1993

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INTRODUCTION

Dworshak National Fish Hatchery (DNFH) is located in north central Idaho downriver from Dworshak Dam, at the confluence of the North Fork and the main stem Clearwater River. Dworshak Dam was constructed by the Corps of Engineers (COE) in 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 26 years to meet the "mitigation goal" of providing 20,000 adult steelhead to the Clearwater River and maintain the unique genetics of the stock.

DNFH consists of a mechanical, electrical, water reuse and reconditioning system employing filtration, sterilization, 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 recycled water flow, for rearing steelhead smolts to the required size of 180 mm in only one year. In 1973, System II (25 ponds) and System III (34 ponds) were converted from single-pass, 2-year rearing cycle, to water reuse and heating for accelerated production growth. This second phase construction, with added mechanical systems (biological filters, electric grid, sand filters, U.V. lamps, chillers, and boilers), increased production capacity and allowed all three water systems to be environmentally controlled.

During the mid-1970's, with DNFH not meeting production 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 ultra violet 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 1980's added 18,000 square feet of nursery building, doubling the number of inside rearing tanks to 128. A new concept of biological filtration, known as a fluidized sand filter, replaced the oyster shell media in System I. This filtration system has proven to be unworkable and the ability to operate reuse in System I is no longer possible. We are presently working with COE to rehab this system. Also in the 1980's, an additional thirty 8' x 80' raceways were constructed under the Lower Snake River Compensation Plan (LSRCP) to provide production facilities for spring chinook salmon (*Oncorhynchus tshawytscha*).

The uniqueness of DNFH's water systems provides several options for egg incubation and rearing. Three temperature schematics are available for egg development through the incubators. Three 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, one mile downriver from the Dam, is capable of providing 92,500 gpm of water. Water reuse in Systems II and III, used during the colder months of November through March, is made up from 10 percent new water to allow heating for desired fish growth. 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. Limitations still remain on the amount of water which can be heated in the nursery for early rearing of steelhead. This has caused some problems in the past couple of years with different reservoir operations.

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 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. Some of these items are being accomplished through O&M funding. Larger items are being funded directly by the District. In FY 95 the COE funded an electrical upgrade contract and an emergency electrical repair. Future projects include an upgrading of the railroad overpass,

removal of the unused underground storage tanks, upgrading the domestic drinking water system, converting Burrows ponds to raceways, System I reuse modifications, structural work on the main hatchery building, nursery building roof, and getting additional heated water to the nursery building. Getting additional heated water to the nursery building is top priority. This is due to the current operation of Dworshak Reservoir and the effects of cold water releases on the steelhead program.

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 Dworshak Fish Health Center and the Idaho Fishery Resource Office are also included in the new Dworshak Complex.

The Dworshak hatchery has capacity for producing 2.3 million steelhead smolts; 1.4 million yearling chinook salmon smolts; 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 9,000 spring chinook. Steelhead goals are being satisfied in some years but were not in 1995. Spring chinook returns remain well below mitigation levels.

This report covers the period of hatchery activities from October 1, 1994 to September 30, 1995.

PROGRAM HIGHLIGHTS

Dworshak's Fiscal Year (FY) 1995 total funding package from the Corps of Engineers (COE), including overhead costs, was $1,716,000. Operating funds, not including support costs, were $1,331,320 (1935 account). Another $10,000 was received from quarters rental reimbursements (8610 account) for a total of $1,341,320 from funding. Included in this figure was $50,000 budgeted to the Dworshak Fish Health Center (FHC) for their assistance and $50,000 to Idaho Fishery Resource Office (FRO) for continuation of their monitoring evaluation of Dworshak's steelhead smolt production.

The Lower Snake River Compensation Plan (LSRCP) provided $314,000 (4710 account) for production of spring chinook salmon. The Clearwater Youth Program, an eight-week summer work program for Dworshak Fisheries Complex and Clearwater State Fish Hatchery, was also covered by LSRCP at a cost of $20,000 for salaries of ten enrollees and one crew leader.

The hatchery received $13,500 in transfer costs from Idaho FRO for assistance on a Stewardship Project, "Interactions of Hatchery and Wild Steelhead in the Clearwater River of Idaho." Two (2) temporary bio-aid positions were funded over a six-month period of study.

Total hatchery operation and maintenance (O&M) funding, excluding $100,000 for FHC and FRO assistance was $1.2 million. Salaries and benefits accounted for 53 percent.

Fish marking costs included $41,000 to ad-clip 2.4 million steelhead. Marking of spring chinook cost $6,500 for coded-wire tagging and $12,000 for adipose fin clipping.

Major costs were also distributed between ten cyclical projects ($19,000), and purchase of new or replacement equipment ($117,200).

Full-time staff years employed were 23.30; permanent employees 22 and temporaries 1.3 years. Twenty-six (26) employees were represented in the staffing during the year. This number does not include one Older Worker Program employee.

An amended budget was provided the COE, Walla Walla District, for increased funding in FY 1996/1997. This increase was necessary to assure funds were available to meet a 100,000 pound rainbow trout mitigation requirement for Dworshak Reservoir. Dialogue between Idaho Department of Fish and Game (IDFG) and the COE has continued over recent years to justify increasing resident fish production. To resolve this issue and provide the numbers requested by the State appears several years away. Dworshak's 10,000 pounds of rainbow production, due to disease concerns by IDFG, are presently being planted in other state waters with a trade for disease-free fish from elsewhere for planting Dworshak Reservoir.

Overall feed conversion was 1.59 (less than 2 pounds of food to produce 1 pound of fish gain); spring chinook 1.60, steelhead 1.59 and rainbow trout 1.80. Total feed cost per pound of fish produced was $0.52; chinook $0.73, steelhead $0.47 and rainbow trout $0.68. Costs remained comparable to recent years.

Production gain for steelhead was 352,457 pounds for the year (10/01/94 - 9/30/95) compared to last year's 278,223 pounds. IHN virus disease, followed later by Ich, caused devastating losses in System II when operating on reuse. These losses resulted in fewer numbers of smolts in Spring 1995. Dworshak released 2,387,182 steelhead, weighing 255,318 pounds (193 mm), both off site and directly from the hatchery.

Spring chinook production gain of 61,328 pounds was lower than last year's 88,054 pounds. The program was at full capacity providing 1,431,336 smolts, weighing 61,328 pounds (147 mm), in April-May 1994.

Broodyear 1994 spring chinook spawning, completed September 1994, resulted in the hatchery carrying 104,000 fish through 1995 in excellent health condition. The hatchery anticipates another good year of quality fish production assuming similar conditions continue through release in Spring 1995. Broodyear 1995 steelhead spawning, completed in early May 1995, provided the hatchery with over 2.7 million fingerlings on station September 30, 1994. Projected smolt release in Spring 1996 is 2.4 million. The hatchery was holding 103,835 spring chinook fingerlings (Broodyear 1994) at the end of the reporting year. A total of 80,000 smolts are anticipated to be on hand for release in Spring 1996.

The 1994 steelhead program escaped early IHN detection through nursery rearing and remained free of the virus until first noticed in outside rearing ponds in October, a period of eight months. This year's ponding strategy maximized use of the cleaner reservoir water supply. The young steelhead were in the nursery tank for a longer period of time reaching a size of 96 fish per pound before transferring to the outside ponds on river water. For the second year, no outbreaks from IHN have occured in the nursery since the COE provided a reservoir water supply.

System II returned to heated reuse and the entire system was treated during a 24 hour period with 35 ppm formalin System I and System III experienced few health problems.

By September 30, 1995, Dworshak's IHN problems were confined to only six of 90 outside Burrows ponds and raceways. Losses were less than 1.5%; low, when considering the virus problems of past years.

Several changes in ponding were initiated this year which may prove beneficial in the future for minimizing INH:

1) Fish were ponded at final loadings of approximately 30,000 fish per pond.
2) Fish were fed moist feed for a longer period of time.
3) Reuse will be initiated earlier than usual, hopefully by early November. Heated nursery water will be used to raise System I water temperature by several degrees.

Broodyear 1995 spring chinook spawning, completed in mid-September 1995, provided 22,250 eggs for Dworshak and 57,000 for Kooskia. Only 28 females were available for spawning. Adult return numbers were the lowest in hatchery history. Next year's return also remains bleak when noting consistent poor ocean conditions and in-river passage problems continue to reduce fish numbers.

An annual power outage occurred on May 17 for Clearwater Power Company. This is a routine scheduled outage for maintenance on the Ahsahka substation. The entire hatchery complex was on generator power for the day.

July 13 was the start of a six-week program for cooler water to be discharged from Dworshak reservoir. This 50°F water was discharged to help the fall Chinook Salmon in the Snake and Clearwater Rivers.

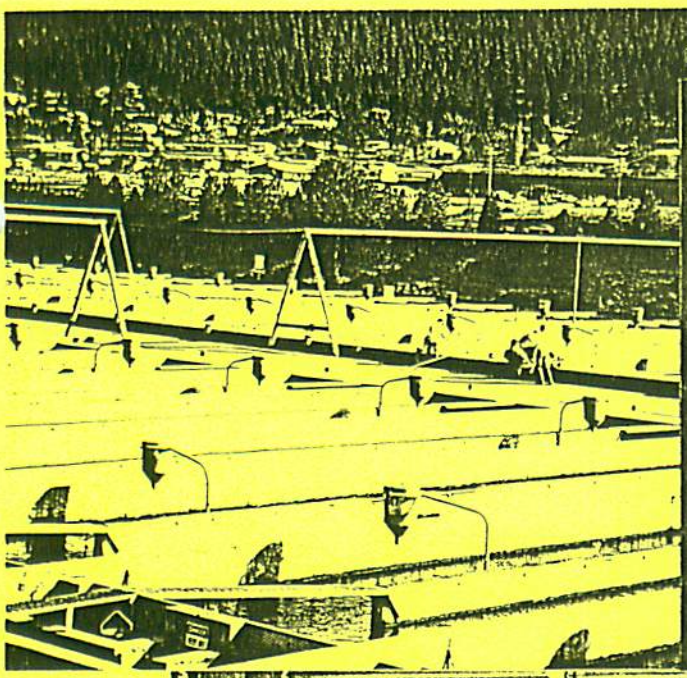
A contract for a boom truck at a cost of $77,973 was issued and the truck is to be delivered December 14, 1995.

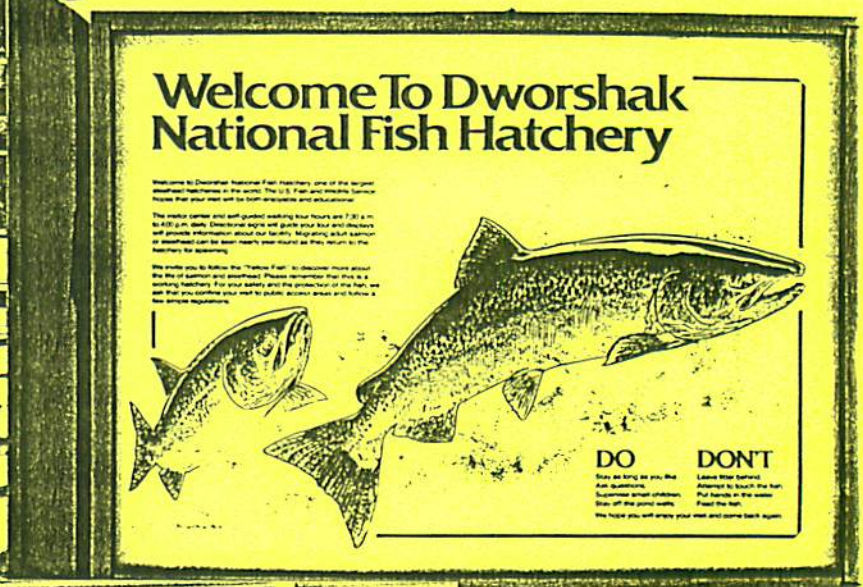
Packed columns were added to each of the six main pumps at the main aeration chamber. This concludes the rehab portion of the main aeration chamber. The hatchery crew still has two main pumps left to install in the main pump house.

The fifth Annual Open House, again highly successful, was held on June 17, 1995. The highlight was a free fishing pond attracting 582 children to register and catch two rainbow trout each. Another 300 adults attended the popular activities in conjunction with National Fishing Week. New activities were added this year, including the Japanese art of fish painting . There was involvement from other public agencies including the Dworshak Dam, Clearwater County Sheriff's Office, and the Orofino Police Department D.A.R.E. officer.

An eight-week Clearwater Youth Program ended on July 28. The program, staffed with six enrollees and one crew leader, performed numerous work projects with special attention to buildings and grounds maintenance. Dworshak has participated in the YCC program since 1982, but because of its possible discontinuance, an agreement was set up with Joint School District #171 to administer the program. Funding was provided by LSRCP.

Mary Lou Galloway represented fisheries field offices on the Region One Budget Administration Consolidation Team in November-December 1994, and at a Financial Monitoring Workshop June 6-8, 1995, in Portland, Oregon.




Welcome To Dworshak
National Fish Hatchery
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DON'T

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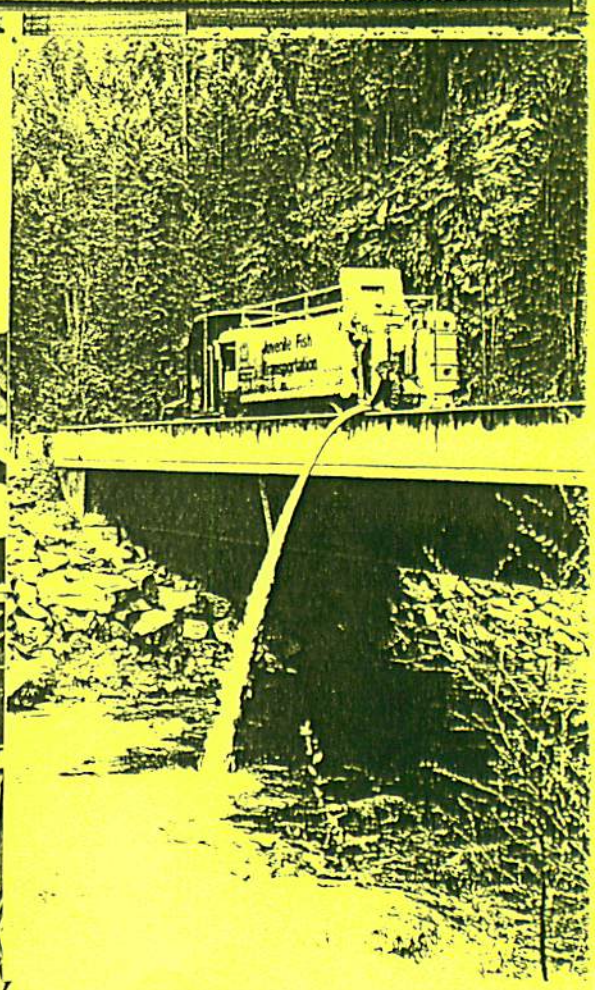
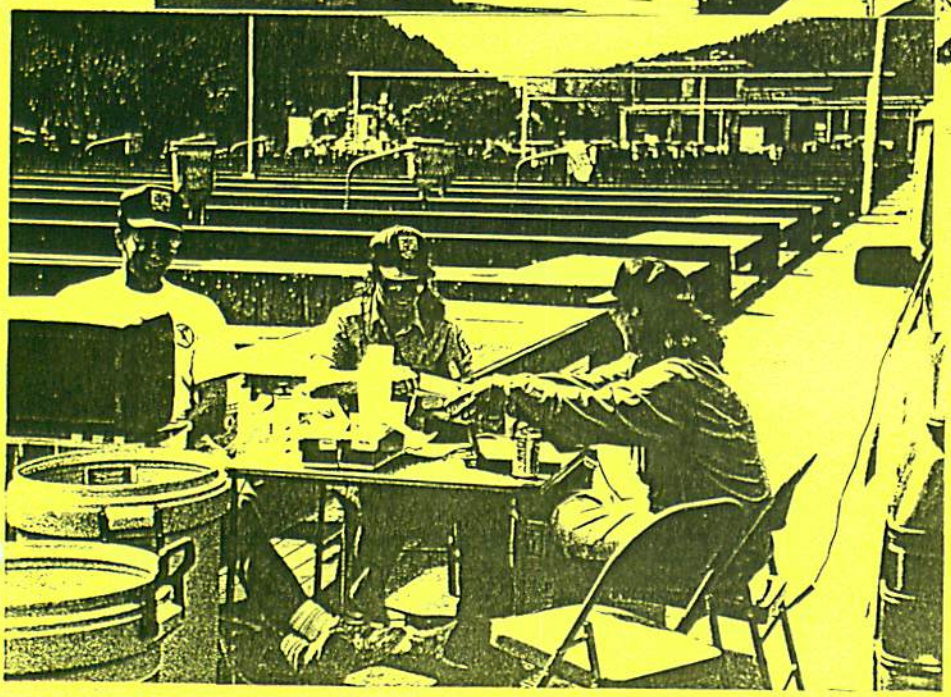




