

Annual Report for

Dworshak National Fish Hatchery

**Ahsahka, Idaho
Fiscal Year 2010**



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Complex Manager

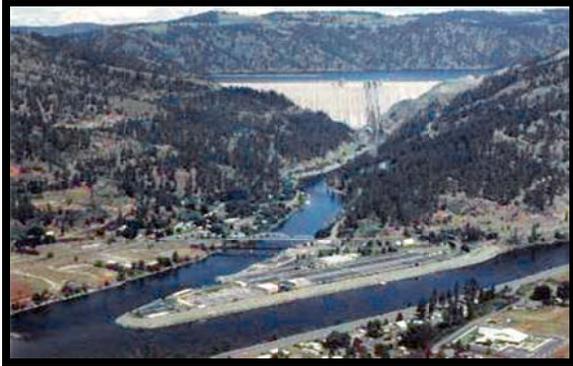
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Introduction



Dworshak National Fish Hatchery at the confluence of the North Fork and main stem of the Clearwater River, below Dworshak Dam.

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

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

The Nez Perce Tribe (NPT) initiated the Clearwater Coho Restoration (CCR) program in 1994. The CCR production goal is presently 830,000 smolts annually. Production of Coho at DNFH became a component of CCR in 1997. The Dworshak production goal is 300,000 smolt at 20-23 fpp. The fish were initially raised in the raceways of the converted adult holding ponds. The fish are currently raised in five System III Burrows ponds. Coho smolts reared at DNFH are transported to Kooskia NFH in March each spring for acclimation and final release into Clear Creek. An additional 550,000 fish are produced at the Eagle Creek National Fish Hatchery

(ECNFH). The Coho Restoration Project is gradually building its smolt production effort to achieve its adult return goal of 14,000 adults to the Clearwater Basin (Coho Master Plan 2004).

DNFH produces 2.1 million steelhead smolts at 6 fpp (200 mm in length), 1.05 million yearling Chinook salmon smolts at 18 to 20 fpp (140 to 145 mm in length) and 280,000 Coho pre-smolt. The hatchery's annual production capacity exceeds 400,000 pounds. Mitigation goals to the Clearwater River are 20,000 returning adult steelhead, 9,135 adult spring Chinook salmon (SCS) and 14,000 coho salmon (COS). Steelhead goals are being satisfied in most years and an estimated 20,600 fish returned in 2010. Spring Chinook adult returns before 2000 were well below mitigation, but for three years (2000-2003) were near or over mitigation goals. Estimated adult returns for 2010 were 3,700, well short of the 9,135 goal for Dworshak. The coho salmon goal has yet to be achieved and in 2010 only 936 adults were captured as broodstock in the Clearwater basin. In 2010, the count at Lower Granite dam totaled 1,509 adults and 393 jacks. The highest count at Lower Granite Dam occurred in 2009 with 4,629 adults and 283 jacks. Broodstock captured in the Clearwater sub-basin totaled 1,972 fish of which 346 were jacks.

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. This “clean” water, supplying egg incubators and nursery rearing, has afforded disease protection from IHN in the early production stages. During 1998, a water line was completed between Mechanical Building I and the main water line from the large boilers in Mechanical Building II. This line now enables us to heat all the nursery reservoir water for better steelhead production.

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

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

IHN had a huge impact on steelhead production at DNFH in 2009 and 2010. Steelhead production goals were not achieved due to the loss of 500,000 fish to IHN in 2009 and over 1 million fish to IHN in 2010. Analysis of the virology indicated that the Dworshak fish had been infected with a new genotype of the M-clade ((M139) (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. This virus led the hatchery to take a proactive management strategy in the spring of 2010 to minimize the impact of IHN on steelhead production.

This report covers the period of hatchery activities from October 1, 2009, to September 30, 2010.

FY 2010 Highlights

Summer Steelhead Brood Year 2009

At the beginning of October 2009, all of the summer steelhead (SST) from Brood Year 2009 (BY09) were outside in Burrows ponds (BP's). There were 2.56 million SST moved from the nursery to outside BPs during the summer of 2009. High mortality occurred during the summer once the fish were outside in Systems I and III due to *Infectious Hematopoietic Necrosis Virus* (IHNV), Cold-water disease, and gas-bubble disease. Therefore the production target release of 2.1 million SST smolts was not achieved. Mortality from ponding SST in the summer of 2009 until release was approximately 52 percent. The Idaho Fish Health Center (IFHC) provided samples to Rachel Life, United States Geological Survey (Western Fisheries Research Center), Seattle, Washington in 2008 and 2009 for further analysis relative to genotyping of IHNV. As a result of this, we have learned that we are dealing with a couple different genotypes of IHNV. The "U" Clade is the genotype associated more commonly with Chinook and has caused increased mortality in steelhead production at Dworshak since the early 1980s. More recently, IHNV has been more virulent. In 2008 and 2009 IHNV mortality resulted in much higher mortalities than in previous years. Rachel's analysis was key in identifying the "MD" Clade genotype from samples collected by the IFHC from BY 08 and BY 09. This was the first documentation of the "MD" Clade genotype of IHNV at Dworshak.

Overall mortality from October 1, 2009 through final release on April 22, 2010 was approximately 5.3 percent. Table 1 illustrates the SST on station at the start of FY09 until final release.

Table 1. Fish inventory summary for BY09 SST on October 1, 2009 and release in April, 2010.

Location	October 1, 2009				Oct 1 - April 19 % loss	Final Release April 12 - 22, 2010			
	Number*	Wt (lbs)	Lgth in	Lgth mm		Number	Wt (lbs)	Lgth in	Lgth mm
Syst I*	378,263	13,952	4.7	120	3.1	366,607	62,314	7.9	200
Syst II	694,450	18,835	4.3	108	5.6	655,220	95,085	7.5	189
Syst III *	231,089	11,800	5.3	134	7.9	212,736	35,413	7.8	198
Tot/Ave	1,303,802	44,587	4.6	117	5.3	1,234,563	192,812	7.6	194

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

Source: DNFH - Final Release Summary, May 2010.
Monthly Inventory Summary (MIS), October 1, November 1, 2009.
Monthly Activity Report, May, 2010.

Outside ponding of SST included System I receiving SST from Takes 5-7, System II being stocked with Takes 8-10, and System III receiving Takes 1-4. Reuse and heated water were not used during the rearing cycle for any system.

Some SST in all systems received adipose (AD) fin clips, coded wire tags (CWTs) and left ventral (LV) clips. As in FY09, there were no freeze brands placed on the SST because enough data is available from branding in past years to assess the needed information. The various marks are used for the following studies; system contribution of smolt to adult returns, offsite release contribution, broodstock evaluations, and early-run predictions at Lower Granite Dam. A total of 178,896 BY09 SST received CWTs in the summer of 2009 along with LV clips. All fin clipping and CWTing was done by the Columbia River Fishery Program Office (CRFPO) using a manual marking trailer.

There were 43,622 SST which received PIT (Passive Integrated Transponder) tags as part of a hatchery evaluation study of smolt to adult returns and comparative survival studies which include fish reared in modified Burrows Ponds. There were also 1,494 SST PIT tagged for smolt monitoring and evaluation studies at the Fish Passage Center. See the marking/tagging tables under each System for details. The Idaho Fishery Resource Office Annual Report has details of these studies.

Included in Dworshak production numbers were 209,638 BY09 SST which were unmarked/untagged and released from Dworshak. This represents about 20 percent of the BY09 SST released at Dworshak. These are the twelfth group of SST released from Dworshak since 1984 without an external mark specifying a hatchery fish. This is being done under the Harvest Settlement Agreement between the USFWS and the Columbia River Tribes.

System I

Fifteen Burrows ponds were used in System I for BY09 SST production. This System had 378,263 SST in it at the start of the fiscal year and 366,607 at release in April, 2009 (Table 2).

Adipose fins were clipped on BY09 SST in System I from June 29-July 13, 2009. Other marking of BY09 SST in System I is summarized in Table 3.

Table 3. Marking and tagging of BY09 SST, System I.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 11	01/29/10		3,819	AD	Comparative Surv/ Hatchery Evaluation	Dworshak
BP 13	02/01/10		3,962	AD	Comparative Surv/ Hatchery Evaluation	Dworshak
BP 21	10/28/09	30,165		AD LV	System I Contribution	Dworshak
BP 23	01/11/10		249	AD	Smolt Monitoring at Fish Passage Ctr	Dworshak
BP 31	CWT 10/24/09 PIT 11/11/2010	30,039	247	AD LV	System I Contribution/ Smolt Monitoring at Fish Passage Ctr	Dworshak
Total		60,204	8,277			

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

Source: DNFH- MIS System I, October 2009, January 2010
CRFPO marking summary for CWTs, January 2010
IFRO marking strategy schematic BY2009 SST

During the eight months of outside rearing in System I, SST were intermittently treated with formalin for parasites. All SST were reared on single pass pumped river water after they were moved outside from the nursery. Mortality for fish in System I from October 1, 2009 until final release in April of 2010 was approximately 3.1 percent.

Truck drivers from the NPT stocked a total of 27,286 BY09 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. This is being done under the Harvest Settlement agreement with the Columbia River Tribes. There were no other SST outplanted from System I in FY10.

Direct release of 339,321 BY09 SST from System I took place on April 19, 2010, into the mainstem of the Clearwater River. The total release from System I was 366,607 BY09 SST (Final Release Summary, BY09 SST).

System II

Twenty-two Burrows ponds were used in System II for BY09 SST production. This System had 694,450 SST in it at the start of the fiscal year and 655,220 at release in April, 2010 (Table 4).

Adipose fin clipping was done on BY09 SST in System II from July 20 through July 28, 2009. Other marking of BY09 SST in System II is summarized in Table 5.

Table 5. Marking and tagging of BY09 SST, System II.

Released from BP #	Date	Number CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 6	2/4/10		1388	None	Comparative Survival/ Hatchery Evaluation	Lolo Creek
BP 8	2/4/10		3,401	None	Comparative Survival/ Hatchery Evaluation	Peasley Creek
BP 10	2/2/10		5568	AD	Comparative Survival/ Hatchery Evaluation	Dworshak
BP 12	2/3/10		5559	AD	Comparative Survival/ Hatchery Evaluation	Dworshak
BP 22	CWT 9/23/09 PIT 1/11/10	32,553	250	AD/LV	Smolt Monitoring at Fish Passage Ctr/ Syst II Contribution	Dworshak
BP 46	CWT 9/30/09 PIT 1/11/2010	30,714	249	AD/LV	Smolt Monitoring at Fish Passage Ctr/ Syst II Contribution	Dworshak
Total		63,267	16,415			

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

Source: DNFH- MIS System II, October 2009, January 2010

CRFPO marking summary for CWTs, January 2010

IFRO marking strategy schematic BY2009 SST

During the outside rearing of fish in System II, SST were intermittently treated with formalin for parasites and given medicated feed for bacterial infections. All SST were reared on single pass pumped river water after they were moved outside from the nursery. Mortality for fish in System II from October 1, 2009 until final release in April of 2010 was approximately 5.6 percent.

There were a total of 152,067 BY09 SST from System II stocked into Peasley Creek and 30,285 into Lolo Creek April 12-14 and 21. These fish received no fin clips to designate them as hatchery fish. This is being done under the Harvest Settlement agreement with the Columbia River Tribes.

Direct release of 472,868 SST from System II took place on April 22 into the mainstem of the Clearwater River. The total release from System II was 655,220 BY09 SST (Final Release Summary, BY09 SST).

System III

Ten Burrows ponds were used in System III for BY09 SST production. This System had 231,089 SST at the start of the fiscal year and 212,736 at release in April, 2010 (Table 6).

Adipose fin clipping was done on BY09 SST in System III from May 19 through June 20, 2009. Other marking of BY09 SST in System III is summarized in Table 7.

Table 7. Marking and tagging of BY09 SST, System III.

