4	123	123	128	222	128	222	1.04	1.04		49.8		0.07	0.31	
Jun-11	909,819	7,418	123	2.9	2,025	1,902	1,494	2,877	1,366	2,655	0.88	0.72	42	51.3	0.46	0.12	0.54	
Jul-11	1,540,876	21,209	72.7	3.4	9,512	7,487	8,188	14,030	6,694	11,153	0.91	0.94	33	50.2	0.55	0.12	0.53	
Aug-11	2,259,053	45,324	49.8	3.9	27,457	17,945	22,143	35,994	13,955	21,964	0.85	0.79	26	48.4	0.63	0.11	0.50	
Sep-11	2,200,461	83,515	26.3	4.8	65,276	37,819	57,826	76,004	35,683	40,010	0.90	0.96	20	50.1	0.88	0.12	0.51	
Oct-11	2,192,978	128,107	17.1	5.5	110,026	44,750	101,396	114,513	43,570	38,509	0.96	1.01	24	49.4	0.71	0.15	0.67	
Nov-11	2,187,925	172,892	12.7	6.1	155,091	45,065	146,316	152,091	44,920	37,578	0.97	0.98	27	48.3	0.60	0.18	0.81	
Dec-11	2,185,101	226,669	9.6	6.7	208,283	53,192	199,908	190,673	53,592	38,582	1.01	1.05	23	45.2	0.56	0.19	0.96	
Jan-12	2,180,698	261,556	8.3	7.0	242,798	34,515	242,432	216,466	42,524	25,793	1.17	1.34	32	42.6	0.33	0.21	1.05	
Feb-12	2,177,173	304,380	7.2	7.4	286,057	43,259	288,830	244,385	46,398	27,919	1.14	1.11	25	41.3	0.37	0.23	1.16	
Mar-12	2,173,502	349,349	6.2	7.7	329,793	43,736	338,156	275,219	49,326	30,834	1.23	1.31	28	41.2	0.33	0.25	1.26	
Apr-12	2,171,846	354,790	6.1	7.8	336,665	6,872	345,028	280,113	6,872	4,894	1.11	1.00		41.1	0.06	0.26	1.28	*Rel 4/12

\*All BY11 SST released by April 12, 2012

Source: DNFH - Monthly Inventory Summary, May 2011 – Apr 2012

Final Release summary BY11 SST

Monthly Activity Reports May 2011 - Apr 2012

Daily Water Temperature Records May 2011 – Apr 2012

Table 9. Fish distribution summary by site, BY11 SST, April 4-12, 2012.

Site	Number	Weight	fpp	Length	
				in	mm
<b>Outplants 4/2 - 4/10</b>					
Lolo Ck Unmarked SST	68,666	10,494	6.5	7.6	193
Red House Hole	403,894	65,357	6.2	7.7	196
Clear Creek	339,219	54,500	6.2	7.7	196
Meadow Cr. Unmarked SST	141,035	21,023	6.7	7.5	191
Subtotal	952,814	151,374	6.3	7.7	195
<b>Direct Release 4/12</b>					
Main Stem of the Clearwater River	1,219,032	203,370	6.0	7.8	198
<b>Totals/Averages</b>	<b>2,171,846</b>	<b>354,744</b>	<b>6.1</b>	<b>7.8</b>	<b>197</b>

Source: Final Release Summary, BY11 SST

Table 10. Final Release Summary by Egg Take BY11 SST.

Take	Number	Weight	fpp	Length	
				in	mm
1	0	0	0.0	0.0	0
2	295,911	53,024	5.6	8.0	203
3	250,586	41,278	6.1	7.8	198
4	218,387	39,361	5.5	8.0	204
5	232,278	39,470	5.9	7.9	200
6	244,368	40,154	6.1	7.8	197
7	226,096	36,335	6.2	7.7	196
8	413,321	66,736	6.2	7.7	196
8A	290,899	38,386	7.6	7.2	183
<b>Totals/Averages</b>	<b>2,171,846</b>	<b>354,744</b>	<b>6.1</b>	<b>7.8</b>	<b>197</b>

Source: Final Release Summaries, Systems I-II-III BY11 SST

Table 11. Adult disposition of BY2012 SST from Dworshak.