SALMON RECOVERY

Dworshak Reservoir drawdown is set to begin next week

■ Orofino Chamber of Commerce director hopes judge stops it

By Michael R. Wickline

IDAHO FISHERIES

Steelheaders face an uncertain season

Short fishing could be cut back or canceled; decision isn't expected until mid

SAVING SALMON

NMFS plans to halt drawdown of Dworshak Reservoir Aug. 23

■ Hydrologist says new data leads agency to reconsider

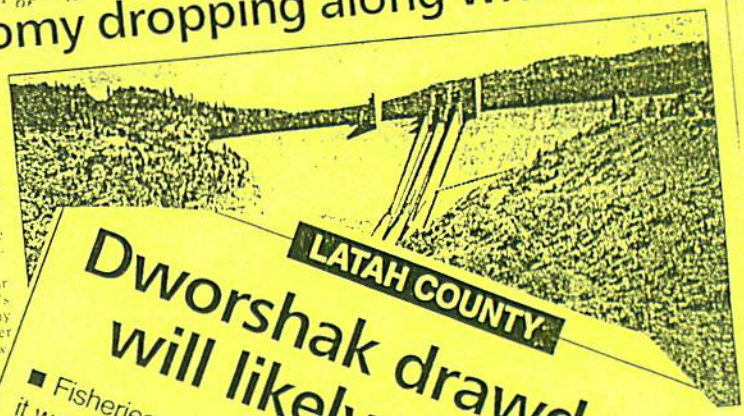
Drawdowns aiding smolts, agency claims

■ Salmon: U.S. Fish and Wildlife Service says water from Dworshak helping young chinook migrate, but alliance calls scientific basis shaky

By Michael R. Wickline of the Tribune

Orofino's economy dropping along with water

By Michael R. Wickline of the Tribune



DWORSHAK RESERVOIR

NMFS, Orofino might 'find common ground'

■ Fisheries service indicates a willingness to talk about a solution to summer drawdown controversy

By Michael R. Wickline of the Tribune

LATAH COUNTY

Dworshak drawdown will likely continue

■ Fisheries service expects it won't end release Aug. 23

Associated Press and Tribune

OROFINO

STEELHEAD

Tight regs foreseen for B-run

■ Idaho may impose a 30-inch limit on Snake steelhead, catch-and-release on Clearwater

By Paul M. Emerson

Dworshak manager looks to the salmon

■ William H. Miller hopes to expand the vision of the Clearwater River fish-

By David Johnson of the Tribune

FREE FISHING DAY!

Steelhead Jack and Jill say :

"Come on Down and Join Your Friends "

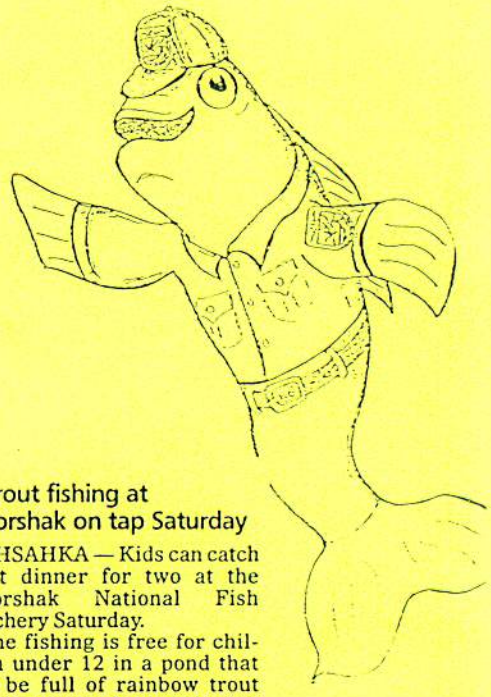
at

DWORSHAK NATIONAL FISH HATCHERY

Saturday , June 17 , 1995

9 a.m. to 3 p.m.

Win A Free Soft Drink !
Aquariums...Equipment Displays...
Balloons and Buttons...Activity Books...
Japanese Art of Fish Printing (Gyotaku)
CONCESSIONS!
AND MUCH MORE!



Trout fishing at Dworshak on tap Saturday

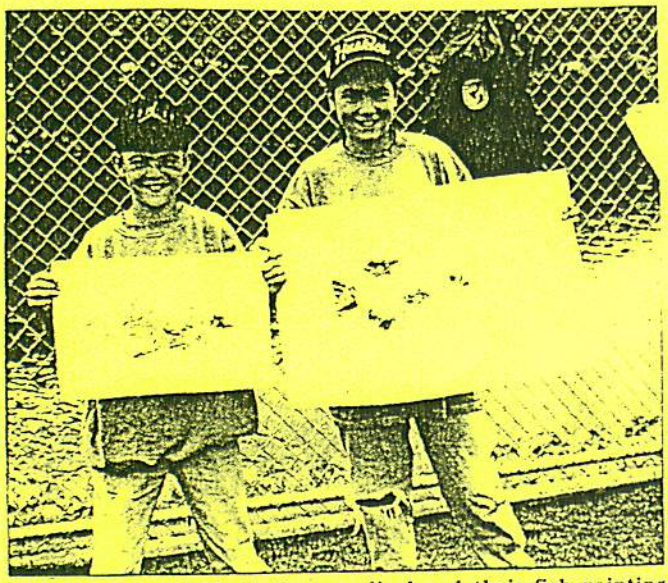
AHSAHKA — Kids can catch trout dinner for two at the Dworshak National Fish Hatchery Saturday.

The fishing is free for children under 12 in a pond that will be full of rainbow trout ranging in size from 11 inches to "very large," according to event organizers. Poles, tackle and bait will be provided for kids to each catch two trout. The fish will then be iced in a plastic container to take home.

Fishing is the focal point of the fifth annual open house for the fisheries complex in Ahsahka starting at 9 a.m. until 3 p.m.

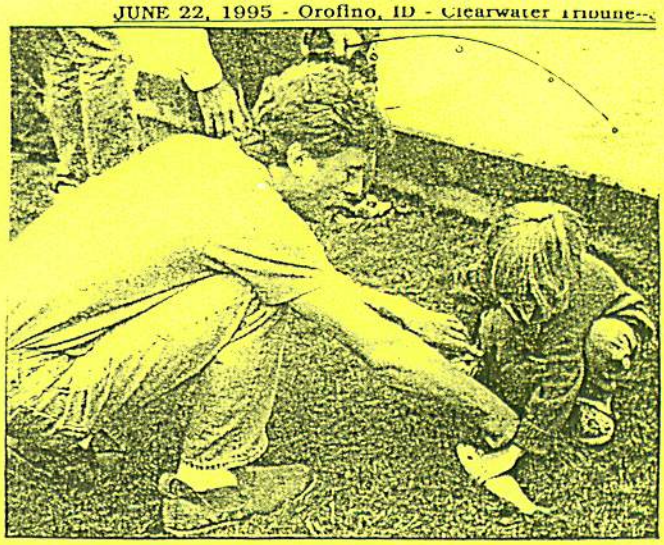
The Japanese art of fish painting, Gyotaku, has been added to this year's fun, which is open to all children. The activities include informational displays for adults and children in the Dworshak Dam Resources Office and the U.S. Department of the Interior offices.

Fisheries employees will be available to answer questions. The Orofino High School Boosters Club will sell hamburgers, hot dogs, soft drinks and other treats.



Twins, Cody and Nicole Turner, displayed their fish painting techniques during the open house and free fishing day at Dworshak National Fish Hatchery Saturday.

JUNE 22, 1995 - Orofino, ID - Clearwater Tribune



Tom Jasper helps his daughter, Jade, take care of the fish she caught. Jaspers participated in the annual free fishing day at Dworshak National Hatchery.

FISH CULTURE OPERATIONS

Steelhead Trout Production

- Brood Year 1994 SST -

At the close of September 1994 all of the summer steelhead trout (SST) from Brood Year 1994 (BY 94) were outside in the Burrows ponds (BP), totaling 2.65 million fish (Table 1). It was anticipated that approximately 2.3 million SST smolts would be available for release in spring of 1995. Final release number was actually 2.39 million smolts.

Table 1. Fish inventory summary by number and size for BY 94 SST as of end of fiscal year, 09/30/94, and projected release number on 5/1/95.

	Balance				Projected	
Location	Number	Weight	fpp	L(in/mm)	Loss (%)	Release No.
System 1	813,391	40,185	20.2	5.21/132	11	724,000
System 2	760,338	12,798	59.4	3.64/92	11	677,000
System 3	1,072,684	25,484	42.1	4.08/104	11	955,000
Totals/averages	2,646,413	78,467	33.7	4.39/112		2,355,300

Dworshak's 1994 SST program showed a production gain of 352,457 pounds for the fiscal year, just over 74,000 pounds more than the 278,223 pound gain of BY 93 the previous fiscal year. The BY 93 steelhead had been significantly impacted by a combination of IHNV and *Ichthyophthirius* (Ich) in System II which affected weight gain The 2.39 million BY 94 steelhead smolts at release averaged 187mm in length, under the 200mm target length. This smaller average smolt size at release was likely a result of cold water temperatures caused by releases from Dworshak Reservoir during July and August of 1994.

BY 94 steelhead achieved a green egg to smolt survival of 62.6%, which may be a record high (Table 2). This extraordinary survival is 11 percentage points above the previous high of 51.7% attained with BY 90. Overall survival has been increasing in recent years, with much of the credit due to the direct reservoir water supply to the nursery first used by BY 92 steelhead. Other likely contributors to the better survival are changes in fish cultural practices and strategies such as 1) first ponding fish no earlier than June 20 and no smaller than 130 fpp to minimize IHNV losses, 2) ponding the fish no later than September 1 to enable the fish to acclimate before reuse and thus be less susceptible to Ich infections, 3) treating System II with a 24-hour formalin bath to reduce Ich, and, 4) reducing initial ponding numbers which allows lower fish rearing densities.

Table 2. Survival summary from green eggs to released smolts, BY 89 through BY 94, for SST reared at Dworshak NFH.

	Percent Surviving from Previous Stage				==Cumulative % Survival==		
Brood Year	Eyed Egg	Tanked Fry	Ponded Fingerling	Released Smolt	Green Egg to Smolt	Eyed Egg to Smolt	Tanked Fry to Smolt
1989	86.7	97.9	21.9	92.3	17.2	19.8	20.2
1990	84.1	97.0	71.1	89.1	51.7	61.4	63.4
1991	80.3	87.5	58.5	92.0	37.8	47.1	53.8
1992	81.0	90.9	82.2	81.2	49.1	60.7	66.7
1993	90.6	92.6	87.2	68.9	50.4	55.6	60.1
5YRavg	**84.5**	**93.2**	**64.2**	**84.7**	**41.2**	**48.9**	**52.8**
1994	91.5	89.5	87.4	87.4	62.6	68.4	76.4

Note: Data are only for SST reared entirely at Dworshak NFH.
* Data does not include eggs deliberately culled before eye-up.

One other contributor to increased survival could have been the high 1994 summer flows in the North Fork of the Clearwater River, which would have diluted the IHN virus levels in the hatchery's water supply. Nine of the 25 ponds in System I, nine of System II's 25 ponds, and 10 of System III's 34 ponds broke with the virus this rearing cycle. Most losses were subdued, however, and BY 94 experienced an 87.6% survival from initial ponding through smolt release, the highest since BY 91.

In addition to treating all of System II (both in response to moderate levels of parasites in some ponds and prophylactically in the remainder), only three other steelhead ponds received treatments this rearing cycle. One pond in System I was treated successfully with formalin for *Trichodina* in early April 1995, and two ponds in System III were treated with formalin for Ich and other external parasites. It is an open question whether these latter two treatments were effective, because these fish populations were also suffering from environmental gill disease. The formalin treatment caused an initial loss of fish, but after a few days mortalities dropped significantly. Losses in non-treated fish populations also eventually diminished over time.

Initial standard treatment for Ich has been a one-hour standing bath of formalin at 167 mg/L. This procedure has had only limited success in controlling the parasite, so a one-day, 35 mg/L flow through treatment protocol was developed and tested. This flow treatment technique proved to be a more effective control, and has now been made our standard technique for Ich treatments. A half-hour to one-hour treatment with formalin at 167 mg/L continues to be effective on treatments for *Trichodina*.

System I

This system of 25 ponds began the fiscal year with 813,391 SST (Table 1). The ponds contained fish from Take 1 through 8, with the offspring of early returning adults in Takes 1 through 4. This system had a ponding to release survival of 86.3%, with 780,747 smolts released from the 904,001 (adjusted for fish marking corrections) fish initially ponded. Nine of the 25 ponds broke with IHN virus during outside rearing, but losses were quite low. Aside from one pond treated for *Trichodina*, the fish in this system remained fairly healthy, as indicated by the monthly growth increments and low monthly mortality in their performance through release (Table 3).

Table 3. Production data for BY 94 SST reared in System I, FY 95.

Month	Year	------1st of Month------ Number	fpp	L (mm)	Growth (in/mm)	Mortality (%)	Temperature (°F)
October	94	813,391	20.2	132	0.43/11	1.22	52.6
November	94	816,265	16.0	143	0.42/11	1.06	48.7
December	94	813,101	12.9	154	0.34/9	1.21	44.3
January	95	799,248	10.9	163	0.27/7	0.97	41.3
February	95	793,739	9.64	169	0.29/7	0.67	40.7
March	95	788,430	8.52	176	0.24/6	0.52	40.9
April	95	784,500	7.67	183	0.19/5	0.30	41.0
Release		780,747	7.33	186	-	-	-

Most steelhead in System I had their adipose fins removed by fish marking crews in October and November 1994. Inventoried ponds contained an average of 6.8% over book numbers. Part of this difference was likely due to over-estimated mortality numbers during the peaks of IHN losses. Coded wire tag (CWT) marking was done in BP 13 and BP 29 by the IDFG at the end of December. Approximately 20,000 fish in each pond were CWT and left vent-clipped. Ten thousand of the CWT fish in BP 13 were freeze-branded. Additional fish in each BP were ad-clipped. More CWT marking and freeze branding was completed in January 1995 in BPs 21 and 49.

Two hundred and fifty fish from BP 11 were PIT tagged by Vancouver FRO personnel and moved into BP 13 on February 5, and another 250 fish in BP 49 were PIT tagged on the same day. Fin-clipped, branded, and CWT marked fish from BPs 13 and 49 will help assess System I's contribution to later returns, while those from BP 49 will additionally provide information on early return offspring survival and timing. Idaho FRO PIT tagged 500 fish in March 1995 to be included in a selector gate study at Lower Granite Dam on March 30. Another 648 fish were PIT tagged from BPs 9 and 15 on March 31 for the Stewardship program in cooperation with Idaho FRO. An additional 984 steelhead trout from BPs 7, 11, and 17 were PIT tagged on April 5 for the Idaho FRO Stewardship project. Idaho FRO personnel checked for CWT retention, freeze brand retention, and adipose fin clip quality. Four ponds in System I had an average of 98.9% CWT retention. Freeze brand retention averaged 92.7% in 3 ponds, and 98.3% of the fish checked had proper adipose fin clips.

Most of the fish in System I were released from April 17 through April 26. Outplanting occurred on April 17 and 18. The COE assisted in the outplanting of 310,014 fish to sites at Clear Creek; the mainstem of the Clearwater River at Kamiah; and the South Fork of the Clearwater River at Cottonwood Creek, Mount Idaho Bridge, and River Mile 8.7. The outplanted fish averaged 7.88 fpp or 7.13 in (181mm). Direct releases from Dworshak NFH occurred the following week on

April 25 and 26, and 471,183 steelhead were sent on their way. These fish were slightly larger at 7.36 fpp and 7.40 in (188mm). About 600 fish were held through May in System I to be used in the gate selector study at Lower Granite Dam. Idaho FRO PIT tag marked 500 of these fish in May.

System II

This system began the new fiscal year with 760,338 BY 94 steelhead, and consisted of fish from the late takes (Takes 12 through 15). Two ponds of fish were involved in the National Biological Services (NBS) stock/productivity study. Steelhead in System II experienced an 82.6% survival from initial ponding through release, with 635,627 smolts surviving from the initial 769,148 fish (number adjusted for fish marking inventory corrections) ponded in summer 1994. This good survival reflects the relatively low losses to IHNV and to Ich. Only 9 of the 24 ponds in this system were confirmed positive for the IHN virus during this production program, with only limited losses. Ich was only a minor problem during pond rearing. Monthly growth was in line with historical averages (Table 4), but was not enough to compensate for growth lost during the cold water releases from Dworshak Reservoir in July and August of 1994. The fish from this system averaged 188mm at release, making these fish slightly larger than those from either Systems I or III this release year.