Released from BP #	Date	CWT	Number PIT tags	Fin Clips	Study	Release Site
BP 60	1/28/10		4,954	AD	Modified Burrows pond Evaluation	Dworshak
BP 62	1/27/10		5,051	AD	Modified Burrows pond Evaluation/ Comparative Survival/ Hatchery Evaluation	Dworshak
BP 64	1/26/10		4,981	AD	Modified Burrows pond Evaluation	Dworshak
BP 66	1/25/10		4,938	AD	Modified Burrows pond Evaluation	Dworshak
BP 77	CWT 10/13/2009 PIT 1/11/2010	30,130	250	AD/LV	Smolt Monitoring at Fish Passage Ctr/ Contribution	Dworshak
BP 80	CWT 10/7/2009 PIT 1/11/2010	25,295	249	AD/LV	Smolt Monitoring at Fish Passage Ctr/ Contribution	Dworshak
Total		55,425	20,423			

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

Source: DNFH- MIS System II, October 2009, January 2010
CRFPO marking summary for CWTs, January, 2010
IFRO marking strategy schematic BY2009 SST

During the outside rearing of fish in System III, SST were intermittently treated with formalin for parasites and given medicated feed for bacterial infections. All SST were reared on single pass pumped river water after they were moved outside from the nursery. Mortality for fish in System III from October 1, 2009 until final release in April of 2010 was approximately 7.9 percent.

No BY09 SST from System III were outplanted during FY10, all were direct released from Dworshak NFH. Direct release of 212,736 SST from System III took place on April 19-21 into the mainstem of the Clearwater River (Final Release Summary, BY09 SST).

Summary of BY09 SST production reared at Dworshak

The hatchery production summary for all BY09 SST reared at Dworshak is illustrated in Table 8.

Distribution Summary

Release of BY09 SST began April 12 and ended April 22, 2010. The final distribution summary is illustrated in Table 9.

Table 9. Fish distribution summary by site, BY09 SST, April 12 to April 22, 2010.

Site	Number	Weight	fpp	Length	
				in	mm
Outplants 4/12 - 4/21					
Lolo Ck Unmarked SST	57,571	8,882	6.5	7.6	193
Peasley Ck - Unmarked SST	152,067	21,668	7.0	7.4	188
Subtotal	209,638	30,550	6.9	7.5	190
Direct Release 4/21 -4/24					
Main Stem of the Clearwater River	1,024,925	162,262	6.3	7.7	195
Totals/Averages	1,234,563	192,812	6.4	7.6	194

Source: Final Release Summary, BY09 SST

The Final Release Summary by Egg Take for BY09 SST is illustrated in Table 10

Table 10. Final Release Summary by Egg Take, BY09 SST, April 12 to April 22, 2010.

Take	Number	Weight	fpp	Length	
				in	mm
1*	N/A	N/A	N/A	N/A	N/A
2	44,952	8,679	5.2	8.2	208
3	51,119	8,803	5.8	7.9	201
5	187,717	30,427	6.2	7.7	197
6	107,018	18,055	5.9	7.8	199
7	188,537	31,763	5.9	7.8	199
8	192,232	31,777	6.0	7.8	198
9	182,498	24,907	7.3	7.3	186
10	280,490	38,401	7.3	7.3	186
Total/Ave	1,234,563	192,812	6.4	7.6	194

*Take 1 decimated by IHN. Survivors incorporated with Take 2 in summer, 2009.

Source: May 1, 2010 MIS

Brood Year 2010 SST

Adult Collection

Adult summer steelhead (SST) for Brood Year 2010 (BY10) were collected in the fall of 2009 and in the winter and spring of 2010 to represent the entire run. The ladder was open from October 6-10, 22-24, and 29, 2009 for collection of early-return SST. During this period there were 788 steelhead collected. There were 587 SST held in holding pond 1 (HP1) and the remaining fish were outplanted back to the Clearwater River.

The ladder was opened intermittently from February 19, 2010 to April 23 to limit the number of SST entering the hatchery. During this staggered ladder operation a total of 3,615 adult SST entered the hatchery, including 660 jacks (Idaho Fishery Resource Office final rack return numbers, BY10 SST). There were a total of 24 wild 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 and are included in the 3,615 total return number.

There were 36 fish of the early return adults which died before spawning began on January 5, 2010 (prespawning mortality). Formalin treatments were started in October 2009 to control fungus in the early-return adults. Formalin treatments stopped in the spring as broodstock were not kept on station. Once fish were collected weekly from the river they were either spawned or, as excess fish, outplanted the same day back to the river.

Broodstock spawning numbers and Fish Health assessment

A total of 10 Egg-Takes were spawned over the BY10 season, beginning on January 5, 2010, and ending on April 27. 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 in the early-returning SST. Early-returning adults (October) were spawned during Takes 1-2, and later returning adults (February-April) were spawned during Egg-Takes 3-10.

There were 1,617 SST spawned, 677 males (including 55 jacks) and 940 females. 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 1:1.5 for BY10 SST, the spawning ratio was reduced slightly to 1:1.4. Of the 55 jacks spawned during the season, 39 were used for Dworshak National Fish Hatchery (DNFH) and 9 were used for Clearwater State Fish Hatchery (CWH) and 7 were used for Magic Valley State Fish Hatchery (MVH) this year.

On December 22, 2010 there were 75 males from the early-returned BY10 SST injected with salmon gonadotropin-releasing hormone analogue (sGnRH_a). 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 16 positive IHNV results from the CWH SST (16/180) of the females from Takes 5-6. There were 15 females (15/198) of the MVH lot which tested positive for IHNV. These females came out of Takes 7-8-8A and this testing was done by personnel from the Idaho Fish Health Center (IFHC). All eggs taken for either CWH or MVH which tested positive for IHNV were discarded. There were 215 (215/693) adult SST sampled for Dworshak which tested positive for IHNV. Dworshak does not cull eggs which test positive for IHNV in its production program since it's water source contains IHNV positive adult steelhead and Chinook; whereas the state hatcheries water supplies are essentially IHNV free.

Egg Disposition

In years past the SST eggs were incubated at 54°F in Heath incubator trays. The exception for BY10 SST was that Takes 1-2 were initially incubated on 45°F water from initial spawning January 5 until February 4. Because these two egg-Takes were spawned earlier than usual, the eggs development was slowed to allow for ponding time out of the nursery to remain in mid-May. There were an estimated 6.1 million green eggs from BY10 SST taken at Dworshak. As was done in recent years, Dworshak incubated the CWH eggs until eye-up, at which time personnel from CWH shocked and transported the eggs for enumeration at the CWH facility. An estimated 1.2 million eyed-eggs were incubated for CWH.

There were an estimated 1.3 million green eggs shipped from Dworshak to CWH for MVH from Takes 7-8-8A. These eggs were shipped to CWH the same day spawning took place. Dworshak also provided approximately 2,000 eyed eggs for aquarium-rearing at various elementary schools for its Information and Education program.

After shipping eggs for CWH and MVH, Dworshak put 2.78 million eyed eggs into either hatching jars or incubator trays for its production. Eye-up for the BY10 SST eggs enumerated at Dworshak was 93.4 percent and the fecundity rate was 6,491 eggs per female.

Research

Dworshak provided opportunities for university research projects during BY10 SST spawning by the University of Idaho, Lewis and Clark State College, and Washington State University. A summary of their research is in the BY10 Steelhead Spawning Report.

Dworshak hatchery staff also coordinated with Idaho Department of Fish and Game (IDFG) on several research projects. In an effort to establish a localized broodstock for the South Fork of the Clearwater River, adults were collected from the South Fork by IDFG personnel and transported to Dworshak. Forty five females and 31 males were spawned and eggs kept isolated until eye-up and transport from Dworshak to the Clearwater Hatchery. Dworshak also provided genetic sampling of all spawned BY10 SST for IDFG along with supplying SST carcasses for bear research.

Adult Disposition

There were 1,768 hatchery adults outplanted from Dworshak during the spring return of BY10 SST. In years past the excess adults were outplanted using trucks from the Nez Perce Tribe and transported downstream to provide increased angler opportunities as the fish moved back upstream a second time. In 2009 and 2010, fish were loaded on to the Dworshak hatchery truck and released locally. The majority of these fish were transported to Five Mile Creek boat ramp on the main stem of the Clearwater River. There were 93 of the outplanted fish which returned to the hatchery.

There was no food processor available this year for the SST carcasses, so the majority of spawned fish went to research. Complete adult disposition is illustrated in Table 11.

Table 11. Adult disposition of BY10 SST from Dworshak.

Destination	Number	Comments
Boise-Payette-Weiser subbasin	1,504	WSU stream nutrient enhancement
Couer d' Alene basin	50	IDFG carnivore bait for research
Clearwater River	24	Wild fish - unclipped
Five Mile Ck, Clearwater River	1,768	Outplanted
Landfill	28	Education, school dissection
Landfill	334	No boxes from WSU available for storage
Sub Total	3,708	
	-93	Recaptures
Total Returns	3,615	

Source: DNFH-Spawning Activity Report BY2010 SST, Final for BY10 SST
Spawning and Run Summary, BY2010 SST

Nursery and ponding of fingerlings

The first two egg-Takes were from early-return adults collected in October, 2009. Eggs were put into hatching jars in the nursery at an average rate of 18,000 eggs/tank. All eggs/fry were loaded at final rearing numbers in the nursery. This method maximized growth and reduced stress on the fish by eliminating the need to split and handle fish while being reared in the nursery. When approximately 70 percent of the fry had hatched in the jar, the remaining fry were poured into the tank. Due to lack of nursery space, Takes 9-10 were hatched in Heath trays (6,000 eggs per tray). These were moved as fry from the incubation trays into nursery tanks vacated once Takes 1-2 were transferred outside. Dead eggs and fry were picked and enumerated from each tank and tray. There was a 97 percent survival from the eyed-egg stage to feeding fry for BY10 SST.

This year the fry from the nursery averaged 85 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 on all but approximately 210,300 SST to designate them as a hatchery fish. 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 IHNV. Adult steelhead and Chinook are suspected to shed the virus in front of Dworshak's river intake.

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. Because of this “cleaner” water supply, almost all BY10 SST moved out of the nursery were initially loaded into System I for initial outside rearing. There was enough water available to operate 17 Burrows ponds in System I on reservoir water from May through August. Up to 4,500 gallons per minute should become available in FY2011 as adjustments to this waterline (configuration of Ported Sleeve) were made by Idaho Fish and Game (IDFG) during November, 2010. The SST from Takes 1-7 were later transferred from System I into the final rearing ponds when either Takes 8-10 were moved outside from the nursery or when they reached the appropriate size for splitting into System II or III. Steelhead from Takes 8-10 were reared completely in System I and not introduced to river water until September 1, 2010, 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 IDFG’s Clearwater Hatchery and close coordination and cooperation from IDFG’s staff was vital and much appreciated for the success of this operation.

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

Final loading of SST included System I receiving SST from Takes 7(partial)-10; System II being stocked with Takes 4(partial)-7; and System III receiving Takes 1-4(partial) along with 5 Burrows ponds of coho and one pond of RBT.

The two Burrows ponds which had the center walls removed (Mixed Cell Units) in June of 2008 were stocked with SST from Take 3. This renovation was done in an attempt to improve the rearing environment for SST at Dworshak. Water flow along with overall water consumption, dissolved oxygen levels, ease of cleaning and picking mortalities, the condition factor of the SST, growth rate, survival, possible decreased effluent and reduced chemical treatments for disease are being evaluated. Coating of the ponds with a concrete sealer (Crete Cote, a product of Multi-coat) was complete by the end of FY09. Two additional unmodified burrows ponds that were coated with Crete Cote are also included in the evaluation.