Destination	Number	Comments
Foodbank, Orofino area	1,756	Spawned out carcasses
Ahsahka ID, Hocus boat ramp, Clearwater R	2,019	Excess Broodstock -live returned to river
Landfill	83	Died in trap, holding morts, etc
Landfill	80	Information & Education school dissection
Greer Bridge, Middle Fork Clearwater R	695	Carcass nutrient enhancement
Ahsahka ID, Hocus boat ramp, Clearwater R	65	Natural fish - unclipped - live returned to river
<b>Total Returns</b>	<b>4,698</b>	

\* Dworshak also trapped SST for kelt air-spawning on Feb 7-8, 2012. The majority of these eggs went for kelt food. These eggs did not go into Dworshak production and broodstock were not counted in the rack return.

Source: DNFH-Final Spawning Activity Report BY2012 SST  
Spawning and Run Summary BY2012 SST

Table 12. System I production, BY12 SST, FY2012.

BY 12 SST	Fish on Feed End of Month				Fish Transfer	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp for Mo	Lgth Incr 30 day	Den Index	Flow Index	Comments
	EoM	Number	Wt lbs	FPP			Lgth in	Number	Wt	LBS FY								
May-12	293,106	2,035	144	2.7	0	228	229	423	229	423	1.00	1.00		51.3		0.13	0.63	Take 1 added in May
Jun-12	1,459,875	18,305	80	3.3	0	14,463	5,606	9,946	5,377	9,523	0.68	0.37	14	55.6	1.71	0.19	0.86	Takes 2-5 added in June
Jul-12	828,703	13,930	59	3.6	886,834	18,875	15,885	27,240	10,279	17,294	0.61	0.54	31	53.9	0.72	0.21	0.99	Takes 6 added July
*Aug-12	806,365	10,445	77	3.3	548,801	14,292	22,449	38,221	6,564	10,981	0.53	0.46	32	47.6	0.02	0.15	0.69	Takes 7-8 added Aug
*Sep-12	802,417	16,014	50	3.8	0	5,569	25,785	43,889	3,336	5,668	0.57	0.6	33	49.1	0.52	0.20	0.92	End FY12

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

Source: DNFH - Monthly Inventory Summary, May 2012 - Oct 2012  
 Monthly Activity Reports-May, 2012 - Oct 2012  
 Daily Water Temperature Records, May - Oct 2012

Table 13. BY12 SST Coded wire tagging System 1.

Released from BP #	Date	CWT	Fin Clips	Study	Release Site
BP 13	09/05/12	41,123	AD	Contribution	Dworshak
<b>Total</b>		41,123			

Source: IFRO BY12 SST CWT data FY12

Table 14. System II production, BY12 SST, FY2012.

BY 12 SST	Fish on Feed End of Month					Gain this FY Wt	Gain this Mo Wt	Fish Feed Fed				FY Feed Conv	Mo Feed Conv	TU per inch	Ave Temp for Mo	Lgth Incr 30 day	Den Inde x	Flow Inde x	Com ment
	EoM	Number	Wt lbs	FPP	Lgth in			LBS FY	Cost FY	LBS Mo	Cost Mo								
Jul-12	503,030	13,577	37.0	4.3	1,577	1,577	1,447	2,394	1,447	2,394	0.92	0.92	81	46.1	0.17	0.08	0.38	Tk 2-3 added from Syst 1	
Aug-12	1,121,118	48,214	23.0	5.0	31,180	29,603	10,829	15,916	9,382	13,522	0.88	0.85	15	46.6	0.97	0.13	0.65	Tk 4-5 added from Syst 1	
Sep-12	1,120,056	64,385	17.0	5.5	47,351	16,171	29,863	31,693	19,034	15,777	1.03	1.18	34	49.1	0.50	0.16	0.78		

Source: DNFH - Monthly Inventory Summary, Aug - Oct 2012

Monthly Activity Reports-Aug - Oct 2012

Daily Water Temperature Records, Aug - Sept 2012

Table 15. BY12 SST Coded wire tagging System II FY2012.