Table 4. Production data for BY 94 SST reared in System II, FY 95.

		------1st of Month------			Growth	Mortality	Temperature
Month	Year	Number	fpp	L (mm)	(in/mm)	(%)	(°F)
October	94	760,338	59.4	93	0.79/20	0.62	52.6
November	94	755,657	33.0	112	0.42/11	5.54	48.7
December	94	712,996	25.2	123	0.53/13	1.87	50.6
January	95	701,711	18.4	137	0.83/21	0.70	54.0
February	95	696,828	12.0	157	0.46/12	2.51	53.9
March	95	679,303	9.66	169	0.51/13	5.53	54.5
Release		635,627	7.03	188	-	-	-

Fish marking operations in System II began November 1, 1994, with ad-clipping, CWT marking, left or right ventral fin clipping, and freeze branding being accomplished by marking crews supervised by IDFG personnel. This marking concluded on December 16. Two-hundred and fifty fish in two ponds were given PIT tags by Vancouver FRO personnel on February 5, 1995, as part of a loading study being conducted at Dworshak. On April 6 another 1021 steelhead were PIT

tagged as part of the ongoing Stewardship study. Idaho FRO also conducted a mark retention check on System II fish and estimated that of the ponds sampled, 92.0% of the freeze branded fish, 99.0% of CWT fish, and 99.5% of adipose fin clipped fish had retained their marks.

System II was converted to heated reuse operation for its water supply on December 12, 1994, slightly later than usual because of increased IHN mortalities in several ponds during November. On December 21 the entire system was treated for 24 hours for Ich using formalin at an initial charge of 50 mg/L, even though Ich prevalence at the time was low. The treatment was delayed for one week due to concerns that going on reuse and a formalin treatment might be too much cumulative stress for these steelhead. The fish survived the treatment well, with a rise in daily mortality of only 3,500 fish (0.5%).

System II steelhead performed well during reuse operations, although pinhead dropout began in December as in years past. Dropout continued through the winter months, with additional losses being recorded in February and March as water quality and fish quality both deteriorated. Deterioration of fish quality was accompanied by swollen gills and loss of appetite.

Water temperature in System II was dropped to ambient starting April 12, with reuse operations discontinued on April 14. Outplanting of System II occurred on April 17 and 18. COE trucks transported 290,406 steelhead with a total weight of 40,309 pounds. Of the outplants, 117,925 went to Clear Creek and 172,481 went to the three locations on the South Fork of the Clearwater River. The outplanted steelhead averaged 7.21 fpp or 187mm in length (7.36 in). The remainder of System II fish were directly released into the mainstem of the Clearwater River from April 24 to 27. The directly released fish averaged 190mm in length (7.49 in) with an average size of 6.96 fpp.

We found no significant survival differences between groups of fish taken from the nursery and put in outside ponds at different sizes. Fish ponded at 300 fpp, 150 fpp, and 80 fpp had average survivals of 87.4%, 90.9%, and 82.6% through February 28. This lack of difference between groups is in contrast to a similar test conducted with BY 93 steelhead where differences were recorded. We believe parasite and IHN problems in BY 93 contributed to the ponded, larger-size SST populations suffering greater losses than those ponded earlier and smaller.

System III

System III began the new fiscal year with 1,072,684 SST, with fish size averaging 28.8 fpp, slightly behind the historical (1991 - 1994) average. Fish in this system represented the middle portion of the run (Takes 9, 10, and 11). Losses to bacteria, viruses, parasites, or to cultural conditions were low overall (Table 6). The 970,808 smolts released in spring 1995 represented an 86.5% ponding to release survival from the 1,121,684 fish initially ponded (number adjusted for fish marking inventories). Survival was up significantly from the 80.2% recorded for BY 93 steelhead. Only 10 ponds were confirmed positive for IHN virus during outside rearing, and parasite levels were generally low although several ponds experienced moderate Ich level.

Table 5. Production data for BY 94 STT reared in System III, FY 95.

Month	Year	------1st of Month------ Number	fpp	L (mm)	Growth (in/mm)	Mortality (%)	Temperature (°F)
October	94	1,072,684	42.1	104	0.50/13	0.30	52.6
November	94	1,066,235	29.8	116	0.51/13	1.59	48.7
December	94	1,102,654	21.8	129	0.60/15	2.43	50.6
January	95	1,077,344	15.5	145	0.38/10	4.60	54.0
February	95	1,027,750	12.8	154	0.47/12	3.72	53.2
March	95	989,472	10.3	166	0.41/10	1.30	52.1
April	95	977,727	8.54	176	-	-	47.7
Release		970,808	7.20	187	-	-	-

System III heated, reuse water operations began December 13 and continued through mid-April. Monthly growth rates in the system during winter reuse operations were substantially below historical (1991 - 1994) growth rates. Water quality and fish quality problems arose in mid-winter which resulted in higher mortality rates during December through February (Table 6). Over 25,000 fish died in December 1994 with another 50,000 lost during January 1995. While many of these mortalities were smaller fish (pinheads) dropping out, a significant portion were larger fish. Dworshak FHC noted both higher than normal levels of Ich and swollen gills on many active fish, indications of water quality problems. Around mid-January fish abruptly went off feed with fish health examinations showing empty gastrointestinal tracts for both healthy and in sick-looking fish.

Previous records over the last decade show recurring water quality problems in System III after several months of reuse operations. Fish culturalists and biologists have consistently remarked about the murkiness of System III water during mid-winter. Records show periodic elevated losses of large, apparently healthy fish in this system. In 1985 it was noted "Steelhead in System III have suffered a variety of problems throughout the production year ... and associated mortality accounted for the loss of 706,000 fish." A September 8, 1988, memo listing rehabilitation projects mentioned System III problems with packed columns plugging and with the need that they "... should be replaced with a pure oxygen system". Staff biologists believe this is not merely a problem of not enough cleaning during reuse, as every pond was cleaned weekly for BY 94, but a filter reuse problem.

Two BPs suffering losses were treated with formalin (35 mg/L, 24 h) on February 7 while six non-treatment control ponds were also monitored for comparison. The formalin treatments resulted in acute mortality of 2.2% in the two treated ponds, and a post-treatment daily mortality to about one tenth of pre-treatment levels. However, based on mortality data comparison between treated and control ponds, the treatment did not appear to have impacted long-term survival. A compounding factor was water temperature in the system was reduced from 54°F to 52°F in February to help fish survival.

IDFG marking trailers were set up October 14, 1994, and ad-clipping activity began October 17. Adipose fin clipping, CWT marking, ventral fin clipping, and freeze branding exercises were completed by December 8. Two hundred and fifty fish in two ponds were PIT tagged by Vancouver FRO crews in February for a Fish Passage Center study, and Idaho FRO put another 999 PIT tags into fish from three ponds for their Stewardship study.

Heating reuse water was stopped in System III on April 17, 1995, and on April 18 reuse operations discontinued. Outplanting System III fish took place on April 19 and 20 with 573,635 steelhead weighing 77,860 pounds moved via trucks to their various predetermined locations. Direct release of System III steelhead took place on April 27 and 28, with 397,173 smolts weighing 56,970 pounds going into the mainstem of the Clearwater River. System III produced 970,808 steelhead smolt weighing 134,830 pounds averaging 7.2 fpp (187mm , 7.35 in).

Distribution

By May 1 all of BY 94 steelhead smolts had been released from the hatchery. From April 17 through 20 just over 1.17 million steelhead smolts were outplanted at upriver sites on the mainstem and on the South Fork of the Clearwater River (Table 6). In a record 3½ days, four drivers, and four distribution units from the COE in cooperation with Dworshak crews, loaded and hauled 40 BPs of steelhead smolts to the distribution points. Loading, hauling, and stocking operations went extremely well.

Direct smolt releases from Dworshak NFH to the Clearwater River began April 24, one week earlier than normally planned because of early spring runoff of the Clearwater River Also aiding the out-migration of released smolts was the increase in flows from Dworshak Reservoir, which increased from 1100 cfs on April 9 to 5000 cfs on April 10 and to 14,600 on April 24. Flows were further increased to 23,000 cfs on April 27. Steelhead smolt releases from the hatchery were staggered over a five day period from April 24 through 28, 1995, to avoid overwhelming any downstream sampling or fish-collection operations. Table 7 presents a brief summary of numbers of released fish from each of the three rearing systems. All releases were non-volitional and went smoothly. The number of SST released directly into the mainstem totaled 1,213,577 with a total weight of 174,291 lbs (Table 6). These fish averaged 6.96 fpp (7.43 in, 189mm).

Table 6. Fish distribution summary by water and site, BY 94 SST, April 17-28, 1995.

Site	Number	Weight	fpp	--Length-- in	mm
Outplants: (April 17-20, 1995)					
MAIN S. CLEARWTR. R. KAMIAH BDG.	150,746	20,973	7.19	7.35	187
S.F. CLEARWTR. R. COTTONWOOD CR.	290,613	38,582	7.53	7.24	184
S.F. CLEARWTR. R. RIVER MILE 8.7	287,544	39,935	7.20	7.35	187
S.F. CLEARWTR. R. MT. IDAHO BDG.	96,584	13,089	7.38	7.29	185
CLEAR CR.	348,118	44,927	7.75	7.17	182
	---	---			
Subtotals/averages	1,173,605	157,506	7.45	7.27	185
Direct: (April 24-28, 1995)					
M.S. CLEARWTR. R.	1,213,577	174,291	6.96	7.43	189
	=========	=======			
Grand Totals/Averages	**2,387,182**	**331,777**	**7.20**	**7.35**	**187**

Table 7. Fish distribution summary by system, BY 94 SST, April 17-28, 1995.

System	Number	Weight	fpp	--Length-- in	mm
System 1	780,747	106,585	7.33	7.30	185
System 2	635,627	90,362	7.03	7.41	188
System 3	970,808	134,830	7.20	7.35	187
	---	---			
Grand Total	2,387,182	331,777	7.20	7.35	187

The total number of SST released from Dworshak NFH this year was 2,187,632 fish at a total weight of 331,777 pounds. Average size at release was 7.20 fpp (187mm, 7.35 in total length), 6mm smaller than release year 1994's 193mm average. This is the third year in a row that the 200mm goal has not been achieved. The drawdown of Dworshak Reservoir in the spring of 1994 and cold water releases from Dworshak Dam in summer 1994 slowed growth below projections. In addition, we reduced the temperature in System III for one month during the winter to aid in treating fish health problems.

- Brood Year 1995 -

The following is a condensation of Production's "Adult Holding, Spawning, and Egg Handling" report for BY 95 SST. For more complete information, please refer to this document.

Adult Holding

Adult SST for BY 95 were collected in late fall and again in winter and spring to represent the entire run spectrum. The ladder was first opened between October 25 and December 1, 1994, with 180 steelhead collected. It was re-opened from January 23 through May 4, 1995, with a total collection of 1,214 SST. An additional 417 B-run SST trapped at Kooskia NFH were transferred to Dworshak, bringing the total return to the Complex to 1,811.

Seventeen flow-though bath treatments of formalin were administered to adult steelhead being held between November 28 and January 6. Treatments were intended to control external fungus and reduce pre-spawning mortality. Pre-spawning mortality was 18.3% (33 of 180 fish), with a total mortality of 12.3% (23 fish) for those adults held in Holding Pond (HP) 1 and treated with formalin during the holding period. Another 10 fish died in HP 9 where formalin treatment was not applied.

Spawning Operations

Spawning began on Tuesday, January 24, and was conducted each Tuesday until May 2. The procedure was similar to past years: adults were moved from holding ponds to the crowding channel, into the channel basket, and then into an anesthetic bin Adults were anesthetized using carbon dioxide. Ripe females had their spinal columns cut, and were then put into the bleeding rack. Males were stripped of milt into small cup containers. The milt was placed into a cooler while the male was either sampled for diseases or was placed into a basket for shipment to the meat processor. Eggs were collected in sterilized colanders to drain ovarian fluid, then poured into a bucket. Single female spawns and incubation were maximized, but because of limited incubation space, double female spawns and double incubations were necessary for portions of many takes. One male was used to fertilize one or more females. A one percent saline solution was used to maintain milt motility at fertilization. Green and surplus males and females were returned to holding ponds.

Eggs were rinsed and placed into Heath incubator trays in a 75 mg/L iodophor solution. They were allowed to water harden for 30 minutes. Upon eye-up approximately 17 days after fertilization, the eggs were shocked, salted, passed through an electronic egg picker to remove dead eggs, and enumerated using an automated egg counter. Eggs were disinfected in a 100 mg/L iodophor solution for 10 minutes and placed into hatching jars (30,000 to 33,000 eggs per jar) or returned to the trays (10,000 to 12,000 eggs per tray).

Considerable time and effort was given to the stock/productivity evaluation study being conducted in cooperation with personnel from NBS. Three special handling days and 10 special spawning days were conducted beginning in mid-March with Take 9 and extending into early May with Take 15.

We had a total of 15 egg takes this spawning season, beginning on January 24 and ending on May 2. The 978 females spawned, excluding the 90 involved in the NBS study, produced 6.2 million green eggs, enough to meet Dworshak's commitments to its own production program and to those of Clearwater and Magic Valley hatcheries (Table 8).

Table 8. Spawning data from BY 1995 steelhead trout, Dworshak NFH.

	Number --Spawned-- Male	Female	Green Eggs	Culled Green Eggs	Eyed Eggs	Culled Eyed Eggs	EyeUp[1] Enum. Eggs(%)	EyeUp[2] Total Eggs(%)	Eggs/ Female
Dworshak Hatchery:									
Totals	407	978	6280296	173043	5537919	203684	90.7	89.2	6421
NBS-Seattle Study Spawns:									
Totals	12	90	439858	5364	252108	7435	67.4	na	na

[1] Data only from spawns that had live eggs separated from dead eggs.
[2] Data includes spawns discarded because more than 80% of eggs were dead.

Average fecundity of the females spawned was estimated at 6,470 eggs per female. With an excellent 90.7% eye-up we had an estimated 5.5 million eyed eggs. Just under 3.0 million eyed eggs were retained for Dworshak's production program this year (Table 9), the fourth consecutive year that the hatchery has kept its entire steelhead program on station. Included in this number are 155,000 eyed eggs brought into Dworshak's production program from the NBS study.

Table 9. Eyed egg disposition, BY 95 SST.

		Disposition				
	Eyed Eggs	Dworshak Production	Clearwater Hatchery	Magic Valley Hatchery	North Fork Palouse R.	Culled
Totals	**5693462**	**2989909**	**952000**	**1502200**	**38234**	**211119**

Another 480,000 green eggs were taken during NBS spawns. The fecundities, eye-ups, and other spawning data from these crosses was not included in the discussion above.

Just over 1.5 million eggs were shipped to Magic Valley Hatchery from Takes 9 through 12 for use in a B-run SST program on the East Fork of the Salmon River. In addition, 952,000 eyed eggs were also sent to Clearwater Hatchery for rearing and later release in 1996 in the Clearwater River drainage. Only eggs from IHN-negative parents were shipped out of the Clearwater drainage.

Of the 1,811 adult SST returning to the complex, 899 carcasses went to the Idaho Department of Education food program, 382 to the prison system food program, 124 to the landfill, 393 to the Washington State University bear program, three outplanted, one was poached, and 9 were unaccounted for. Another 35 natural adult steelhead collected at Kooskia were released above the weir in Clear Creek.

Nursery Rearing

Eyed steelhead eggs were enumerated, disinfected for 10 minutes in 100 mg/L iodophor, and then placed into Dworshak hatching jars over nursery tanks, or put back into Heath incubators. Eggs placed into egg jars hatched into swimming fry in approximately three weeks. Once two-thirds of the fry were out of the egg jars and into the nursery tank, the remaining fry were placed in floating screened boxes. Dead fry and eggs that had not hatched were then separated from the remaining live fry. Feeding was initiated the next day. Eggs from Takes 6, 7, and 8 were placed back into Heath incubator trays for hatching and swim-up development. BY 94 rainbow trout occupied A- and B-bank nursery tanks until April, limiting tank use by these three steelhead takes. Fry from Heath incubators were transferred to tanks once they were fully buttoned-up. Initial nursery tank loadings ranged from 18,000 to 36,000 fish per tank. Only fish in Takes 8 through 11 were at the higher densities. These takes were all split to other rearing units once space became available.

Dead eggs and fry were picked and enumerated from each tank. Mortalities up through two days after swim-up were subtracted from initial loadings, resulting in "adjusted initial loading" numbers. For BY 95 a total of 2,923,778 swim-up fry were calculated for initial starting numbers, a survival from the eyed egg stage of 94.4%, higher than the five-year running average of 91.5%, and second only to BY 90's 97% (Table 10).

Table 10. Survival summary from green eggs to released smolts, BY 90 through BY 94, for SST reared at Dworshak NFH.