A total of 2.52 million BY10 SST were moved from the nursery to outside BP’s. Two ponds of SST (60,000 fish) in System III broke with IHNV on the weekend of September 4-5, 2010. These fish were killed and removed from the hatchery on September 7 in an attempt to keep the IHNV from spreading to other fish. Samples of these fish were collected by the IFHC and sent to Rachel Life, USGS, Western Fisheries Research Center for genotyping. The virus was the more virulent genotype typically associated with Steelhead, the MD Clade. Due to water needs at Clearwater State Fish Hatchery, river water was blended with reservoir water in System1 on September 1, 2010. Steelhead in Takes 9-10 in System I broke with IHNV by the end of September. Samples from these fish were also collected by IFHC and shipped to the Western Fisheries Research Center and the results identified the “U Clade” genotype which is typically associated with Chinook. Mortalities peaked and then decreased in a couple week period. Low to moderate

levels of mortality continued into the late fall. Fish health samples typically found some bacterial Cold Water Disease (CWD) in conjunction with the IHNV.

Feed

All steelhead in the nursery were fed Bio Vita feed for the fifth straight year with good results. Starter feed size #3 was omitted from the regime again this year, as it clogged the nursery tank screens in previous years. There appeared to be no detrimental effects by skipping this feed size. BY09 SST were fed, Florfenicol medicated feed for ten consecutive days just before moving the SST outside to combat CWD. Florfenicol medicated feed was not administered to BY10 fish inside the nursery or during outside rearing in the Burrows ponds.

System I

System I water supply has been retrofitted with the option of supplying water from Dworshak Reservoir. This reservoir water is used for the early outside rearing months for SST in an attempt to avoid or reduce the impact of IHNV on the fish by eliminating exposure via the river water supply. Personnel from the marking trailer hand-clipped adipose (AD) fins on the SST and then transferred the fish into System I at a rate ranging from approximately 75,000-138,000 fish/BP. In order to compare these SST with fish reared on river water, approximately 33,000 SST from Takes 1-4 were moved via tank attached to a forklift into System III. Metal crowders were initially placed into these ponds to rear the SST at similar densities to the fish in System I, but proved to be problematic and were removed after a few weeks.

System I initially received 2,387,032 BY10 SST during the summer of 2010. Steelhead in System I were moved out of the nursery beginning with Take 1 on May 19, 2010 and ending with Take 10, on August 26. 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 30-50 fpp, they were then split from System I into the appropriate ponds in Systems II or III. Table 12 illustrates the BY10 SST production in System I from initial ponding until the end of FY10.

There were three ponds of SST in System I that received CWTs. These fish were pumped from BP's and moved to the marking trailer, tagged, and LV or RV clipped. There were 30,085 SST which received CWTs and transferred into BP15; 30,096 SST which were tagged and transferred into BP25; and 30,114 which were tagged and transferred into BP39. This tagging was done on September 3, 7, and 8, respectively. The SST were tagged for evaluation of System I contribution to the fishery and hatchery returns along with differential survival of fish with and without CWTs and fin clips.

Steelhead in BPs 45 and 31 received a total of 210,300 SST which remained unclipped under the U.S. vs. OR Harvest Settlement Agreement. These fish are from Takes 9 and 10 and were moved from the nursery using a PR Aqua fish pump into a Vaki Micro Fish Counter (fish counter) and then directly into either pond. They were split in September into nearby ponds in System I when they reached approximately 45 fpp.

Steelhead from Takes 9 and 10 broke with IHNV in late September, 2010, approximately 25 days after river water was introduced to System I. The outbreak was moderate and the decision was made to keep these fish on station. Losses from this outbreak peaked at about 25 percent of the total fish in some of the ponds.

System II

System II received SST from Takes 4-5-6-7 (partial) which were split from System I August 11-September 1, 2010. Steelhead were moved from System I to System II using a PR Aqua fish-pump and fish counter. Table 13 illustrates the BY10 SST production in System II from initial ponding until the end of FY10.

There were three ponds of SST in System II that received CWTs. These fish were pumped from BPs in System I and moved to the marking trailer, tagged, and LV or RV clipped. There were 30,159 SST which received CWTs and transferred into BP16; 30,056 SST which were tagged and transferred into BP20; and 30,069 which were tagged and transferred into BP26. This tagging was done on August 31 and September 1. The SST were tagged for evaluation of System II SST contribution to the fishery and hatchery returns along with differential survival of fish with and without CWTs and fin clips.

System III

System III utilizes all river water and initially received one pond of SST from each of Takes 1-2-3 and 4. These fish were used to compare SST from the same Takes which were stocked from the nursery into reservoir water in System I. On September 7, 2010, fish from Takes 3-4 were diagnosed with IHNV. They were destroyed on that day and removed from the hatchery to prevent spreading the disease to other fish on station. The earliest fish to be moved into river water from Takes 1-2 never broke with IHNV by the end of the FY.

From July 27-August 11 SST from Takes 1-4 were moved from System I via the PR Aqua fish pump and fish counter into final rearing ponds in System III. System III received a total of 857,629 SST during this time. Table 14 illustrates the BY10 SST production in System III from initial ponding until the end of FY10.

There were three ponds of SST in System III that received CWTs. These fish were pumped from BP's and moved to the marking trailer, tagged, and LV or RV clipped. There were 30,146 SST which received CWTs and transferred into BP52; 28,658 SST which were tagged and transferred into BP69; and 31,456 which were tagged and transferred into BP70. This tagging was done on August 26-30 and is for evaluation of System III SST contribution to the fishery and hatchery returns along with differential survival of fish with and without CWTs and fin clips.

Projected Release

Release will take place approximately 3 weeks earlier than usual due to necessary water valve maintenance. Table 15 illustrates the steelhead on station at the end of FY2010 and projected release numbers.

Table 15. BY10 SST on station and projected release summary from 9/30/2010.

As of September 30, 2010					Projected to Release - April 2011		
System	Number	Weight (lbs)	fpp	L mm	Proj % Mortality until Release	Projected Release Number	Proj Release size mm
System I	823,039	27,527	29.9	116	7	765,426	182
System II	776,376	30,383	25.6	122	2	760,848	195
System III	780,843	48,802	16.0	143	8	718,376	197
Total/Ave	2,380,258	106,712	22.3	128	5.7	2,244,650	191

Source: DNFH - MIS data, October 1, 2010; DNFH – Monthly Activity Report, September, 2010

Spring Chinook Salmon Brood Year 2008

On October 1, 2009, there were 1,124,728 BY08 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 5-9, 2010, there were a total of 51,888 BY08 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 Hatchery 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 (IFRO) Annual Report.

The release date of the BY08 SCS was March 31, 2010. There were 1,109,195 BY08 SCS released from Dworshak into the North Fork of the Clearwater River. Monthly summaries of rearing data and release numbers for BY08 SCS for FY10 are in Table 16.

Dworshak and Kooskia stock BY08 SCS had an enumerated survival of green to eyed egg of 98 and 97 percent, respectively. Personnel at Dworshak enumerated eggs from both stocks of BY08 SCS eggs. As was done in the past, all BY08 Kooskia stock SCS eyed eggs (725,000) were shipped to Kooskia National Fish Hatchery (KNFH) for incubation and final rearing. There were also 820,000 Dworshak stock eyed eggs shipped to KNFH for incubation and rearing over the winter.

There were 372,000 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 2009, 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 susceptibility of the fry to high rates of mortality during this cleaning. The construction of a nursery for the SCS has been identified but will not happen in the immediate future as the facility will be undergoing multiple infrastructural changes and plans for a nursery for initial rearing of Chinook must be approved and incorporated into the design of the hatchery. In anticipation of this future nursery, a comparison was made between four 20' x 3' x 3' aluminum troughs, seven 6' x 3' fiberglass circular tanks, and eight 8' x 80' concrete RWs during the early rearing of BY08 and BY09 SCS. Evaluations of these rearing units illustrated there were no significant differences in growth, mortality, temperature, or dissolved oxygen levels among the different units. Tank and raceway cleaning and feeding of fry will be similar in all rearing units throughout the early-rearing cycle. This strategy will probably be used until a nursery for the SCS is completed.

Brood Year 2009

There were 2,171 adult BY09 SCS which returned to Dworshak and 589 returned to KNFH. Adults spawned and eggs produced from BY09 SCS are represented in Table 17.

Table 17. Dworshak and Kooskia adult broodstock and both green & eyed egg numbers, BY09 SCS.

Location of Adult Returns	Males Spawned	Females Spawned	# Eggs/ Female	Total Eggs Enumerated	# Eyed Eggs Enumerated	% Surv Enum Eye-up
Dworshak	372	397	4,110	1,261,673	1,229,391	97.4
Kooskia	191	223	3,748	753,402	733,317	97.3
Total/ Average	563	620	4,174	2,015,075	1,962,708	97.4

Source: DNFH - Final BY09 SCS Enumeration and % Survival of Eggs. SC09EGEN.xls
 BY09 SCS Spawning Report

Both Dworshak and Kooskia stock BY09 SCS had an enumerated survival of green to eyed egg of 97 percent. Personnel at Dworshak enumerated eggs from both stocks of BY09 SCS eggs. As was done for BY99-08, all BY09 Kooskia stock SCS eyed eggs (733,000) were shipped to

Kooskia for incubation and final rearing. There were also 575,000 Dworshak stock eyed eggs shipped to Kooskia for incubation and rearing over the winter.

There were 582,000 Dworshak stock SCS eyed eggs which remained at Dworshak for incubation and rearing. Once the eggs at Dworshak hatched and the fry were ready to go on feed in April of 2010, they were placed directly from the incubation trays into either outside raceways or experimental circular or rectangular tanks (see explanation under BY08 SCS). Evaluations of the circular and rectangular tanks used with BY08 and 09 SCS illustrated there were no significant differences in growth, mortality, temperature, or dissolved oxygen levels among the different units. A total of 1.14 million BY09 SCS fry were put the outside rearing units during April, 2010.

The USFWS fish marking trailer from the Columbia River Fishery Program Office (CRFPO) began coded wire tagging (CWTing) the BY09 SCS on August 3, 2010 and ended on August 13. The tagging is being done for contribution research. Personnel from the marking trailer also clipped adipose (AD) fins on all BY09 SCS and split fish into several raceways during the marking/tagging operation. Monthly summaries of rearing data for BY09 SCS for FY10 are illustrated in Table 18.

During August, vacuum degassers were installed in the head-box of raceways 1-15 (A Bank). These are being used to reduce gas saturation and reduce gas bubble disease in the SCS. During this effort, it was identified that overall water volume was limited and the incoming water line had to be lowered on each degasser to obtain necessary water flows per raceway. Hatchery staff believe that the main incoming line to the “A Bank” raceways is likely being obstructed by media from the main aeration reservoir. Plans to excavate this line in the spring of 2011 are being developed to improve water flow to the “A Bank” raceways.

By the end of FY 2010, there were 1,087,455 BY09 SCS at Dworshak. Table 19 illustrates the size and number of BY09 SCS on station at the end of the fiscal year and projected release numbers.

Table 19. BY09 SCS at the end of the FY and projected release from Dworshak, April 2011.

As of September 30, 2010					Projected to Release - April 2011		
Stock	Number	Weight (lbs)	fpp	L mm	Proj % Loss to Release	Projected Release Number	Proj Size at Release mm
Dworshak	1,087,455	21,272	51	102	1	1,076,580	145

Source: DNFH - MIS, October 2010; DNFH – Monthly Activity Report, September 2010.

Brood Year 2010

Fish traps at both Dworshak and Kooskia were operated to collect BY10 SCS. The Dworshak fish ladder was opened June 1, 2010 and closed July 25 for collection of BY10 SCS for spawning. The total Chinook returning in 2010 to Dworshak and Kooskia were 1,225 and 807 fish, respectively (Table 20). This includes 142 one-ocean fish returning to Dworshak and 27 to Kooskia. There were 799 fish transported from Kooskia to Dworshak for spawning.

Table 20 Adult returns, BY10 SCS. (09/30/10).

