Annual Report for

Dworshak National Fish Hatchery

Fiscal Year 2000

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Date

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Introduction

Dworshak National Fish Hatchery (DNFH) is located in north central Idaho down river from Dworshak Dam, at the confluence of the North Fork and the main stem of the Clearwater River. Dworshak Dam was constructed by the Corps of Engineers (COE) between 1966–70. Operation of the hatchery by the Fish and Wildlife Service (FWS) was authorized by a 1969 COE Memorandum of Understanding. The hatchery has since served primarily as a mitigation hatchery for steelhead trout (*Oncorhynchus mykiss)*; a unique run of the North Fork "B" strain threatened by the construction of Dworshak Dam. The FWS has endeavored, over the past 29 years, to meet the "mitigation goal" of providing 20,000 adult steelhead to the Clearwater River and maintain the unique genetics of the stock.

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 because of reduced densities and rearing to a large size. The adult return goal for DNFH is 9,135 spring chinook (calculated using the 15 fpp size, total rearing capacity, and 0.87 percent return rate guideline).

Dworshak NFH consists of a mechanical, electrical, water reuse and reconditioning system employing filtration, biological nitrification, pollution control and monitoring facilities, alarm system, water chillers, heaters, and numerous pumps. Initial construction at DNFH included 84 Burrows ponds, 64 nursery tanks, and 9 adult holding ponds. Twenty-five Burrows 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. In the late 1980s the target size for steelhead smolts was changed to 200 mm, based on data developed by the Fish and Wildlife Service.

During the mid-1970s, with DNFH not meeting production goals nor meeting 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 1980s 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 has proven to be unworkable and the ability to operate reuse in System I is no longer available. We are presently working with COE to rehab this system. Also in the 1980s, an additional thirty 8' x 80' raceways were constructed under the LSRCP to provide production facilities for spring chinook salmon. Also in the 1980s, 5 of the 9 adult holding ponds were converted to raceways for needed rainbow trout mitigation for Dworshak Reservoir.

The uniqueness of DNFH's water systems provides several options for egg incubation and rearing. Three temperature options are available for egg development through the incubators. Different temperature regimes are also available to the nursery tanks with ozone treated water to 32 of the 128 inside tanks. The outside steelhead ponds are furnished single-pass river water from May through November, when desired temperatures can be obtained through selector gates at Dworshak Dam. A pump station on the North Fork River, one mile down river from the Dam, is capable of providing 92,500 gpm of water. In Systems II and III, water reuse and heating is used during the colder months of November through March enabling the hatchery to get the desired fish growth. During reuse, 10 percent new water enters the system to make up for loss. Each of the three outside ponding systems is independent of each other for temperatures when reuse and heated water are available. Beginning in 1992, the hatchery was supplied with an additional 6400 gpm of gravity flow Dworshak Reservoir water directly by pipeline. This "clean" water furnishing egg incubators and nursery rearing has afforded disease protection from *Infectious Hematopoietic Necrosis* (IHN) virus 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.

A Dworshak National Fish Hatchery Rehab Plan was prepared in 1990–91 by the Corps of Engineers (COE). This rehab plan detailed major upgrades and needs of the then 20 year old hatchery. It seems that the status of this Dworshak rehab plan now is no longer active. The hatchery continues to work with the COE on line items identified in the rehab plan. We are trying to accomplish some of the rehab project items through O&M funding. Larger items will need to be funded directly by the COE.

Future projects we are asking the COE to undertake include converting Burrows ponds to raceways, System I reuse modifications, structural work on the main hatchery building and replacing nursery building roof.

The Kooskia hatchery, 35 miles upriver from Dworshak on the Clearwater River, has operated as a Complex with Dworshak since 1978 to restore the spring chinook fishery in the Clearwater. The administrative headquarters for the Dworshak-Kooskia Complex is located at the Dworshak hatchery. The Idaho Fishery Resource Office is also included in the Dworshak Complex. The Idaho Fish Health Center is a separate entity functioning on Dworshak Hatchery grounds.

Dworshak Hatchery has the capacity to produce 2.3 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 200,000 sub-catchable rainbow trout for stocking Dworshak Reservoir. The hatchery's

annual production capacity exceeds 550,000 pounds. Mitigation adult fish goals to the Clearwater River are 20,000 returning steelhead and 9,135 spring chinook. Steelhead goals are being satisfied in some years but were not in 1999. Spring chinook adult returns have been well below mitigation levels except for this past year.

This report covers the period of hatchery activities from October 1, 1999, to September 30, 2000.

Fish Culture Operations

Brood Year 1999 Steelhead

There were 2.15 million steelhead smolts (370,919 pounds) released from Dworshak in April and May 2000. The steelhead at release averaged 201 mm in total length, meeting the 200 mm target size. Fish health and condition was good throughout the rearing cycle as water temperature was kept about 2°F lower in the reuse systems than normal (52°F rather than 54°F). The reuse system effects growth in about 2/3 of the steelhead on station. Approximately half of the smolts were outplanted to the South Fork of the Clearwater River the third week of April. The direct release of 1.3 million smolts took place the first week of May, one week later than usual this year. The fish ladder was closed and de-watered once the direct release began in System III. This one week delay in direct-releasing the smolts, coupled with dewatering the ladder, helped reduce the number of smolts which usually return up the ladder and become stranded.

Included in the direct release from the hatchery were 97,000 SST released for the Nez Perce Tribe under a Harvest Settlement Agreement Plan which had no external mark designating them as hatchery fish. These fish had blank coded wire tags only.

Brood Year 2000 Steelhead

There were 2,882 adult steelhead returned to Dworshak NFH in the fall of 1999 and spring of 2000. A total of 2.7 million eyed eggs went into Dworshak's production program. Dworshak provided 957,000 eyed eggs for the Clearwater Hatchery. Also, 1.66 million green eggs were taken for Magic Valley Hatchery and another 20,000 for Potlatch Pulp & Paper school projects. The production program at Dworshak completed another early rearing phase in the hatchery's nursery without any problems with IHN virus, largely due to a program that relied entirely on the nursery water supply from Dworshak Reservoir rather than the North Fork of the Clearwater River. At the end of FY2000 there were 2.3 million BY2000 SST on station.

There will be 100,000 SST released for the Nez Perce Tribe under a Harvest Settlement Agreement which will have no external mark designating them as hatchery fish.

Brood Year 1998 Chinook Salmon

Dworshak NFH released 1,017,873 BY98 spring chinook salmon, weighing 42,395 pounds. There were approximately 65,000 released March 29–30, 2000, and the remaining 952,000 on April 5–6, 2000.

Brood Year 1999 Chinook Salmon

There were 957 SCS adults returned to the complex in the summer of 1999, 157 returning to Kooskia and 800 to Dworshak. Twenty of the Kooskia fish were passed over the weir into Clear Creek for Idaho Supplementation Study (ISS) fish. Dworshak adult returns for BY99 SCS yielded 84 percent (670) I-ocean males while Kooskia trapped 46 percent (72) I-ocean males. Since 1984, records indicate I-ocean SCS returns average only 12 percent of the run.

These fish produced approximately 338,000 eyed eggs which were shipped to Kooskia for incubation in their colder water. The Complex also received approximately 140,000 SCS eggs of Rapid River stock from Lyons Ferry Hatchery. These eggs were also incubated at Kooskia.

At the end of FY2000 there were 208,000 Dworshak stock, 87,000 Kooskia stock, and 127,000 Rapid River stock on station. These fish averaged 39 fpp and 112 mm (4.4 inches) total length.

Brood Year 2000 Chinook Salmon

Adult returns of BY2000 SCS totaled 3,202 fish to Dworshak. Kooskia had 1,851 fish return, 92 of which were passed over the weir as Idaho Supplementation Study fish (ISS), and 1,175 transferred to Dworshak for spawning. There were approximately 1.11 million Dworshak eyed eggs and 670,000 Kooskia eyed eggs transferred from Dworshak to Kooskia. Included in the Kooskia eggs are 134,000 ISS eggs. There were also 105,000 eyed eggs of Rapid River stock transferred to Dworshak and 175,000 Rapid River stock eyed eggs shipped to Kooskia. These are to be reared at Dworshak and given to the Nez Perce Tribe for release in the summer of 2001. None of these Tribal release fish will have external marks designating a hatchery fish.

Brood Year 1998 Coho Salmon

The coho salmon (COS) at Dworshak are being reared in a cooperative program with the Nez Perce Tribe. There were 273,600 BY98 COS produced at Dworshak. These fish were transferred to Kooskia on April 17–19, 2000, and subsequently released in May of 2000.

Brood Year 1999 Coho Salmon

Adult COS were trapped at Dworshak and various tributaries on the Clearwater River. Coho from Lyons Ferry Hatchery were also transported to Dworshak and mixed with coho adults trapped from the Clearwater River basin. Personnel from the NPT conducted the spawning at Dworshak with assistance from Dworshak staff. The eggs were incubated at Dworshak. There were 88 females spawned which produced 212,000 eyed eggs.

On December 7, 1999, Dworshak received approximately 184,000 BY99 COS eyed eggs from Eagle Creek NFH. On July 10, 2000, the NPT outplanted an estimated 80,000 BY99 COS into Meadow Creek, a tributary of the South Fork of the Clearwater River. There were approximately 200K–300K BY99 COS on station at Dworshak at the end of the fiscal year. No data was reported to Dworshak personnel from the NPT concerning these fish. The Service has currently given office space at Dworshak for a NPT biologist to oversee the COS program.

Brood Year 2000 Coho Salmon

Coho were trapped in the Clearwater River Basin and brought to Dworshak, where personnel from the NPT will conduct the spawning with assistance from Dworshak staff. Spawning will begin in October 2000, and the eggs will be incubated at Dworshak.

Because of the policy of not bringing live adult fish from another basin or out-of-basin hatchery to Dworshak without proper disease certification, the NPT was informed that we would not permit adult COS from Lyons Ferry be brought to Dworshak.

Rainbow Trout—Open House

Dworshak raised approximately 12,000 BY99 RBT. There were 9,000 stocked into a fishing pond at Dworshak for Open House in June 2000 and about 3,000 shipped to Kooskia for their Open House. There were 857 participants at the Open House for Dworshak. The remaining RBT were then stocked into ponds for public fishing and Tribal waters. There are approximately 14,000 BY00 RBT on station for Open House 2001.

Rainbow Trout—Dworshak Reservoir Stocking

Due to concerns about stocking RBT in Dworshak Reservoir, the following fish exchange is planned:

Hagerman NFH will raise approximately 145,000 10" Arlee and Shasta rainbows to be stocked in September and October into several locations including; L. Camas, Oxbow, Hells Canyon, Lucky Peak, and C.J. Strike reservoirs.

IDFG's Hayspur Hatchery will raise approximately 130,000 10–12" sterile rainbows for stocking into Dworshak Reservoir in March, April and May 2001.

Administration

Cost

Funding for hatchery operations included $1,670,064 from COE, $368,328 from LSRCP, $12,591 from Nez Perce Tribe and $22,000 quarters reimbursement.

Fish marking costs billed during FY 2000 were $53,682 to clip steelhead adipose fins. Marking of spring chinook cost $11,535 for coded-wire tagging and adipose fin clipping. Maintenance projects included remodeling the Assistant Hatchery Manager's office and I&E Specialist's office to install new furniture; assembling new dam boards and clean-up in the aeration chamber.

Staffing and Other

Full-time staff years employed by Dworshak NFH were 24.44; permanent employees 23.24 and temporary employees 1.2 staff years. Twenty-seven employees were represented in the staffing during the year.

Outreach and Visitor Activities

A record number of on- and off-site programs and visitor contacts occurred this year since the Information/Education (I/E) section was established in 1995. The addition of a seasonal I/E Assistant allowed for many of these additional program opportunities. A new *Hatchery in the Classroom* program was awarded to two area schools, to raise and release steelhead trout. The tenth annual Open House and Kids' Fishing Day was held June 9, with 857 children attending. Many cooperative programs were presented to the public and to student groups this year. The Dworshak I/E team conducted the first ever week-long "IDAH_2O Water Camp" in Lewiston for teachers throughout the state.

Program Highlights

The Clearwater River Youth Program was re-established this summer, with 6 high school students and a crew leader hired for 8 weeks. The I/E team provided activity leadership at two major salmon festivals in Idaho and Washington for over 13,000 people. Various student career days and job shadows also occurred throughout the year. Grants totaling over $7000 were awarded for outreach projects at Dworshak hatchery this year, and planning for the Lewis/Clark Bicentennial celebration increased outside funding opportunities for the next several years.

Steelhead Trout

Brood Year 1999

At the beginning of October 1999, all of the summer steelhead trout (SST) from brood year 1999 (BY99) were outside in Burrows ponds (BPs), totaling 2.2 million fish. Overall mortality from October 1, 1999, through final release on May 5, 2000, was less than four percent. The final release number was 2.15 million SST smolts with an average total length of 201 mm (Table 1).

Table 1. Fish inventory summary for BY99 SST on October 1, 1999, and final release summary in May, 2000.

	October 1, 1999			Sept-May % Loss	Final Release April 17–May 5, 2000		
Location	Number	Length in	Length mm		Number	Length in.	Length mm
Sys I	614,980	5.61	142	1.1	613,297*	8.05	204
Sys II	632,590	4.95	126	2.7	623,297	7.99	203
Sys III	971,249	4.16	106	6.9	909,113	7.74	197
Tot/Ave	2,218,819	4.79	122	3.3	2,145,707	7.90	201

[1]Numbers increased slightly after October 1 due to the inventory from the coded wire tagging done in November 1999.
* This number includes 2,800 fish which were used in a radio frequency study at various dams along the migration corridor.
Source: DNFH - Final Release Summary, May 2000.
Monthly Inventory Summary (MIS), October 1, 1999.
Production Narrative, May, 2000.

There were 837,060 smolts outplanted to the South Fork of the Clearwater River and Clear Creek during the third week of April. The direct release of 1,308,647 smolts took place the first week of May, one week later than usual. The fish ladder was closed and de-watered once the direct release began in System III. This one week delay in direct-releasing the smolts, coupled with de-watering the ladder, helped reduce the number of smolts which usually return up the ladder and become stranded.

Water temperatures in the two reuse systems (Systems II & III) were kept close to 52°F during the winter rather than the usual 54°F. This appeared to help control disease problems while still allowing for desirable growth of the fish.

Fish in seven BPs were diagnosed positive for *infectious hematopoietic necrosis* (IHN). Six of these ponds were in System III.

BY99 SST were reared to final release size in BPs. Table 2 illustrates the survival rates of various stages of development for BY99 SST along with a five-year comparison. FY91 was the first year that a direct water-line from Dworshak Dam to the incubators and nursery was available, helping reduce health problems in the early rearing stages of SST.

Loading of SST from the middle and later egg Takes in Systems II and III was reversed from previous years, with System II being stocked with Takes 6–9 and System III receiving Takes 9–14. This was due to construction of an aluminum release channel in System III at the time of ponding Take 6 out of the nursery. This ponding strategy worked better for the marking crew than in previous years and may be repeated in future rearing cycles.

Table 2. Survival summary from green eggs to released smolts, BY94 through BY99 SST reared at Dworshak NFH.