Released From BP #	Date	CWT	Fin Clips	Study	Release Site
BP 2	08/24/12	20,139	AD	Contribution	Dworshak
BP 16	08/28/12	40,159	AD	Contribution	Dworshak
BP 28	08/29/11	20,325	AD	Contribution	Dworshak
BP 40	08/30/12	20,659	AD	Contribution	Red House
Total		101,282			

Source: IFRO BY12 SST CWT data FY12

Table 16. System III production, BY12 SST, FY2012.

BY 12 SST	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed	Mo Feed	TU per	Ave Temp for Mo	Lgth incr inch 30 day	Den Index	Flow Index	Comments
	Number	Wt lbs	FPP	Lgth in			LBS FY	Cost FY	LBS Mo	Cost Mo								
Jul-12	354,680	12,230	29.0	4.6	1,661	1,661	1,346	2,127	1,346	2,127	0.81	0.81	65	46.3	0.22	0.09	0.44	From Sys I
Aug-12	282,021	13,502	21.0	5.2	8,576	6,915	5,126	7,152	3,780	5,025	0.84	0.87	27	46.6	0.53	0.17	0.87	TK 2 move to sys II
Sep-12	281,777	16,303	17.0	5.5	11,377	2,801	8,926	10,107	3,800	2,955	1.10	1.36	51	49.1	0.34	0.20	0.99	End of FY 12

Source: DNFH - Monthly Inventory Summary, Jul – Oct 2012

Monthly Activity Reports Jul - Oct 2012

Daily Water Temperature Records Jul - Oct 2012

Table 17. BY12 SST Coded wire tagging System III, FY2012.

Released from BP #	Date	CWT	Fin Clips	Study	Release Site
BP 66	08/29/11	25,080	AD	Contribution	Dworshak

Source: IFRO BY12 SST CWT data FY12

Table 18. BY12 SST on station and projected release summary from 10/01/2012.

As of October 1, 2012					Projected to Release - April 2013		
System	Number	Weight (lbs)	fpp	L mm	Proj % Mortality until Release	Projected Release Number	Proj Release size mm
System I	802,417	16,014	50.1	98	3	778,344	173
System II	1,120,056	64,385	17.4	139	3	1,086,454	214
System III	281,777	16,303	17.3	139	3	273,324	214
Total/Ave	2,204,250	96,702	22.8	127	3.0	2,138,123	199

Source: DNFH - Monthly Inventory Summary, Oct 1, 2012  
 DNFH - Monthly Activity Report, Sept, 2012

Table 19. BY10 SCS in Raceways, April 2011 through March 28, 2012.