Age	Number/Dworshak	Number/Kooskia*	Total
I - Ocean	142	27	169
II - Ocean	798	725	1,523
III - Ocean	285	47	332
Total	1,225	799	2,024

*7 of the 807 returning adults were passed over weir into Clear Creek - ISS fish, and 1 fish was a trap mort.

Source: IFRO - Dworshak/Kooskia Complex SCS News- September 10, 2010 Edition
DNFH - Spawning Activity Report BY2010 SCS

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

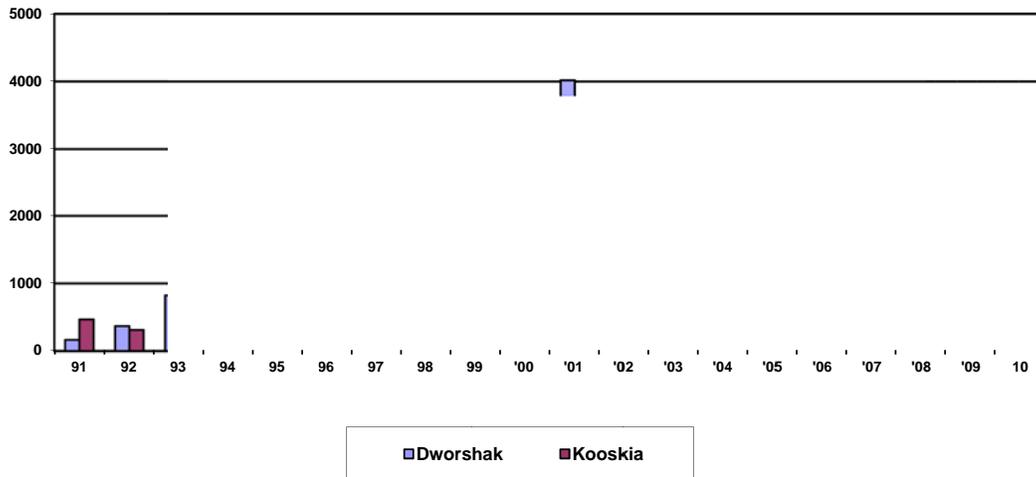


Figure 1. SCS returns to Dworshak/Kooskia 1991-2010

Source: IFRO - SCS rack returns

Adult returns for BY10 SCS were enough to meet the production requirements for Dworshak. A sport fishery took place in the Clearwater River in the spring and summer of 2010. A tribal harvest also took place along the Clearwater River and Clear Creek below Kooskia Hatchery during the spring and summer.

Adult Holding

Dworshak stock SCS were kept in holding ponds (HPs) 1, 2, and 9. The 799 Kooskia stock transfers were held in HP3. Kooskia stock received a right opercule punch in order to distinguish between the two stocks. Formalin treatments were administered to the adults in order to impede fungus infection. On July 13 personnel from 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 BKD to the egg.

Adult Mortality

There were 19 adult SCS of Dworshak stock and 20 of Kooskia stock which died before spawning began on August 10 (prespawning mortalities). Table 21 depicts the mortality for adult BY10 SCS held at Dworshak.

Table 21. Mortality of adult BY10 SCS held at Dworshak.

Mortality	Dworshak		Kooskia	
	Number	Percent of total return at Dworshak	Number	Percent of Kooskia return transferred to Dworshak
Prespawning	19	1.6	20	2.5
During Spawning	18	1.5	18	2.3
Total	37	3.0	38	4.8

Source: DNFH - Spawning Activity Report, BY10 SCS. Includes 3 trap morts.

Adult Disposition

Table 22 lists BY10 SCS adult disposition from both Dworshak and Kooskia stock held at Dworshak.

Table 22 Adult disposition of BY10 SCS held at Dworshak.

Destination	Dworshak Stock	Kooskia Stock	Comments
Adult Outplants	417	169	Main Stem Clearwater River
Landfill	808	630	Carcasses from spawning
Total	1,225	799	

Source: BY10 SCS Spawning Activity Report.

Spawning Season

The BY10 SCS spawning season began August 10 and ended on August 24 for Dworshak and Kooskia egg collection for the two respective facilities. Fish from each HP were sorted and spawned once each week along with new fish coming up the ladder into HP9. Dworshak NFH also helped personnel from Clearwater State Fish Hatchery (CWH) collect eggs from 97 Kooskia stock females; 68 females on August 24 and 29 on August 31. Eggs from the fish spawned for CWH were transported to their facility the same day as spawning. Adults being held in HPs 1, 2, and 3 were treated with formalin twice per week to help control fungus.

There were 319 males (including 8 jacks) and 345 females (1:1.08 ratio) of Dworshak stock spawned during the season. There were also 150 males (including 7 jacks) and 222 females (1:1.48 ratio) of Kooskia stock spawned during the season.

The SCS averaged 4,400 eggs/female for Dworshak stock and 3,741 eggs/female for Kooskia stock. Dworshak put 1.25 million eyed eggs into its program and will incubate all of them at Dworshak over the winter. There were also 737,048 eyed eggs of Kooskia stock shipped to Kooskia for incubation and rearing. The number of adult spawners, eggs produced, and survival of BY10 SCS are illustrated in Table 23.

Table 23 Dworshak and Kooskia broodstock; both green and eyed egg numbers, BY10 SCS.

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

Source: DNFH - Spawning Activity Report BY10 SCS
DNFH – BY10 SCS Spawning Report

Idaho Fish Health Center (IFHC)

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 2009, 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 1.2 percent (4/345) greater than 0.250 ELISA for Dworshak stock and 1.8 percent (4/222) for Kooskia stock. Eggs from females which were in the upper range of ELISA were culled for both 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.

Dworshak also provided portions of 39 spawned out males and 2 egg skeins from green killed females to IDFG for sturgeon capture and research.

BY10 SCS adult return numbers were adequate to fulfill both Dworshak's and Kooskia's production goals. Projected release of BY10 smolts in the year 2012 at Dworshak NFH is approximately 1.05 million smolts of Dworshak stock SCS.

Fall Chinook Salmon Brood Year 2009

The IFRO is participating in two studies on fall Chinook salmon (FCS); 1) an evaluation of migrational behavior of Clearwater River fall Chinook salmon subyearlings and 2) an evaluation of the effect of transportation and summer spill in the Columbia River hydro system on smolt-to-adult return rates of Snake and Clearwater River FCS. Both of these studies are 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 Clearwater River surrogates for the migrational behavior study were initially incubated and reared at the Nez Perce Tribal Hatchery in Lenore, Idaho. The Snake and Clearwater River surrogates for the transportation study were initially incubated and reared at the Umatilla State Fish Hatchery in Umatilla, Oregon. All groups 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 14-15, 2010 there were 335,000 BY09 FCS transferred to Dworshak. From May 17 until July 9, 2010, a total of 332,000 FCS were PIT tagged and released; 217,000 at Couse Creek on the Snake River and 115,000 at Kayler's Landing on the Clearwater River. All FCS were off station at Dworshak by the end of the day on July 9.

Coho Salmon Brood Year 2008

On February 12, 23-24, 2010 there were 347,437 BY08 coho salmon (COS) transferred from Dworshak to Kooskia NFH for final acclimation before release. These fish averaged 14 fpp and 149 mm (5.9 inches) total length at the time of transfer (Table 24).

Brood Year 2009

Brood Year 2009 (BY09) COS were trapped at Dworshak and Kooskia hatcheries. Unlike prior years, all spawning of BY09 COS was done at KNFH instead of Dworshak. Spawning began October 28 and ended November 9. There were 233 female COS from the Clearwater Basin which were spawned and subsequent progeny reared at DNFH. Due to high mortality and fungus in some of the egg trays, eggs from only 191 females were shocked and enumerated. These fish produced 376,709 eyed eggs which were incubated at KNFH.

On May 18-19, 2010, there were 340,602 BY09 COS transferred from K NFH to two BP's at DNFH. These fish were 241 fpp and 58 mm (2.3 inches) total length at time of transfer (Table 25).

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 green 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.

**Rainbow Trout
Brood Year 2009**

At the start of FY10 there were a total of 13,653 BY09 RBT in BP 61. These were triploid RBT from Trout Lodge, Washington. Table 26 illustrates the production of BY09 RBT at Dworshak during FY10.

Dworshak held its annual Kid’s Fishing Day on May 15, 2010 at the Tunnel Pond in Orofino, Idaho. Approximately 240 RBT were caught by the 121 kids 12 years of age and under who took part in the activities. Table 27 illustrates outplanting of BY10 RBT from Dworshak.

Table 27. Fish Distribution Summary BY09 RBT from Dworshak NFH.

Date 2009	Number	Wt (lbs)	fpp	L in	L mm	Location
4/26/2010	566	412	1.4	12.2	310	Tunnel Pond
5/4/2010	2,750	2,000	1.4	12.2	310	Tunnel Pond
5/5/2010	1,100	1,000	1.1	13.1	334	Karolyn's Pond
5/5/2010	825	750	1.1	13.1	334	Robinson's Pond
5/5/2010	2,200	2,000	1.1	13.1	334	Spring Valley
5/6/2010	825	750	1.1	13.1	334	Campbell's Pond
5/11/2010	605	550	1.1	13.1	334	Talmac
Total/Ave	8,871	7,462	1.2	12.8	325	

Source: Monthly Inventory Summary BY09 RBT June 1, 2010.

Brood Year 2010

Rainbow Trout from BY10 will be used for Kid’s Fishing Day in 2011. On February 4, 2010 Dworshak was to receive 5,000 triploid Troutlodge strain RBT eyed eggs from Troutlodge, Washington. Upon subsequent inventory of the fish it was determined there were approximately 9,500 eyed eggs shipped to Dworshak.

On July 23, 2010 all the RBT in the circular tanks were moved outside to BP59 using the PR Aqua fish pump. At the time of move there were 8,902 RBT at 58 fpp and 89 mm (3.5 inches) total length. Table 28 illustrates the BY10 RBT production for FY10 at Dworshak.

Dworshak Hatchery Production Summary FY 2010

Steelhead Brood Year 2009

Due to heavy losses from IHNV and other diseases, there were only 1.2 million steelhead smolts released from Dworshak in April, 2010. The steelhead at release averaged 6.4 fpp and 194 mm in total length. The smolts were released from April 12-22, 2010. Under the Harvest Settlement Agreement with the Columbia River Tribes and included in the 1.2 million final release number were 209,000 unmarked smolts. These SST were released without an adipose fin clip or mark/tag to designate them as a hatchery fish and released in either Peasley or Lolo Creek. There were a total of 192,000 pounds of steelhead produced from BY09 SST.

Steelhead Brood Year 2010

There were 3,615 adult steelhead returned to Dworshak NFH in the fall of 2009 and spring of 2010. A total of 2.78 million eyed eggs went into Dworshak's production program. Dworshak provided 1.2 million eyed eggs for the Clearwater Hatchery and 1.3 million green eggs were taken for Magic Valley Hatchery. As in 2009, SST spawning began in January. Spawning of mid and late returning adults ended on April 27. At the end of FY10 there were 2,380,000 BY10 SST on station.

There will be approximately 200,000 BY10 SST released in 2011 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 2008

Dworshak NFH released 1.1 million BY08 spring Chinook salmon averaging 17 fpp and 148 mm (5.8 inches) total length. These fish were released on March 31, 2010.

Spring Chinook Salmon Brood Year 2009

At the beginning of FY2010, BY09 SCS eggs of both Dworshak and Kooskia stock were incubating at Dworshak. During October of 2009 there were 733,000 eyed-eggs of Kooskia stock shipped to Kooskia for final incubation. There were also 575,000 Dworshak stock SCS eggs shipped to Kooskia as well. Dworshak incubated 582,000 Dworshak stock SCS over the winter. An experiment was conducted using both circular fiberglass and aluminum rectangular tanks for initial rearing of the SCS out of the incubation trays. At the end of FY10 there were 1,087,455 BY09 SCS of Dworshak stock on station, averaging 51 fpp and 102 mm (4.0 inches) total length.