	% Surviving from previous stage				Cumulative % Survival		
Brood Year	(Green to) Eyed Egg*	Tanked Fry	Ponded Finger lings	Smolt Release	Green Egg to Smolt**	Eyed Egg to Smolt	Tanked Fry to Smolt
1995	90.7	89.5	95.4	90.1	60.0	74.9	85.9
1996	88.5	91.1	86.3	97.2	51.0	75.2	83.5
1997	88.6	91.7	92.3	87.4	45.2	73.4	80.0
1998	87.5	90.0	96.6	89.5	49.1	77.7	86.4
1999	91.9	94.9	93.2	94.3	50.3	83.2	87.9
5yr Ave	**89.5**	**91.4**	**92.8**	**91.7**	**51.1**	**76.9**	**84.7**
2000 YTD[1]	90.7	90.0	91.3				

Note: Data are only for SST reared entirely at Dworshak NFH.
[1]Due to malfunction with egg picker, numbers are estimated.
* % Survival Green to eyed = Enum Eyed Eggs / Enum Eyed Eggs + Enum Dead Eggs. i.e. survival after culling bad trays, females.
** Green eggs to smolt = Total Green Eggs (including those from females culled during enum) - Magic Valley Grn Eggs - Clearwater Hatchery eggs. (This calculation method beginning in 1997).
Source: DNFH - Egg Enumeration and Disposition Summary- EgEnumST00.wk4
Nursery Loss-nulo99st.wpd
Spawning/Egg Take Plan, BY99 SST

Reuse (heated water) was turned on November 29, 1999, for System II and III. Water temperature spiked to 58°F in System II and went to 55°F water in System III. On November 30, reuse was kept on but the boilers shut off. On December 7, the boilers were turned back on, resulting in approximately 52°F water for both systems. The boilers were turned off for the final time in System II on March 28 and on April 3 for System III. The reuse system was turned off for System II on April 10 and on April 6 for System III.

Some SST in all Systems received coded wire tags (CWTs) and left ventral (LV) clips. Within these study groups, some fish also received freeze brands (FBs). The various marks and brands are used for studies concerning system contribution of these fish to later adult returns, offsite

release contribution, broodstock evaluations, and early-run predictions at Lower Granite Dam. Fish which received PIT tags will be monitored for downstream survival and for residual studies.

There were a total of 97,000 SST from System III which received a CWT but no AD clip to designate them as hatchery fish. These are the first SST released from Dworshak since 1984 without an external mark specifying a hatchery fish. This is in accordance with the Harvest Settlement Agreement with the Columbia River Tribes.

A total of 227,000 SST received CWTs; 70,000 received FBs; and 9,500 received PIT tags. See the Marking/Tagging tables under each System for details.

System I

For BY99 SST, System I production included 24 BPs. This System held 614,980 SST at the start of the fiscal year and 613,297 at release in April and May 2000 (Table 3).

Table 3. System I Burrows pond production, BY99 SST, FY2000.

Month	Year	1st of Month			Growth		% Mortality for Month	Ave Temp °F for Month
		Number	fpp	L (mm)	in	mm		
October	99	614,980	16.18	143	0.70	18	0.09	48.2
November	99	618,456*	11.60	159	0.66	17	0.15	47.3
December	99	617,520	9.78	169	0.4	9	0.10	45.1
January	00	616,883	8.46	177	0.33	8	0.18	42.6
February	00	615,783	7.43	185	0.31	8	0.16	41.7
March	00	614,781	6.59	192	0.30	8	0.14	40.2
April	00	613,893	5.86	200	0.30	8	0.10	42.1
May[1]	00	415,990	5.32	206	0.26	7	0.14	43.6
Release Tot/Ave	00	**613,297**	5.48	**204**			1.07	43.9

* Slight increase in numbers due to CWT inventory
[1] Partial release of fish in April
Source: DNFH - MIS, Sept 1999–May 2000
Final Release summary, BY99 SST
Production Narratives Sept–May, 1999–00
Daily Water Temperature Records, Oct–April, 1999–00

Adipose fins were clipped on BY99 SST in System I from June 2 until July 17, 1999. Other marking of BY99 SST in System I is summarized in Table 4.

Table 4. Marking and Tagging of BY99 SST, System I, FY2000.

Date	BP #	Number CWT	Number Freeze Brands	Number PIT tags	Fin Clips	Study	Release Site
4/17/00 10/25/99	BP 11	22,204	10,452	250	AD LV	Sys I Contribution Outmigration	Dworshak
3/29/00	BP 9			2,800	AD	Radio Frequency	6 dams*
4/05/00	BP 15			300	AD	Off-site Residual	South Fork CWR
4/05/00	BP 17			300	AD	Off-site Residual	South Fork CWR
4/18/99	BP 21			300	AD	Residual	South Fork CWR
4/18/99	BP 27			300	AD	Residual	Kooskia
4/17/00	BP 31			300	AD	Residual	Dworshak
4/17/00	BP 35			300	AD	Residual	Dworshak
4/17/00	BP 39			300	AD	Residual	Dworshak
4/17/00 10/28/99	BP 49	22,212	10,279	251	AD LV	Early Return Progeny Outmigration	Dworshak
Total		44,416	20,731	5,401			

* 800 fish to Lower Granite dam. 400 fish to each of the following dams: Little Goose, Lower Monumental, McNary, John Day, and Bonneville.

Source: DNFH - MIS System I, Sept 1999
IFRO - Branding, Tagging.DBF
IFRO - MRKLPN99.wk4
IDFG - Fish Marking Summary 1999

There were 75,147 SST from System I split into BPs 46, 48, and 50 (System II) from July 27 to August 12. These were SST of early-return progeny from Takes 1–3.

During the10-month outside rearing cycle in System I, fish were treated for small outbreaks of both *Pseudomonas* infection and *Trichodina*. Mortality in System I from October 1, 1999, until final release in May of 2000 was approximately 1.1 percent. Numbers increased slightly during the inventory of the coded wire tagging operation in the fall of 1999.

On April 17–20, 2000, there were 200,134 SST outplanted from System I. The Corps of Engineers (COE) assisted in outplanting the SST to Clear Creek and the South Fork of the Clearwater River at River Mile 8.7, Red House Hole. Included in this number were 2,800 SST

which were PIT tagged for the National Marine Fishery Service (NMFS) to check various radio frequencies of new tags. These fish were divided up and outplanted to various dams along the Snake and Columbia Rivers.

Direct release of 413,163 SST from System I into the main stem of the Clearwater River took place on May 5. The total release from System I was 613,297 BY99 SST (Final Release Summary, BY99 SST).

System II

For BY99 SST, System II production included 25 BPs. This System held 632,590 SST at the start of the fiscal year and 623,297 at release (Table 5).

Table 5. System II production, BY99 SST, FY2000.

Month	Year	1st of Month			Growth		% Mortality	Ave Temp °F for Month
		Number	fpp	L (mm)	in	mm		
October	99	632,590	23.58	126	0.71	18	0.61	48.2
November	99	628,746	15.56	144	0.74	19	0.15	47.6*
December	99	634,342**	12.39	156	0.45	11	0.57	51.2*
January	00	630,700	10.23	166	0.40	10	0.48	51.3*
February	00	627,666	8.87	174	0.32	8	0.41	51.9*
March	00	625,079	7.49	184	0.40	10	0.19	52.8*
April	00	623,876	6.05	198	0.54	14	0.09	42.6
May[1]	00	375,223	5.44	205	0.28	7	0.15	43.6
Release Tot/Ave	00	**623,297**	5.59	**203**			2.7	48.7

* System under heated reuse water for part or all of month
** Slight increase in numbers due to CWT inventory
[1]Partial release of fish in April
Source: DNFH - MIS, Sept 1999–May 2000
Final Release summary, BY99 SST
Production Narratives Sept–May, 1999–2000
Daily Water Temperature Records, Oct–April, 1999–2000

In July and August there were a total of 75,147 SST from System I transferred to System II (see System I for details).

Adipose fin clipping was done on BY99 SST in System II from July 15–28, 1999. Other marking of BY99 SST in System II is summarized in Table 6.

Table 6. Marking and tagging of BY99 SST, System II, FY2000.

Date	BP #	Number CWT	Number Freeze Brands	Number PIT tags	Fin Clips	Study	Release Site
4/05/00	BP 12			300	AD	Off-Site Residual	South Fork CWR
4/05/00	BP 16			300	AD	Off-Site Residual	Clear Creek
4/17/00 11/02/99	BP 22	22,149	5,308	250	AD LV	System II Contribution Outmigration	Dworshak
4/17/00 11/04/99	BP 24	22,164	5,308	250	AD LV	System II Contribution Outmigration	Dworshak
4/19/00	BP 36			300	AD	On-Site Residual	Dworshak
4/19/00	BP 46			301	AD	On-Site Residual	Dworshak
4/19/00	BP 48			300	AD	On-Site Residual	Dworshak
4/19/00 11/05/00	BP 50	22,159		300	AD LV	On-Site Residual Early Progeny Outmigration	Dworshak
Totals		66,472	10,616	2,301			

Source: DNFH - MIS System II, August 1999
IFRO - Branding, Tagging.DBF
IFRO - MRKLPN99.wk4
IDFG - Fish Marking Summary 1999

Fish in System II were treated with oxytetracycline feed for control of *Pseudomonas* infection in the fall of 1999. There was a low-level infection of *Ichthyophthirius* (ICH) during the winter. Control of the ICH was accomplished using formalin treatments and keeping the water temperature in the reuse system near 52°F rather than the usual 54°F. Mortality remained low and resulted in a loss of approximately 2.7 percent from October 1, 1999, until release in May 2000.

System II converted to reuse on November 29. Temperature then spiked to 58°F. The reuse system remained on, but the boilers were shut down on November 30. On December 7 the boilers were turned back on, and temperature were kept near 52°F until the boilers were shut down on March 28. The reuse system was turned completely off in System II on April 10.

On April 17–19 there were 248,084 SST outplanted from System II. The COE assisted in outplanting the SST to Clear Creek and the South Fork of the Clearwater River at River Mile 8.7, Red House Hole.

Direct release of 375,213 SST from System II into the main stem of the Clearwater River took place on May 4. The total release from System II was 623,297 BY99 SST (Final Release Summary, BY99 SST).

System III

System III has 34 BPs. This System had 971,249 SST at the beginning of the fiscal year. Final release numbers were 909,113 fish which averaged 197 mm total length (Table 7).

Table 7. System III production, BY99 SST, FY2000.

Month	Year	1st of Month			Growth		% Mortality	Ave Temp °F for month
		Number	fpp	L (mm)	in	mm		
October	99	971,249	39.6	106	0.70	16	1.92	48.2
November	99	952,572	26.1	122	0.62	16	1.92	47.5
December	99	934,313	19.3	134	0.51	13	0.19	50.5*
January	00	932,556	14.1	149	0.58	15	0.55	51.3*
February	00	927,419	11.6	159	0.39	10	1.35	51.9*
March	00	914,887	9.1	173	0.53	13	0.45	52.8*
April	00	910,772	6.8	190	0.69	18	0.18	43.1*
May	00	520,283	6.2	196	0.23	6	0.32	44.1
Release Tot/Ave	00	**909,113**	6.2	**197**			6.9	48.7

* System under reuse part or all of month.

Source: DNFH - MIS, Sept 1999–May 2000
Final Release summary, BY99 SST
Production Narratives Sept-May, 1999–00
Daily Water Temperature Records, Oct–April, 1999–00

Adipose fin clipping was done on BY99 SST in System III from July 28 until August 27, 1999. Other marking of BY99 SST in System III is summarized in Table 8.

Table 8. Marking and tagging of BY99 SST, System III, FY2000.

Date	Burrows pond	CWT	Freeze Brands	PIT Tags	Fin Clips	Study	Release Site
4/05/00	BP 51			300	AD	Off-Site Residual	Clear Creek
4/19/00	BP 53			306	AD	On-Site Residual	Dworshak
4/19/00	BP 56			300	AD	On-Site Residual	Dworshak
11/10/99	BP 57	25,407			No AD	NPT - No AD clip/ No marks to show hatchery fish	Dworshak
11/10/99	BP 59	24,612			No AD	NPT - No AD clip/ No marks to show hatchery fish	Dworshak
11/16/99	BP 62	22,330			AD LV	Off-Site Residual	Clear Creek
4/05/00 11/10/99	BP 63	21,892	5,300	250	AD LV	System III Contribution	Dworshak
05/17/00 11/08/99	BP 68	22,007	5,300	250	AD LV	System III Contribution Outmigration	Dworshak
9/05/00	BP 67			300	AD	Off-Site Residual	South Fork CWR
11/11/99	BP 81	23,465			No AD	NPT - No AD clip/ No marks to show hatchery fish	Dworshak
11/11/99	BP 83	23,499			No AD	NPT - No AD clip/ No marks to show hatchery fish	Dworshak
Total		139,713	10,600	1,706			

Source: DNFH - MIS System III, Sept 1999
IFRO - Branding, Tagging.DBF; IFRO - MRKLPN99.wk4
IDFG - Fish Marking Summary 1999

There were a total of 97,000 SST in BPs 57, 59, 81, and 83 which received a CWT but no AD clip to designate them as hatchery fish. These are the first SST released from Dworshak since 1984 without an external mark specifying a hatchery fish. This is in accordance with the Harvest Settlement agreement with the Columbia River Tribes.

As with System II, steelhead in System III were treated with oxytetracycline feed for control of *Pseudomonas* infection in the fall of 1999. There was also a low-level infection of ICH over

the winter. Control of the ICH was accomplished using formalin treatments and keeping the water temperature in the reuse system near 52°F rather than the usual 54°F. Cumulative mortality in System III was approximately 6.9 percent from October 1, 1999, until release in May 2000.

System III was converted to reuse on November 29. Temperature then spiked to 55°F. The reuse system remained on, but the boilers were shut down on November 30. On December 7 the boilers were turned back on, and temperatures were kept near 52°F until the boilers were shut down on April 3. The reuse system was turned completely off in System III on April 6.

On April 18–20, 2000, there were 388,842 SST outplanted from System III. The COE assisted in outplanting the SST to Clear Creek and the South Fork of the Clearwater River at River Mile 8.7, Red House Hole.

Direct release of 520,271 SST from System III into the main stem of the Clearwater River took place on May 3–5, 2000. The total release from System III was 909,113 BY99 SST (Final Release Summary, BY99 SST).

Distribution Summary

Release of BY99 SST began April 17, 2000, and ended May 5. Final release numbers are illustrated in Table 9.

Table 9. Fish distribution summary by site, BY99 SST, April 17 to May 5, 2000.

Site	Number	Weight	fpp	Length	
				in	mm
Outplants 4/17-4/20					
Clearwater R. - Red House Hole	622,567	103,341	6.02	7.80	198
Clear Creek	211,693	35,830	5.91	7.85	199
Six Snake R. & Columbia R dams (System I)	2,800	410	6.83	7.48	190
Subtotal	837,060	139,581	6.00	7.81	198
Direct Release 5/03-5/05					
Main Stem of the Clearwater River	1,308,647	231,338	5.66	7.96	202
Totals/Averages	**2,145,707**	**370,919**	**5.78**	**7.90**	**201**

Source: DNFH - Final Release Summary, BY99SST

Brood Year 2000

Adult Collection

Adult summer steelhead trout (SST) for Brood Year 2000 (BY2000) were collected in the late fall of 1999 and again in the winter and spring of 2000 to represent the entire run. The ladder was first opened on October 1, 1999, and closed December 16. During this 77-day period there were 473 early-run steelhead collected. The fish ladder was reopened February 3, 2000, and closed May 1. During the February through May operation there were 2,409 steelhead collected for a total of 2,882 fish returned for the BY2000 run. This number includes 470 jacks but does not include the approximate 90 adults which escaped from the trap in February.

Sometime before February 29, 2000, a poacher snagged the grating off the bottom of the fish trap. An estimated 90 SST escaped through the opening and were lost in the various water channels and pipes underneath Dworshak National Fish Hatchery (DNFH). Attempts to recover these fish proved futile. The grating was secured by a diver so that no more fish could escape. When spawning was completed, the water from the fish ladder and trap was drained and carcasses collected. There were approximately 90 dead SST found.

Figure 1 illustrates the numbers of returning SST adults since 1989, the first year that opening the ladder in the fall became the standard operating procedure for Dworshak NFH.