BY 10 SCS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed Conv	Mo Feed Conv	TU per in	TU FY	Ave Temp for Mo	Lgth Incr 30 day	Den Index	Flow Index	Comments
	EoM	Number	Wt lbs	FPP			Lgth in	Wt	Wt	LBS FY									
Apr-11	1,104,379	1,237	893	1.6	1,237	733	411	713	411	713	0.33	1.15	22	22	41	0.40	0.26	0.28	Stock split into 9
May-11	840,889	2,004	420	2.0	2,004	767	1,348	2,351	937	1,638	0.67	1.22	28	50	44	0.45	0.15	0.30	
Jun-11	837,279	4,706	178	2.7	4,706	2,702	3,152	5,489	1,804	3,138	0.67	0.67	19	69	45	0.66	0.20	0.31	
Jul-11	833,819	7,548	111	3.1	7,574	2,868	6,309	11,203	3,157	5,714	0.83	1.10	30	99	46	0.46	0.18	0.31	
Aug-11	1,049,764	13,467	78	3.5	13,493	5,919	10,828	18,955	4,519	7,752	0.80	0.76	41	140	48	0.38	0.11	0.31	missing fish accounted for during
Sep-11	1,047,916	21,247	49	4.1	21,273	7,780	16,306	27,960	5,478	9,005	0.77	0.70	29	169	49	0.58	0.15	0.30	
Oct-11	1,047,261	25,996	40	4.4	26,022	4,749	22,360	37,571	6,054	9,611	0.86	1.27	60	229	49	0.28	0.15	0.34	
Nov-11	1,046,690	32,006	33	4.7	32,032	6,010	28,690	45,659	6,330	8,087	0.90	1.05	51	280	48	0.31	0.17	0.33	
Dec-11	1,046,192	36,575	29	4.9	36,601	4,569	33,654	51,693	4,964	6,034	0.92	1.09	61	342	45	0.21	0.19	0.39	Feed
Jan-12	1,045,562	37,835	28	4.9	37,861	1,260	36,270	55,015	2,616	3,322	0.96	2.08	186	528	43	0.06	0.19	0.41	Fasted/PIT
Feb-12	1,044,811	44,830	23	5.2	44,856	6,995	42,166	62,503	5,896	7,488	0.94	0.84	32	560	41	0.29	0.21	0.49	
Mar-12	1,044,080	52,442	20	5.5	52,164	7,308	49,768	71,433	7,602	8,930	0.95	1.04	34	594	41	0.27	0.24	0.50	Rel Mar 28 2012

Source: DNFH- Monthly Inventory Summary, Apr 2011 – Mar 2012  
 Monthly Activity Reports, Apr 2011 – Mar 2012  
 Final Release Summary, BY10 SCS

Table 20. Mortality of adult BY12 SCS held at Dworshak.

Mortality	Dworshak		Kooskia	
	Number	Percent of total return at Dworshak	Number	Percent of Kooskia return transferred to Dworshak
Prespawning	15	0.8	51	6.2
During Spawning	169	9.0	31	3.8
<b>Total</b>	<b>184</b>	<b>9.8</b>	<b>82</b>	<b>10.0</b>

Source: DNFH - Spawning Activity Report, BY12 SCS - Includes trap morts

Table 21. Dworshak and Kooskia adult broodstock and both green & eyed egg numbers, BY11 SCS.

Location of Adult Returns	Males Spawned	Females Spawned	# Eggs/ Female	Total Eggs Enumerated	# Eyed Eggs Enumerated	% Surv Enum Eye-up
Dworshak	354	410	4,195	1,476,618	1,426,771	96.6
Kooskia	225	256	0	0	0	0.0
<b>Total/ Average</b>	<b>579</b>	<b>666</b>	<b>4,195</b>	<b>1,476,618</b>	<b>1,426,771</b>	<b>96.6</b>

Source: DNFH - Final BY11 SCS Enumeration and % Survival of Eggs.  
BY11 SCS Spawning Report

Table 22. Raceway production, BY11 SCS, FY2012.