Spring Chinook Salmon Brood Year 2010

Broodstock collection of BY10 SCS produced 1,225 Chinook adults to Dworshak. Kooskia trapped 807 adult fish, transferring 799 to Dworshak for spawning. There were a total of 345 Dworshak and 222 Kooskia females spawned during the season producing 1.17 million and 737K eyed eggs, respectively. Eye-up survival for these eggs was 96.6 percent. All BY10 SCS eggs were incubating at Dworshak at the end of FY10.

Fall Chinook Salmon Brood Year 2009

The Idaho Fishery Research Office is participating in two studies on Lyon's Ferry Hatchery stock fall Chinook salmon (FCS); 1) an evaluation of migrational behavior of FCS subyearlings and 2)

an evaluation of the effect of transportation and summer spill in the Columbia River hydro system on smolt-to-adult return rates of FCS. Dworshak has cool water temperatures to allow date and size at release to be controlled to match rearing timing and size of fish in the wild. From May 17 until July 9, 2010, a total of 332,000 FCS were tagged and released; 217,000 at Couse Creek on the Snake River and 115,000 at Kayler's Landing on the Clearwater River.

Coho Salmon Brood Year 2008

On February 12-24, 2010, there were 347,437 BY08 coho salmon (COS) transferred from Dworshak to Kooskia NFH for final acclimation before release.

Coho Salmon Brood Year 2009

Adult COS were trapped at Dworshak and Kooskia hatcheries and spawned at Kooskia NFH. There were a total of 233 female COS from the Clearwater Basin which were spawned, producing 376,000 eyed eggs for rearing at Dworshak. These eggs were incubated at Kooskia NFH and the coho were transferred from Kooskia to Dworshak on May 18-19, 2010. At the end of FY 2010 there were 322,963 BY09 COS on station at 39 fpp.

There were also 453 females spawned and 943,520 green eggs transferred to Dworshak NFH during November, 2009. There were 760,000 eyed eggs subsequently transferred to Eagle Creek NFH in Estacada, Oregon during December, 2009 along with 30,000 transferred to Potlatch Corporation in Lewiston, Idaho.

Rainbow Trout Brood Year 2009

Dworshak received approximately 15,000 triploid RBT eggs from Trout Lodge, Washington in February 2009. Three thousand of these RBT were stocked into Tunnel Pond in Orofino, Idaho for Kids Fishing Day. There were 121 participants fishing at the event on May 15, 2010. Approximately 5,500 13-inch RBT were stocked from Dworshak into state and tribal fishing lakes in the spring and summer of 2010.

Rainbow Trout Brood Year 2010

Rainbow Trout from BY10 will be used for Kid's Fishing Day in 2011. On February 4, 2010 Dworshak received approximately 9,500 triploid Troutlodge strain RBT eyed eggs from Troutlodge, Washington.

On July 23, 2010 all the RBT in the circular tanks were moved outside to BP 59. There were 8,826 RBT on station at 11.8 fpp and 152 (6.0 inches) total length at the end of FY2010.

Significant changes to operations FY2010 Dworshak Fisheries Complex

Aug 2009-Feb 2010

A new roof was put on the nursery building to replace the leaky one. Along with the roof a new heating system was installed. Four degassing towers were placed on the outside of the north side of the nursery building. These towers proved problematic in two major aspects: 1) The gas levels in the nursery water are above 100 percent saturation after being “degassed” and, 2) small adjustments in the water flow inside the nursery cause alarms and dewatering of the towers and nursery tanks. The existing plumbing system inside the nursery building was slightly modified for a different configuration for the low-water alarm system. The lighting system in the nursery also proved problematic as light intensity from the fluorescent fixtures far exceeded demand and adjustment of this intensity from the fluorescent lights is not possible under the present scenario.

Feb 2010

Boilers in Mechanical II were repaired and the control panels were relocated to a safer location inside the building.

Removed sludge from System I clarifiers and transferred to digesters.

April – May 2010

In order to minimize the risk of infection with *Infectious Hematopoietic Necrosis Virus* (IHNV), an effort was made to utilize reservoir water rather than river water for early outside rearing of steelhead. There were multiple ongoing hatchery modifications/improvements to utilize reservoir water in System I. Water treatment includes 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, and a variety of plumbing changes. A “Hot Tap” was completed connecting the reservoir water supply line into the System I reuse line. The result of these modifications provides reservoir water to the burrows ponds in System I. These efforts hinged heavily on the cooperation of Clearwater State Fish Hatchery staff to communicate and coordinate the water needs and use of both facilities. We were able to run reservoir water exclusively in System I through August and then blended river and reservoir water in System I on September 1st as the Clearwater SFH’s water needs increased. This first year of reservoir water operation in System I was a learning experience with high success as IHNV did not occur in System I until after river water was blended on September 1, 2010. Approximately 10,000 GPM of reservoir water was run in System I for a peak reservoir water flow. This allowed us to utilize 17 of the 25 ponds in System I. Additional discussions are ongoing to increase the volume of reservoir water to Dworshak and not negatively impact the Clearwater SFH’s operations. Additional plans have been compiled by PR Aqua to convert all of System I and II to circular tanks with 75% reuse including mechanical aeration and CO₂ stripping. At this level of reuse, biofiltration is not necessary.

Ongoing meetings with NPT and COE concerning Tribal access issues at Dworshak NFH took place throughout spring, summer and fall, 2010.

May 2010

On May 14th, Roto-Rooter, Lewiston, Idaho completed the vacuuming project which included vacuuming out all the burrows pond drains, channels and clarifiers, and the offline settling basin.

August 2010

A-bank raceways (RWs) 1-15 had vacuum degassers installed in the headbox to strip nitrogen gas which typically comes into the hatchery at supersaturated levels. The maintenance staff modified these units after the initial installation to meet flow and water quality needs for the fish.

September 2010

Cleaned and cycled System I digesters; cleaned System II clarifiers and pumped sludge to drying beds.

Legal representatives are now participating in the matter of tribal access on hatchery grounds and long-term solutions.

Facilities Maintenance

October, 2009

- Electrical: Gathered information and assisted U.S. Army Corps of Engineers (COE) with blueprint upgrade; troubleshot and repaired FRO sewage pump; assisted Clearwater Power with voltage adjust in Substation #2; installed motion detector light in Idaho Fish Health Center; installed and rewired new hot water heater in Feed Bldg. basement and continue with the rewiring of Mech II boilers.
- Vehicle and cart maintenance on Caravans, replacement of windshields and batteries.
- Built new handles and net frames.
- Replaced cooling hoses on Tig torch.
- Poured concrete pads for pond crowder in HP area and concrete for sidewalk in hatchery housing.
- Fabricated jig and hoops for mort nets.
- Cut holes in Mech II boiler doors for new controls.
- Continued working on parts for new FRO tagging trailer.
- Winterized hatchery irrigation systems.
- Hauled five loads of steelhead/coho from DNFH to Clearwater River.
- Removed ramp used to roll off oil spill containment pallets.
- Daily maintenance performed daily by cleaning moss trap, check main pumps, ran traveling water screens in Main Pump House, greased screens, grounds and building maintenance.

November, 2009

- Fabrication projects: Oxygen valve with regulator for Nez Perce Tribe (NPT) to inject pure oxygen into an envelope containing live Coho sperm samples; a pipe brace for a fresh water line in the Incubator Room.
- Electrical projects: Adjust and calibrate auto transfer switch in System I pump house; assisted contractors with outside circuit placement; performed power outage and transferred at HSQ-2 for installation of new feeder breaker on Nursery Room contract; pulled and repaired sump from system I digester sump; changed defective pressure switch on #1 air compressor in Mech I; troubleshot and repaired FRO grinder pump and repaired portable heater circuit in Feed Bldg. basement.
- Performed work on FRO trailer project, replacing bolts.
- Welded leaking water line in street, replaced pipe and pipe fittings.
- Installed snow plow, blade and tire chains and filled dump bed with gravel for snow removal.
- Daily maintenance performed daily by cleaning moss trap, check main pumps, ran traveling water screens in Main Pump House, greased screens, grounds and building maintenance.

December, 2009

- Electrical: troubleshoot and adjust incubator chiller; troubleshoot and repair formalin storage heater; troubleshoot and repair battery charger in Cart #6; assisted contractor with alarm system layout in Nursery Room and testing; removed thermocouple and wiring from biofilter incoming line for Nursery Room contractor and made an extension for conference calling to upstairs Conference Room.
- Repaired and reinstalled digester building sump pump.
- Changed incubator chiller water from cold water line to Mech I water.
- Removed snow from ground; checked fire maintenance pumps daily and cleaned screens; removed and replaced brushes on pond scrubber; grounds and building maintenance daily.
- Hauled dump truck loads of dirt, rock and mud to fill in a pit.
- Loaded and hauled brush pile to Dam burn pile.
- Fabrication project still ongoing with new FRO PIT tagging trailer.

January, 2010

- Electrical: Conducting light and alarm test with Nursery room contractor which involved reconnecting all outdoor lighting circuits; reconnected ladder camera and associated wiring for video display; troubleshoot and repaired unit heater for formalin storage; walk through and pre-final inspection of Nursery room contract; repaired wall heater in rest room; prepped and connected transmitter and receiver for Turtle H2O alert system; troubleshoot and repaired FRO sewage grinder pump; set up power monitors for demand readings for COE; repaired power cord for pressure washer; installed new pressure switch on air compressor #2 in Mech I and tested control circuits on Mech II boilers, #3& 4.
- Cleaned system I clarifiers and transferred sludge to digesters.
- Installed Nursery room cleaning pump on C-bank in Nursery.
- Installed six pack columns in Nursery room for testing.
- Fabrication projects: six net frames for poles; fabricate three pond wall net brackets; blind flange for Nursery bio tanks; modified pedestal stands for marking trailer; welded bracket for ladder in Nursery; welded clamp to adapt de-watering tower to FRO marking trailer.
- Mounted oxygen regulator on Fish truck.
- Removed #2 compressor from Mech I.
- Hauled lockers from Dworshak Dam to hatchery.
- Started heated water to Nursery and Incubator room in preparation for spawning.
- Daily: checked pumps, traveling water screens, cleaned moss trap at Main pump house; checked fire and maintenance Pump House; grounds and building maintenance.

February, 2010

- Electrical: Repaired blow-ups and relocated controls for Mech II boilers; reconnected ladder camera after construction company has left; repaired and calibrated liquid level controller for Mech II make-up sump; troubleshoot and repaired Mech II south heat exchanger electro-pneumatic transducer; disconnected power to construction company trailer; installed circuit and assisted with installation of wireless PIT tag detector and equipment in Pond #9.
- Fabrication projects: aluminum pond crowder for rearing ponds; support standard for pack columns; cover plates for lab; support shelves for nursery tank “egg jar”; material cut for

broom and net holders in RW's A & B; built overhead hangers and rack for a dispenser in the Idaho Fish Health Center's pick-up.

- Pumped and transported NPT coho to Kooskia National Fish Hatchery.
- Cleaned and transferred sludge in system I clarifiers to system digesters.
- Refit the nursery with hanging packed columns for each tank.
- Daily: checked Main Pump House pumps, traveling water screens and moss trap; checked and cleaned filter baskets in fire and maintenance building; cleaned up large pile of broken bottles in visitor parking lot; grounds and building maintenance.
- Cut holes in Mech II boiler doors for new fans.
- Repaired and replaced door knobs, locks and hand rails.
- Removed the tops from new packed towers and re-did the media.
- Pumped water from all the man holes on hatchery.
- Attended training for packed tower blowers and H-vac systems for Nursery.
- Exercised all 3 standby generators.
- Hauled adult steelhead to Five Mile boat ramp.