	Percent Surviving from Previous Stage				==Cumulative % Survival==		
Brood Year	Eyed Egg	Tanked Fry	Ponded Fingerling	Released Smolt	Green Egg to Smolt	Eyed Egg to Smolt	Tanked Fry to Smolt
1990	84.1	97.0	71.1	89.1	51.7	61.4	63.4
1991	80.3	87.5	58.5	92.0	37.8	47.1	53.8
1992	81.0	90.9	82.2	81.2	49.1	60.7	66.7
1993	90.6	92.6	87.2	68.9	50.4	55.6	60.1
1994	91.5	89.5	87.4	87.4	62.6	68.4	76.4
5YRavg	**85.5**	**91.5**	**77.3**	**83.7**	**50.3**	**58.6**	**64.1**
1995	90.7	94.4	96.2	na	na	na	na

Note: Data are only for SST reared entirely at Dworshak NFH.
* Data does not include eggs deliberately culled before eye-up..

Egg jars in A- and B-banks began receiving eyed steelhead eggs on February 10. These two banks of rearing units were filled first because they could be provided a heated 54°F water supply. Once these 64 tanks were filled with fish from Takes 1 through 8, tanks in C-bank and then those in D-bank were filled. By the time C-bank tanks were in use in early May, warmer water was available through the primary water line leading to Dworshak Reservoir. This tanking strategy generally maximizes the use of Dworshak's heated nursery water supply.

In 1995 nursery water temperatures averaged 52.9°F in A and B banks and 49.1°F in C and D banks. Twice during the month the water supply was shifted to the cold secondary line. On May 4 the temperature was dropped to 48°F and then to 41°F on May 5 so that yearly maintenance of line valves could be performed. The temperature was raised to 47°F on May 15, then back to 54°F on May 16. On May 24 temperatures had to be dropped again for two and a half days due to water line problems at Clearwater Hatchery. Overall, the nursery had a total of 14.5 days of 41°F water which reduced growth in Takes 9 through 15 by an estimated 0.2 in (5mm).

The performance of this BY 95 fry in the nursery was good, with good growth (Table 11) and almost no health problems. Most takes had an average monthly growth rate of 0.6 to 0.7 in, with some exceeding 0.9 in per month. Cold water during some of the nursery rearing prevented optimum growth in all tanks. Proper attention to projected split dates, to tank densities, and to weekly feeding rate adjustments can be credited for the good performance and health of the fish. The only fish health problem was a confirmed outbreak of cold water disease, caused by the *Flexibacter psychrophilus* bacteria, in two tanks. In recent Dworshak production history, cold water disease is usually preceded by higher than desired densities or by low water flows in water temperatures higher than 50°F. The populations of the two confirmed tanks were immediately split, which resulted in a fairly rapid drop-off in daily mortality. No chemical treatments were administered in the nursery this year.

Table 11. Nursery production data for BY 95 SST, FY 95.

	End of Month				Monthly		
	Numbers	Weight	fpp	L (in/mm)	Growth(in/mm)	Mort.(%)	Temp(°F)
03/95	310,578	308	1008	1.42/36	0.37/9*	0.70	53.3
04/95	1,345,192	1,775	758	1.56/40	0.14/4	0.73	51.1
05/95	2,466,783	5,420	455	1.84/48	0.28/7	0.29	51.6
06/95	2,478,976	10,706	232	2.31/59	0.47/11	0.43	51.6
07/95	1,434,555	12,145	118	2.89/73	0.58/14	0.61	54.8

* Growth actually averaged about 0.65 in/mo (17mm/mo); fish transfers to outside ponds distort data.

A total of 48,000 fish (two tanks) involved in the NBS stock/productivity study were brought into Dworshak's production. These were the equivalent of Take 13 fish. Another 53,000 fish surplus to the NBS study were also brought into the steelhead program.

The only exception to recent nursery fish cultural practices was the installation of a timed flood light over the two Take 15 tanks. This provided another four hours of light for the smallest-sized steelhead. With the addition of automated belt feeders on these tanks providing more feed to these fish, additional growth was attained. By the time Take 15 fish were moved to ponds in late August, they were the same size as fish from Take 14.

The good health and performance of BY 95 fish in the nursery is reflected in the fry to ponded fish survival of 96.2%. This is substantially above the 77.3% average of the previous five years, and well above the previous two brood year's survival of 87%.

Nine different sizes of feed are used in the production of steelhead at Dworshak (Table 12). The variety of feed sizes provide the growing fish the proper sized feed at various stages, and eliminates the need to mix feeds when changing to a larger size.

Table 12. Feed changeover table for BY 95 SST.

Feed No.	Feed Type	Feed Name	Abbrev.	Start fpp	End fpp
1	Biodiet Starter	BDS 1	BDS1	2500	1500
2	Biodiet Starter	BDS 2	BDS2	1500	700
3	Biodiet Starter	BDS 3	BDS3	700	400
4	Biomoist Grower	BMG 1.0 mm	BG10	400	300
5	Biomoist Grower	BMG 1.3 mm	BG13	300	200
6	Biomoist Grower	BMG 1.5 mm	BG15	200	100
7	Biomoist Feed	BMF 2.5 mm	BF25	100	50
8	Abernathy	AB 6/64"	A664	50	13
9	Abernathy	AB 8/64"	A864	13	1

Fish cultural practices contributed to the increased survival of fish in the nursery. Also, better enumeration of eyed eggs and fish throughout cycle provided truer estimates of numbers. Spot checks in recent years of enumerated lots of eyed eggs, which should have numbered from 8,000 to 10,000 eggs, revealed shortages ranging from 5 to 25%. More intensive training, discussion with crew members about the problem, and increased oversight of egg enumeration essentially eliminated this error. Fish inventories taken as steelhead fry were moved to outside ponds this year produced an overall inventory loss of only 2.0% from book values. This is a considerable improvement over the 12% to 17% losses experienced the last seven years.

Take 1 steelhead were the first to be taken to outside rearing, with the first ponding taking place June 14, 1995. All fifteen takes were transferred to BPs over the next 11 weeks, so that by August 30, 1995, all steelhead were in ponds on river water supplies. Timing of steelhead ponding has been programmed so that few fish are ponded before July 1 and so that none are ponded after September 1. The old sage, Assistant Manager Jon Streufert, has concluded that steelhead ponded before mid-June suffer significant losses to the IHN virus, while those ponded after September 1 are often plagued by outbreaks of Ich, especially after reuse operations are initiated. The data for this conclusion is a "little weak," or non-existent; the manager has not accepted this thesis but has gone along with further evaluation of the hypothesis. Stay tuned.

Pond Rearing

Prior to September, all SST were inventoried and moved to outside ponds, with 1,128,185 going to System I and raceways, 653,410 to System II, and 949,086 to System III, for a total of 2,730,681 initially ponded.

Through September 30, 1995, only one pond broke with IHN in System I, BP 19, confirmed by the Dworshak FHC on August 14. Three raceways of SST broke with the virus, raceways B 17, B 18, and B 23, confirmed September 5, 25, and 14, respectively. Two ponds in System III were confirmed positive, BPs 73 and 80 on September 17 and 25, respectively. Total losses through the end of the fiscal year were limited. Just under 10% were lost in BP 19, which lost the most fish. Cumulative losses in raceways were less than 5%. The total steelhead fingerlings on hand September 30, 1995, was 2.69 million (Table 13). Considering historical losses as well as the present health of these steelhead, it is anticipated that 2.32 million smolts will be released in Spring 1996.

Table 13. Fish inventory summary by number and size for BY 95 SST as of end of FY 95, and projected release number on 5/1/96.

Location	Balance Number	Balance Wt.	Balance fpp	Balance L(in/mm)	Projected Loss(%)	Projected Release No.
System 1	1,098,579	47,518	23.1	4.98/126	12	967,000
System 2	651,940	17,230	37.8	4.23/107	15	554,000
System 3	943,205	33,186	28.4	4.66/118	15	802,000
Totals/averages	2,693,724	97,934	27.5	4.70/119		2,323,000

System I and Raceways. - System I and the raceways received almost 1.13 million fish in initial ponding this year. Because BY 94 chinook occupied only six raceways this year we loaded 28 of the empty raceways with fish generally destined for System I. Only 13 of System I's 25 BPs were initially loaded with steelhead. By using the raceways we programmed over 200,000 more steelhead into ambient water than in past years. This allowed us to load fewer fish and lower densities in both reuse systems, Systems II and III. Usually only fish from Take 7 and earlier are put in System I under ambient water conditions because of the longer time needed to rear fish to smolts without reuse. This year most of Take 8 was put in System I and raceways with the remainder of the take going to System III.

Over 320,000 steelhead from Take 8 were incorporated into an evaluation study to determine the effects of rearing unit type and feeding method on fish growth, fish quality, and length-weight relationships. Study fish were split into six BPs at 32,000 fish per pond and into six raceways at 22,000 fish per pond. There are two replicates in each of the two rearing systems (raceways and BPs) with three different treatment groups in each system, for a total of six ponds in each system. Two ponds in each system will be hand fed through release, two will be fed using two demand feeders per pond, and two will be fed using four demand feeders per pond. Comparisons will then be made between treatments within pond types and between pond types with the same treatment. Among the parameters being measured for comparison are fish growth, food conversion, survival, condition factor, and length/frequency relationships. Through the end of September 1995 there were no significant differences between treatment groups. However, length frequencies curves were already becoming bimodal in several of the rearing units involved. One additional observation was that the steelhead in raceways have been taking about one week longer to go on feed than those in the Bps. This evaluation study is a joint effort shared by the Dworshak Hatchery Evaluation Team, and includes Dworshak FHC, Idaho FRO, and Dworshak NFH.

System 2. - System 2 was filled with steelhead over a two-week period, from August 17 through August 30. As in past production years, this system received fish only from the later takes, Takes 11 through 15. Two ponds also received fish that have been designated Take 98, a designation

identifying NBS evaluation fish. These 45,000 Take 98 study fish are the developmental equivalents of Take 13 steelhead. System II SST responded to outside rearing quite well, and at the end of the fiscal year had not exhibited any significant rise in mortalities and had no confirmations of IHN.

System III. - System III was loaded with steelhead from Takes 8 through 11 between August 3 and August 15. The 949,086 fish initially ponded in System III was a reduction of approximately 200,000 fish over past production years. We reduced the loading numbers to try and improve water quality and fish quality in this reuse system.

Two evaluation studies are being conducted on SST in System III. Six ponds of Take 10 steelhead are being used in a "Pinhead Rehabilitation and Size at Feed Conversion" evaluation study. The five ponds committed to the pinhead rehabilitation portion of this study include three ponds of fish which will be graded in January 1996 and two control ponds which will not be graded. Grading will separate the smallest one-third of the fish in each pond. Two ponds of approximately 25,000 larger fish, and one pond of smaller fish will result. Special feeding of the smaller grade fish will attempt to increase the growth rate of these "runts". Studies have shown that larger, more aggressive fish in a population can take disproportionate amounts of the feed available. The sixth pond of Take 10 steelhead will be fed moist feed until fish average 20 fpp, while the other five ponds will be changed to dry feed at 40 fpp. This pilot study should provide insight on what effects feed changeover size has on length frequency spreads of SST being reared at Dworshak NFH.

Spring Chinook Salmon Production

- Brood Year 1993 -

When the fiscal year began on October 1, 1994, we had 1,437,803 BY 93 fish on station weighing 40,870 pounds, and averaging 35.2 fpp (Table 14). Fish were slightly ahead of target size of 40.1 fpp. Most fish had been fed medicated feed containing erythromycin since mid-September. Medicated feeding was completed on October 10, 1994.

Table 14. Production data for BY 93 spring chinook salmon, FY 95, Dworshak NFH.

	End of Month				Monthly		
	Number	Weight	fpp	L (in/mm)	Growth(in/mm)	Mort.(%)	Temp(°F)
09/94	1,437,803	40,870	35.2	4.55/116	-	-	-
10/94	1,318,660	54,262	24.3	5.15/131	0.60/15	0.09	52.6
11/94	1,317,401	66,855	19.7	5.52/140	0.39/10	0.06	48.7
12/94	1,316,709	72,690	18.1	5.68/144	0.16/4	0.04	47.3
01/95	1,316,175	77,891	16.9	5.81/148	0.13/4	0.03	41.3
02/95	1,315,518	81,059	16.2	5.89/150	0.08/2	0.03	40.7
03/95	1,313,904	93,422	14.0	6.20/157	0.31/7	0.06	40.9
Release	**1,311,445**	**93,422**	**14.0**	**6.20/157**	-	**0.06**	**41.0**

On October 26 and 27, 1994, 117,781 chinook weighing 4,630 pounds (25.4 fpp) from four C-bank raceways were moved to Kooskia. Suspected low oxygen levels during transport resulted in a loss of approximately one thousand fish. These Kooskia stock salmon were transferred to bring Kooskia NFH program up to its capacity of 800,000 chinook smolts.

Chinook growth at Dworshak NFH over the following six months remained reasonably good, dropping during the winter months as water temperatures dropped. Mortality remained quite low the entire period, resulting in a cumulative survival during pond rearing of 97.7% (Table 15). This is close to the five year average of 96.3%. BY 93 cumulative survival from green egg to released smolt was 81.2%, a bit below BY 92's 86.3% yet still above the five year average of 78.8%.

Table 15. Survival summary from green eggs to released smolts, BY 88 through BY 93, for spring chinook salmon reared at Dworshak NFH.

	Percent Surviving from Previous Stage				==Cumulative % Survival==		
Brood Year	Eyed Egg	Tanked Fry	Ponded Fingerling	Released Smolt	Green Egg to Smolt	Eyed Egg to Smolt	Tanked Fry to Smolt
1988	96.0	93.9	76.5	93.0	64.1	66.8	71.1
1989	92.8	94.2	89.2	96.5	75.2	81.1	86.1
1990	94.2	98.2	95.6	97.2	86.0	91.3	92.9
1991	89.0	96.1	99.3	96.9	82.3	92.5	96.2
1992	96.4	95.1	96.1	98.0	86.3	89.6	94.2
5YRavg	**93.7**	**95.5**	**91.3**	**96.3**	**78.8**	**84.2**	**88.1**
1993	87.2	95.9	99.4	97.7	81.2	93.1	97.1

Note: Data are only for SCS reared entirely at Dworshak NFH.
Data does not include eggs deliberately culled before eye-up.

Performance of BY 93 chinook continued to be quite satisfactory from October 1994 through release in April 1995. Feeding continued at 90% of manufacturer's recommended feeding rates, producing an average smolt size of 14.0 fpp (157mm). Signs and clinical indications of EIBS were absent, and pre-release BKD symptoms remained low.

Marking and Smolt Assessments

Vancouver FRO PIT tagged 250 fish in each of the 20 raceways involved in the erythromycin study from February 2 - 5, 1995. Another 510 fish were PIT tagged in March and taken to Lower Granite Dam on March 31 for a selector gate diverter study. Fifteen fish from each of the study group raceways were taken for smolt assessment. Sixty-five fish from the same raceways (1,300 total fish) were transported to the Marrowstone NBS field station for salt-water rearing on April 6. Another 300 fish were given to NMFS for dam passage studies on April 12, and National Biological Survey personnel out of Cook, WA, also sampled 60 fish for smolt travel time assessment work.

Erythromycin Studies

We used BY 93 chinook in an erythromycin evaluation study, investigating the effects of erythromycin feeding on survival and performance on station as well as on their outmigration and return to the hatchery. Over 670,000 fish were in this experiment that involved five treatment groups. The first group was comprised of control fish receiving only non-medicated feed. Two groups received 21-day feeding treatments with one of these groups receiving medicated feed both in the spring and in the fall, while the other group received medicated feed in the first spring and again the following spring. Two additional groups compared spring/spring vs. spring/fall medicated feedings, with treatment feeding durations of 28 days. Observations to date indicate no major differences between treatment groups. A final report on this experiment will be issued.

Distribution

On April 13 and 14 we released 1,311,445 spring chinook salmon directly into the North Fork of the Clearwater River (Table 16). These chinook smolts averaged 14.0 fpp (157 mm in length). The releases occurred in the late afternoon during high flows, 5,000 cfs, to move the fish out of the North Fork Clearwater rapidly and reduce predation. Water temperature averaged 41°F.

Table 16. Fish distribution summary, BY 93 spring chinook salmon, April 13-14, 1995.

Date	Water	Group	No.	Wt.	fpp	-Length- in	mm
04/13/95	N.F. CLEARWTR. R.	Prod.	613,441	44,875	13.7	6.24	158
04/14/95	N.F. CLEARWTR. R.	Prod.	698,004	48,547	14.4	6.13	156
			---	---			
Totals/Averages			**1,311,445**	**93,422**	**14.0**	**6.18**	**157**

- Brood Year 1994 -

Incubation

Incubation water temperatures on BY 94 spring chinook eggs remained chilled until October 26, 1994, at which time Kooskia's 330,500 eggs were transferred to that hatchery. We raised the water temperature on the remaining 104,900 Dworshak stock eggs to 48 - 50°F, where it remained until early December. Water temperature of 42° followed in December and early January and swim-up fry were feeding on January 7, 1995. We treated incubating eggs with a 15-minute 1,667 mg/L formalin treatment three times each week through November 9.