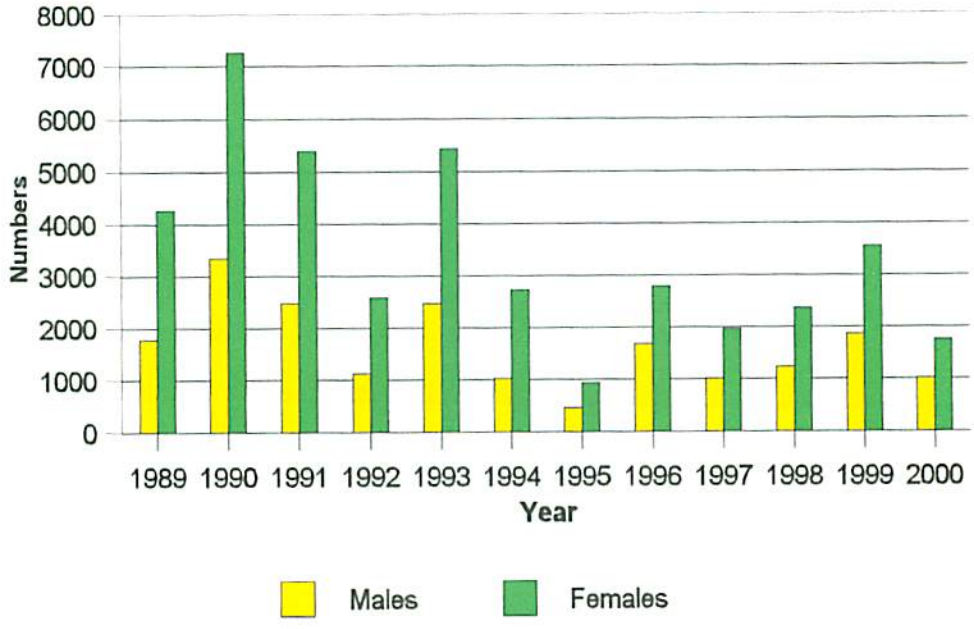


Figure 1. Dworshak adult SST returns 1989–2000

Source: DNFH - Spawning Report SST BY00
Spawning/Egg Take Plan SST BY00, ST00EgTk.wk4
IFRO - SST Rack Returns, Sth00ent.wk4

Nine of the 473 early return adults died before spawning. One hour formalin bath treatments of 167mg/l began on December 6, 1999, and appeared to control the fungus infection.

Spawning Numbers/Ratio

There were 1,674 SST spawned over the BY2000 season. Historically, females have outnumbered males in returns and have made the goal of a 1:1, male:female spawning ratio difficult to achieve at Dworshak. In BY2000 the male:female return ratio was 1:1.7, and the spawning ratio was 1:1.4. There were 274 jacks spawned during the season. Green and surplus males and females were returned to HPs 1, 2 or 3 to be either spawned later or outplanted.

Spawning Procedures

Spawning began Tuesday, February 1, 2000, and was conducted each Tuesday through May 2. Beginning with egg Take 1, personnel from both DNFH and the Idaho Fishery Resource Office (IFRO) concurrently inspected and spawned the most recently returning adults from HP9.

Adult SST were pushed by mechanical crowders from HP9 into a channel, moved into a channel basket, and placed into an anesthetic bin. If there were not enough ripe fish in HP9 to meet the number of eggs targeted for the day, unripe adults from earlier Takes were examined.

The fish were anesthetized with carbon dioxide at a rate of 400 to 1000 mg/l solution buffered with 8 to 10 pounds of sodium bicarbonate. Although carbon dioxide (CO_2) as an anesthetic appears more stressful on the fish than MS-222, carcasses anesthetized with CO_2 can be used for human consumption. Oxygen was provided at a rate of one l/minute. Spinal columns of ripe females were severed using a pneumatic knife. The females were then placed on a table for 5–20 minutes for blood drainage. The ventral side was then cut open using a spawning knife, and eggs were collected in disinfected colanders. After ovarian fluid was drained, the eggs were poured into a clean bucket.

Milt from ripe males was stripped into Styrofoam cups, and a one-percent saline solution was added to assist in milt motility. The milt solution was poured onto the eggs and swirled to aid in more complete fertilization. After sufficient time had elapsed for fertilization to take place (one to two minutes), the eggs were rinsed of sperm, blood, and other organic matter.

After rinsing, eggs were placed in Heath incubator trays at approximately 6,660 eggs per tray (1 female). In the tray was a 75 mg/l iodophor solution buffered with sodium bicarbonate. Eggs were maintained in this solution for approximately 30 minutes. This was done as a precaution against disease transmission. The egg trays were then pushed into the incubator stack, flushing the iodine. Water flow rate was approximately five gallons/minute, and temperature averaged approximately 54°F.

Upon eye-up (approximately 15 days after fertilization at 54°F), the eggs were shocked. The next day the eggs were enumerated and sorted using an electronic egg picker and counter (Van Gaalen Model N-100). Eggs from Takes 1–12 were placed into 2.5 gallon hatching jars (16,500 eggs per jar for most Takes) in the nursery. Due to space constraints in the nursery, eggs from Takes 8–10 were enumerated and double-loaded into jars (33,000–35,000 eggs/jar). In June, fish from these Takes were split into tanks which held earlier egg Takes. Eggs from Takes 13 & 14 were enumerated and returned to Heath trays (5,500 per tray) and hatched in the trays.

Once Take 1 was moved from the nursery to outside ponds, fry from Takes 13 & 14 were moved into these vacated nursery tanks. The water flow was approximately 5 gpm in both the trays and jars. The hatching jars drained into 670 gallon rectangular nursery tanks. As the fry swam up, they flowed into these tanks for initial rearing.

Idaho Fish Health Center Disease Sampling

Twenty early-return males were injected with LHRH hormone on January 20, 2000, to insure enough ripe males the first day of spawning on February 1. All of these males were ripe when spawned during the early Takes.

Approximately 32 percent (88 out of 275) of the females spawned for Magic Valley Hatchery (MVH) (Takes 7–12) tested positive for *infectious hematopoietic necrosis* (IHN). Testing was done by personnel from Idaho Fish Health Center (IFHC). Disease testing on eggs for Clearwater Hatchery (CWH) was done by the Idaho Fish and Game (IDFG) Eagle Creek Laboratory. Approximately 5.2 percent (9 out of 174) of the females from Takes 6–8 for CWH tested positive for IHN. All eggs taken for either MVH or CWH which tested positive for IHN were discarded. There were 2.4 percent (3 out of 126) of the females sampled for Dworshak which tested positive for IHN. Dworshak does not cull eggs which may test positive for IHN in its production program.

Spawning Summary

A total of 14 egg Takes were spawned during BY2000 SST, beginning on February 1, 2000, and ending on May 2. There were 970 females and 704 males spawned, and the average fecundity of all SST enumerated at DNFH was 6,660 eggs/female. Early-returning adults were spawned during Takes 1–4 and later returning adults were spawned during Takes 5–14.

Egg Disposition

After shipping eggs for CWH and MVH, and culling both green and eyed eggs, DNFH put approximately 2.7 million eyed SST eggs into its nursery for rearing.

Clearwater Hatchery received 957,000 eyed eggs for incubation for their program. These eggs were from Takes 6–8. Dworshak also provided CWH personnel with 1.66 million green eggs for MVH from Takes 7–12 and 20,000 green eggs from Take 8 for IDFG and Potlatch Pulp & Paper Mill school outreach program.

Performance/Cryopreservation Studies

This is the fourth year that DNFH has provided small amounts of excess SST milt and eggs to the University of Idaho (U of I). Researchers are testing the effects of carbon dioxide and oxygen on sperm motility and fertility. Some of the eggs provided were used in these studies along with research on ATP levels and egg viability studies. Dworshak provided a portion of milt from 53 males and eggs from 66 females for the season-long study. All eggs and milt given for research to the U of I were partial lots shared with DNFH and included in Dworshak's spawning numbers. Dworshak also provided livers from 15 SST carcasses and 38 ml blood from nine carcasses. The livers will be used to help determine whether various chemical agents which may disrupt the effects of endocrine have specific actions on estrogen receptors. The blood samples, along with

some of the milt samples, will be used to examine the buffering capacity of seminal plasma and blood plasma.

On April 4 Dworshak also provided blood samples from carcasses of 11 females and 14 males to a graduate student at the U of I. This study pertains to growth hormones in steelhead prior to spawning.

Nez Perce Tribe Research

The Nez Perce Tribe (NPT) was funded in 1999 by the Bonneville Power Administration (BPA) to coordinate gene banking of male gametes from the Endangered Species Act listed steelhead in the Snake River Basin. Although Dworshak SST are part of the Endangered Species ESU, they are not essential for recovery. Dworshak stock are unique and represent the genetic stock of North Fork of the Clearwater basin. Dworshak provided milt from SST for cryopreservation to the NPT during Takes 7–11. Dworshak provided the Tribe with milt from a total of 91 males, along with tissue samples for DNA analysis from 57 adult fish.

Adult Disposition

There were 285 hatchery adults outplanted from Dworshak during the return run of BY2000 SST. This outplanting was coordinated by staff from Dworshak Fisheries Complex, the IDFG and NPT.

There were also six adult returns which were Biological Resources Division (BRD) Supplementation Study SST (no adipose fin clip, right ventral fin clip, and no coded wire tag). These were outplanted to Crooked River by IFRO personnel on the day they were examined at the hatchery. Table 1 illustrates the dates, number of fish, and location of the outplantings.

Table 1. Returning adult steelhead outplanted from Dworshak NFH in 2000.

Date	Male	Female	Jack	Total	Location
3/22	0	108	0	108	Mill Creek, SF Clearwater R.
4/05	0	95	0	95	Meadow Creek, SF Clearwater R.
4/20	6	56	0	62	Lolo Creek, Main stem Clearwater R.
5/02	8	12	0	20	Lolo Creek
Subtotal	14	271	0	285	
3/14–4/18	1	5	0	6	Crooked River - BRD Supplementation Study Fish
Total	15	276	0	291	

Source: DNFH- Spawning Activity Report, BY2000 SST.
Spawning and Run Summary, BY2000 SST

Usable fish carcasses from spawning and culling activities were provided to a processor to be packaged for human consumption under a program with the Federal Bureau of Prisons. Complete adult disposition is illustrated in Table 2.

Table 2. Adult disposition of BY2000 SST from Dworshak.

LOCATION	NUMBER	COMMENTS
WSU & Idaho Bear Program	609	WSU captive bear & eagle program
Fed Bureau of Prisons	1,766	Latham Processing
Nez Perce Tribe	8	2 Male, 6 Females
Outplanted	285 (plus 6 BRD fish)	See Table 6 for outplant details
Landfill	208	Carcasses deteriorated beyond use
Total*	2,882	

*This total does not include all the missing fish lost when the grate was removed from the fish trap.
Source: DNFH- Spawning Activity Report BY2000 SST, Dworshak Take 14
Spawning and Run Summary, BY2000 SST.

Nursery and Early Rearing

Eyed eggs were put into the nursery at an average rate of 16,500 eggs/tank for Takes 1–7 and 11–14. Takes 8–10 were double loaded at a density of 34,000/ tank due to the lack of available nursery tanks. These fish were later split into tanks previously used for egg Takes 2–4 once these early fish were moved outside the nursery into BPs. Eggs from all of Takes 1–12 were placed into incubator jars over the tanks. When approximately 70 percent of the fry had hatched, the remaining fry were poured into the tank. Due to lack of nursery space, Takes 13–14 were hatched in Heath trays (5,500 per tray). These were moved as fry from the incubation trays into tanks vacated once Take 1 was transferred outside. Dead eggs and fry were picked and enumerated from each tank and tray. Due to a malfunction with the egg counter, the survival from the eyed-egg stage to feeding fry is estimated at 90 percent.

This year the fry from the nursery averaged 83 fish per pound (fpp) when moved out of the nursery into BPs. Fish which did not receive a coded wire tag (CWT) were transferred from the nursery directly to the adipose fin (AD) clipping trailer. From the trailer, fish were distributed directly to the appropriate BP. Steelhead which will receive a CWT went directly from the nursery to a BP and will be tagged in November 2000. Idaho Department of Fish and Game (IDFG) once again provided the trailer and AD clipping crew.

A total of 2.34 million BY2000 SST were moved from the nursery to the BPs beginning with Take 1 on May 31, 2000, and ending with Take 14 on August 30.

Feed

For the first time, all steelhead in the nursery were fed Moore-Clark feed. Major temperature variations in the nursery during the spring of 2000 made it difficult to compare this feed with the traditional Biodiet feed used in previous years at Dworshak.

Projected Release

Historical losses indicate a projected release number of approximately 2.2 million SST in the Spring of 2001. Table 3 illustrates the steelhead on station at the end of FY2000 and projected release numbers.

Table 3. BY2000 SST on station and projected release summary, (9/30/2000).

As of September 30, 2000					Projected to release—April/May 2001		
System	Number	Weight (lbs)	fpp	L (mm)	Proj % Loss to Release	Proj Release Number	Proj Size at Release (mm)*
Sys I	708,593	47,336	15.0	146	4	680,249	200
Sys II	638,572	25,475	25.1	123	4	613,029	209
Sys III	950,534	22,634	42.0	104	4	912,513	190
Total/ Average	**2,297,699**	95,445	29.0	122	**4.0**	**2,205,791**	**198**

*Projected length based on Systems II & III going on reuse end of November through March 1.
Source: DNFH - MIS data, October 1, 2000
DNFH - Production Narrative, September, 2000

System I

System I received 725,000 BY2000 SST. Steelhead in System I were moved out of the nursery beginning with Take 1 on May 31, 2000, and ending with Take 6 on July 19. A small marking trailer from Idaho Fish and Game (IDFG) was set up at the end of May and personnel handled all fish out of the nursery with the exception of the fish which will later receive coded wire tags (CWTs). This is the first time that all early-Take fish went directly through the marking trailer and final loaded into the BPs. Fish in BPs 15 and 49 will be AD clipped and receive CWTs in November 2000.

Only fish in BP 5 had been confirmed positive for IHN in System I by the end of FY2000. All fish in System I were treated for *Trichodina sp.* in September 2000.

System II

System II received 650,000 SST during July and August 2000. Fish in System II were moved out of the nursery beginning with Take 7 on July 24, 2000, and ending with Take 9 on August 9. Steelhead from Takes 7–9 were loaded from the nursery into a transport tank and moved directly to the AD clipping trailer. From the trailer, fish were marked and stocked at final densities to the outside BPs. Steelhead in BPs 16, 34, and 50 will be CWTed and AD clipped in November 2000. Pond 50 will receive fish split from BP49 in November 2000.

Steelhead in five BPs were confirmed IHN positive in System II by the end of FY2000.

System III

System III received 955,000 SST from Takes 9–14 beginning with Take 9 on August 7 and ending with Take 14 on August 30. These fish were loaded directly from the nursery to the marking trailer and then stocked at final rearing densities into System III BPs. Fish in BPs 76, 77, and 78 will be coded wire tagged and AD clipped in November 2000.

Fish in BPs 61, 63, 73, and 75 (approximately 100,000 fish) will be CWTed but will receive no external mark to indicate a hatchery fish. This is the second time since 1984 that Dworshak will release hatchery fish without an AD clip. This is in accordance with the Harvest Settlement Agreement with the Columbia River tribes.

Steelhead in one BP were confirmed IHN positive in System III by the end of FY2000.

Spring Chinook Salmon

Brood Year 1998

On October 1, 1999, there were 961,896 BY98 spring chinook salmon (SCS) on station at Dworshak. All of these fish were low *bacterial kidney disease* (BKD) status and Dworshak stock, except for 20,710 Kooskia stock which were high BKD status. The Kooskia fish were transferred to Kooskia on December 3, 1999.

During November 1999, SCS in 3 raceways (RWs) were diagnosed with BKD. Fish in one RW received pills top-coated with erythromycin using vegetable oil as a carrier. The other fish were treated using standard medicated feed. After nine days, the pill treatment was deemed unsuccessful, as the fish would not eat the pills. These fish were then converted to a standard medicated feed. Mortalities declined during the 21 day treatment.

From February 16, 2000, until March 15, 2000, there were 47,746 BY98 SCS PIT tagged. This study is for a survival comparison of barging vs. trucking of smolts in the Columbia Basin.

On March 2, 2000, there were 101,018 BY98 Dworshak stock SCS transferred from Kooskia to Dworshak. These fish were approximately 22 fpp at time of transfer. They were initially loaded into RWs A12 and A14 and split to RW B30 on March 9.