March, 2010

- Electrical: troubleshoot and repaired front gate operator; installed new start control on pond cleaning pump; took motor temps and amp readings on all main pumps; extended and reconnected temp sensor circuit for Nursery Room; moved control circuit for Boilers #2 & 3 in Mech II; troubleshoot heat and smoke from 31 boiler in Mech II; lockout and tag out #6 pump in Main Pump House; installed new overload heaters on Magic Valley Fish pump; replaced switch on belt sander; reconfigured and tested all low alarm points in Nursery Room; troubleshoot and repaired specimen oven in Idaho Fish Health Center (IFHC) and troubleshoot problem with lobby elevator in Main Building.
- Checked Main Pumps, moss trap, traveling water screens, fire maintenance pumps, cleaned buildings and grounds daily.
- Fabrication Projects: two camera underwater mounts for Idaho FRO biologist to be installed at John Day Dam in Oregon; new aluminum fish crowder and stand pipe screening for Chinook A & B bank.
- Worked on rebuilding Mech II boilers.
- Added water and balance C & D bank packed tower.
- Hauled Coho smolts to KNFH and outplanted steelhead adults to Five Mile Creek.
- Changed oil in vehicles and shop equipment; performed vehicle maintenance and removing snow removal equipment.
- Moved a large rock downriver that was in front of hatchery discharge pipe; repaired and re-shaped anchor that was used for project.

April, 2010

- Hauled fall Chinook from Umatilla Fish Hatchery to DNFH and spring Chinook from KNFH to DNFH.
- Electrical: Disassembled and troubleshoot Mech II boiler 1 and 4 480-volt disconnects and moved controls to safe zone; replaced long boom control hydraulic hose on Boom truck;

removed conduits, wiring and connectors in 30" pipe chase for installation of 20" hot tap; added and ran circuits, conduits, feeders, etc. for vacuum degasser systems.

- Assisted Roto Rooter with the cleaning of System I, flushed digesters and clarifiers.
- Set up fish pumps and pumped steelhead in U.S. Army Corps of Engineers truck for outplanting and outplanted steelhead to Five Mile creek on the Clearwater River.
- Fabrication Projects: remodeled a lab specimen cart in Spawning Room; rack for waders in Spawning area and fabricated a ½" aluminum cover for valve pit in front of Main Building.
- Repaired broken fish screen for "A" bank head tank #11 and installed round and rectangular tanks and piping for spring Chinook.
- Removed old pack columns from system I reuse aeration chamber.
- Repaired leak in Idaho Fish Health Center roof.
- Installed new brushes on pond scrubber; installed MSDS signs to quickly locate MSDS books.
- Daily maintenance performed by cleaning moss trap, check main pumps, ran traveling water screens in Main Pump House, greased screens, grounds and building maintenance.

May, 2010

- Electrical: Ran conduit and wire feeders for new vacuum pumps in A bank and System I; moved conduits and wiring in pipe galley for Knight Construction; removed main Pump #1 in Main Pump house.
- Installed new vacuum degasser columns and blind flanges on pipes in System I reuse aeration chamber.
- Fabrication projects; hose fitting for dewatering tower in tagging trailer; pond crowder for FRO fall Chinook project; broom and brush holder for A bank; welded brackets to frames for grating in System I reuse aeration chamber; assisted professional welder with preparation of A bank RW project; built mounting bracket for controls of pumps on A bank.
- Helped stabilize tagging trailer for Biomark.
- Altered fork lift skids under new tank to fit larger forklift.
- Repaired finger weir for KNFH trap.
- Hauled SCS from KNFH to DNFH.
- Mounted degassing vacuum pumps on A bank and System I reuse pump house.
- Hauled equipment for Kids' Fishing Day, unloaded at Tunnel Pond and re-loaded and hauled back to hatchery after the event.
- Hauled RBT from hatchery to Tunnel Pond for Kids' Fishing Day.
- Repaired broken pond valves on Pond 26 and 62 which involved cutting asphalt.
- Cleaned buildings, checked main pumps, traveling water screens, moss trap at Main Pump House, checked fire maintenance pumps and screens and checked Mech I & II boilers on daily basis.
- Repaired broken irrigation lines and sprinkler heads on hatchery lawns and grounds maintenance.
- Rebuilt damaged ladder on fish truck.

June, 2010

- Electrical projects: Troubleshoot and repaired alarm points for system operations; repaired problems with alarms in Mech I; installed new light switch and replaced air handler in Furnace room; repaired pressure washer circuit in Nursery; installed new 480v and 120 v receptacles in A bank; repaired Aqua pump in Nursery; assisted Whitney Controls with new flow meter and circuits in Main Pump house; connected and energized circuit for vacuum de-gassers in A bank; prepped circuit for portable pumps in clarifiers to aeration chamber.
- Fabrication: sign for propane re-fueling instructions; electrical disconnect box for Nursery Room clarifiers.
- Repairs: Replaced hot water tank in House #2 and repaired bad wire; broken sprinklers which included piping and control box; latch on roll up door; exhaust fan in Incubator Room and broken irrigation pipe; modified RW's for T handle lock-out; serviced hatchery carts and vehicles; mounted hose racks in Incubator Room and attached I/E signs to entrance gate and kiosk.
- Pumped water from man holes and underpass sump.
- Cleaned and greased hot water re-circulating pump motors in Mech II.
- Closed overflow drains and adjuster water for Nursery.
- Hauled Chinook tanks, cut trees from housing and old cabinets to COE.
- Hauled adult SCS from KNFH to DNFH.
- Removed tanks from Chinook RW's.
- Worked with University with Idaho students on their mixed cell project. Installed condensation drain in Spawning Room.
- Assisted A&A Septic with pumping sludge in System I.
- Daily checked Main Pump House and Fire Maintenance Pump House, grounds and building maintenance.

July, 2010

- Electrical projects: Troubleshoot ultra cold freezer in IFHC; repaired 480-volt receptacle on "B" bank; adjusted alarm points; connected feeder for portable pump panel at nursery clarifiers; made up power supply cord for new fish counter; repaired conduit and pulled in new circuit for underpass sump pump; troubleshoot Mech I air compressor; added circuit for air conditioning to room in Main Building that houses the hatchery server and turned temperature set point up to +20 degrees in Feed Bldg.
- Installation: new lock on Tribal access gate; new vacuum de-gas towers in "A" bank; rebuilt elbows to de-gas towers; installed vertical pipes from valves to elbows to de-gas towers which involved cut up and re-weld with extensions.
- Repaired toilets, broken sprinkler lines, cleaned buildings and restrooms in all hatchery buildings on daily basis, shampooed carpets and washed windows.
- Replaced seals on Systems I, II & III stand pipes and replaced seals in "A" bank mud valves.
- Cut down trees and hauled brush to burn pile, grounds maintenance in hatchery housing.
- Checked main pumps, traveling water screens and cleaned trash rake daily in Main Pump House.

August, 2010

- Fabrication & welding projects: net hoops and handles; installed de-gassers in Chinook raceways; removed degassers, cut off pipe and reinstalled; removed degassers again and did some further reconstructive work and re-installed; welded front access door and door stop for a boat.
- Electrical Projects: Repaired conduit and wire to underpass sump pump and walkway luminaries; installed and connected System I digester sump pump; installed #6 main pump motor; checked and prepped incubator chiller, started up and adjusted balance flows; troubleshot and repaired Mech I air compressors; disconnected battery charger for old forklift; removed boosting transformers from tagging trailer circuits; set up portable power supply for degassing projects; repaired light and re-lamp in Server room; removed bad shaft coupling from #6 main pump bowl assembly shaft, performed repairs and replaced.
- Refit System II filter beds for settling, cleaning and two pipes for seals.
- Pumped sludge with contractor in System I digesters, pumped supernate from System I digesters into System I clarifiers and fixed system I, #2 digester back wash.
- Hauled Chinook for outplant to Clearwater River, Pink House Hole.
- Remounted net and brush rack in Chinook raceways.
- Repaired bird netting and side wire that was damaged in the degasser installation.
- Loaded and hauled discarded pipe to bone yard at Dworshak Dam.
- Grounds and building maintenance daily .

September, 2010

- Electrical projects: Ran a 208-volt circuit for freezer in Feed Bldg. basement; troubleshot H2O cooling problem on Trane furnace in Feed Bldg; researched second pump on emergency power in System I reuse pump house; repaired floor drying fan and troubleshot overload and trip problems on pressure switches on Mech I air compressors and checked, adjusted and started incubator chillers;
- Cleaned and cycled System I digesters; cleaned system II clarifiers and pumped sludge to drying beds.
- Fabrication projects: net frames, brackets & handles; cut and welded aluminum pipe fitting for fish counter; rolls for pond scrubber and broom handle brackets; stanchions for oil boom trolleys to carry oil boom sections during rise and fall of river levels.
- Removed and hauled trees to burn pile.
- Building maintenance and grounds maintenance daily; checked main pumps, traveling water screens and cleaning moss trap in Main Pump House daily.
- Hauled aluminum and metal to COE bone yard.
- Assisted with water in System I.
- Maintenance performed on several hatchery vehicles and equipment.
- Trained staff members in fecal water removal in System II.
- Repaired broken stairs.

Administration

Meetings

October, 2009

- Larry Peltz, Complex Manager, Mark Drobish, Hatchery Manager and Jill Olson, Fisheries Biologist traveled to Walla Walla, WA. to attend a meeting which included the Corps, Nez Perce Tribe and CH2MHill to discuss alternatives to solving the National Pollutant Discharge Elimination System (NPDES) issues at the hatchery. The alternatives will be compiled by late November and a followup meeting in December.
- Joy Hardel, Walla Walla District (USACEO) visited the hatchery to better her understanding of the facility and operations relative to the proposed alternatives (from CH2MHill) to address the NPDES issues.
- Nick Ivy and Jared Frank, USACE, Walla Walla District were on-site initiating an effort to update the facilities electrical and mechanical prints which are much outdated due to all the modifications made to the facility over the past 40 years. They will be here on a weekly basis for 4-6 weeks.
- The Combined Federal Campaign 4th Annual Chili Cookoff and Bake Sale was held in the Main Bldg. Conference Room and October birthdays were also celebrated. Over \$170 was raised to donate to charity.

November, 2009

- Complex Manager Larry Peltz, Hatchery Manager, Mark Drobish, Fisheries biologist Ray Jones and I/E Specialist Megan Wandag attended the Hatchery Managers Workshop in Richland, WA. Mark and Chris Peery, Fisheries Biologist, gave a presentation on the status and the ongoing evaluation of the Mixed Cell Units (modified BP's).
- Mike Bisbee, (Dworshak Hatchery biologist, Nez Perce Tribe) Coho Project Leader, traveled to Portland, Oregon and gave an update and overview presentation on the Coho Restoration Project efforts at Dworshak Fish Hatchery to the Columbia River Intertribal Fish Commission (CRITFC). The project has reached a high point as Clearwater River returning Coho Salmon provided enough eggs to meet the production needs of Dworshak and Eagle Creek NFH. One of the goals of the restoration projects is to utilize all Clearwater River returning Coho.

December, 2009

- The Northwest Fish Culture Conference was held in Redding, CA this year. Employees attending were: Wayne Hamilton & Rick Allain, Animal Caretakers; John Vargas, Animal Caretaker Supervisor and Ray Jones, Fisheries Biologist.
- Larry Peltz, Complex Manager, traveled to Walla Walla, WA for a meeting with the U.S. Army Corps of Engineers (COE) on Dec. 2.
- Annual Operating Plan (AOP) meeting held in Main Building Conference Room on Dec. 9.
- Jessica Buehler, Zach Penney and Christine Moffitt, University of Idaho gave a presentation at the Dworshak Fisheries Complex to update our staff on their "Kelt Research Efforts" from the previous sampling year and to discuss upcoming sampling in 2010.

- Larry Peltz traveled to Lapwai for a signing ceremony with the Nez Perce Tribe on Dec. 14.
- Employee Christmas potluck was held on Dec. 16th.