The use of chilled water to differentially slow development of the first four egg takes was quite successful, with eggs in Takes 1 through 5 all being fully eyed by October 8. Take 6 consisted of only one spawn, and it remained about three days behind the other takes. All eggs were physically shocked on October 8 and then picked and enumerated on October 11 and 12. We took 508,080 green eggs this spawning season (Table 17). We recorded an overall egg eye-up of 89.2% with 330,500 eyed eggs from Kooskia stock adults, and 104,900 eggs from Dworshak stock. Four trays of Kooskia stock eggs and one of Dworshak stock were culled due to high-BKD parentage or to gross infertility.

Table 17. Spawning data from BY 94 spring chinook salmon, Dworshak NFH.

	Number --Spawned-- Male	Female	Green Eggs	Culled Green Eggs	Eyed Eggs	Culled Eyed Eggs	EyeUp[1] Enum. Eggs(%)	EyeUp[2] Total Eggs(%)	Eggs/ Female
Kooskia Returns (Takes 1 - 5):									
subTL/avg	75	95	392427	21173	330500	0	89.0	84.2	4131
Dworshak Returns (Takes 1 - 6):									
subTL/avg	22	31	124887	8154	104900	0	89.9	84.0	4029
Totals	**97**	**126**	**517314**	**29327**	**435400**	**0**	**89.2**	**84.2**	**4106**

[1] Data only from spawns that had live eggs separated from dead eggs.
[2] Data includes spawns discarded because more than 80% of eggs were dead.

The 100,826 BY 94 spring chinook salmon were moved from incubation trays to the nursery on the December 28. The chinook were held off feed until their yolk sacs were completely absorbed at swim-up.

Nursery Rearing

The temperatures and duration of chilled water for early egg incubation appears to have been close to ideal, because these fry began feeding on January 7, 1995, within one week of the targeted date of January 1. The delayed development did not seem to have had any major effect on fry survivability, with a 89.5% eyed egg to feeding fry survival. This compares favorably with the five-year average of 93.2%.

The fry went on feed fairly well, considering the cold water temperatures in January. The fish were placed into seven nursery tanks at 14,000 fish per tank. Fish growth and performance during early rearing in the nursery were quite good, with monthly growth increments ranging from 0.21 in to 0.37 in, 6mm to 9mm (Table 18). Aside from the initial month's 2.25% mortality, losses in the nursery were fairly low, ranging from 0.08% to 0.28%. No fish health problems were noted during nursery rearing, and so no therapeutic treatments were given this lot of fish.

Table 18. Production data for BY 94 spring chinook salmon , FY 95.

	End of Month				Monthly		
	Number	Weight	fpp	L (in/mm)	Growth(in/mm)	Mort.(%)	Temp(°F)
01/95	99,891	108	925	1.53/39	0.33/8	2.25	41.8
02/95	99,607	173	576	1.80/46	0.27/7	0.28	41.5
03/95	99,403	305	326	2.17/55	0.37/9	0.20	45.7
04/95	99,223	436	228	2.45/62	0.28/7	0.18	43.5
05/95	98,538	556	177	2.66/68	0.21/6	0.08	44.4
06/95	98,450	877	112	3.09/78	0.43/10	0.09	46.3
07/95	98,347	1,183	83.2	3.42/87	0.33/9	0.10	52.6
08/95	104,161*	2,461	42.3	4.28/109	0.86/22	0.09	51.1
09/95	103,792	4,204	24.7	5.12/130	0.84/21	0.04	54.0

* Inventory gains during marking

Raceway Rearing

On May 15 we moved all of the spring chinook salmon into the first six raceways in A-bank at approximately 16,500 fish per pond. There were 98,538 fish initially ponded, which represents a tanked fry to ponded fingerling survival of 87.4%. This is significantly above the five-year average of 64.2%, but is about the same as BY 93's 87.2% survival. One possible factor contributing to improved survival these last two brood years may be the use of incubator trays and no up-welling colanders. These latter incubation units had water flow characteristics which may have contributed to egg anoxia and to chronic fry losses during nursery rearing in earlier years.

The spring chinook salmon started a 28-day feeding regime of erythromycin medicated feed on July 4, ending July 31. No toxic reactions were observed in these fish during treatment. Toxicity testing was conducted four times in August. About a third of the chinook were diagnosed with sunburn by Dworshak FHC. Sunburn may occur during treatments since erythromycin increases the dermal layer's photosensitivity.

BY 94 spring chinook salmon were CWTed and ad-clipped August 16 through 18. The inventoried number from tagging operations was 5,200 fish greater than the original estimation, giving an adjusted initial outdoor ponding number of 104,252.

BY 94 chinook continued to perform well through September 30, 1995. Monthly growth during summer and fall ranged from 0.21 to 0.43 in per month (6mm to 10mm per month). Monthly mortality rates were quite low, remaining at or below 0.1%. Few fish exhibited BKD during this period, and no treatment was needed for parasites.

On September 30 BY 94 chinook averaged 24.7 fpp (130mm), well ahead of schedule. Feeding of 90% of manufacturer's recommended rates have produced healthy fingerlings to this point in time. It is anticipated that spring 1996 we will have 100,000 smolts averaging 15 fpp (154 mm) for release.

- Brood Year 1995 -

Fish traps at both Dworshak NFH and Kooskia NFH were operated to collect BY 95 spring chinook salmon. The fish ladder at Dworshak NFH was opened on May 19, 1995, and remained open through the last day of chinook spawning on September 25. Kooskia NFH trapped and transported adult spring chinook salmon to Dworshak NFH from June 2 through July 26. Only 165 chinook returned to the complex with 40 returning to Kooskia NFH and 125 to Dworshak NFH.

Holding ponds, handling and mortality

All returning brood fish from Dworshak and Kooskia NFHs were held in HP 1 to facilitate anti-fungal treatment. In order to distinguish stocks, before being transferred, most of the Kooskia (KK) adults (36 of 40) trucked to Dworshak received a yellow spaghetti tag attached through a hole punched in the left operculum. Also a numbered circular staple tag was attached to the right operculum of these same 36 KK adults, while 99 of the Dworshak (DW) adults were staple tagged on left operculum. Tag retention was very low, with an overall loss of 67% for the staple tags. However, because KK and DW stocks were stapled on opposite operculums the residual marks left from the staples provided a clear indicator of their origin.

On July 31, 148 fish held at Dworshak were anesthetized with Tricaine Methane Sulfonate (MS-222) buffered with sodium bicarbonate, measured, and inoculated with Erythromycin Phosphate before being back put to HP 1.

Adult chinook being held in HP 1 at Dworshak were treated with formalin to control external fungus and reduce pre-spawning mortality. Beginning on July 5, fish were treated three to five times a week with a flow-through bath of 167 mg/L formalin for 60 minutes. During treatment HP flows were reduced to 500 gpm.. Ten gallons of formalin were added to "charge" the system to 167 mg/L and five gallons of formalin were dripped into the ponds at 315 ml/min for a 60 minute treatment duration. Formalin treatments were expanded to five days per week (Monday - Friday) from July 20 to August 23. We administered a total of 40 treatments using 600 gallons of formalin.

Pre-spawning mortality of adult spring chinook was 6.1% (10 of 165 fish) for DW and KK stocks combined (Table 19). The Kooskia held fish had a pre-spawning loss of 5%, while Dworshak's experienced a 6.4% loss. An actual spawning season loss of 7.3% occurred, 12 out of 165 that returned.

Table 19. Mortality of adult spring chinook salmon, BY 95, held from June 1995 through spawning, September 1995.

Type Mortality	Dworshak Number	Dworshak Percent	Kooskia Number	Kooskia Percent	Total Number	Total Percent
Pre-spawning[1]	8	6.4	2	5.0	**10/165**	**6.0**
During spawning	29	23.2	14	35.0	**43/165**	**26.1**
Used Males[2]	5	N/A	1	N/A	6/165	N/A
	---	----	---	-----	------	-----
Total (through 9/19)	**42**	**29.6**	**17**	**40.0**	**53/165**	**32.1**
Adjusted Total[3]	8	6.4	4	10.0	12/165	7.3

[1] Mortality picked from holding ponds from July 7 through first spawn on August 22. Adults held: Dworshak - 125, Kooskia - 40

[2] Males spawned once, then returned to the holding pond as a precautionary measure during abnormally low run years.

[3] Normal SCS spawning time ranges from 8/20-9/13.

Spawning Summary

We had egg takes of BY 95 chinook for both Dworshak and Kooskia, starting August 22 and ending September 19. Twenty-eight females were spawned, including 21 from Dworshak returns and 7 from Kooskia returns. This resulted in spawning sex ratios (females:males) of 1.0:1.6 for Kooskia and of 1.1:1.0 for Dworshak spawners. A total of 110,899 green eggs were produced: 34,267 from KK stock and 76,632 from DW. Eye-ups for enumerated eggs were 81.7 and 66.9%, respectively, resulting in 28,000 eyed eggs being available from Kooskia's program and 51,250 from Dworshak's.

BY 95 spring chinook had the lowest adult return on record and, therefore, the fewest eggs taken in comparison with the previous six brood years (Table 20). Average fecundity of 3,961 eggs per female coincides with the five-year average of 4,029. The eye-up for enumerated eggs was 71.5%, considerably lower than the 5-year average.

Table 20. Spring chinook salmon spawning numbers and egg takes for both Dworshak and Kooskia NFHs, 1990 to 1995.

Brood Year	Adult Returns	Percent Females	Green Eggs	Eggs /Fml.	Eye-up Percent
1990	3,183	54.9	4,833,104	3,623	94.2
1991	632	51.9	995,842	4,117	89.0
1992	681	53.2	881,980*	?	?
1993	1,579	51.7	3,489,391	4,270	87.2
1994	306	54.7	517,314	4,106	89.2
5 Yr Avg	**1,276**	**53.3**	**2,143,526**	**4,029**	**89.9**
1995	165	29.1	110,899	3,961	71.5

* Estimate.

Kooskia's adult returns included 8 females, 11 males, and 21 jacks. Jacks made up 52.5% of the Kooskia's run, adult females 20.0% and adult males 27.5%. Dworshak's numbers were 27 adult females (21.6%), 15 adult males (12.0%) and 83 jacks (66.4%). Overall, the 35 adult females represented 21.2% of the 165 fish returning, with adult males comprising 15.8%, leaving the I-ocean jacks with a whopping 63%. This ratio is very atypical.

Spawning Procedures

Adults were anesthetized with MS-222 and checked for ripeness. Males were sent directly to the spawning table while ripe females were killed using a pneumatic knife and bled for 5 to 10 minutes in a spawning rack. Green males and females were sent back to the Hps along with any II- and III-ocean males that were spawned and kept for reserve. Spawned adults were identified with numbered pins if they were sacrificed, which is necessary for later identification and segregation/culling of eggs according to disease status. As previously stated, because of their rarity, approximately six II- and III-ocean males were spawned and held in reserve for possible later spawning. To ensure identification as a previously spawned male, these fish had a V-notch punched into their opercle.

Sperm was collected in disposable Styrofoam cups and kept on ice until needed. Females were cut and eggs collected in disinfected colanders to drain ovarian fluid. Gametes from both males and females were mixed with the addition of a small amount water. After approximately two minutes, fertilized eggs were thoroughly rinsed and placed into incubators where they were disinfected with 75 mg/L iodophor (buffered with sodium bicarbonate) for 30 minutes. One male was spawned with one female, except when not enough males were available, then a male would be reused.

Aseptic procedures were used throughout the entire spawning period. Females were swabbed with iodophor before spawning. Males, however, were not iodophored to avoid contaminating the milt. Iodophor solutions of 500 mg/L and 250 mg/L were used to disinfect equipment and workers' hands.

Shocking and Enumeration

The use of chilled water to differentially slow development of the first four egg takes was quite successful, judging by the fact that Takes 1 through 7 were all fully eyed by October 24, 1995. The eggs were physically shocked on October 2 for Take 1, October 17 for Takes 2 and 3, October 23 for Take 4 and Takes 5, 6, and 7 on October 24 and 25. Dead eggs were removed by a mechanized egg picker and the live eggs enumerated. Eyed eggs were placed back into incubator trays at 5,000 eggs per tray with a flow of 5 to 6 gallons per minute through each stack. Eggs were disinfected for 10 minutes in a buffered 100 mg/L iodine solution prior to being transferred. Fifteen minute formalin treatments three times weekly continued through November 9.

Erythromycin

Results from Dworshak's FHC, ELISA testing for the prevalence and levels of *Renibacterium salmoninarum* (Rs), causative agent of bacterial kidney disease (BKD) for both Dworshak and Kooskia NFHs BY 95 adult chinook indicated that five females had high levels of Rs antigen and three females had moderate levels. Egg samples from these fish were transferred to the University of Idaho to determine if erythromycin was present. Erythromycin was present in the vitellin of eggs from seven of the eight females eggs at levels high enough to assure good protection from the pathogen.

The vitellin of one female did not contain detectable levels of the of the antibiotic. It is likely that this fish was brought from Kooskia NFH after July 31 and was not injected with erythromycin The eggs from this KK female will be culled while those of the other seven female parents that tested at medium and high-BKD levels will be segregated and raised separately at Dworshak.

Disposition

On October 16, 18, and 25 we transferred 57,000 eyed eggs from DW and KK stock to Kooskia NFH for incubation and rearing. In keeping with policy only eggs with low BKD levels were shipped to Kooskia . Eggs were disinfected with iodine upon arrival at Kooskia. Dworshak retained 22,250 eggs of both DW and KK stock in which the parent female registered either high or medium BKD levels.

Production Program Objectives

Approximately 19,000 chinook smolts should result from the 22,250 eyed eggs incubated at Dworshak, and 50,000 smolts from those shipped to Kooskia (Table 21). This assumes a survival from eyed egg through released smolt of 88%, the average survival for the last three brood years released.

Table 21. Projected release numbers of BY 1995 spring chinook salmon.

Program (Egg Source)	Number at Release	Type Release	Fpp at Release	Date of Release
Dworshak (Dworshak)				
(22 K eyed)	19,000	Smolt	15-20	Apr 97
Kooskia (Kooskia)				
(57 K eyed)	50,000	Smolt	18.0	Apr 97
	=======		Eyed egg to smolt	
Total Smolts	69,000		Survival of 88%	

Rainbow Trout Production

Fishing Day Rainbow Trout

The rainbow trout (RBT) grown for Dworshak's Fishing Day in June 1995 grew quite well in the nursery, with 12,049 fish on station to start the new fiscal year October 1, 1994. Population densities were kept fairly low to both maximize growth and to keep fish quality as good as possible. Growth and health of these fish remained excellent in nursery rearing. Monthly growth increments were above 0.6 in (15mm) through April 1995, with four months' growth increment well above one inch (25mm). No treatments were necessary for these fish while they remained on reservoir water supply.

We moved 5,000 of these fish on February 24 to raceway C 10 in the holding pond raceways because nursery tank space was needed by other rainbow trout being reared for mitigation purposes. Almost 7,000 fish remained in Dworshak's nursery on unheated water. In late April the 5,000 fish in C 10 were moved to BP 49 so that maintenance could be done on these lower C-bank raceways. The other 7,000 RBT from this lot were transferred to BP 45. The RBT moved into BP 49 had problems with environmental gill disease and fungus. We treated BP 49 RBT with salt baths on May 19 and on May 25, and with formalin on May 23. The fish responded well to these treatments.

On June 6, 1995, 1,000 fish from BP 45 were transferred to a fishing pond on the Coeur d'Alene tribe's reservation (Table 22). All of the remaining Lot 1 rainbow trout (9,800) were moved from the BPs down to the fishing pond on June 14. Fish averaged about 2.3 fpp (10.3 in/262mm). Dworshak's Open House event was held on June 17, with 580 kids fishing and taking home two rainbow each. On June 28 and 29 the remaining 8,000+ fish were seined from the fishing pond and distributed to Mud Springs Pond (on the Nez Perce Reservation), Fenn Pond (an IDFG stocked pond at Three Rivers up Clearwater about 60 miles), and to Campbells Pond (a local state-stocked pond approximately 15 miles out of Orofino).

Table 22. Fish distribution summary, BY 94 rainbow trout, June 6-29, 1995.