Dworshak continued to work with outside researchers studying chinook. On March 23, 2000, staff from Jim Congleton (University of Idaho professor) sampled 60 BY98 SCS for indices of fish conditioning; body lipid levels, blood glucose concentrations, cholesterol, triglycerides, total protein and activities of various enzymes involved in metabolism. These parameters are used to help determine the effects of fish condition concerning migration through the Snake and Columbia River hydropower system. Fish will also be examined at Lower Granite and John Day dams.

On March 29, 2000, there were 65,468 BY98 SCS smolts released from RW29 and 30 to make room for the Nez Perce Tribe's BY99 coho moved out of the nursery.

On April 5–6, there were 952,405 BY98 SCS released from Dworshak into the North Fork of the Clearwater River. This totaled 1,017,873 BY98 SCS smolts released from Dworshak (Table 1).

The release was performed late in the day to assist the smolts with predator avoidance. High water flow due to heavy rains also assisted in downstream migration.

Table 1. BY98 SCS in System I Raceways, 9/30/99, and release data, 03/22, 04/05 & 04/06/00.

September 30, 1999				% Loss 9/30/99 to 4/06/00	Final Release March 29, April 5-6, 2000			
Number	Weight lbs	fpp	Length mm		Number	Weight lbs	fpp	Length mm
961,896	14,684	65.5	94	4.3	1,017,873*	42,395	24.0	132

*There were an additional 101,018 BY98 Dworshak stock SCS transferred from Kooskia to Dworshak on March 2, 2000, included in the final release numbers.
Source: DNFH- MIS, October 1, 1999
Production Narrative, April, 2000
Final Release Summary, BY98 SCS

Brood Year 98 SCS had an enumerated survival of green egg to eyed egg of 92.9 percent. All Dworshak and Kooskia SCS eggs are shipped to Kooskia in the fall as enumerated eyed eggs to take advantage of the colder incubation water at Kooskia. Fry are then shipped back to Dworshak in the spring and placed directly into outside rearing ponds. Because of this, no precise data is available for percent survival to other life stages.

Personnel from the Idaho Fish Health Center (IFHC) observe little or no increased survival of smolts when treated with erythromycin prior to release. Unlike previous years, there was no INAD investigation study for using erythromycin against BKD done with the BY97 or BY98 SCS.

Brood Year 1999

There were 957 SCS adults returned to the complex in the summer of 1999, 157 returning to Kooskia and 800 to Dworshak. Twenty of the Kooskia fish were passed over the weir into Clear Creek for Idaho Supplementation Study (ISS) fish. Dworshak adult returns for BY99 SCS yielded 84 percent (670) I-ocean males while Kooskia trapped 46 percent (72) I-ocean males. Since 1984, records indicate I-ocean SCS returns average only 12 percent of the run. Adults spawned and eggs produced from BY99 SCS are represented in Table 1.

Table 1. Dworshak and Kooskia adult spawners and both green & eyed egg numbers, BY99 SCS.

Location Adult Return	Males Spwnd	Fmls Spwnd	Fmls Culled BKD	Dead Egg Trays Culled	# Eggs/ Female	Total Eggs Enumerated	# Eyed Eggs Enumerated	% Survl Enum Eye-up
Dworshak	56	63	1	1	4,378	249,726	232,990	93.3
Kooskia	23	26	0	0	4,094	113,827	104,867	92.1
Total/ Average	79	89	1	1	4,295	363,553	337,857	92.9

Source: DNFH - Final BY99 SCS Enumeration and % Survival of Eggs. SC99EGEN.wk4
BY99 SCS Spawning Report
Dworshak Annual Report, 1999

For large-scale incubation, the water temperature in the incubation stacks at Dworshak can be reduced to approximately 44°F. The incubation temperature at Kooskia can be maintained at approximately 39°F. It was decided that all BY99 SCS eggs be shipped to Kooskia for incubation after eye-up and enumeration at Dworshak. This should effectively delay hatching approximately three months and assists in reaching the desired 20 fish per pound (fpp) size at release in the spring of the year 2001.

All BY99 eggs from females with an ELISA reading of greater than 1.0 were culled from Dworshak stock (1 female). There were no females of Kooskia stock with ELISA readings higher than 1.0. Personnel from IFHC recommended that low and medium BKD status eggs be grouped together, as no apparent difference in survival/BKD occurrence has been noted in the past.

After eye-up and enumeration, there were 232,990 BY99 SCS eyed eggs of Dworshak stock shipped to Kooskia during October/November 1999. There were a total of 104,867 eyed eggs of Kooskia stock also shipped to Kooskia during this time.

On September 29, 1999, Dworshak received 112,000 eggs from 30 females of Rapid River stock from Lyons Ferry Hatchery. On September 30 the eggs were picked and enumerated and yielded 107,600 eyed eggs. These were shipped to Kooskia on October 4. On October 6, eggs from 10 additional females of Rapid River stock were transported directly from Lyons Ferry to Kooskia.

On May 17, 2000, there were 133,052 of the Rapid River stock SCS transferred from Kooskia to two outside raceways (RWs) at Dworshak. These fish were approximately 145 fpp.

On May 31, 2000, there were 109,923 Dworshak stock SCS transferred from Kooskia to one outside RW at Dworshak. These fish were 175 fpp.

On June 1, 2000, there were 110,000 Dworshak stock and 99,258 Kooskia stock SCS transferred from Kooskia to outside RWs at Dworshak. These fish were 175 fpp and 195 fpp, respectively.

The USFWS fish marking trailer from the Columbia River Fish Program Office began coded wire tagging (CWTing) the BY99 SCS on August 17 and ended on August 25. There were a total of

199,843 fish tagged during this time (64,000 Rapid River, 67,000 Dworshak, and 69,000 Kooskia stock). Information from this tagging is for contribution research. Personnel from the marking trailer also clipped adipose (AD) fins on all BY99 SCS and split fish into several raceways during the tagging operation.

By the end of FY2000, there were 422,951 BY99 SCS at Dworshak. Table 2 illustrates the size and number of BY99 SCS on station at the end of the fiscal year and projected release numbers.

Table 2. BY99 SCS at the end of the FY and projected release from Dworshak, April 2001.

September 30, 2000					Projected Release - April 2001			
Stock	Number	Wt(lb)	fpp	L mm	Proj % loss to Release	Proj Release Number	Proj Size at Release fpp	Proj Size at Release (mm)
Rapid River	127,343	3,149	40.4	111.0	2	124,796	20	145
Dworshak	207,932	4,284	48.5	104.0	2	203,773	20	145
Kooskia	87,676	3,470	25.3	129.0	N/A*	N/A	N/A	N/A
Total/Ave	422,951	10,903	38.8	112.0	2	328,569	20	145

* Fish to be transferred to and released at Kooskia NFH.
Source: DNFH - MIS, October 2000
DNFH - Production Narrative, September 2000.

Brood Year 2000

Fish traps at both Dworshak and Kooskia were operated to collect BY2000 SCS. The fish ladder at Dworshak was opened June 15–16 with collection of approximately 28 SCS. The ladder was reopened June 19–20 with 400 SCS trapped. The ladder was reopened June 28 and closed June 30 with approximately 400 more trapped. The ladder was then reopened on July 5 and closed on July 12 due to the large number of adults in holding pond (HP) 9. After these fish were examined, the ladder was reopened on July 13 and remained open until the day before spawning ended, September 18, 2000.

There were 3,202 SCS returned to Dworshak and 1,581 SCS returned to Kooskia by the end of the spawning season (Table 1). Of those returning to Kooskia, 1,175 were transferred to Dworshak for spawning and 92 were passed above the weir at Clear Creek. There were approximately 300 jacks and one II-ocean return donated to the Nez Perce Tribe.

Table 1. Adult returns, BY2000 SCS. (09/30/00)

Age	Number/Dworshak	Number/Kooskia*	Total
I-Ocean	221	966	1,187
II-Ocean	2,890	609	3,499
III-Ocean	91	6	97
Unknown	0	0	0
Total	3,202	1,581	4,783

*92 of these fish were passed over weir into Clear Creek - ISS fish
Source: IFRO - Dworshak/Kooskia Complex SCS News-2000 Edition
DNFH - Spawning Activity Report BY2000 SCS

Figure 1 displays the SCS returns to Dworshak/Kooskia since 1986.

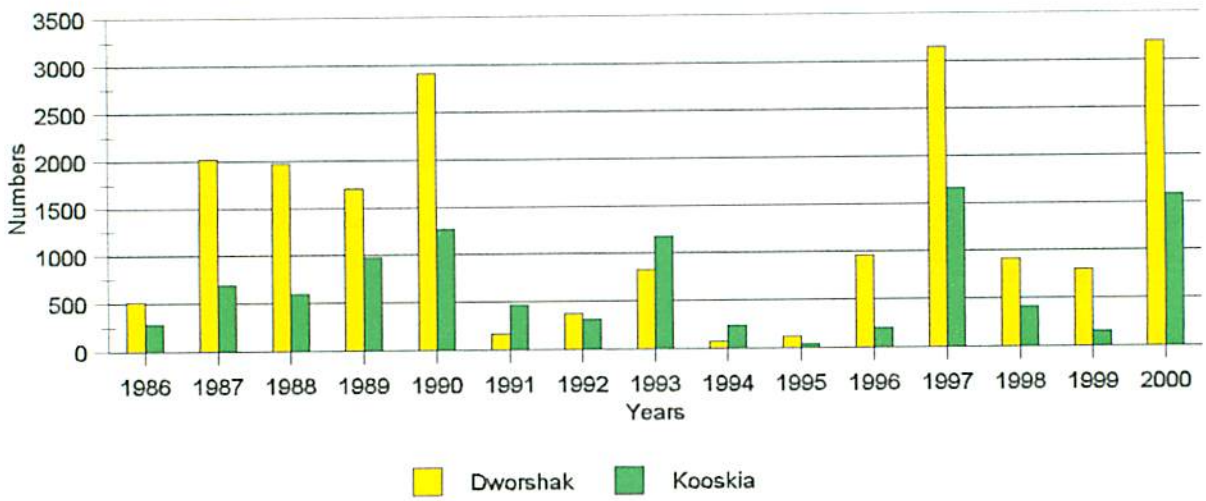


Figure 1. SCS returns to Dworshak/Kooskia 1986–2000
Source: IFRO - SCS rack returns

Adult returns for BY2000 SCS were enough to meet the production requirements for Dworshak and Kooskia. A sport fishery and tribal harvest took place along the Clearwater River in the spring and summer of 2000. The sport harvest on the Clearwater River is estimated by IDFG to have been 4,390. The Tribal harvest at the Dworshak fish ladder as reported to the IFRO by the Nez Perce Tribe was 1,173 chinook.

Adult Holding

Dworshak stock was kept in holding ponds (HPs) 1 and 2, Kooskia stock was held in HP3. Kooskia transported 1,175 adults to Dworshak as spawning stock. Kooskia stock received an opercule punch in order to distinguish between the two stocks. Formalin treatments were administered to the adults in order to retard fungus infection. Incoming females were also injected with erythromycin at a dosage of 20 mg/kg body weight as a preventative against vertical transmission of BKD.

Adult Mortality

Prespawning mortality (mortality before the first spawning on August 22) of BY2000 adult chinook was 5.3 percent for Dworshak stock and 1.4 percent for Kooskia stock. During spawning, losses were 3.0 percent for Dworshak stock and 2.3 percent for Kooskia stock (see Table 2).

Table 2. Mortality of adult BY2000 SCS held at Dworshak

Mortality	Dworshak		Kooskia	
	Number	% of Adult Return	Number	% of Adult Return
Prespawning	170	5.3	16	1.4
During Spawning	95	3.0	27	2.3
Total	265	8.3	43	3.7

Source: Spawning Activity Report, BY2000 SCS
IFRO-SCent.wk4

Adult Disposition

There were 1,868 Dworshak SCS adults outplanted this year. Dworshak and NPT personnel sorted and loaded NPT transport trucks to various sites in the Clearwater River basin. The outplanting was for supplementation purposes. Table 3 illustrates details of the outplants.

Table 3. Adult BY2000 SCS outplants of Dworshak Stock.

Date 2000	Site	Adults	Jacks	Total Number
07/19	Selway-McGruder	476	28	504
07/26	Selway-McGruder	396	35	431
08/09	Lolo Creek	507	24	531
09/07	Gedney Creek	137	16	153
09/07	Meadow Creek	219	30	249
Total		1,735	133	1,868

Source: DNFH - BY2000 SCS Spawning Activity Reports

On June 15, 2000, there were 443 jacks and 1 adult of Kooskia stock killed and given to the NPT for stream nutrient enhancement deposition in the Clearwater basin. These were fish which were earlier transported from Kooskia to Dworshak and anesthetized with Tricanine Methanesulfonate (MS-222). These carcasses will be put into Lolo Creek in November 2000.

Tables 4 and 5 illustrate BY2000 SCS adult disposition from both Dworshak and Kooskia stock.

Table 4. Dworshak stock SCS BY2000 adult disposition.

Location	Number	Comments
Outplant	1,868	See Table 3
Outside Research	32	NMFS, Univ of Idaho
Washington State Univ	1059	Captive Bear & Eagle Rehab
Landfill	243	Carcasses deteriorated
Total	3,202	

Source: BY2000 SCS Spawning Activity Report

Table 5. Kooskia stock SCS BY2000 adult disposition (out of Dworshak only—Kooskia NFH adult transfers on Kooskia's reporting).

Location	Number	Comments
Outplant	0	Adults Outplanted from Kooskia, not Dworshak
Nez Perce Tribe	740	Stream Nutrient Enhancement & Human Consumption
Washington State Univ	547	Captive Bear & Eagle Rehab
Clear Creek, Kooskia ID	92	Idaho Supplementation Study
Landfill	202	Carcasses deteriorated
Total	1,581	

Source: BY2000 SCS Spawning Activity Report

Adult Spawning Numbers/Ratio

The BY2000 Dworshak/Kooskia SCS spawning season began August 22, 2000, and ended on September 19. Fish from each HP were sorted and spawned once per week along with new fish coming up the ladder into HP9.

There were 342 males and 439 females (1:1.3 ratio) of Dworshak stock spawned for the Dworshak program. There were also 266 males and 278 females (1:1.05 ratio) of Kooskia stock spawned for the Kooskia program. Fecundity averaged 3,782, for Dworshak stock and 3,555 for Kooskia stock.

Spawning Procedures

The spawning procedure was similar to past years except that clove oil, rather than MS-222, was used as an anesthetic once spawning began. Adults were crowded from the holding ponds into a crowding channel, moved into a channel basket, and placed into an anesthetic bin. By the end of the spawning season, it was determined that a solution of 80 ppm clove oil effectively anesthetized the fish for handling. Pro-Polyaqua was added (250 ml/bin) to reduce stress and susceptibility to infection. Oxygen was provided at a rate of one L/minute. Spinal columns of ripe females were severed using a pneumatic knife. The females were then placed on a table for 3–20 minutes for blood drainage. The ventral side was then cut open using a spawning knife, and eggs were collected in disinfected colanders. After ovarian fluid was drained, the eggs were poured into a clean bucket. Milt from ripe males was stripped into Styrofoam cups, and a one-percent saline solution was added to assist in milt motility. The milt solution was poured onto the eggs and swirled for more complete fertilization. After sufficient time had elapsed for fertilization to take place (one to two minutes), the eggs were rinsed of sperm, blood, and other organic matter.

After fertilization, eggs were placed in Heath incubator trays at approximately 3,700 eggs per tray (1 female). In the tray was a 75 mg/l iodophor solution buffered with sodium bicarbonate. Eggs were maintained in this solution for approximately 30 minutes. This was done as a precaution against disease transmission. The egg trays were then pushed into the incubator. Water flow rate was approximately five gallons/minute. Eggs in A/B bank were incubated with chilled water from the secondary line from Dworshak Reservoir and temperature averaged 39°F. Eggs in C/D bank were incubated with no chiller on this same intake line and temperature averaged 45°F during incubation.

The number of BY2000 SCS spawners, eggs produced, and survival are illustrated in Table 6.