BY 11 SCS	Fish on Feed End of Month				Gain this FY	Gain this Mo	Fish Feed Fed				FY Feed Conv	Mo Feed Conv	TU per inch	TU FY	Ave Temp for Mo	Lgth Incr 30 day	Den Index	Flow Index	Com ments
	Number	Wt lbs	FPP	Lgth in			Wt	Wt	LBS FY	Cost FY									
Apr-12	1,398,786	885	1,581	1.3	732	732	270	520	270	520	0.64	0.64	95	95	41.0	0.09	0.12	0.26	Trans from incub to RWs
May-12	1,391,892	3,007	462.9	1.9	2,854	2,122	1,205	2,259	935	1,739	0.42	0.44	16	111	42.7	0.65	0.11	0.15	
Jun-12	1,389,104	5,896	235.6	2.4	5,743	2,889	3,089	5,751	1,884	3,492	0.54	0.65	24	135	43.6	0.49	0.21	0.36	
Jul-12	1,385,617	11,225	123.4	3.0	11,072	5,329	7,177	13,314	4,088	7,563	0.65	0.77	23	159	45.6	0.58	0.19	0.39	
Aug-12	1,382,672	14,547	95.0	3.3	13,344	2,272	11,740	21,438	4,563	8,124	0.88	2.01	80	239	46.6	0.18	0.09	0.14	SCS AD clipped, CWTs, split, inventoried
Sep-12	1,382,047	25,473	54.3	4.0	23,554	10,210	18,890	32,651	7,150	11,212	0.80	0.70	28	266	49.1	0.62	0.13	0.22	End of FY12

August numbers reflect inventory from marking crew  
 Source: DNFH - Monthly Activity Reports-Mar - Sept 2012  
 Daily Water Temperature Records, Mar - Sept 2012

Table 23. BY11 SCS at the end of the FY and projected release from Dworshak, April 2013.

As of October 1, 2012					Projected to Release - April 2013		
Stock	Number	Weight (lbs)	fpp	L mm	Proj % Loss to Release	Projected Release Number	Proj Size at Release mm
Dworshak	1,382,047	25,473	54	100	1	1,368,227	145

Source: DNFH - Monthly Inventory Summary, Oct 2012; DNFH - Monthly Activity Report, September 2012.

Table 24. Adult returns BY12 SCS, 09/30/12.

Age	Number/Dworshak	Number/Kooskia*	Total
I - Ocean	50	82	132
II - Ocean	1,537	830	2,367
III - Ocean	296	108	404
<b>Total</b>	<b>1,883</b>	<b>1,020</b>	<b>2,903</b>

\*13 of these fish were passed over weir into Clear Creek - ISS fish

Source: DNFH - Spawning Activity Report BY2012 SCS

IFRO - Dworshak/Kooskia Complex SCS News – Sept 24, 2012 Edition

Table 25. Adult disposition of BY12 SCS held at Dworshak.

Destination	Dworshak Stock	Kooskia Stock	Comments
Outside Research Info/Education	0	0	Elementary School Programs
Washington State University Pullman WA	292	85	Captive Bear Program
Mainstem Clearwater River	170	16	Adult return to river four natural
Foodbank	0	0	Orofino Idaho
Clearwater River Greer Bridge	319	191	Stream nitrification
Landfill	904	448	Majority female carcasses injected with antibiotic
<b>Total</b>	<b>1,685</b>	<b>740</b>	

Source: BY12 SCS Spawning Activity Report

Table 26. Dworshak stock; both green and eyed egg numbers, BY12 SCS.

Location of Adult Return	Males Spawned	Females Spawned	Eggs/ Female	Total Eggs Enumerated	Eyed Eggs Enumerated	Percent Enumerated Eye-up
Dworshak	476	762	3,726	2,708,768	2,620,680	96.7

Source: DNFH - Spawning Activity Report BY12 SCS  
 DNFH – BY12 SCS Spawning Report

Table 27. Dworshak stock; both green and eyed egg numbers, BY12 Selway SCS.

Location of Adult Return	Males Spawned	Females Spawned	Eggs/ Female	Total Eggs Enumerated	Eyed Eggs Enumerated	Percent Enumerated Eye-up
Powell	105	105	4,268	332,905	313,642	94.2

Source: CWH - Spawning Report BY12 SCS  
 DNFH – Egg enumeration and shipment BY12 SCS

Table 28. BY09 COS 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	Com ments
	EoM	Number	Wt lbs	FPP			Lgth in	Wt	Wt	LBS FY									
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 29. BY10 COS, from April 18-19, 2011 transfer from Kooskia until end of FY2011.