Stocking Site	Date	Number	Wt (lb)	fpp	L (in/mm)
Lot 1 (Fishing Day RBT)					
Coeur D'Alene Tribe	06/06/95	1,000	325	3.1	9.3/236
Mud Springs Lake	06/28/95	2,000	909	2.2	10.4/264
Fenn Pond	06/28/95	1,000	450	2.2	10.4/264
Campbells Pond	06/28/95	2,750	1,250	2.2	10.4/264
Campbells Pond	06/29/95	1,910	868	2.2	10.4/264
		---	---		
Totals		**8,660**	**3,802**	**2.3**	**10.3/262**
Lot 2 (Mitigation RBT)					
Cascade Reservoir	06/19/95	37,878	1,387	27.3	4.71/120
Cascade Reservoir	06/20/95	37,879	1,384	27.3	4.71/120
Cascade Reservoir	06/19/95	37,878	1,387	27.3	4.71/120
		---	---		
Totals		**113,635**	**4,158**	**27.3**	**4.71/120**

Mitigation Rainbow Trout

Over 124,000 rainbow trout eggs were received from Ennis NFH on November 22, 1994, with another 123,000 arriving on December 13. These two groups of RBT eggs comprised Dworshak's RBT mitigation program, and were initially destined for stocking in April and May of 1995. This was the second consecutive year that Dworshak's mitigation program was conducted on station. Over the past decade, this program had been shifted off-site to Hagerman or to Kooskia NFH to rear fish in IHN virus-free conditions, so stocking the fish into Dworshak Reservoir would not present fish health risks to either Dworshak or Clearwater hatcheries. With Dworshak Reservoir water becoming available for the nursery's water supply in 1992, the RBT program is now back at Dworshak NFH. Decisions on where to stock Dworshak mitigation RBT are made each year by FWS, IDFG, and the Nez Perce tribe, usually at the spring coordination meeting.

BY 94 mitigation rainbow also grew extremely well in Dworshak's nursery, with monthly increases in length of 0.6 in (15mm) or greater. Fish health also remained quite good during nursery rearing, with no disease problems and no treatments required. During the spring of 1995 after discussions with the IDFG, where they expressed a need for stocking larger size RBT, we decided to hold fish until July, a month or two longer than originally planned. In late March and early April 1995 these rainbow were moved to C-bank raceways and a raw water supply because the steelhead program needed the nursery tanks the rainbow were in.

The mitigation rainbow were subsequently moved in early May to two BPs in System I. This was the first time small fish had been moved from C-bank raceways to other rearing units on station. The fish were initially loaded onto the new Ford distribution truck using our Magic Valley fish pump. However, a high number of mortalities were noted and the intake structure on the fish pump was determined to be the cause. The remainder of the fish were then loaded on the truck by hand using fish nets. It was determined that over 2,000 rainbow were lost during the transfer operations. The Magic Valley fish pump was returned to the manufacturer and repaired.

Shortly after being moved, both ponds of RBT broke with IHN virus, possibly due to the stress of being handled. BP 47 was particularly hard hit by the IHN virus, losing over 49% of its population by the end of May. BP 43's losses remained relatively low at 8%. An attempt was made to move all of the mitigation RBT on June 8 to Cascade Reservoir with an IDFG fish distribution truck and trailer. After loading and getting part way to the Cascade Reservoir the truck returned to Dworshak NFH because of mortality in the tanks (overall it was actually less than 1%, but did cause problems with recirculation system). The decision was made to delay the stocking of these fish until after Idaho's annual free fishing day on June 17. Eventually, 113,635 RBT were planted by the Dworshak crew and FWS truck at three locations on Cascade Reservoir on June 19, 20, and 21 (Table 22). A total mortality of only 1% during the three fish planting trips was estimated.

Division of Fish Hatcheries
HPDW9509.WK1
19-Dec-95
03:09 PM

HATCHERY PRODUCTION SUMMARY

Station:
DWORSHAK NFH
Period covered:
10/1/94 through 09/30/95

Density Index: 0.08 | Flow Index: 0.41 | Total Flow: 53006 gpm

Species and Lot	FISH ON HAND END OF MONTH			THIS F.Y.						TO DATE		LENGTH INCREASE 30 DAY MONTH
	Number	Weight	Length	FISH SHIPPED	WT GAIN	FISH FEED EXPENDED		Conver-sion	FEED COST	T.U. per Inch	T.U.	
				Number	Weight	Pounds	Cost		Per Lb.			Inches
1	2	3	4	5	6	7	8	9	10	12	13	14
STT-NFW-94-DWO-1	0	0		780,747	68,407	112,420	27,503.04	1.64	0.40	36.5	148.4	0.11
STT-NFW-94-DWO-2	0	0		635,627	77,566	124,692	33,504.68	1.61	0.43	33.8	180.5	0.23
STT-NFW-94-DWO-3	0	0		970,808	109,345	179,693	44,230.89	1.64	0.40	40.4	168.9	0.40
STT-NFW-95-DWO-0	0	0		0	27,663	40,549	26,230.23	1.47	0.95	55.7	126.6	NA
STT-NFW-95-DWO-1	1,098,579	47,518	4.98	0	35,906	53,258	17,879.88	1.48	0.50	39.8	76.0	0.64
STT-NFW-95-DWO-3	943,205	33,186	4.65	0	23,678	34,400	12,419.34	1.45	0.52	24.9	43.7	0.89
STT-NFW-95-DWO-2	651,940	17,230	4.23	0	9,892	14,291	5,714.90	1.44	0.58	41.0	43.1	0.82
	0	0		0	0	0	0.00			NA	NA	NA
RBT-ERD-95-ENN-1	13,289	144	3.00	0	142	97	78.88	0.68	0.56	30	66.5	1.09
RBT-ERD-94-ENN-0	0	0		122,295	9,769	17,780	6,653.18	1.82	0.68	23	308.2	0.51
SCS-CRW-94-DWO-0	103,835	4,204	5.13	0	4,148	3,410	1,720.71	0.82	0.41	34.0	132.2	0.84
SCS-CRW-93-DWO-0	0	0		861,638	35,819	61,020	27,850.44	1.70	0.78	45.4	222.1	0.00
SCS-CRW-93-KK-0	0	0		569,698	21,361	33,693	15,323.03	1.58	0.72	44.0	222.1	0.00
Subtotal RBT	13,289	144	3.00	122,295	9,911	17,877	6,732.06	1.80	0.68	26.2	187.4	0.80
Subtotal STT	2,693,724	97,934	4.68	2,387,182	352,457	559,303	167,482.96	1.59	0.48	90.7	262.4	1.03
Subtotal SCS	103,835	4,204	5.13	1,431,336	61,328	98,123	44,894.18	1.60	0.73	NA	NA	NA
TOTALS	2,810,848	102,282		3,940,813	423,696	675,303	219,109.20					
AVERAGES			4.69					1.59	0.52			

Form 3-229
(Sept.1971)
DWRV.2/10/95

Copy: To Regional Office _____19__
CC: Mgr., KNFH, Asst. Mgr., Production, FHC, FRO
CRCO(Tom Sheldrake), AFF(Dan Diggs), Kay Cole

OK with Daily Dist. _____
OK with 3-1857 _____

FISH AND FISH EGG FISCAL YEAR 1995 DISTRIBUTION SUMMARY

Fiscal Year: 1995

Delivering Hatchery: Dworshak NFH

Check One: __ Initial Report
__ Nothing to Report
__ Amended Report

Line 1	Program 2	Agency 3	State 4	WT Type 5	Management Area 6	Water Name 7	Acres/ Miles 8	Species 9	Strain 10	Fish & Fish Egg Numbers 11	Fish Length 12	Total Weight 13	Trips	Mi's
1	RM	FWS	ID	SR	IDAHO	CLEAR CR.	540	STT	NFW	348118	7.17	44927	12	960
2	RM	FWS	ID	SR	IDAHO	M. S. CLEARWTR. R. @DNFH	500	STT	NFW	1213577	7.43	174271	0	0
3	BS	STG	ID	HO	CLEARWATER AFH	CLEARWATER AFH	0	STT	NFW	952000	0	0	4	4
4	BS	STG	ID	HO	MAGIC VALLEY SFH	MAGIC VALLEY SFH	0	STT	NFW	1502200	0	0	3	900
5	BS	FWS	ID	HF	KOOSKIA NFH	KOOSKIA NFH	0	SCS	CRW	330500	0	0	1	80
6	BS	FWS	ID	HF	KOOSKIA NFH	KOOSKIA NFH	0	SCS	CRW	117781	5.08	4630	3	240
7	RM	FWS	ID	SR	IDAHO	M.S.CLEARWTR.R.@KAMIAH	527	STT	NFW	150746	7.35	20973	5	270
8	RM	FWS	ID	SR	IDAHO	S.F.@COTTONWOOD CR.	538	STT	NFW	290613	7.24	38582	10	760
9	RM	FWS	ID	SR	IDAHO	S.F.@RIVER MILE 8.7	542	STT	NFW	287544	7.35	39935		
10	RM	FWS	ID	SR	IDAHO	N.F. CLEARWTR. R.	500	SCS	CRW	1311445	5.88	93421		
11	RM	FWS	ID	SR	IDAHO	S.F. @MT.IDAHO BDG.	580	STT	NFW	96584	7.29	13089		
12	RE	NMF	WA	RE	WASHINGTON	NMFS	0	SCS	CRW	300	5.85	21		
13	RE	NMF	WA	RE	NMFS LWR GRANITE RES	NMFS LWR GRANITE RES	0	SCS	CRW	510	6.18	36		

___ OK with Daily Distribution Log
___ Copy to IFRO, MGR, ASST.MGR.

Form 3-2026 (Rev. 12/91)
Source: (fy95dsum.wk1) RV 10/5/95

FISH AND FISH EGG FISCAL YEAR 1995 DISTRIBUTION SUMMARY

Fiscal Year: 1995

Delivering Hatchery: Dworshak NFH

Line	Program	Agency	State	WType	Management Area	Water Name	Acres/ Miles	Species	Strain	Fish & Fish Egg Numbers	Fish Length	Total Weight	Trips	Mi's
1	2	3	4	5	6	7	8	9	10	11	12	13		
14	RE	NBS	WA	RE	WASHINGTON	NBS - MARROWSTONE		SCS	CRW	1300	5.85	92	0	0
15	RM	STG	ID	RS	IDAHO	CASCADE RES. @SUGARLOAF		RBT	ARD	37878	4.51	1387	1	340
16	RM	STG	ID	RS	IDAHO	CASCADE RES. @POISON CR.		RBT	ARD	37879	4.51	1384	1	340
17	RM	STG	ID	RS	IDAHO	CASCADE RES. @CAMPBELL CR.		RBT	ARD	37878	4.51	1384	1	340
18	RM	STG	ID	LK	IDAHO	FENN POND		RBT	ERD	1000	10.4	450	1	0
19	RM	STG	ID	LK	IDAHO	CAMPBELLS POND		RBT	ERD	4660	10.4	2118	1	116
20	RM	BIA	ID	LK	IDAHO	COEUR D'ALENE TRIBE		RBT	ERD	1000	9.32	325	1	300
21	RM	BIA	ID	LK	IDAHO	MUD SPRINGS POND		RBT	ERD	2000	10.4	909	1	138

FISH AND FISH EGG FISCAL YEAR 1995 DISTRIBUTION SUMMARY

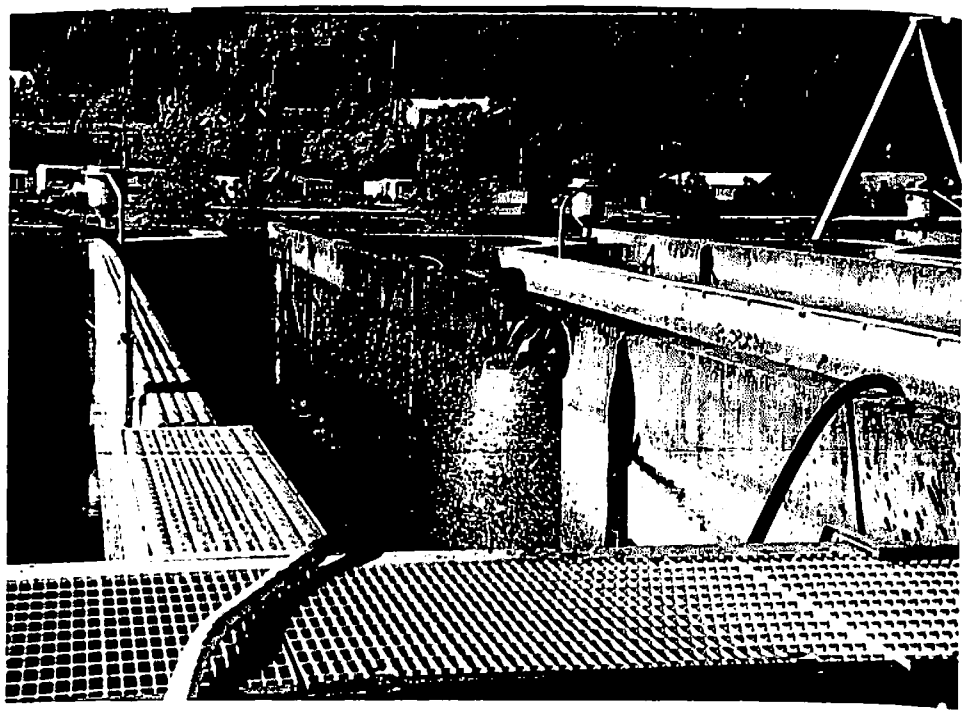
Fiscal Year: 1995

Delivering Hatchery: Dworshak NFH

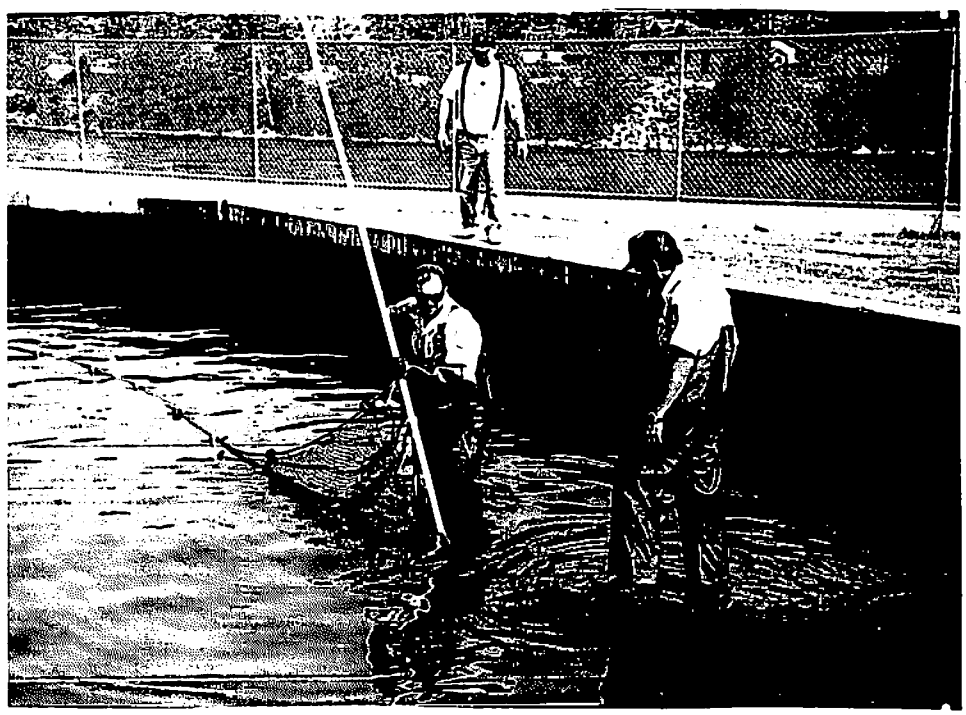
	SPECIES	STAGE	NUMBER	WEIGHT
SUMMARY:	STT	EGGS	2,454,200	0
		SMOLT	2,387,182	331,777
	SCS	EGGS	330,500	0
		FINGERLINGS	117,781	4,630
		SMOLT	1,313,555	93,570
	RBT	FINGERLINGS	122,295	7,957
	FY 1994 DISTRIBUTION TOTALS		6,725,513	437,934

Form 3-2026 (Rev. 12/91)
Source: (fy95dsum.wk1) RV 10/5/95

FISH CULTURE OPERATIONS



Ron Oatman, Fish Culturist, washes down Burrows pond in preparation for steelhead transfer.