Table 6. Dworshak and Kooskia adult spawners and both green & eyed eggs, BY2000 SCS.

Location of Broodstock Return	Males spwnd	Fmls spwnd	Fmls Culled BKD/ Dead	No eggs /female	Total number of eggs enumerated	Percent Enum Eye-up	No eyed eggs
Dworshak	342	439	129	3,782	1,172,404	95.1	1,115,448
Kooskia	266	278	78	3,555	710,972	94.0	668,555
Total/ Average	608	717	207	3,693	1,883,376	94.7	1,784,003

Source: DNFH - Spawning Activity Report BY2000 SCS
DNFH - BY2000 SCS Spawning Report

Idaho Fish Health Center (IFHC)

Kidneys were sampled for bacterial kidney disease (BKD) from all females spawned. No males were sampled this year. The IFHC also took ovarian fluid from all females spawned for viral inspection. The adult females tested 0.9 percent (4 out of 439) high BKD (ELISA >1.0) for Dworshak and 5.4 percent (15 out of 279) for Kooskia. To assist in managing the run, culling of Dworshak stock was at the 0.080 level for Takes 1–2 and 0.100 level for Takes 3–8. Culling of Kooskia stock was at the 0.125 level for Take 3; 0.110 level for Take 4, and 0.100 level for Takes 1, 2 and 5.

On July 31 and August 1, personnel from IFHC injected all Dworshak and Kooskia stock females on station with erythromycin. This was done to help prevent vertical disease transmission to the egg. Late arriving females were injected up until one week before spawning began on August 22.

Cryopreservation Study/University of Idaho

Dworshak continued to coordinate with researchers from the University of Idaho (U of I) in the cryopreservation of salmonid gametes. Rolf Ingermann is studying the relationship between carbon dioxide (CO_2) and the motility and viability of the sperm along with the adenosine triphosphate content of the sperm after exposure to the CO_2. Other studies include examination of pH and aluminum toxicity in salmonid sperm. Continued studies include examining buffering capacities of seminal and blood plasma along with endocrine disrupting effects of various

chemicals. Dworshak provided a total of 196 ml milt from 16 Kooskia males. Dworshak also provided a total of 11,500 eggs from 15 Kooskia females along with 102 ml blood from 12 SCS carcasses. All samples were from excess spawning requirements at Dworshak.

Dworshak also provided James Nagler from the U of I with a total of 4 ml milt from four males and a total of 2,000 eggs from four females. These samples are for research on the effect of fluctuating water temperature on sex inversion in SCS. All samples taken were from excess spawning requirements at Dworshak.

Energetics Study/National Marine Fisheries Service

On August 30, 2000, Dworshak provided adult SCS carcasses to John Colt from the National Marine Fisheries Service (NMFS) for research on energetics and reproductive success of SCS. The study is to evaluate whether hydropower contributes to unaccounted losses of migrating adult SCS in the Snake and Columbia Rivers by incurring excessive energetic costs. Dworshak provided carcasses from 17 males (including 2 jacks) and 15 females.

Idaho Supplementation Study (ISS)

There were 80 females and 80 males of Idaho Supplementation Study (ISS) fish spawned this year at Dworshak. Forty of these pairs will be incorporated into Kooskia production. There were 92 ISS fish passed over the weir at Kooskia.

Spawning Summary

BY2000 SCS adult return numbers were more than adequate to fulfill Dworshak's and Kooskia's production goals. Projected release of BY2000 smolts in the year 2002 is approximately 1.05 million smolts of Dworshak stock and 250,000 parr of Rapid River stock SCS reared at Dworshak.

There were 1,868 adults of Dworshak stock outplanted for supplementation purposes by the NPT.

Coho Salmon

Brood Year 1998

These coho salmon (COS) were reared in RWs in C-bank in a cooperative program with the Nez Perce Tribe (NPT).

On April 17–19 the NPT moved 273,600 BY98 COS from Dworshak to Kooskia. These fish were released from Kooskia in May. No other data concerning these COS was reported to Dworshak personnel.

Brood Year 1999

BY99 COS are being reared at Dworshak in a cooperative program with the Nez Perce Tribe (NPT).

Coho from Lyons Ferry Hatchery were also transported to Dworshak and mixed with coho adults trapped from the Clearwater River basin.

On October 21, 1999, the NPT began spawning BY99 COS returning to the Clearwater River basin and those mixed in from Lyons Ferry Hatchery in Washington. Spawning ended on December 7. There were 88 females spawned with an unknown number of males reported. There were 212,000 eyed eggs enumerated from these 88 females.

On December 7, 1999, Dworshak received approximately 184,000 BY99 COS eyed eggs from Eagle Creek NFH. These eggs were enumerated at Dworshak and put into the incubation trays with a water temperature of approximately 46°F.

The fry from these eggs were transferred from the incubation room to the nursery in January and February 2000. They were transferred to B-bank raceways (RWs) on March 24. Normally the COS are transferred to C-bank RWs; however, water to C-bank had to be shut off in order to recover approximately 90 steelhead adults which escaped under the inflow grating in the fish trap. The COS were transferred to C-bank RWs on May 24–25, 2000, with an inventory of 386,000 fish.

On July 10, 2000, the NPT outplanted an estimated 80,000 BY99 COS into Meadow Creek, a tributary of the South Fork of the Clearwater River.

There were approximately 200K–300K BY99 COS on station at Dworshak at the end of the fiscal year. No data was reported to Dworshak personnel from the NPT concerning these fish. The Service has currently given office space at Dworshak for a NPT biologist to oversee the COS program.

Brood Year 2000

BY2000 COS were trapped at Dworshak hatchery, Clear Creek, Potlatch, Lolo, Eldorado and Lapwai creeks in the Clearwater Basis and Lyons Ferry Hatchery in Washington State. Personnel from the NPT conducted the spawning at Dworshak with assistance from Dworshak staff. Spawning of these fish will begin in October, 2000. The eggs were incubated at Dworshak.

This year, we informed the NPT that we would no longer allow adult fish to be brought for holding at Dworshak from outside the basin, such as from Lyons Ferry. The NPT agreed to adhere to this policy and projected that they would get sufficient COS eggs from fish within the basin.

Rainbow Trout

Brood Year 1999

On June 2, 2000, BY99 rainbow trout (RBT) were moved from BPs 1 and 3 and RW 15, to the settling pond for Open House on June 9. On June 9, approximately 1,700 RBT were caught by 857 participants at the Open House. Rainbow remaining after the open house were outplanted for fishing on Tribal and State fishing waters (see Table 1).

Table 1 illustrates outplanting of BY99 RBT from the Open House fishing pond.

Table 1. BY99 RBT Distribution from Dworshak.

Date 2000	Number	Fish/lb	Weight	Harvest/Release Site	Comments
6/2	2,000	1.00	2,000	Kooskia	Open House
6/5	1,505	1.00	1,505	Kooskia	Open House
6/19	1,234	1.22	1,505	Worley Pond	Coeur d' Alene Tribe
6/22	2,015	1.22	2,458	Mud Springs Lk	Nez Perce Tribe
6/29	1,033	1.22	1,275	Campbell's Pond	Public Water
6/29	1,709	1.22	2,085	Talmac Lake	Nez Perce Tribe
7/13	1,217	1.22	1,490	Soldiers Meadow Lake	Nez Perce Tribe
Total/Ave	10,713*	1.16	12,424		

Source: DNFH - RBT MIS, July 2000; Production Narrative, June-July 2000.
DNFH - Fish and Egg Fiscal Year 2000 Distribution Summary
*There were an additional 200 RBT from BY2000 distributed by Dworshak this year. See below.

Brood Year 2000

Rainbow Trout from BY2000 to be used for Open House Fishing Day 2001

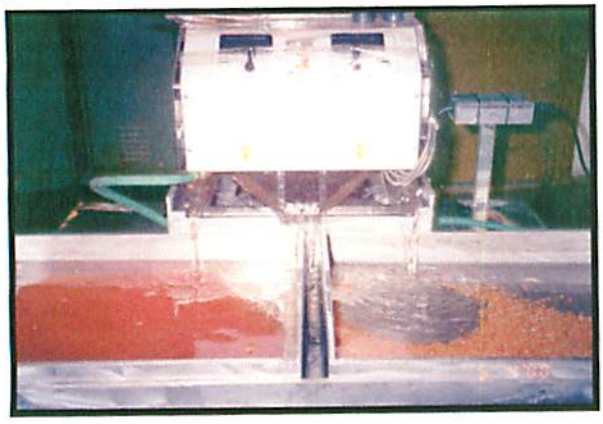
On January 11, 2000, Dworshak received approximately 15,000 Shasta strain RBT eyed eggs from Ennis NFH. For ease of record keeping at Dworshak, these RBT will be recorded as BY2000. On February 8, approximately 14,500 of the RBT were moved from the incubation trays to the nursery. On June 30, 2000, these fish were moved from the nursery to RWs B 16–19. At the end of FY2000 there were 14,118 RBT averaging 3.6 fpp and 224 mm (8.8 inches total length) on station.

On June 29, there were 200 BY2000 RBT (10.6 lbs) transferred from Dworshak Hatchery to Dworshak Dam. These fish went into a public exhibit pond for the Corps of Engineers at the dam.

Rainbow Trout for Outplanting

Dworshak's current RBT mitigation program commitment is to provide fish for stocking into Dworshak Reservoir. Kooskia raised RBT for this program in 1991, '92, '93, and '95. The 1995 RBT from Kooskia were never stocked into Dworshak Reservoir. Rainbow trout reared at Dworshak (river water) have not been stocked into the reservoir since 1984. There are several concerns with the stocking of these fish into Dworshak Reservoir, including disease introduction into Dworshak's and Clearwater Fish Hatchery's water supply, RBT crossbreeding with cutthroat in the North Fork, low catch rate by fishermen, etc. Therefore, the following agreement has been made with the state of Idaho:

> Hagerman NFH will raise approximately 145,000 10" Arlee and Shasta rainbows to be stocked in September and October into several locations including; L. Camas, Oxbow, Hells Canyon, Lucky Peak, and C.J. Strike reservoirs.
>
> IDFG's Hayspur Hatchery will raise approximately 130,000 10–12" sterile rainbows for stocking into Dworshak Reservoir in March, April and May 2001.



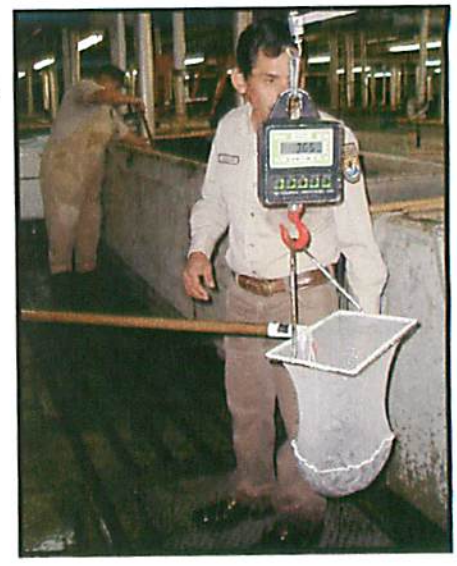


Photo highlights for the Dworshak Production section include, clockwise from top left:

Egg counter/picking machine.

Removing dead fish from water supply pipes. Vandals removed the holding pond water intake cover while trying to snag adult steelhead, letting about 100 fish escape into underground water channels, where they eventually died.

Removal of carcasses done with assistance from Idaho FRO diver Howard Burge.

Production fish culture Work Leader John Vargas weighing, moving steelhead fry from nursery to marking trailer.

Contract marking crews fin-clipped over 2 million steelhead fry during the summer.

Dworshak NFH Maintenance crew was kept very busy this year. A number of "high priority" events occurred, including flooding of the Spawning Room basement and serious complications during the traveling water screen repair. These and other larger projects are noted below. Not included in the following list and descriptions are most of the routine maintenance, such as upkeep on the landscaping, painting, basic and small repairs, and vehicle maintenance although these occurred in abundance during this fiscal year.

Housing

The exteriors of Residences #1 through #4 were pressure washed in the fall. Contractor Ron Stryker completed the construction of new patio awnings for three of the residences in June. Painter Richard Shope, contracted to paint the hatchery housing, completed work on Quarters #1 and #2 in July and early August; however, Mr. Shope was unable to fulfill his contract. Painting of Quarters #3 and #4 was completed by Ed's Painting and Roofing in August. Each of the garages for the 4 residences had upgrades to lighting in September; three 4-tube flourescent fixtures were installed.

OSHA

Oxygen Tank

A new oxygen tank and regulator stand were built and installed on the Nursery Room forklift that is used to transport fry and fingerling fish to the Burrows ponds. The new set-up will prevent the tank heads from being jarred or severed and possibly causing injury or property damage.

Fire & Maintenance

A new Fire & Maintenance line was installed between Mechanical Building II and the sludge basin area in December. At the end of the Fiscal Year, asphalt was cut before digging to check for Fire & Maintenance leaks. Art Sutton excavated 3 leaks (at the Maintenance Shop, the Feed Building and the Main Office area). Complex maintenance crew repaired the lines and backfilled the excavated holes. Bids are currently being taken to have the asphalt repaired.

Grip Struts

Ryerson Steel, Lewiston, has been awarded the contract for the production of new braces for widening the grip struts on the Burrows pond walkways. Approximately one-third of the required materials will be obtained this fiscal year. The project will double the width of the grip struts from 9" to 18". The work will progress in phases and take approximately 3 years to complete.

Vehicle Maintenance

Automobiles

During the winter, the wooden deck on the Dodge 1-ton flatbed pickup was replaced with Diamond Plate steel, and the front windshield on the S-10 Emergency Call-back Truck was replaced. The new Meyers snow plow and electrical controls were installed on the new Dodge 1-ton pick-up in March. In the spring, the 1986 Dodge 4x4, with snow plow, dump bed and spare parts, was surplused, and the new Maxi Dump was and installed onto the bed of the new Dodge 1-ton pick-up.

Heavy Equipment

The propane carburetor on the forklift was rebuilt in October and required follow-up repairs in December. In July, the hydraulic pump from the AMZ-50 manlift was removed and sent to Coast Crane, Spokane, for repairs.

Ponds, Raceways and Reuse Systems

New brine tank filters for Systems II and III were fabricated and installed in October. New holes were cut in the concrete for eight back-up filters, and piping was installed. Also, the #1 incubator pump in Mechanical Building I was repaired and replaced, and new conduit runs were installed in the main Pump House for vibration and low flow monitors.

During the winter, holes were cut and drilled for 105 aluminum stop logs for chinook raceways in A- & B-bank. Heat exchange pumps #2 and #3 for steelhead raceway heating systems in Mechanical Building II were replaced. Six-inch pipe protectors were built and installed for make-up pumps and heat exchanger control cabinets in Mechanical Building II. The aerator from the sludge basin was removed and replaced with a spare. The main heat pump was removed for bearing and seal replacement; Idaho Machine performed the work.

In January, motors for both Pumps #9 and #10 required repairs. The #9 motor was rewound by Strom Electric, Troy, Idaho, while the #10 motor required bearing replacement and other repairs, which were done by Idaho Machine & Rewind, Lewiston, Idaho. Also in January, the circulation pump for Boiler #2 was taken to Idaho Machine, Lewiston, Idaho, for re-bearing. While the pump was out, heated water for Nursery Room C & D banks was switched from Mechanical Building II to Mechanical Building I.

Following final release of smolts and completion of spawning for BY2000 SST, the following system maintenance was done: the #10 reuse pump motor for System III was replaced; inflow water valves were removed from #21 and #28 B Bank raceways for repair; the #7 and #8 reuse pump motors were removed for dip, bake and rebearing; fifteen aluminum stand pipes were extended for B Bank chinook raceways; the valve on raceway #28 was replaced with a new style valve, and the valve on raceway #21 was repaired; 174 aluminum stop logs were made for A & B Bank raceways.