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	Com ments
	EoM	Number	Wt lbs	FPP			Lgth in	Wt	Wt	LBS FY									
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

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 <sup>1</sup>	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest <sup>2</sup>	Estimated North Fork Tribal Harvest <sup>3</sup>	Unharvested Dworshak Hatchery Fish <sup>4</sup>	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. <sup>5</sup>	290	0	1,988
1975-76	1,858	N.S. <sup>5</sup>	430	0	2,288
1976-77	3,100	N.S. <sup>5</sup>	410	0	3,510
1978-79	4,939	4,610	(500) <sup>6</sup>	0	10,049
1977-78	12,272	14,000	(1,000) <sup>6</sup>	0	27,272
1979-80	2,519	N.S. <sup>5</sup>	1,250	300	4,069
1980-81	1,968	4,510	(1,000) <sup>6</sup>	500	7,978
1981-82	3,054	1,665	(1,000) <sup>6</sup>	0	5,719
1982-83	7,672	13,967 <sup>7</sup>	(1,500) <sup>6</sup>	0	23,139
1983-84	3,284	6,500	(500) <sup>6</sup>	100	11,384
1984-85	14,018	19,410	(1,500) <sup>6</sup>	2,700	37,628
1985-86	4,462	7,240	1,471	1,800	15,002
1986-87	5,286 <sup>8</sup>	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 <sup>9</sup>
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 <sup>1</sup>	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest <sup>2</sup>	Estimated North Fork Tribal Harvest <sup>3</sup>	Unharvested Dworshak Hatchery Fish <sup>4</sup>	Total Returning to Clearwater River
1999-00	2,882	7,177	1,000	720	11,779
2000-01	6,411	12,230	(1,000) <sup>6</sup>	513	20,154
2001-02	7,733	22,774 <sup>10</sup>	(1,000) <sup>6</sup>	774	32,281 <sup>10</sup>
2002-03	5,244 <sup>8</sup>	25,030	1,118	830	32,222
2003-04	3,767 <sup>8</sup>	20,806	(1,336) <sup>6</sup>	855	26,764
2004-05	4,362 <sup>8</sup>	19,252	1,331	280	25,225
2005-06	3,243 <sup>8</sup>	14,916	1,470	457	20,086
2006-07	3,514 <sup>8</sup>	13,301	(1,000) <sup>6</sup>	840	18,655
2007-08	3,374 <sup>8</sup>	13,289	(1,470) <sup>6</sup>	71	18,204
2008-09	4,350 <sup>8</sup>	27,772	(1,470) <sup>6</sup>	473	34,065
2009-10	3,615 <sup>8</sup>	15,841	(1,470) <sup>6</sup>	381	21,307

Table 1. Footnotes;

<sup>1</sup>Return year is from October through May.

<sup>2</sup>Estimates of sport harvest in the Clearwater River provided by Idaho Department of Fish and Game.

<sup>3</sup>Estimates of tribal harvest in the Clearwater River provided by Nez Perce Tribe Department of Fishery, except as noted by Footnote 6.

<sup>4</sup>Estimated by using the return percentage to Kooskia NFH, applied to returning II-oceans from offsite releases.

<sup>5</sup>N.S. = no sport fishing season.

<sup>6</sup>( ) guesstimate on tribal harvest by authors.

<sup>7</sup>Pettit, IDFG, Lewiston, Idaho (personal communication) included an additional 2,000 fish in harvest from Snake River for a total of 15,967.

<sup>8</sup>Ladder was operated intermittently for broodstock management.

<sup>9</sup>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.

<sup>10</sup>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 <sup>1</sup>	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 <sup>2</sup>	na	3125
2009	2171	1373	354	848	4746
2010	1225	1476	1077	3177	6950
2011	1075	2381	943	4378	8777

<sup>1</sup> Estimates of escapement are not available for years 1987 to 2008

<sup>2</sup> Total number based on angler interview and is not an expanded estimate