January, 2010

- Larry Peltz, Complex Manager and Mark Drobish, Hatchery Manager attended a pre-Annual Operating Plan (AOP) meeting at Clearwater Fish Hatchery.
- Larry Peltz, Complex Manager gave a presentation on DNFH to the National Association of Retired Federal Employees (NARFE) at their noon luncheon meeting.

February, 2010

- Mike Bisbee, Fisheries Biologist, Steve Coomer, Gia Growing Thunder, Lou Ann Lasswell, Eric Kashkash, Animal Caretakers traveled to Pendleton, OR to attend the Columbia Intertribal Fish Commission (CRITFC) Feb. 2 & 3. Mike Bisbee made a presentation to the Commission on the Coho Restoration Project.
- M. Bisbee, S. Coomer, G. Growing Thunder, L. Lasswell and E. Kashkash attended the NPT Science Workshop in Lapwai, ID.
- Under contract with the COE, CH2MHill visited DNFH to evaluate electrical capabilities for the proposed alternatives to comply with our NPDES permit and collect water samples during cleaning and non-cleaning times to aid them in planning and calculating Total Suspended Solid (TSS) load removal.
- Rick Allain, Animal Caretaker, traveled to Sacramento, CA for a Wage Grade meeting.
- Annual Operating Plan held here in the Dworshak Main Building Conference Room on Feb. 17.
- Larry Peltz attended a HGMP meeting at Clearwater Hatchery.
- Larry Peltz, Complex Manager; Kathy Clemens, Project Leader for Idaho Fish Health Center and Mike Faler, fisheries biologist traveled to Lapwai for a meeting on the current Nutrient Enhancement program being conducted at Dworshak Reservoir.
- Larry Peltz met with BPA energy efficiency staff at the hatchery, Feb. 24.
- Rick Jones, Bonneville Power Administration (BPA) visited DNFH and collected electrical use data to evaluate the cost/benefit of changing a couple of our intake pumps to variable frequency drives. If this work moves forward it would reduce our electrical usage for pumping excess water relative to the water needs of the hatchery. The hatchery currently utilizes over \$2 million worth of electricity mostly from pumping water. Any improvements here fit well with our agency's priorities to reduce waste and overall environmental impacts relative to climate change.

March, 2010

- Larry Peltz, Complex Manager, Mark Drobish, Hatchery Manager, Jerry McGehee and Tom Rogers, Idaho Fish & Game (IDF&G) and Scott Marshall, Lower Snake River Compensation Plan (LSRCP) to discuss potential opportunities for holding adult Fall Chinook salmon and development of the localized broodstock for steelhead returning to the South Fork of the Clearwater River on March 3.
- Met with Scott Marshall, LSRCP and IDF&G staff to discuss new summer Chinook program for the Clearwater River drainage.

- Larry Peltz traveled to Joseph, OR for a meeting to discuss steelhead HGMP with NPT and IDF&G.
- Larry Peltz was in Enterprise, OR for a meeting to discuss regional Chinook salmon management for 2010.
- Larry Peltz, Mark Drobish, Ed Larson, Nez Perce Tribe, Tim Dykstra, USACE met at DNFH to discuss tribal access issues on March 17.
- Larry Peltz, Mark Drobish, Ed Larson, Tim Dykstra and Scott Bettin from Bonneville Power Administration (BPA) met at DNFH to discuss hatchery issues.
- Larry Peltz, Tim Dykstra and Ed Larson met with representatives for U.S. Senators Mike Crapo and Jim Risch and U.S. Representative Walt Minnick for a discussion on IHN and a tour of the hatchery.

April, 2010

- The Hatchery Evaluation Team (HET) met on April 6 and 29 to discuss and plan out rearing strategies for steelhead after the fish are moved from the nursery tanks to the BP's. The staff at the Clearwater State Fish Hatchery has been working with us to utilize additional reservoir water to delay exposure of the steelhead to pumped river water (North Fork) to minimize the risk of infection with *Infectious Hemapoietic Necrosis Virus* (IHNV). In conjunction with this effort, there are multiple ongoing hatchery modifications/improvements to utilize reservoir water in System I. Water treatment includes fabrication and installation of a vacuum degassing system for the reservoir water, modification to the System I reuse, a variety of plumbing changes and a ton of adaptability on the part of the hatchery staff.
- Larry Peltz, Mark Drobish and Jill Olson had a conference call on April 8 & 19 with the USACE and the Environmental Protection Agency (EPA) to discuss NPDES issues.
- Larry Peltz, Mark Drobish and Jack Christiansen, Aquatics Engineer traveled to Walla Walla, WA to discuss facility piping changes with the USACE, USFWS, LSRCP, NPT and IDF&G. Future facility needs at DNFH were also discussed.
- On April 12 Larry Peltz met with Eric Barker, Lewiston Tribune to discuss future needs of DNFH.
- Larry Peltz traveled to Walla Walla, WA to meet with USACE and discuss boiler issues on April 20.
- Larry Peltz traveled to Walla Walla, WA to meet with USACE and CH2MHill to discuss NPDES project on April 23.
- Larry Peltz met with staff on an informal basis to bring everyone up to date on hatchery happenings.

May, 2010

- Larry Peltz traveled to Walla Walla, WA on May 3 to attend project completion meeting for the nursery roof project.
- Larry Peltz met with Congressional aides from Senator Risch's office on May 21.
- Larry Peltz participated in conference call planning Project Leaders meeting in August.
- Met with NPT representatives to discuss feasibility of construction broadband tower on hatchery property.

June, 2010

- Tribal Access meeting attended here on June 2 by Larry Peltz, Mark Drobish.
- Richard Hannan, Assistant Regional Director of Fisheries (ARD) and Rich Johnson here on June 8 & 9 to tour DNFH as well as meet with hatchery, Fisheries Resource office and Idaho Fish Health Center staff.
- HET meeting here on June 2 & 22.
- Brian Vinci, Freshwater Institute visited the hatchery to assist Kelly Stockton with velocity data collection on the mixed cell units. Brian also visited with hatchery staff to discuss potential modifications to the hatchery to maximize water utility using serial reuse in circular tanks. Kelly Stockton, University of Idaho graduate student completed the particle analysis component of her study on the experimental mixed cell ponds during the month.
- Jack Christiansen attended Value Engineering meeting at the CH2MHill office in Boise, ID for the hatchery effluent study on June 14-15.
- Larry Peltz and Jack Christiansen participated in Value Engineering Teleconference on June 16.
- Carla Fromm, EPA visited DNFH on June 17. A formal inspection was not conducted; however, changes in operations of the hatchery and infrastructure modifications were reviewed and discussed.
- Jill Olson attended the IDF&G hatchery managers workshop which included a session on NPDES with emphasis on Discharge Monthly Reporting on June 17 & 18.
- Larry Peltz, Jack Christiansen & Jill Olson participated in Value engineering conference on June 18.
- OSHA inspectors on-site for a surprise inspection on June 25. Howard Burge, Fisheries Resource Office Project Leader, Terry Weeks, Maintenance, Mike Bisbee, Production and Jack Christiansen gave them a tour of the facility. Their report will be submitted to Larry Peltz.
- Larry Peltz attended a public information meeting hosted by IDF&G on Dworshak Reservoir Nutrient Enrichment Project.

July, 2010

- Mark Drobish visited Dubois State Fish Hatchery in Dubois, WY. This facility utilizes circular tanks with serial reuse and low head oxygen supplementation. Circular tanks with partial serial reuse are being considered in the future for system I to extend the time frame for rearing steelhead on reservoir water to reduce the chances of parasite and IHNV exposure and infection.
- Larry Peltz attended a Tribal Access meeting on July 8.
- Staff from the IFHC, NPT Hatchery, KNFH, DNFH & Hagerman NFH met to discuss the role of the IFHC, existing work products as well as better ways to provide services in the future.
- On July 28 Larry Peltz conducted a tour for the new USACE District Commander, LTC Dave Caldwell and several other USACE representatives.
- Larry Peltz participated in a conference call on July 29 with CH2MHill about NPDES upgrade.

- On July 1 a retirement party was held with a potluck for Kathy Clemens, Project Leader for Idaho Fish Health Center after 38+ years with USFWS.

August, 2010

- Larry Peltz, Jack Christiansen, and Mark Drobish met with CH2MHill engineers to discuss NPDES project on August 4.
- Larry Peltz, Howard Burge and Marilyn “Guppy” Blair, Idaho Fish Health Center Acting Project Leader attended Project Leaders meeting in Portland, OR, August 16-19.
- Larry Peltz and Mark Drobish attended a Tribal Access meeting with USACE and NPT staff on Aug. 25.
- Larry Peltz, Jack Christiansen and Mark Drobish met with Tim Dykstra, USACE to discuss DNFH planning process on Aug. 27.
- Larry Peltz and Jack Christiansen met with USACE staff in Walla Walla, WA to discuss the NPDES project on Aug. 30.
- Seth Oatman (Kamiah, ID) and Trevor Johnson (Orofino, ID) finished up their internships through the Coho Restoration Project and returned to high school. Seth and Trevor were introduced to fish culture and had the opportunity to participate in a variety of hatchery operations including Spring Chinook Salmon spawning. Their efforts also lightened the load for the rest of the crew by lending a hand with feeding, cleaning and inventory of fish during their internship here at Dworshak.
- Preston Scheidt, Portland, OR, volunteered for 3 days with the hatchery crew and participated in fish cultural activities and SCS spawning. Preston also volunteered with the IFHC for a day while visiting relatives (Randy Bowne, FRO biologist) in the area.

September, 2010

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

Training

- A training session for staff was conducted in conjunction with water manipulation and set up for operation of the fish ladder. The ladder was operated intermittently to collect a targeted 500 early returning steelhead. These fish will be held and spawned in early January to ensure the genetics of these early returners is not lost from the run over time on Oct. 6.
- Jill Olson, fishery biologist attended a training course, “*Aquatic Toxicology*” in Portland, Oregon on December 15-16, 2009.
- Joan George, Admin Officer, traveled to Portland, OR to attend Data Mart training, Jan. 27-29, 2010.
- Jill Olson, Fisheries Biologist participated in and completed the Webinar Training with the Environmental Protection Agency (EPA) for Discharge Monthly Reporting (DMR) as required by our National Pollutant Discharge Elimination System (NPDES) permit, Feb. 4 & 9, 2010.
- Mark Drobish attended, “*Advanced Supervision: Building on Experience,*” at the NCTC in Shepherdstown, WVA.
- Joan George, Admin Officer, traveled to NCTC in Shepherdstown, WVA for training, “*Applied Supervision.*”
- Terry Weeks, Maintenance Mechanic and Jill Olson, Fishery Biologist attended “*Environmental and Facility Training,*” at the Tualatin National Wildlife Refuge in Oregon.

Safety & Wellness

October 2009

- Hearing tests were conducted by Federal Occupational Health for staff: AJ Sisto, G. Growingthunder, R. Bohn, S. Bradbury, D. Trainor, F. Mullins, T. Biladeau, A. Garcia, J. Olson & R.J. Hemingway.

November 2009

- Tom Biladeau presented a short video on wading safety to the staff.
- Confined space training by Oxarc. Employees participating: H. Sims, T. Weeks, B. Greene, R. King, D. Trainor, J. Vargas, T. Trock and M. Drobish. Also lockout-tagout training was provided to B. Greene & T. Weeks.

December 2009

- Penny Hasenoehrl, Purchasing Agent, facilitated a CPR/AED/First Aid and Bloodborne Pathogens class to the following employees: D. Trainor, L. Sprague, T. Biladeau, L. Laswell, S. Coomer, F. Mullins, R.J. Hemingway, S. Bradbury & A.J. Sisto.

January 2010

- Staff viewed a short video on Radon gas and testing for your home. Handouts from the Department of Public Health were provided to staff.