Holding ponds were dewatered for maintenance in May, and the old center and end grates in Hps #1, #2, & #9 were removed and replaced, and the areas underneath were cleaned; cleaning was also done under the center and end grates of HP #3, and new grates arrived and were installed later. The Holding Ponds and fish ladder were watered up May 22.

By the end of spring, the plugged drain on the net disinfection tank in Mechanical Building I was repaired and a plate attached on the outside clean-out. In June, new steelwork was fabricated for lifting the nursery room tank with the forklift.

In July, a total of 453 aluminum stop logs were fabricated for A & B Bank chinook raceways. Also, 9 aluminum stop logs were fabricated for the fish pond on the point. The 10" wafer water supply valve in the Incubation Room and the LoveJoy coupler (motor to pump) on the Incubation chiller pump were replaced. Repairs were made to the concrete expansion joints in the Burrows Ponds, and the front cable on the #1 channel crowder was repaired.

During the summer months, repairs and alterations were made to the bird netting around the Burrows Ponds to more effectively keep out the large number of blue herons which showed up this year for a free meal. Work on this project was completed in August.

The #12 reuse pump 200HP motor was sent to Strom Electric for dip, bake and rebearing. Work was done on the System II and III reuse aeration chamber overflow weirs; the old steel units were replaced with aluminum, the stops on the adjustable weir were repaired, and new aluminum covers were fabricated and installed on the drain valves. New hydraulic lift cylinders were installed on the #2 Magic Valley fish pump tower.

In September the drain valve in the sludge basin was removed and rebuilt, and leaks in the System II & III reuse aeration chamber were repaired. A finger weir guard was built and installed for Holding Pond 9.

Production Equipment

By the end of spring, a new aluminum table and basket were fabricated for Production's #2 egg picker, the plugged drain on the net disinfection tank in Mechanical Building I was repaired and a plate attached on the outside cleanout, new steelwork was fabricated for lifting the nursery room tank with the forklift, and five pond cleaning brush heads and 4 "J" hooks for stand pipe removal were fabricated. A new pond brush head was fabricated for testing and approval by the Production Section in September.

Building and Grounds Maintenance

A wheeled steel stand was fabricated for the new wire feed welder in the Shop in November. Also, a cleaning brush was fabricated to attach to the trash rake at the main pump house; there had been an algae buildup problem from low flows in the North Fork of the Clearwater River.

A concrete pad was poured for a second chemical storage building on the Complex. The shed was installed onto the slab and bolted into place in December. Repairs were made to the diesel dispenser piping system.

Wayne Dalton Door Company installed new roll-up doors in the Spawning Room and main Pump House in October and November, and Dworshak's maintenance crew assisted Quality Heating and Air with installing new Mitsubishi HVAC units in the Administration Building. Quality Heating also repaired a leak and recharged the cool room cooling system and installed a new chiller compressor system for the Main Building. One of the two compressors was faulty and was replaced on warranty.

The Production Supervisor's office was remodeled during the months of November–January. Insulation, sheet rock, new lighting and auxiliary heat were installed, as well as new carpet and modular furniture.

In December remodeling began on the I/E office. The interior West wall had been covered only partially by plywood and cork. This surface of the interior West wall was covered completely with a layer of plywood and finished, tongue-in-groove wood paneling to insulate against noise from the Spawning Room and match the remaining office decor. Modular furniture was arranged in the office in January.

In January new chain link cages were constructed in the Feed Building basement to provide secure storage space for outreach equipment and IFRO's PIT tagging equipment. In April, the basement was cleaned out and old incubator stacks and other items taken to the COE bone yard.

Temporary maintenance workers Joel Pearcey and Jerald Oleson were assigned to clean up the main aeration chamber and paint piping during the month of June.

In preparation for Open House, flowers were planted by the flag pole in front of the Visitor Center in May, and prison labor was contracted for major grounds cleanup, pruning and transplanting of shrubs. Dworshak maintenance staff prepared the grounds and set up signs, banners and exhibit canopies, as well.

In spring, air lines were run and duct work completed in the Maintenance Shop in preparation for the installation of a new waste oil furnace. The Clean Burn unit was installed by Quality Heating & Air, Grangeville, Idaho, with the waste oil heater frame and tank assembled in July.

Other Projects

Alarm System

The Complex alarm call-back system was upgraded by Dan Calligari with KMC Sales Corporation in December.

Idaho Fish Health Center

This year, an addition was built onto the IFHC lab, more than doubling the office and laboratory space. Dworshak NFH Maintenance staff assisted in the completion of the addition, such as

excavating, locating old and installing new sprinkler lines, landscaping, including pouring a new concrete mow strip, and replacing the old, metal vehicle parking stops with new concrete stops provided by COE. Also during the year, IFHC was given assistance in replacing, re-plumbing and rewiring their commercial hot water heater, refurbishing of wooden cabinets and repair of water heater lines.

Kooskia NFH

In January, the Maintenance staff from Dworshak NFH assisted the staff at Kooskia NFH by fabricating an aluminum spawning table, trap entrance and stop logs for the weir. In September, Maintenance Workers Greene and Weeks installed the feed rail and motorized hoist for the fish trap. Staff from COI hauled the AMZ-50 manlift to Kooskia NFH and back to aid in installation.

Traveling Water Screens

Repair work on the traveling water screens was contracted out to Metal Benders. In preparation for the work, the #1 bay sill was cleaned and de-watered, new picking eyes were fabricated for the wooden stop which was made, and the stop logs from the #1 bay were moved to bay #2. At the end of June, pump #6 had to be removed for repair, as sand from broken sand bags had penetrated the system and fouled the bearings. The #1 Bay was de-watered, and debris was removed by the Big Sky Company, Spokane, Washington. Howard Burge, IFRO, dove into the Bay, first discovering the sand, and later checking the Bay following Pump #6's second bearing failure. Pump #6 received all new shafts, bearings and bushings by Idaho Machine, Lewiston, Idaho, and the #6 main pump was re-assembled in September. Metal Benders had completed repairs on #1 and #2 traveling water screens but were unable to begin on #3, as their contract had run out. Metal Benders will return in November 2000 to complete the repairs.

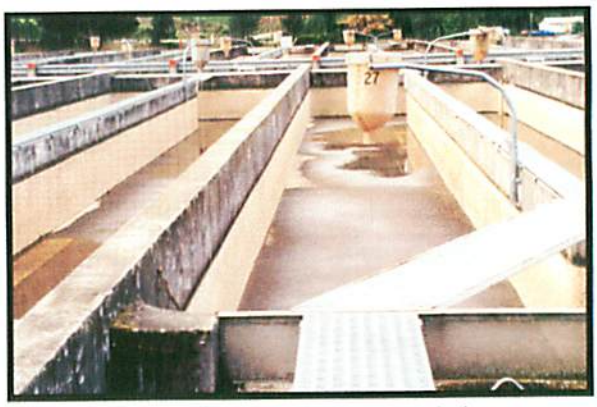
Clearwater River Youth Program

Youth involved in the CRYP program performed maintenance projects throughout the hatchery over the summer months, including: pouring a slab for the housing area picnic tables; pouring a curb for the driveway of residence #3; cleaning the duck weed from the System I clarifiers; painting the reuse pipes in System I; cleaning and pruning the grounds; and helping the Production crew in the spawning room and nursery. The crew also completed the very large task of taking down the fence along Highway 7, removing the shrubs for replanting, and pouring a low retaining wall for the full length of the fence.

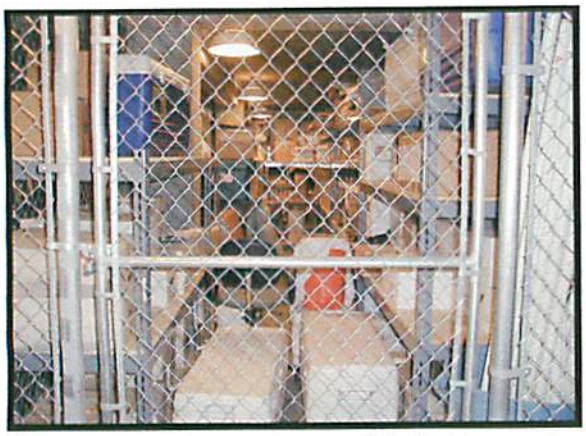
Remote controlled HVAC units were installed in six hatchery building offices.

New V-10 Dodge dually with snow plow and dump bed was purchased for hatchery maintenance.

Patio covers were replaced on all four hatchery residence units.



Rearing pond bird netting was extended to cover the walkway entries, due to increased bird traffic inside the enclosures.



Storage cages were constructed in the basement of the feed building for Outreach and FRO supplies.

Holding pond crowder was refurbished and painted.

Budget

Dworshak's FY2000 O&M funding package from the COE, including overhead costs, was $1,991,812 plus $91,976 in funding re-directed from another project for a total of $2,083,787.78. Operating funds, not including support costs, were $1,670,064 (1935 and 1937 sub-activities). Another $22,000 was received from quarters rental reimbursements (8610 sub-activity), and $12,591 was received from the Nez Perce Tribe for coho production at Dworshak and Kooskia hatcheries. Included in the COE funding was $68,000 budgeted to the Idaho Fish Health Center for their assistance on steelhead fish health issues and $68,000 to the Idaho Fishery Resource Office for continuation of their monitoring/evaluation of Dworshak's steelhead smolt production. Lower Snake River Compensation Plan (LSRCP) provided $368,328 (471- sub-activity) for production of spring chinook salmon. This funding included $23,000 for an 8-week Summer Youth Program of nine students working at Dworshak NFH and Clearwater FH.

Major purchases included: re-roofing of Mechanical Building I and Generator Buildings, $37,000; new office furniture in one administrative station, conference tables and conference room carpeting, totaling $6,054; compressor replacement, $24,085; repair of all demand feeders, $7,055; material to widen grip struts on Burrows ponds, $9,948; material for dam boards on raceways, $9,984; fiber optic cable line to Maintenance Shop, $3,890; painting of all four hatchery houses, $3,550; new patio covers on three hatchery houses, $5,801; new roll-up awnings on hatchery houses, $2,805.

FY2000 closed out with all accounts within one-half percent of allocation.

Meetings

Northwest Fish Culture Conference

Deputy Complex Manager Owsley served on the planning committee for the 50th Northwest Fish Culture Conference. He was the Program Chairman coordinating the five sessions and Session Chairman along with a poster session. The 50th Northwest Fish Culture Conference was held in Seattle, Washington, December 6–10. Dworshak staff who attended this year's event were Complex Manager Miller, Deputy Complex Manager Owsley, I&E Specialist Sawyer, I&E Assistant Grant, Dworshak Assistant Hatchery Manager Semple and Fishery Biologists Trock, Clark and Bright and Kooskia NFH Assistant Manager Bottomley. I&E Specialist Sawyer and I&E Assistant Grant participated with displays and presentations. See the Outreach section for more details.

Dam Breaching Hearings

On February 9, Bill Shake, ARD, Region 1, presented information to Dworshak Complex staff and answered questions regarding options for aggressive salmon recovery in the region and the USFWS's recommendations. Staff from Kooskia NFH and Idaho FHC were in attendance. Mr. Shake was in the area to sit on the panel at the widely publicized hearings regarding breaching the four Lower Snake River dams, which were held the following day, February 10, in Lewiston.

Staff from Dworshak who also attended the hearings were Project Leader Burge, Assistant Project Leader Faler, and Fishery Biologist Connor (each from Idaho FRO) who were there to observe. Complex Manager Miller manned the Hatchery/Harvest booth, answering questions for hearing attendees, and Fishery Biologist Bigelow (IFRO) manned the Hydro-power booth.

VIP Visitors Arrive in Blackhawk Helicopters

On February 17, several VIPs visited Dworshak NFH. They arrived in Blackhawk helicopters, landing in the visitor parking lot, which had to be cordoned off for safety reasons. The visitors included Dr. Joe Westphal, Asst. Secretary of the Army, Civil Works, Washington, D.C., BG, Carl Strock, Commander and Division Engineer, COE, Portland, Oregon, Jim Waddell, Chief Programs Management, COE, Walla Walla, Washington, LTC Rapp, Dr. Westphal's military assistant, Washington, D.C., Lois Schiffer, Assistant Attorney General, Justice Department, Washington, D.C., LTC bill Bulen, District Commander, COE, Walla Walla, Washington, Peter Coppelman, Shiffer's deputy assistant, Washington, DC, Doug Arndt, Chief Fish Management Division, COE, Portland, Oregon, MAJ Kevin Wilson, Dr. Westphal's military assistant (to be), Washington, D.C., and Claudia Tornblom, Principal Deputy Assistant to Assistant Secretary of the Army, Washington, D.C.

The VIPs were given a short, informative tour and were provided with folders containing background material on hatcheries, Dworshak NFH and Lower Snake River Compensation Plan (LSRCP).

Vandalism at the Hatchery

Some time between Friday evening, February 25, and Tuesday morning, February 29, vandals entered the Dworshak NFH property and presumably attempted to take adult steelhead from the holding ponds. Using light nylon cord and radio speaker wire with large treble hooks attached, the vandals managed to hook a grate on the bottom of the pond and pull it up out of position, moving it enough to provide access for adult fish to enter the water supply pipe and channels. Project Leader Burge donned scuba gear and entered the holding pond to clean up the debris and replace the grate.

It was estimated, comparing the electronic pond counter numbers with the hands-on inventory, that about 150 adult steelhead may have entered the hatchery water supply piping system. When the water was shut off in May, approximately 90 dead and decaying steelhead were found.

Small Hydro Project

Deputy Complex Manager Owsley attended planning meetings for the Dworshak Small Hydropower Facility two to four times each month until the project's completion in June 2000. This project, coordinated by the Idaho Water Resource Board, can produce 2.9 megawatts of power, enough to supply 2000+ homes. The dedication ceremony for the small hydro project was held Friday, August 25. Idaho Governor Dirk Kempthorne and other dignitaries addressed a group of about 75 people celebrating the opening of the plant. In attendance were local residents and officials, designers and engineers who worked on the project, and a representative from the Bonneville Power Association. Complex Manager Miller attended the event; Office Automation Clerk Gardner and I/E Assistant Grant took photographs.

On-site Meetings

Supervisor's meetings were held November 4, January 5, February 23, March 29, April 24, May 30, June 27, and August 1.

Dworshak's Fall Coordination meeting was held November 18. Representatives from Idaho Fish & Game, Nez Perce Tribe, Army Corps of Engineers, USGS/NBS and FWS were in attendance. The Spring Coordination Meeting was held Thursday, March 9. Project Leader Burge, IFRO, conducted in the absence of Complex Manager Miller.

Deputy Complex Manager Owsley attended the public drinking water meetings at the Clearwater National Forest Service office, May 25, June 5, and June 19.

Off-site Meetings

On October 21, Owsley attended the Clearwater Management Council meeting. Complex Manager Miller attended a team meeting in Portland, November 8-10 regarding the hatchery team of Sound Science and Good Management. On January 12-13, Owsley attended the Coeur d'Alene Tribe trout production facility interdisciplinary team meeting. Deputy Complex Manager Owsley met with Idaho Fish & Game personnel at the Clearwater Hatchery regarding the new EPA discharge permit process January 19.

On March 22-23, Complex Manager Miller was in the Regional Office filling in for Fred Olney.

Deputy Complex Manager Owsley attended the Clearwater Management Council meeting at Lenore, May 18. Owsley asked the council to put a porta-potty out for the Ahsahka bridge fishermen. The council agreed to do this.

Complex Manager Miller attended a NMFS/Water Resources meeting of Snake River flows and gas waivers in Lewiston, June 6.

During the month of July, Complex Manager Miller attended a Technical Management Team (TMT) meeting in Lapwai. Flows and temperature releases from Dworshak Reservoir were discussed. Miller attended a Policy Advisory Committee (PAC) meeting of the Clearwater Watershed Advisory Group. The group discussed progress on planning and study proposals for aquatics, wildlife and habitat for the Clearwater Basin.

Also in July, Miller attended a Clearwater Management Council meeting and discussed fishing access from the Ahsahka Bridge. Council may get involved to help Clearwater Hatchery finish the access work.