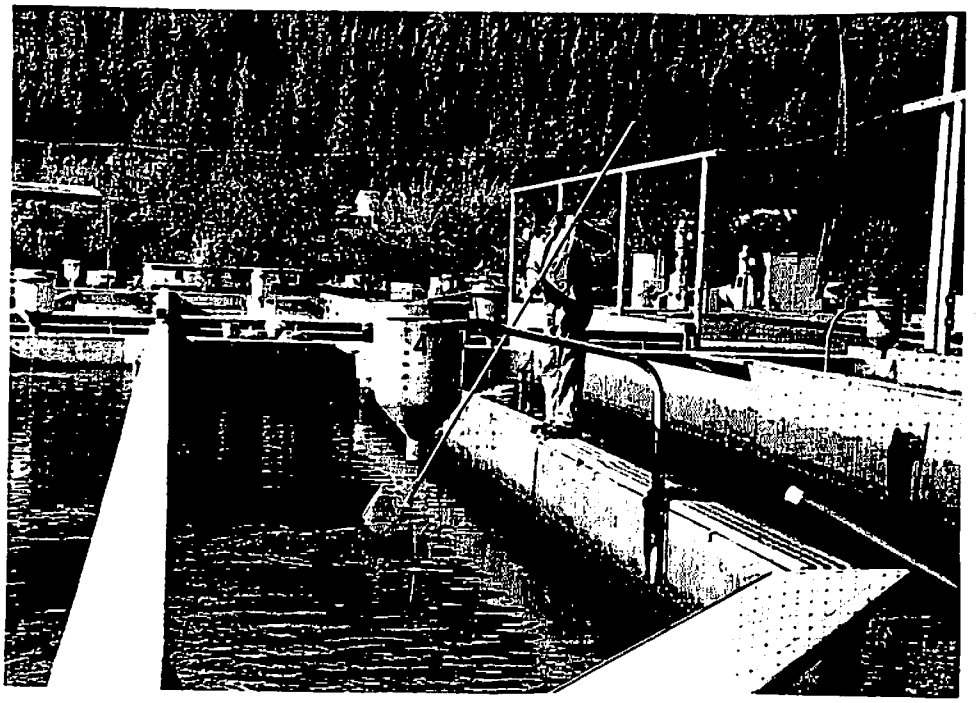


Glenn Green, Fishery Biologist, and Ben Wright, Fish Culturist, net trout from the fishing pond.

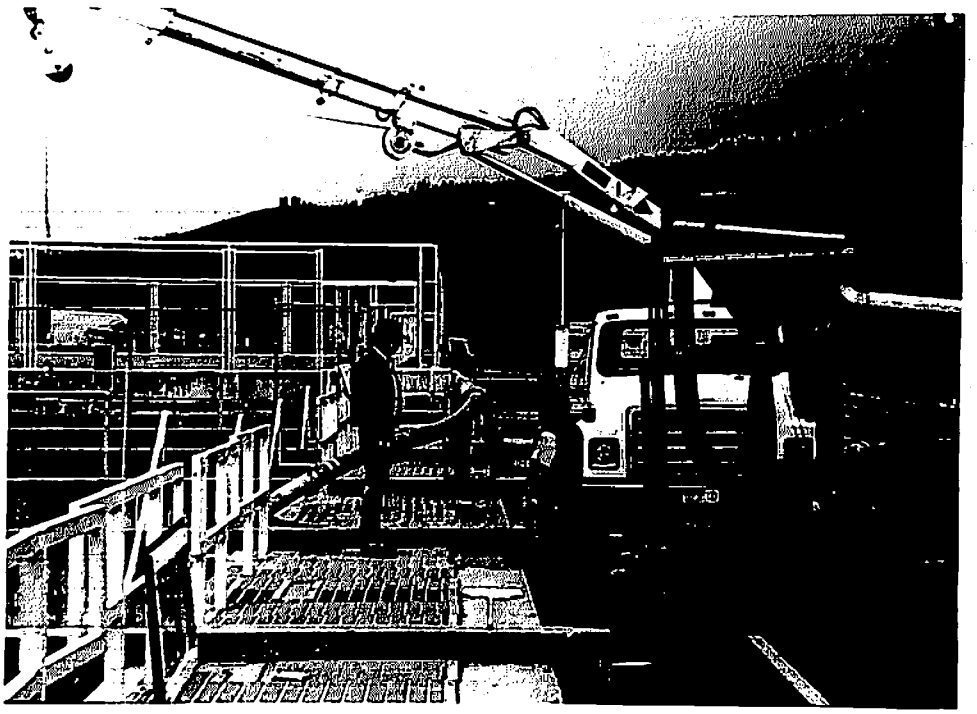
"B" run steelhead on sorting table.

Checking steelhead for ripeness. Fishery Biologists, Ken Peters and Peter Long.

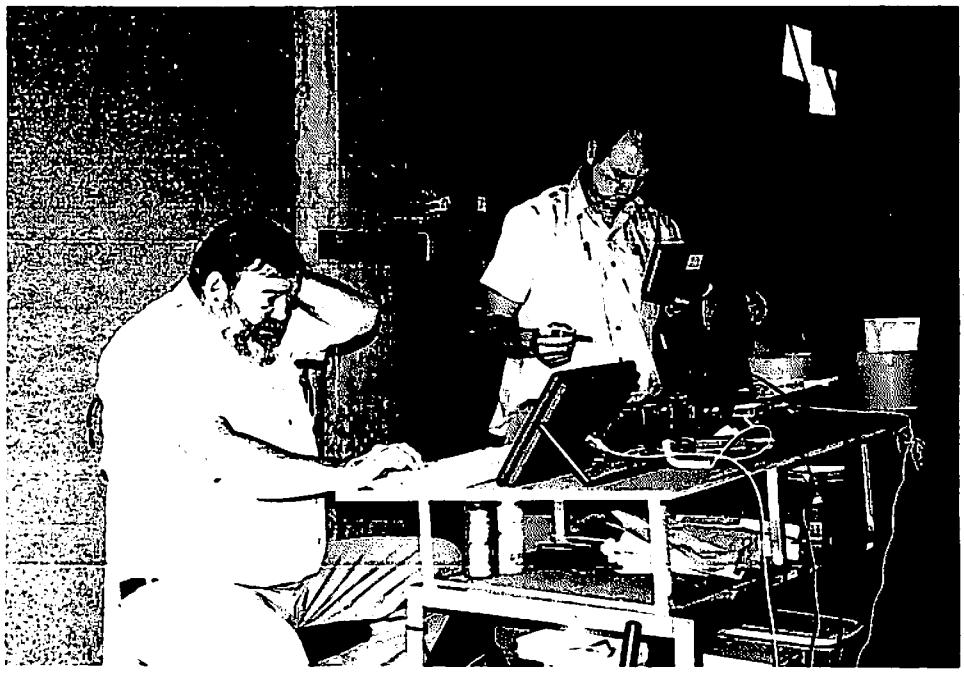
Measuring steelhead prior to spawning - Ralph Roseberg, Idaho FRO Fishery Biologist, and Michelle Bouchard, Fishery Biologist.



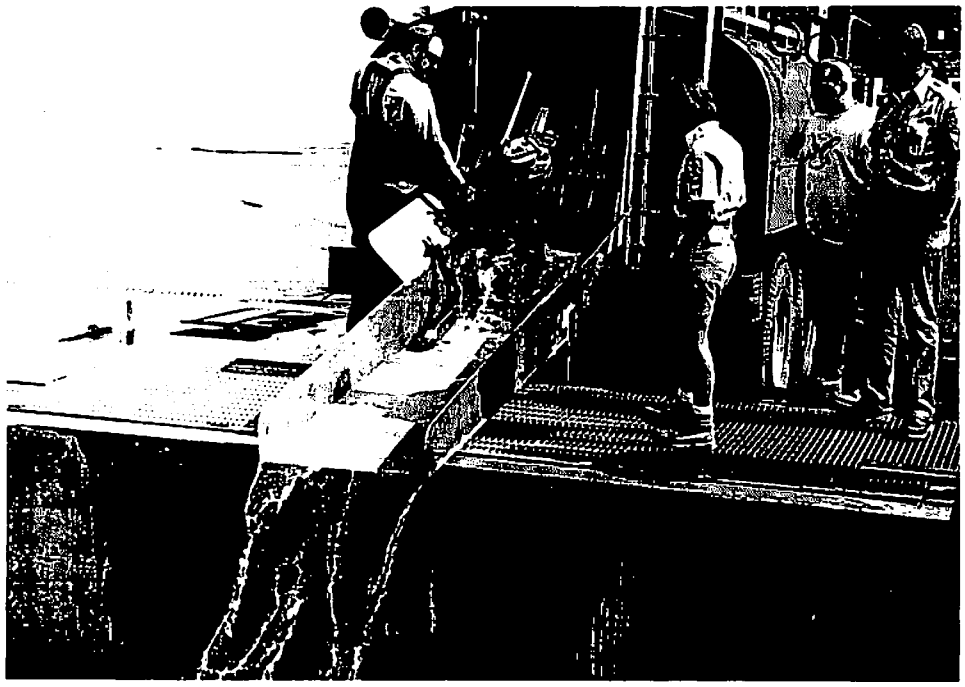
Ben Wright, Fish Culturist, removing dead fish from steelhead ponds, a daily task.



Jon Streufert, Production Supervisor, and Hank Jenks, Maintenance Worker, prepare a fish transfer pump.



Idaho Fisheries Resource staff, Doug Burum and Paul Hayduk, assist in marking and measuring fish.



Spring chinook salmon from Kooskia NFH arrive at Dworshak for spawning. Left to right: Fishery Biologists, Glenn Green and Michelle Bouchard, Jason Ash, Kooskia YCC enrollee and Jon Streufert, Production Supervisor.

REPAIRS/IMPROVEMENTS/NEW EQUIPMENT

The Corps of Engineers (COE) let a $64,000 contract to upgrade hatchery electrical systems to H & N Electric. This is part of an ongoing hatchery rehabilitation project. The work was started April 27 and completed in late May.

Hatchery maintenance crew and COE staff from Dworshak Dam upgraded the holding pond raceway gates in May after release of fish.

Clearwater Power conducted the annual power outage on May 17. Everything went as scheduled.

Clearwater Hatchery experienced a broken primary supply line and Dworshak NFH had to shut down the nursery primary line for the reservoir and go to a secondary line for one week.

Maintenance crew spent several days repairing a broken fire and maintenance supply line. The four-inch supply line is the major line for the main pump house.

Johnson Electric was on station June 8 to pull a broken electrical supply line that services the reuse systems II and III.

Annual electrical breaker testing was completed at a cost of $2,200.

COE staff from Walla Walla did a camera inspection of the broken conduit that carries the electrical service for reuse systems II and III supply.

Testing for lead contamination was conducted by Walla Walla COE at all four residences.

Clearwater Youth Program members contributed over 2,000 hours towards a number of improvement projects. These included preparation for Open House activities, landscaping projects, clean-up and painting the overpass.

Annual maintenance repairs of the bird netting cover over steelhead production ponds was completed. A more permanent enclosure similar to the chinook pond cover is a future project.

Joey Vaughn, a certified welder, completed the modification of the main pump piping during August. Two packed columns were added to each pump.

Annual overhead entrance bridge inspection was completed September 26 by the Federal Highway Administration.

Residence improvements included new kitchen and bathroom cabinets at a cost of $14,000; completion of carports at a cost of $8,119 to the contractor, plus $5,100 for materials purchased by the hatchery.

--Equipment--

A 1995 Ford Aerostar Minivan purchased with FY 94 funds was delivered in July.

A cost bid of $44,300 was accepted for purchase of one 250 HP pump to be installed in Dworshak's main pump station. It replaces a 200 HP pump. This work is part of an upgrade of Dworshak's water system to increase pumping capability from the river.

Two computers were purchased for use in Administration, and one computer with laser jet printer purchased for Production at a cost of $7,000.

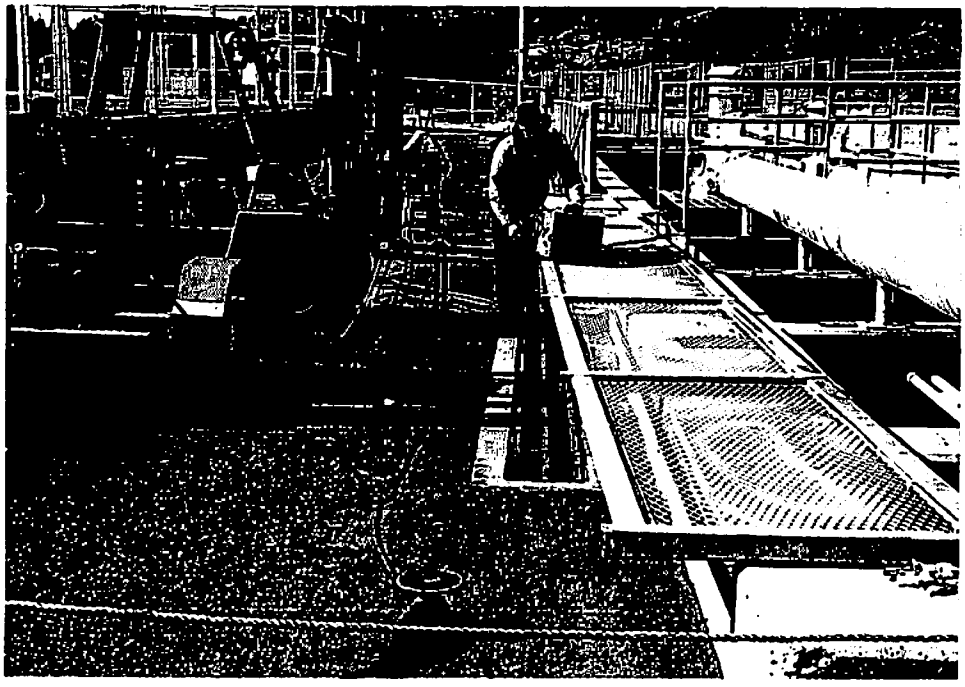
An electric cart was replaced at a cost of $6,370.

An Infotext telephone identifier was purchased for $3,100.

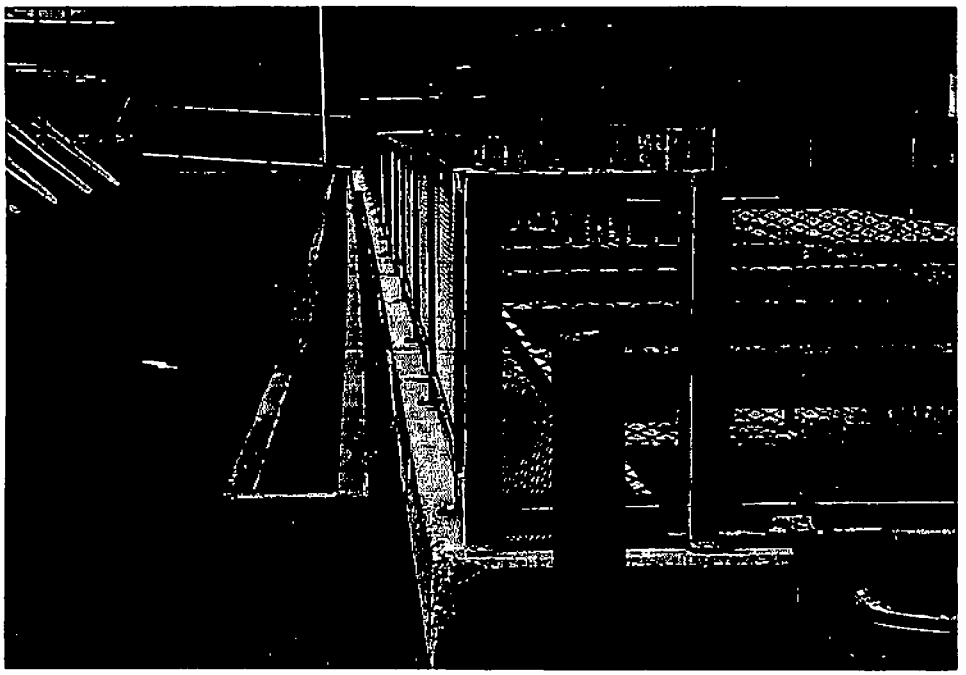
A wet model scale was purchased for $2,400.

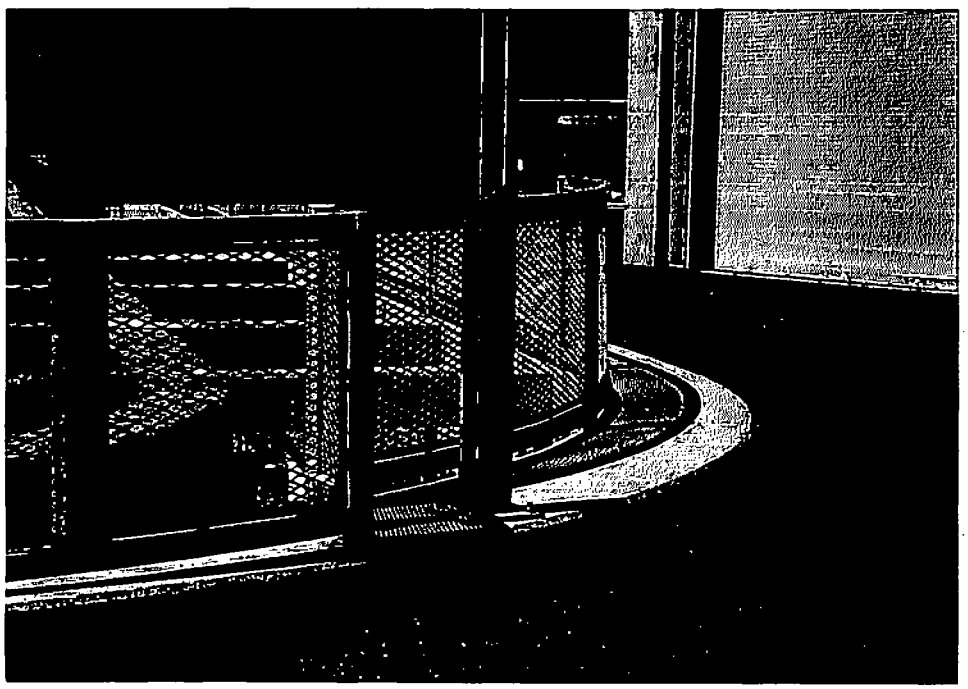
A boom truck was purchased to replace the obsolete one now on station at a cost of $77,900.