February 2010

- Staff safety meeting held with the staff viewing a video on Lyme disease.

March 2010

- Oxarc conducted Confined Space Training and Respirator Fit Testing for hatchery staff that had not completed the training in November, 2009.

April 2010

- Mike Gladhart, Clearwater County Sheriff's Department gave a presentation on cold water immersion to staff on April 12.

May 2010

NA

June 2010

NA

July 2010

- Staff viewed video on ATV safety.

August 2010

- Swiftwater safety training provided by Tom Biladeau, biologist.

September 2010

- Staff viewed a video on Spill Prevention and Countermeasures presented by Mark Drobish, Jill Olson & Terry Weeks.

Staffing

DNFH Employees, FY 2010.

Name	Position Title	Period of Employment	Status
Allain, Richard E.	Animal Caretaker	10/01/09–09/30/10	Permanent
Bisbee, Mike	Fishery Biologist	10/01/09-09/30/10	Permanent
Bohn, Rob	Animal Caretaker	6/4/10-09/30/10	Permanent
Bright, Mark	Fishery Biologist	10/01/09-09/30/10	Permanent
Christiansen, Jack	Aquatic Engineer	03/22/10-09/30/10	Permanent
Drobish, Mark	Hatchery Manager	10/01/09-09/30/10	Permanent
George,Joan	Admin. Officer	10/01/09-09/30/10	Permanent
Greene, Benny C	Electronics Mechanic	10/01/09-09/30/10	Permanent
Hamilton, William W	Animal Caretaker	10/01/09-09/30/10	Permanent
Hasenoehrl, Penny	Purchasing Agent	10/01/09-09/30/10	Permanent
Kellar, Robbie D	Animal Caretaker	10/01/09-09/30/10	Permanent
King, Rick	Maintenance Worker	10/01/09-09/30/10	Permanent
Peltz, Larry	Complex Manager	10/01/09-09/30/10	Permanent
Sims, Hubert M	Maintenance Mechanic	10/01/09-09/30/10	Permanent
Stretsbery, Gerald	Laborer	10/01/09–09/30/10	Permanent
Trainor, David A	Maintenance Worker	10/01/09–09/30/10	Permanent
Trock, Thomas J.	Fishery Biologist	10/01/09–09/30/10	Permanent
Vargas, John J	Animal Caretaker Leader	10/01/09–09/30/10	Permanent
Wandag, Megan	Information/Education Specialist	10/01/09-09/23/10	Permanent
Weeks, Terry C.	Maintenance Worker	10/01/09–09/30/10	Permanent
Wright, Benjamin A	Animal Caretaker	10/01/09–09/30/10	Permanent

Personnel

- Monique Stamper, STEP student, EOD as a clerk in the Admin Office on Dec. 11.
- Terry Weeks, Maintenance worker was promoted to WG-10 on March 19.
- Jack Christiansen, Aquatics Engineer EOD on March 22.
- Monique Stamper started working full-time to accommodate Production Dpt. needs on June 1.
- Rob Bohn, EOD June 4th as a full-time Animal Caretaker.

- Last day for Megan Wandag, on Sept. 23, I/E Specialist who has accepted a position at the Neal Smith National Wildlife Refuge in Prairie City, IA.

Outreach and Visitor Activities

FY2010 Outreach Program Summary

At the beginning of FY08, DNFH had 2 staff members focused entirely on Information/Education (I/E). Both of these staff members have moved on the other jobs in the USFWS and the hatchery currently has no I/E staff at the end of FY10. Consultation with the COE has led the hatchery to take a new approach to the outreach program. The COE is willing to provide support for a half-time position to address I/E issues at Dworshak. Hatchery staff requested funding from the Fish and Wildlife Service (FWS) to fund the other half position and create one fulltime position for I/E activities. Unfortunately the FWS was unable to come up with the funding. The hatchery is hiring a biologist with COE funding who will spend half-time on I/E and half-time working on fish production. The I/E work is going to focus on 3 areas: visitor services, volunteer program and Kids Fishing Day.

DNFH has adopted a new approach to visitor services. We are no longer interested in making the hatchery a tourist destination. Disease issues at DNFH have led the hatchery to increase biosecurity in all areas of fish production. A large number of tourists wandering around the hatchery jeopardizes our fish production by compromising our biosecurity and also poses a safety issue to the tourists. During the next year, the hatchery will focus on producing a series of short video clips that show what happens at this hatchery during the course of a year. The video clips can be shown in the lobby, on social media and at the COE Visitor Center at the dam. This may prove to be more educational than to have people wander around the hatchery and not understand what they see. As a result of this new approach, the hatchery is no longer keeping track of visitor statistics.

The Volunteer program saw a decrease in total volunteers and number of hours worked on hatchery projects, due mainly to the absence of one temporary volunteer who worked a huge number of hours in FY08. A total of **30 volunteers contributed 755 hours** of service towards spawning, field work, outreach events and public contact duties.

The 20th annual Kids Fishing Day was held off-site for the third year in a row with continued success. The USFWS partnered with the Nez Perce Tribe (NPT) to hold the event at the Tunnel Pond fishing site owned by the NPT. The hatchery provided the rainbow trout, all equipment, volunteers, and other activities for approximately 121 kids age 12-years and under who registered (approx. 400 non-fishing guests also attended). Transportation was coordinated with the local school district to provide a shuttle bus from a parking area in Orofino to the pond. Staff and attendees again remarked how much they liked the natural setting.

The Complex website continues to be an important way for “visitors” to learn about the hatchery and plan hatchery visitations. Teachers also use the website to access information about resources and field trips available to them. Thus web visits increased by 1%, the only statistic to show a positive trend this year. The website was particularly important during the hatchery closure. The highest counts were again recorded during the calendar school year – September to May – with an average of 1,450 visitors/month. Once again, virtual visitors were included in the on-site contact total.

Hatchery in the Classroom: Eight (8) schools received hatchery-supplied equipment and/or full levels of support; two received just the eggs, feed and technical support. All projects went well this year, with an average egg-to-fry survival rate of 75%, including one school with an incredible 100% survival rate! All schools had post-project release activities for students, which hatchery staff participated in and facilitated. Most schools had a variety of partners and sponsors who supported the field activities, and assisted with classroom and outdoor environmental lessons. A few schools have contacted the hatchery with interest in obtaining their own classroom incubation systems or applying for the HIC project. Evaluations from participating teachers showed satisfaction with the program, and included notes on the great educational benefits to students. I/E staff also co-facilitated a “Trout in the Classroom” teacher workshop with staff from Idaho Department of Fish & Game; two participants began incubation projects with eggs and assistance from Dworshak I/E staff.

Significant Events

The nursery roof project was completed in February 2010. The old roof was completely removed and replaced with a new pitched roof. A new heating and ventilation system was installed as were new degassing towers for the nursery water supply. The new degassing towers reduce dissolved gas levels but they do not lower the levels enough to achieve desired levels. Consequently, the individual packed columns for each nursery raceway were reinstalled to reduce dissolved gas to acceptable levels. Future plans are to install vacuum degassers in the hatchery's main head tank to eliminate high gas saturation in all hatchery rearing systems, especially the nursery tanks.

IHN disease took a heavy toll on Steelhead smolt production in 2010 (BY09). Over 1.3 million fish were lost in BY09 production. This was the first major outbreak of IHN since 2002 and the largest loss of fish since the nursery was redesigned to use reservoir water only. Recent outbreaks are appearing in larger size fish (> 90 fpp) that had been thought to be capable of fighting off the disease. IHN disease typically occurs in June 21-28 days after ponding with river water. Previous outbreaks in the last decade or more had occurred primarily in the fall. Extensive virology sampling was conducted to gain some insight into why IHN was a problem again. In addition to IHN, it was found that many fish had Gas Bubble Disease (GBD) and Coldwater disease. This mixture of ailments may have made a bad situation worse. Analysis of the virology indicated that the Dworshak fish had been infected with a new viral genotype, the M-clade (M139) of the IHN. Minimal genotype analysis from previous outbreaks had mostly been from the U-clade. The M139 genotype appears to be more virulent and affects larger fish than were susceptible to other genotypes of the virus.

The source of the IHN is water pumped from the North Fork of the Clearwater River. The virus is present in the water after being shed by returning adult steelhead and Chinook salmon. Sampling of the adults revealed that the steelhead had both the M- and U-clade of the virus but the Chinook salmon only had the U-clade.

The increased loss of Steelhead caused by IHN and subsequent loss of fish caught the attention of co-managers, resource users and other hatchery operators. There was widespread concern that something needed to be done or the catastrophic losses would continue in future years.

Hatchery staff felt that in order to reduce mortalities it was important to keep the fish on virus free water for as long as possible once they were moved outside. Discussions with Clearwater Hatchery staff early in 2010 revealed that Clearwater Hatchery does not use its full allotment of reservoir water between May until the end of August. This meant that Dworshak Hatchery could use more reservoir water to rear fish outside (i.e. System 1) until Clearwater Hatchery needs the water in August. As a result, management devised a way to get reservoir water to the System I's twenty-five Burrows ponds. A plan was developed to convert part of the System 1 reuse system to allow reservoir water to be routed to the System I Burrows ponds. The conversion was completed in May just prior to fish moving outside. The conversion involved a hot-tap technique to connect a line containing reservoir water to the System I reuse head tank. Vacuum degassers were then installed in the System I reuse tower to control gas saturation levels below 100%. The modification eliminated reuse and System I was operated on reservoir water as single pass system.

One tank in the nursery, for unexplained reasons, broke with IHN and was immediately destroyed. No evidence of IHNV was found in the other nursery tanks. Ponding began in May. Most fry coming out of the nursery were ponded in System 1 on reservoir water. Four Burrows ponds in System 3 supplied with river water received early fish as a control measure to detect IHN disease. Two of the four Burrows ponds in System 3 came down with IHN. These two groups of fish experienced rapidly increasing mortality so they were destroyed rather than take a chance of horizontal transmission of the virus. Virology on these fish indicated they had the M-clade IHN virus typically associated with Steelhead Trout. In August, Clearwater Hatchery needed all the reservoir water back so all the Burrows ponds went to river water. Early in September, several of the System I ponds broke with IHN disease. However, these groups of fish did not experience catastrophic mortalities and consequently none of the twenty-five groups were destroyed. Sampling indicated these ponds had the U-clade virus typically associated with Chinook Salmon. Total losses to IHN disease for BY10 steelhead are about 100,000 juvenile Steelhead. This is a significant improvement from the previous two years and the hatchery fully anticipates meeting its steelhead mitigation goal of 2.1 million in 2011.

The hatchery was issued a National Pollution Discharge Elimination System (NPDES) "Notice of Violation" in December 2008 from the Environmental Protection Agency for failure to comply with the Clean Water Act (CWA). Much of the hatchery was constructed prior to passage of the CWA and the hatchery does not have the infrastructure necessary to come into compliance. The COE hired a consulting firm, CH2MHill, to design a pollution abatement system for the hatchery. Hatchery staff spent a great deal of time in 2010 working with CH2MHill and the design should be completed in June 2011. Hatchery staff also spent a great deal of time working with EPA to develop best management practices to help address the NPDES violation.

The electrical controls for the boilers in Mechanical Building II continued to malfunction and be a safety hazard. An OSHA inspection on June 25, 2010 identified the boilers as a safety hazard. Interim measures have been taken to make the boilers safer to operate and the COE is working on a permanent fix which will be completed in the fall of 2011. The OSHA inspection also noted other safety violations. Most of the violations were addressed within the recommended time frame.

The Chinook salmon raceways have been experiencing elevated total dissolved gas (TDG) levels and the fish have been experiencing chronic low level gas bubble disease (GBD). The hatchery installed vacuum degassing towers on 15 of the raceways (i.e. A1-A15) to lower TDG levels. The project was completed in July and the raceways with the vacuum degassers had lower TDG levels than the other raceways.