Deputy Complex Manager Owsley attended the regional drinking water meeting at the Forest Service Office, July 18. Owsley attended 3 Regional Drinking Water meetings at the Forest Service Office, August 7, 21 & 28.

Inspections

Deputy Complex Manager Owsley assisted Gary Blefgen, RO, Engineering, on the final inspection of the IFHC new addition February 10.

Tamra Swerdlik, Contract Specialist, Region 1, performed a procurement review of FY 1999 and FY 2000 purchasing documents for the three-station complex, February 29 and March 1. She met with Deputy Complex Manager Owsley, Admin Support Assistant Galloway and Budget Assistant Praest to discuss the results, and Owsley gave ms. Swerdlik a tour of the hatchery.

Deputy Complex Manager Owsley assisted Russ Eaton, COE, with the nitrogen gas monitor at the main intake to the hatchery water supply, May 2.

Deputy Complex Manager Owsley assisted the Idaho Fish & Game-Clearwater Hatchery crew with the annual valve exercise for the reservoir water supply, May 10.

Deputy Complex Manager Owsley assisted Mark Summers, COE, Walla Walla, with the annual railroad overpass inspection, July 26.

Deputy Complex Manager Owsley assisted Dan Forney, Safety, R.O. with and Environmental Compliance Audit for Dworshak and Kooskia NFHs, Idaho Fishery Resource Office and the Idaho Fish Health Office, August 14–17.

VIP Tours

Deputy Complex Manager Owsley provided a tour of the hatchery to Dr. John Colt following a HET meeting January 4.

Deputy Complex Manager Owsley gave the crew from Leavenworth NFH a tour of Dworshak NFH February 15. Leavenworth crew was Leonard Garcia, Leroy Gifford, Gary Malm and Lance Schott.

Deputy Complex Manager Owsley gave Dr. Sandra Ristow and 20 Washington State University students a tour of the facility, March 21.

On August 9, Complex Manager Miller met with, and gave a station tour to, Muriel Slattum and Diane Stone from the WSU Department of Animal Science. The purpose of the visit was to review a research proposal by one of the Department staff member Kate Byrne. The proposed WSU study is an evaluation of Endoscopy to evaluate sex of salmon and sturgeon. This will be a non-invasive technique and would help the hatchery in salmon management.

Deputy Complex Manager Owsley made a presentation and gave a tour to twenty-one students and instructors from Spokane Community College October 18.

In November, Complex Manager Miller gave a tour to 12 Russian natural resource delegates touring the area through the Pacific Rim Taiga, Inc. consulting company.

Deputy Complex Manager Owsley gave a tour to the University of Idaho Aquaculture Club on April 6. Deputy Complex Manager Owsley gave the fish clippers working at the hatchery a tour, July 19.

Domestic Water

On April 6 and 7, Deputy Complex Manager Owsley met with Larry Seibel, Anderson & Perry Engineers, on the domestic water system for the Complex. Deputy Complex Manager Owsley met with Chuck Palmer, COE, and Larry Seibel, Anderson & Perry Associates regarding the design of a new drinking water system for Dworshak NFH on June 1.

Owsley gave a tour of the Complex domestic drinking water system to George Dekan and Kirby Cole of the Idaho Department of Environmental Quality (DEQ), August 24.

Real Property

Excess furniture from Dworshak NFH was donated to the vacant residence at Kooskia NFH in February, which will be used for an indoor classroom/public use area, temporary office space and VIP quarters. Wall units from the Dworshak Production office were donated to the CCC-Natural Resource Classroom at Clearwater Valley Junior High in Kooskia. These will be used for study stations and equipment storage.

Deputy Complex Manager Owsley and Purchasing Agent Sperber completed the property inventory for the COE property at the Dworshak Complex March 7–14.

Deputy Complex Manager Owsley assisted Orin Thomas, COE, Walla Wall, on excess property April 26.

Hunter Education

Deputy Complex Manager Owsley met with new IDFG Conservation Officer Jim Collom about use of the hatchery and Hunter Safety Education, February 3. Mr. Owsley teaches the semi-annual IDFG-sponsored Hunter Safety course at Orofino Junior High School as a community service. On February 29, Mr. Owsley assisted IDFG personnel from the Clearwater Hatchery with the installation of a backstop for the Hunter Education rifle range.

March 8–18, Deputy Complex Manager Owsley conducted the semi-annual Hunter Education program at the Orofino Junior high School. The class was 8 days with a half-day at the range. Forty-five students and five adults completed the course. In February, six sheets of plywood for the IDFG Hunter Education rifle range were painted and delivered to the range site as a community service. Supporting poles were also painted with roofing sealant for weather protection.

Deputy Complex Manager Owsley attended the annual awards dinner in Lewiston for Hunter Education, June 17. Mr. Owsley received an award for twenty years of volunteer instructing.

Training

October 1999

Office Automation Clerk Gardner and Animal Caretaker Seldon attended *New Employee Orientation* in Portland October 4–8. Admin Support Assistant Galloway and Budget Assistant Praest attended *Paradox Budget Tracking System* training at the R.O. October 19–21.

November 1999
Purchasing Agent Sperber attended *Paradox Budget Tracking System* training in Boise, November 2–4.

December 1999
Budget Assistant Praest and Purchasing Agent Sperber attended *Procurement Procedures for Administrative Professional* training at NCTC, Shepherdstown, WV, December 6–10.

January 2000
Complex Manager Miller, Deputy Complex Manager Owsley, Assistant Hatchery Manager Bottomley (Kooskia NFH), and Office Automation Clerk Gardner attended a *How to Get Organized* class in Spokane, WA, January 11. Complex Manager Miller, Deputy Complex Manager Owsley, I&E Specialist Sawyer, and Computer Specialist Bowen (Idaho FRO) attended a *PowerPoint* training class in Spokane, January 24. PowerPoint presentations will be used to create a new interactive exhibit in the hatchery's upstairs lobby area.

February 2000
Complex Manager Miller attended the *Whirling Disease Symposium* in Coeur d'Alene, Idaho, February 3–4. Office Automation Clerk Gardner attended *Simplified Acquisition Procedures* and *Purchase Card Training* at the R.O., February 15–17.

June 2000
Budget Assistant Praest attended *Administrative Training* at the R.O., June 5–7. Animal Caretaker Leader Vargas attended *Supervision, The Next Step* training, provided by NCTC and held in Phoenix, AZ, June 5–9. Admin Support Assistant Galloway attended *Convenience Check Pilot Program* training at the R.O., June 12. Animal Caretaker Niles attended *Introduction to Fish Health* at NCTC, Shepherdstown, WV, June 19–23.

August 2000
Complex Staff were invited to view the video presentation *Managing Change and Transition.* Ideas for dealing with change and recognizing the symptoms of grief that can accompany change were presented. The video, audio and booklet were made available to be checked out by staff who were unable to attend.

Safety & Wellness

The Safety Committee for calendar year 2000 consisted of Safety Officer Dave Owsley, Gerald "Scooter" Stretsbery (chairman elect) from Maintenance, Kelly Gardner from Administration, Kim Seldon from Production, Russ Waitt from Idaho FRO and Laura Kessel from Idaho FHC.

This year the Committee posted hazard plaques at several water outlet locations on the Complex to warn Staff against drinking non-potable water, made recommendations for upgrades to the grip strut walkways on the Burrows ponds to meet OSHA standards (see Facilities Maintenance-OSHA) and improving safety along the Hatchery's Self-guided Tour path.

Following is a list of safety meetings and activities held throughout FY2000.

November 1999
Dr Riley, physician from Clearwater Valley Hospital, spoke to the staff about *Avoiding and Detecting Illness* during the flu season. Several information sheets and pamphlets regarding respiratory illnesses such as asthma and emphysema were made available.

January 2000
Representatives from Oxarc, Lewiston, Idaho, gave a hands-on demonstrations for *Use and Calibration of Gas Monitors*, and instruction was given regarding *Confined Space Safety*. In attendance were Deputy Complex Manager Owsley, Maintenance Supervisor Clifford, all of the Dworshak NFH Maintenance Crew, Assistant Hatchery Manager Bottomley and Maintenance Mechanic Fogleman (Kooskia NFH), and staff from the City of Orofino, Clearwater State Hatchery and Corps of Engineers (Dworshak Dam).

February 2000
Videos regarding *Forklift Safety* and *Ladder Safety* were shown and discussed by Dworshak Staff, February 24.

March 2000
Two *CPR/First Aid* classes were held March 16 & 30. Classes were taught by Certified First Aid Instructor Ginger Christiansen from the U.S. Forest Service. Twenty-four staff members received a two-year certification.

April 2000
Don Gardner, certified driver trainer for Smith Advanced Driving Skills, spoke to Dworshak Staff regarding *Safe Driving Habits*, April 24.

Confined Space Entry safety classes were held at the Quality Inn in Clarkston, Washington, April 26 and 27. Deputy Complex Manager Owsley and all maintenance staff attended the one-day class, 4 on the first day and 5 on the second.

May 2000
A *Fire Drill* was conducted May 31, followed by a staff Safety Meeting to identify problems in notifying and evacuating Complex employees in the case of an actual emergency. Following discussion, staff viewed the video *A Living Legacy: Protecting Our Most Valuable Resources* which was distributed throughout the Department of Interior in coordination with the department-wide Safety Day to encourage all employees to make safety a high priority.

Deputy Complex Manager Owsley delivered "Buckle Up America" safety posters to all of the local schools, May 23.

June 2000
Dr. Steven Ozeran, a plastic surgeon from Lewiston, addressed the staff in a Safety Meeting regarding *Skin Cancer Prevention, Detection and Treatment*, June 22. This is an important issue considering the season and the number of employees we have working out of doors. Jeanette Gorman of the Clearwater Valley Hospital Clinic assisted the Safety Committee in organizing the presentation.

July 2000

A *Safety Awards Banquet* was held July 26 in the Administration Conference Room. Pictures were displayed during the week prior to the banquet depicting various possible safety hazards around the workplace, and Staff were given the opportunity to identify these hazards and/or produce humorous captions for the photos. Twenty-five people attended the meeting, and 10 people participated in the contest. Awards were presented over pie and ice cream. This event was in lieu of the planned DOI Safety Day, which occurred April 5.

August 2000

Staff viewed a video outlining the *Lock Out/Tag Out* safety procedures, outlined by OSHA, for shutting down power for safely working on machinery. Those who attended the meeting also received an accompanying booklet. Every department was represented at the meeting, including those that do not actually have any use for the Lock Out/Tag Out procedures, but all were made aware of the purpose of the locks and tags, and will now know to exercise caution when they are seen around the Complex. On August 23, a representative from Oxarc, Lewiston, was on station to present another *Confined Space Training* class for Dworshak Maintenance staff.

September 2000

Complex Staff viewed a video *Survival!* on the morning of September 25. This video showed tips for surviving harsh wilderness conditions and explained steps to take before embarking on a trip that will assure survival if one becomes lost.

Personnel Actions

New Hires

- Steven P. Lodman, Animal Caretaker, WG-5048-4, effective November 14, 1999.
- Gerald (Scooter) Stretsbery, Laborer, WG-3502-2, effective November 7, 1999.
- William Wayne Hamilton, Animal Caretaker, WG-5048-3, effective May 7, 2000.
- Cliff Walker, Social Services Assistant, GS-0186-5, permanent-seasonal, effective June 5, 2000.

Terminations

- Steven P. Lodman, Animal Caretaker, WG-5048-4, resigned position effective January 6.

Promotions

- Mark Bright promoted to Fishery Biologist, GS-0482-7, effective January 16, 2000.
- Kim Seldon promoted to WG-5048-5, effective April 9, 2000.
- Mary Lou Galloway promoted to GS-0303-9, effective April 9, 2000.
- Kelly J. Gardner, promoted to GS-0326-4, effective May 7, 2000.
- David E. Clifford, promoted to WS-4749-10, effective June 4, 2000.

Temporary

- James Garrison, Animal Caretaker, WG-5048-4/1, effective February 27.
- Jerald Oleson, Laborer, WG-3502-2, effective June 1, completed duty effective July 27.
- Joel Pearcy, Laborer, WG-3502-2, effective June 1, completed Duty effective July 21.

Clearwater River Youth Program (CRYP)

Nine local youths began working on June 5. Six were assigned to Dworshak NFH; Kelly Burge, Soren Newman, Chelsea Rohrback, Dane Plank, Jeremy Hedrick, Dallas Fertitta. Three worked at the Clearwater State Hatchery; Leah Brandt, Chris Burge and Dustin Roby. Social Services Assistant Walker was the crew leader. The Clearwater River Youth Program (CRYP) workers went to Crooked River and Red River, July 11-13. The CRYP workers and some hatchery staff went to Lower Granite Dam for a tour, July 27. Certificate awards were presented to the CRYP youth workers for their efforts, July 28. The youth workers completed their terms on August 10.

Dworshak Staffing

Dworshak Employees

Name	*Position Title*	*Period of Employment*	*Status*
Bright, Mark G.	Fishery Biologist	10/01/98 - 09/30/00	Permanent
Clark, Robert W.	Fishery Biologist	10/01/99 - 09/30/00	Permanent
Clifford, David E.	Maintenance Supervisor	10/01/99 - 09/30/00	Permanent
Galloway, Mary Lou	Supv. Admin. Support Asst.	10/01/99 - 09/30/00	Permanent
Gardner, Kelly J.	Office Automation Clerk	08/30/99 - 09/30/00	Permanent
Garrison, James	Animal Caretaker	02/27/00 - 09/30/00	Temporary
Grant, Connie	Information/Education Assistant	07/04/99 - 09/30/00	Temporary
Greene, Benny C.	Electronics Mechanic	10/01/99 - 09/30/00	Permanent
Hamilton, William W.	Animal Caretaker	05/07/00 - 09/30/00	Permanent
Izbicki, Adam H.	Fishery Biologist	10/01/99 - 09/30/00	Permanent
King, Rick A.	Maintenance Worker	10/01/99 - 09/30/00	Permanent
Lodman, Steven P.	Animal Caretaker	11/14/99 - 01/06/00	Permanent
Miller, William H.	Complex Manager	10/01/99 - 09/30/00	Permanent
Ochszner, Dennis J.	Animal Caretaker	10/01/99 - 09/30/00	Permanent
Oleson, Gerald	Laborer	06/01/00 - 07/27/00	Temporary
Owsley, David E.	Environmental Engineer/ Deputy Complex Manager	10/01/99 - 09/30/00	Permanent
Pearcy, Joel	Laborer	06/01/00 - 07/21/00	Temporary
Praest, Diane E.	Budget Assistant	10/01/99 - 09/30/00	Permanent
Rosales, Raymundo A.	Maintenance Worker	10/01/99 - 09/30/00	Permanent
Sawyer, Susan E.	Information/Education Specialist	10/01/99 - 09/30/00	Permanent
Seldon, Kimberly K.	Animal Caretaker	10/01/99 - 09/30/00	Permanent
Semple, Robert A.	Supv. Fishery Biologist	10/01/99 - 09/30/00	Permanent
Sims, Hubert M.	Maintenance Mechanic	10/01/99 - 09/30/00	Permanent
Sperber, Joan, M.	Purchasing Agent	10/01/99 - 09/30/00	Permanent
Stretsbery, Gerald	Laborer	11/07/99 - 09/30/00	Permanent
Trainor, David A.	Electrician Helper	10/01/99 - 09/30/00	Permanent
Trock, Thomas J.	Fishery Biologist	10/01/99 - 09/30/00	Permanent
Vargas, John J.	Animal Caretaker Leader	10/01/99 - 09/30/00	Permanent
Walker, Cliff L.	Social Services Assistant	06/05/00 - 09/30/00	Permanent/ Seasonal
Weeks, Terry C.	Maintenance Worker	10/01/99 - 09/30/00	Permanent
Wright, Benjamin A.	Animal Caretaker	10/01/99 - 09/30/00	Permanent

Other Staffing

Clearwater River Youth Program (CRYP)

Dworshak NFH

Burge, Kelly
Fertita, Dallas
Hedrick, Jeremy
Newman, Soren
Plank, Dane
Rohrback, Chelsea

Clearwater SH

Brandt, Leah
Burge, Christopher
Roby, Dustin

Temporary Personnel Services

Adams, Lawnica	Laborer	02/16/00 - 04/19/00
Elwood, Rick	Laborer	12/06/99 - 04/18/00
Goodwin, Lisa	Laborer	03/01/00 - 04/19/00
Taylor, Amber	Laborer	02/16/00 - 04/19/00

Meetings, travel, training and other administrative business included:

Left & above: Top officials from Army Corps of Engineers, Washington DC office, flew in two blackhawk helicopters and toured the hatchery; Complex Manager Bill Miller briefs Dr. Joe Westphal, Assistant Secretary of the Army, on hatchery operations

Left: Adam Izbicki (DNFH) and Ray Jones (Idaho FRO), Fisheries Biologists, presented a poster on feed trials and growth rates at the 50th annual Northwest Fish Culture Conference in Seattle.

Mary Lou Galloway, Supervisory Administrative Support Assistant confers with Dworshak Complex Manager Bill Miller over the annual Army Corps budget meeting.

Job Shadowing/Internships/Volunteers

Two Orofino High School students spent a day job shadowing with the Production crew and learning about fish culture. Gordon Theissen and Jesse Lyda were steady volunteers for tours and information during spawning seasons and were treated to lunch by Complex Manager Miller in July in appreciation of their efforts. A student intern through Walla Walla Community College signed on for a spring semester project at the hatchery; he is majoring in Fish & Wildlife Resources and lives in Lewiston.

10th Annual Open House

Preparations for this year's Open House began in February. In celebration of the 10th anniversary of this event, special shirts were designed for staff and volunteers to show appreciation for their hard work over the past 10 years and in anticipation of their assistance in the future. The event was a huge success, with terrific weather and 857 children registering to fish. The corresponding poster contest showcased the artistic talents and concern for the environment by area 4th graders; the winner received a $50 gift certificate, and all entries received certificates of participation. Volunteers included local youth and adults, staff from LSRCP, Boise ES, Clearwater State Hatchery and the University of Idaho. Exhibits provided by U.S. Army Corps of Engineers, U.S. Forest Service and Idaho Fish & Game.

Fin Bins

Currently two educational resource trunks, *Fin Bins*, are available for teachers to check out from Dworshak NFH. These trunks contain books, videos, worksheets, posters, models and other learning aids to familiarize students with the biology, life-cycle and migration patterns of anadromous fish. Curriculum-based lesson plans were compiled in October by I/E Assistant Grant, who produced further lessons and added a number of resources throughout the fiscal year. Office Automation Clerk Gardner designed a very professional-looking cover for the lesson plan books. The *Fin Bins* are very popular with local schools and were checked out frequently throughout the year.

55 Gallon Show Tank

This large aquarium was purchased and sits just inside large nursery room viewing window, allowing visitors to view live fish from the lobby, enhancing their experience at the hatchery. "Gill," a blue metallic rainbow trout is currently living in the aquarium, and there are plans to keep juvenile steelhead or chinook in the tank year-round. Funds for this project were provided by an Idaho Community Foundation grant through the Albertson's Education Fund.

Salmon Sense

Puget Sound Waterway Commission loaned Dworshak NFH an educational computer game developed to teach youth about the life-cycle and migration challenges of salmon. This game is to be used as model to develop a similar game specific to Columbia Basin salmon issues. Dworshak NFH was awarded a $1,000 Small Outreach Project grant in April and received in May the award of an additional $5,500 grant from the Idaho Community Foundation. Development of the project began in August with the drafting of a financial obligation for funds agreement with University of Idaho. This project will continue into FY2001.

Off-Site Activities

Project WET

Two *Project WET* teacher workshops were held this past year. These events were coordinated by Dworshak NFH Outreach staff and were presented to area schools and agencies. The first workshop, which took place in November in Kamiah, Idaho, was presented to 10 teachers from 3 local schools. The second of these workshops was held in conjunction with the Idaho Water Camp in June at LCSC.

Hatchery in the Classroom

This was the inaugural year for the *Hatchery in the Classroom* project. Local schools were invited to submit proposals for the project, and the schools selected were each provided with an aquarium, 200 eyed steelhead eggs, and the equipment (data sheets, tank supplies, fish food), training and support needed to raise the eggs from eyed stage to fry. The schools chosen for this year were Nez Perce High School and Weippe Elementary School.

Fish tanks were set up in each school during the month of March, and students were shown how to perform weekly water quality tests, tank maintenance and fish culture. Volunteers needed to be found for feeding fry 8x daily during vacation and weekends. Students were treated to a classroom fish anatomy and dissection lesson with adult steelhead trout in April.

Weippe Elementary School completed their project in May with an 89.5% survival rate from eyed egg to 3.5cm fry. The fry were then released into the main Clearwater River. The release was attended by all 5th and 6th graders from the school, and the local paper carried photos and a story about the project and event.

I/E Specialist Sawyer spoke to 27 area ranchers, farmers and agency staff at a luncheon in Nez Perce regarding the *Hatchery in the Classroom* project. Following the luncheon, participants visited the classroom to view the hatching steelhead fry. In April, fish in Nez Perce School tank developed Ichthyopthirius (ICH), and sick fish were isolated and treated. Nez Perce High School completed their project in May with an 88.2% survival rate from egg to 1.5–2" fry. The juvenile fish were released into a private wildlife pond near Winchester, Idaho. Landowners, 11 students, Lewis County Soil Conservation District staff and news media assisted and/or attended the event.

In addition to these two schools, 200 eyed steelhead eggs were also donated to Deary School for a similar class incubation project using their own equipment. Complications arose over the school's spring break, (water fouled by too much feeding), and all of the young fish died. Although this event seemed somewhat tragic for the students, it was a very good learning experience for them regarding the sensitivity of fish. This gave them an understanding of the difficulties faced by biologists in raising hatchery fish, as well as the hazards wild fish face during their natural lives.

IDAH$_2$O Water Camp

I/E Specialist Sawyer was the lead facilitator for this event, held at Lewis-Clark State College, while I/E Assistant Grant assisted with site visits and logistics. The four-day "camp" consisted

of two classroom days and two field days to support and enhance teacher learning of North Central Idaho aquatic resources. Hands-on lessons and activities were provided for 18 Idaho teachers, one of which was selected to participate in the winter 2001 *Hatchery in the Classroom* incubation project.

6th Grade Forestry Tour

This annual event is sponsored by the Clearwater County Extension Office for several days each July for 6th graders from Clearwater County. As part of this educational event, students toured the hatchery and played a fish hazard simulation game called *Hooks and Ladders*. Outreach staff participated in off-site activities as well; I/E Specialist Sawyer met group at Lolo Creek and presented information about how anadromous fish find their way home by their sense of smell; I/E Assistant Grant met with the group at Bertha Hill Lookout and led them in a game of *Bat and Moth*, which demonstrated how bats use echo-location to seek out their prey, which includes fish for one species of bat.

50th Annual Northwest Fish Culture Conference

FWS was host agency this year, and the theme for the conference was historic fish culture. I/E Specialist Sawyer served as the Idaho Prize Committee chairperson and was asked to create an historical fish culture display for this year's conference. This display was created using artifacts from the DC Booth Hatchery in South Dakota and picture prints from older fish and wildlife publications. Besides providing an interesting look back at the history of fish hatcheries, the display was often used by conference participants as a backdrop for photographs. I/E Specialist Sawyer also presented a poster for the event, highlighting outreach tools for any budget, and I/E Assistant Grant was invited to present a paper on developing educational programs for the Fin Bins. Several follow-up inquiries were received regarding outreach and education programs at Dworshak NFH.

Lewis-Clark Bicentennial

I/E Specialist Sawyer is on the regional Lewis-Clark Bicentennial Committee and is working in cooperation with area agencies on projects such as developing an action plan for projects, improvements and events and for grant research and writing. Sawyer attended a meeting at Hells Gate State Park in July to decide funding priorities for the new anadromous fish exhibit in the expanded visitor center; Sawyer's idea of a walk-through interactive fish model were voted on to submit for funding. This will be an ongoing project for the next several years.

Other Events

Dworshak Fisheries Complex was represented by Outreach staff at several other events during the year, including: Kiwanis Kid Fair, Orofino, Idaho; 6th Annual Earth Day, Big Eddy Marina, Clearwater County, Idaho; 12th Spring Valley Environmental Awareness Days, Latah County, Idaho; Salmon and Steelhead Days, Boise, Idaho; Clearwater County Fair, Orofino, Idaho; Wenatchee River Salmonfest, Leavenworth NFH, Leavenworth, Washington.

Visitor Use Statistics

Type of Program	# of contacts	% change from FY99
On-site		
Hatchery Visitors (Register and self-guided tour)	7682	(-5%)
Guided Tours	82	no change
Tour Visitors	1800*	30%
Open House (children 12 & under)	857	21%
Others	1885*	7%
Total On-Site Contacts (*)	**19,906**	**67%**
Off-site		
Programs/Displays/Events	58	+71%
Total Off-Site Contacts (**)	**15,498****	**+105%**
Total Programs for FY99	140	0.16
Total Contacts for FY99 (* + **)	35,404	82%

Summary of Visitor Statistics

Every program and contact area showed an increase in activity over last year. Overall hatchery visitation was down by 5%, but the same number of guided tours were given as last year, to 30% more people. The 10th anniversary open House event saw an increase in attendance by 21% for the children but still 4 under the overall attendance record of two years ago. Overall attendance was up 7%.

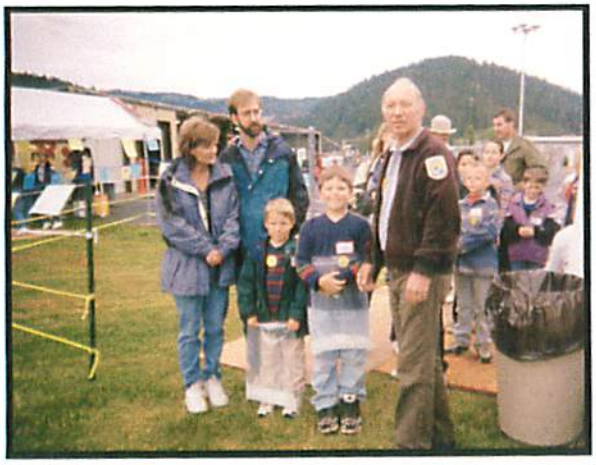
Off-site programs saw the largest increase from last year. These included fairs, career days, environmental awareness and natural resource events at schools, and the new Hatchery in the Classroom programs. The largest increase (nearly double FY99 outreach contacts) occurred in 3 big events out of the area: the Boise Salmon and Steelhead Days; Leavenworth NFH Salmonfest, and the Clearwater County Fair.

Weekend tours continued to be popular and will be offered again in the FY01 summer season. Mild winter weather also allowed more people to visit during this time of year.

Outreach Photos:

Left: Students release steelhead fry into the Clearwater River at the conclusion of their "Hatchery in the Classroom" project.

Right: 6th grade Forestry Tour students play "Hooks and Ladders" as part of their environmental awareness days; the outreach team participated in several multi-agency outdoor events this year.



Above: 90 students rotated through 3 learning stations set up by hatchery staff in the lab, research and production sections on Junior High Science Day.

Left: a new 55 gallon aquarium was installed by the nursery viewing window for unusual fish and aquatic species display.

Middle left: 10th annual Kids' Fishing Day was held for 857 children 12 and under, second highest attendance for the event.

Dworshak Fisheries Complex personnel (Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and Idaho Fisheries Resource Office) worked closely with the following agencies and groups to accomplish various activities throughout the year.

Federal Agencies

- Federal Emergency Management Administration (FEMA)
- National Marine Fisheries Service (NMFS)
- National Park Service (NPS)
  - Nez Perce National Historical Park
- National Weather Service
- Natural Resource Conservation Service (NRCS)
- United States Department of Agriculture (USDA)
  - Clearwater National Forest
  - Clearwater County Extension Office
  - Nez Perce County Extension Office
- United States Army Corps of Engineers (COE)
  - Walla Walla District
  - Dworshak Dam and Reservoir Project
- United States Geological Survey (USGS)
  - Biological Services Division
  - Seattle Research Center
  - Columbia River Research Laboratory
- United States Fish & Wildlife Service (USFWS)
  - Hagerman National Fish Hatchery

State Of Idaho

- Idaho Department of Employment
  - Job Training Partnership Act (JTPA)
  - Job Service - Orofino
- Idaho Department of Fish & Game (IDFG)
  - Boise Headquarters Office
  - Lewiston Office
  - Salmon Office
  - Clearwater State Hatchery
- Idaho Parks and Recreation Department
  - Dworshak State Park
- Idaho State Historical Preservation Office (SHPO)
- Lewis-Clark State College
- University of Idaho (U of I)
  - Cooperative Fishery Research Unit (CFRO)
  - School of Forestry, Wildlife and Range Sciences
  - Aquaculture Research Center

State of Washington

- Washington State University (WSU)
  Bear and Eagle Research Unit

Tribal Entities

- Kootenai Tribal Fisheries
- Nez Perce Tribal Fisheries
- Coeur d'Alene Tribe

Public Utilities

- Bonneville Power Administration (BPA)
- Clearwater Power Company (CPC)
- Idaho Power

Local Government

- Clearwater County Sheriff's Office (CCSO)
- Clearwater County Soil Conservation District
- Latah County Soil Conservation District
- Joint School District #171
- Orofino Chamber of Commerce

Special Interest Groups

- Idaho Community Foundation
  Northern Region Grant Program
- Idaho Food Commodity Program
- Pulp and Paperworkers Resource Council (PPRC)
- Retired Senior Volunteer Program (RSVP)

Other

- Lewis-Clark Recyclers
- Latham's Meats
- NADL Recycling

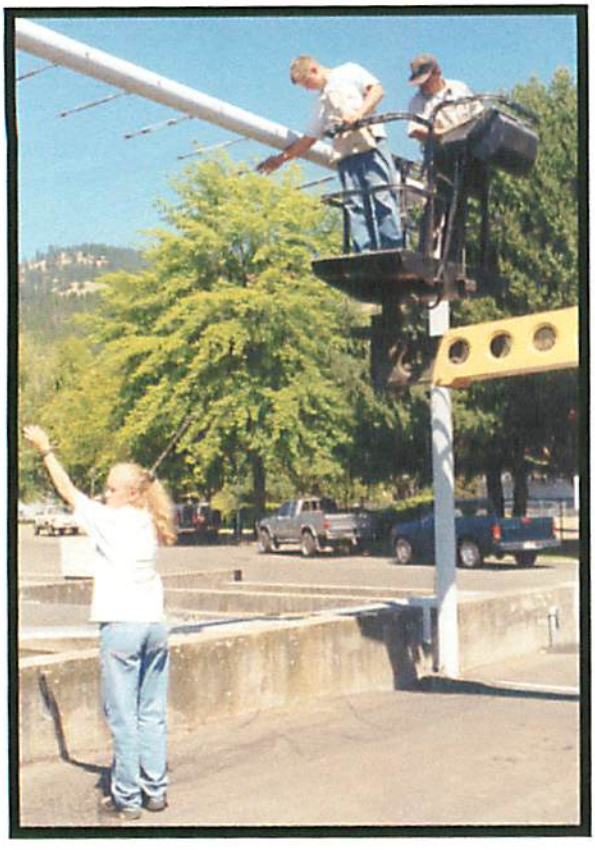


Photo highlights for the Cooperative Programs at Dworshak NFH included:

Top and bottom left: The Clearwater River Youth Program, through the local high school, provided a 6-week summer program for 6 students, shown here stringing new bird netting over ponds; below is the last-day group photo with crew leader Cliff Walker.

Top right: Dworshak NFH worked closely with Idaho Fish Health Center veterinary medical officer Marilyn Blair, left, and the Nez Perce Tribe in the second year of the tribal coho salmon spawning program.

Lower right: The Retired Senior Volunteer Program provided senior helpers during the steelhead spawning season for tours and public contact on the viewing balcony.