Maintenance Mechanic Supervisor, Dave Clifford, assisting with construction of gates on modified holding ponds.

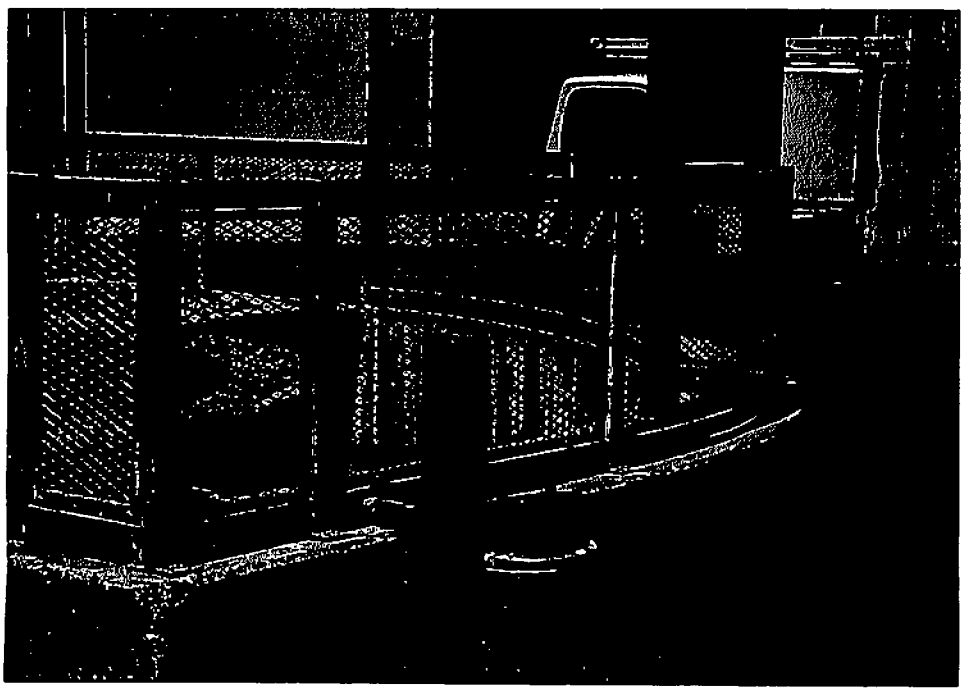


Hubert Sims, Maintenance Mechanic, installing a safety rail along the wastewater channel.



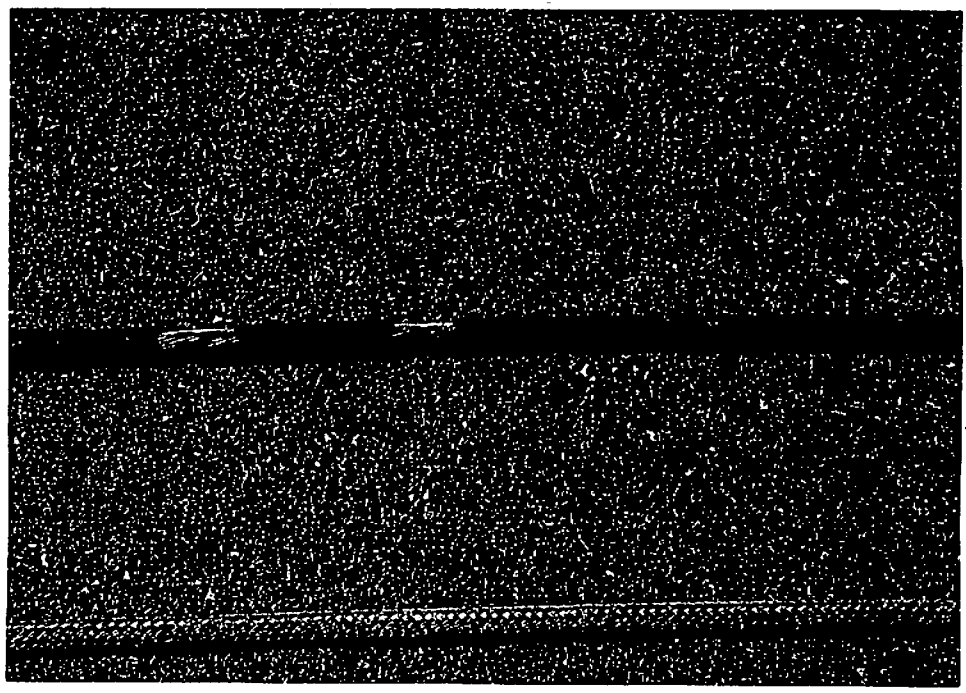


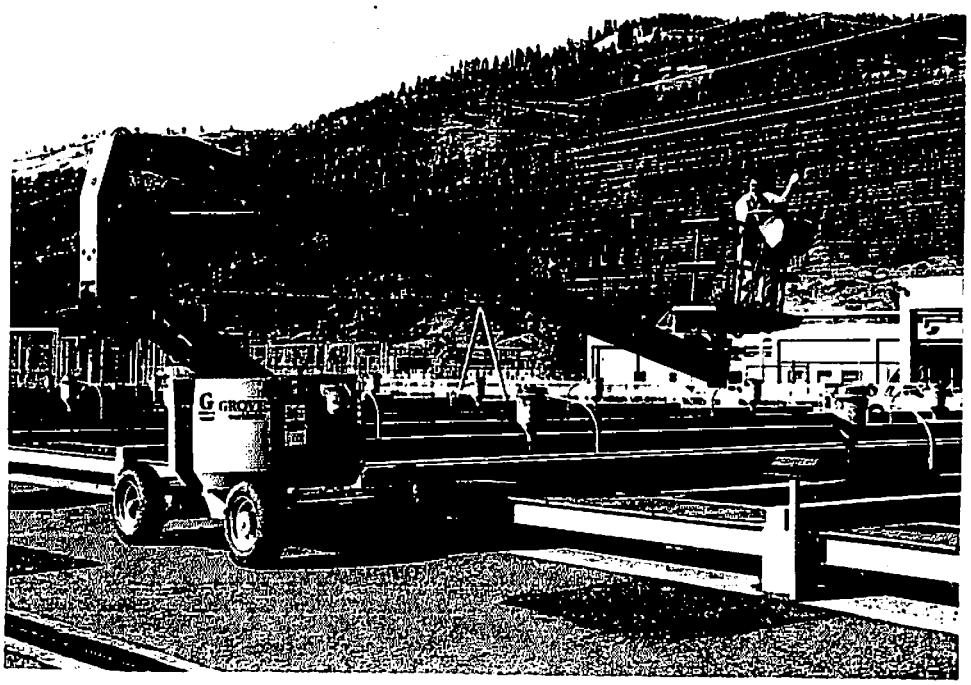
Protective guardrail was relocated and welded to prevent visitor injuries on high concrete curb while viewing the fish ladder.



Army Corps of Engineers provided a remote video camera to locate defects in underground conduit.

Inspection and repair of broken electrical conduit by Johnson Electric from Lewiston, Idaho.





Ray Rosales, Maintenance Worker, and Adam Izbicki, Fishery Biologist, complete repair of bird netting over brood ponds.

Maintenance workers, Ray Rosales and Terry Weeks install tree squirrel nest boxes near Dworshak visitor picnic area.

Ray Rosales, Maintenance Worker, repairing a 4" water suupply line to main pumphouse.

MEETINGS/TRAVEL/TRAINING

Bill Miller and/or Dave Owsley attended the monthly meetings of the Clearwater Management Council in Orofino.

A meeting on the operation of the reservoir intake supply for the primary supply line was held October 13 at Dworshak NFH. Attendees were Wayne Olson and Jon Streufert, Dworshak NFH; Jerry McGehee and Tom Rogers, IDFG; Ed Crateau, LSRCP; Dave Hull, Brian Miller, and Russ Thorton, COE; Howard Burge, IFRO.

The Idaho Department of Environmental Quality (DEQ) conducted a training/refresher course of drinking water standards and treatments at Dworshak October 20. Dave Owsley toured the group on Dworshak's Ozone System. Dworshak uses Ozone to treat the domestic water supply.

Dave Owsley, Jerry McGehee (IDFG), and staff met to discuss reservoir intake problem and solutions on October 28.

Biologists Glenn Green and Peter Long traveled to Hood River, Oregon to attend the West Coast Smoltification Workshop on October 21st.

Mary Lou Galloway was selected as a team member, representing Fisheries field offices, to review and make recommendations on budget administration consolidation of the Regional Office. Mary Lou traveled to Portland Nov. 7, Nov. 14, Nov. 27, and Dec. 5 to take part in the review.

In attendance at the Northwest Fish Culture Conference in Bend, Oregon, December 6-8, were Wayne Olson, Dave Owsley, Glenn Green, Peter Long, Kip Bottomley, and Jay Ahn. Papers were presented by Owsley, "Dworshak - 25 Years Later," and Long, "The Effects of Three Rearing Densities on the Growth, Health, and Mortality of Spring Chinook Salmon at Dworshak NFH."

Wayne Olson and Dave Owsley attended meetings in Walla Walla at the COE District Office to review a number of items relative to budgeting, maintenance, rehab project status, and production programs on December 13 and 14.

Dave Owsley and Randy Ryan, COE Dworshak Dam, met on the removal of underground storage tanks at Dworshak on January 17.

Dave Owsley traveled to Warm Springs NFH to meet and plan for a reuse system at Warm Springs NFH on January 24 and 25.

Dave Owsley and Dave Clifford traveled to Walla Walla to meet with the Corps of Engineers on the scheduled work for the hatchery overpass on February 15.

Ron Bauer, Clearwater Power Company, met with Bill Miller and Dave Owsley on upgrading the existing electrical supply to Dworshak on February 23.

Dave Owsley met with the District 171 school superintendent to propose a summer work program on February 28.

March 9, Dave Owsley presented a paper and slide presentation on disinfecting drinking water using ozone to the Idaho Rural Water Treatment Operations in Lewiston, Idaho at their annual meeting.

Bill Miller, Dave Owsley, and Mary Lou Galloway attended a one-day meeting at COE, Walla Walla, on Dworshak NFH '96 and '97 budget. They met with Mike Taylor, Wayne John, and their staff.

March 15-17 Jay Ahn visited Hagerman National Fish Hatchery.

March 23 was the Dworshak semi-annual coordination meeting.

Gary Wilson, RO Safety, met with Bill Miller, Dave Owsley, and later some staff members on safety concerns at Dworshak on April 12.

Dave Owsley, Mary Lou Galloway, and Bill Miller met with the local school board on a summer youth work program on April 17. Mr. Owsley presented a cooperative agreement that was accepted by the school board.

Colonel Weller, Wayne John, Randy Ryan, and other COE staff met with Bill Miller and Dave Owsley on operations and rehab concerns at Dworshak NFH on April 21.

Grant Buckingham, COE Walla Walla, met with Dave Owsley on structural problems in the main hatchery building on April 24.

Chuck Palmer, COE Walla Walla, met with Dave Owsley on rehab of Dworshak's domestic drinking water system May 3.

Dana Knudtson, COE Walla Walla, met with Dave Owsley on rehab of the railroad overpass on May 3.

Bill Miller attended the Project Leaders meeting in Portland on May 8-11.

MaryAnn McLaughlin, Clearwater County EMT and Certified CPR instructor, conducted CPR training May 8, 9, 10 for all available Complex personnel. Participants received annual certification cards.

Dave Owsley and Fred Olney (FWS) met with local citizens and other agencies on the reservoir drawdown and fish flush in Lewiston on May 10.

Dave Owsley, Mary Lou Galloway, and Kip Bottomley attended a school board meeting in Grangeville May 15. Dave Owsley presented a plan for a summer youth program at Kooskia.

Bill Miller attended an I&E Coordination meeting with Fisheries, ES, Refuges, LE, and LSRCP personnel in Boise on May 25.

John Vargas and Ron Oatman attended the Fish Culturists Conference in Pendleton, Oregon, on June 5-9. John presented a slide presentation.

Mary Lou Galloway traveled to Portland, OR on June 6-8 for a series of Financial Monitoring Meetings.

Diane Praest chaperoned four female students from Clearwater Youth Program to IDFG Red River Satellite station for a work detail and overnight stay on June 19-20.

Dave Owsley chaperoned four male students from Clearwater Youth Program to IDFG Red River Satellite station for a work detail and overnight stay on July 11-12.

Dennis Coleman, John McKern, and Jim Bluhm, COE Walla Walla, met with Dave Owlsey on Dworshak operations and rehab on July 19.

Jim Oliver, COE Walla Walla, met with Dave Owsley about structural problem in main building August 1.

Kay Cole made a site visit to Spokane Ecological Services Office on August 18.

August 23-24 Bill Miller attended a LSRCP meeting in Boise on captive broodstock rearing associated with LSRCP facilities.

Kay Cole made a site visit to Boise Ecological Services and LSRCP offices August 23-25. She assisted at the FWS display booth at Boise State Fair on August 25 and 26.

August 26-31 Dave Owsley attended the annual AFS meeting in Tampa, Florida.

Bill Miller attended the Captive Breeding Workshop in Newport, Oregon, September 11-13.

Bill Miller attended the Columbia Basin Ecoregion Project Leaders meeting in Pendleton, Oregon, September 18-21.

Station employees were involved in 358 hours of training.

Dave Clifford	Pre-Retirement Counseling, Reno NV, March 6-8. Conducting Employee Performance Evaluations, Spokane, Washington, April 5.

Kay Cole	Grammar Usage and Business Writing Skills, Spokane, WA, April 18. Violence in the Workplace, Lewis-Clark State College Secretaries Day seminar, Lewiston, ID, April 26.
Mary Lou Galloway	Pre-Retirement Counseling, San Diego, CA, Jan 24-26. Conducting Employee Performance Evaluations, Spokane, WA, April 5. Administrative Training, Sacramento, CA, June 26-29.
Rocky Greenland	Introduction to Fish Health, Olympia, WA, June 19-23. How to Manage Conflict, Anger, and Emotion in the Workplace, Spokane, WA, July 7.
Amy Kishpaugh	Grammar Usage and Business Writing Skills, Spokane, WA, April 18. Administrative Training, Boise, ID, August 7-10.
Peter Long	Genetic/Brood Stock, Anchorage, AK, May 22-26.
Bill Miller	Pre-Retirement Counseling, Reno NV, March 6-8. Freedom of Information Act (FOIA) training, Boise, ID, May 15-16.
Dave Owsley	Performance and Conduct Issues, Portland, OR, April 4-6. Administrative Training, Boise, ID, August 7-10.
Diane Praest	Administrative Training, Portland, OR, August 14-17.

Cardiopulmonary Resusitation (CPR) instructor, MaryAnn McLaughlin, held a class for Dworshak hatchery employees.

Dworshak hatchery employees in CPR training. From left to right: Pat Bigelow, Kay Cole, Hubert Sims, and Ben Wright.

STAFFING

One GS-2 Bio-Aide (Bunten, three months) and one GS-3 Bio-Aide (Summers, six months) provided assistance on a Fisheries Stewardship study funded through the Idaho FRO project. On September 3, 1995, Stephanie Summers, GS-0404-3, Bio-Aide, began working for NBS on an on-site project, part of NBS' long-term stock/productivity study at Dworshak.

A one-month appointment of Joey Vaughn, Welder, WG-10, was effective August 6, 1995, to assist in a major piping modification at the hatchery's main aeration chamber.

The hatchery continued to participate in the Older Workers Program with Margaret Howard working weekends in production until her resignation August 8, 1995. The program has been temporarily discontinued at Dworshak National Fish Hatchery due to lack of funding in the Older Workers Program.

A group special act award was presented to Anne Rockhold, Rocky Greenland, and Randy Bowen for their assistance with a visitor accident on February 4, 1995. An on-the-spot award of $50 was presented to Diane Praest on September 7, 1995, for setting up new procedures to convert BPA's to Visa transactions. An on-the-spot award was presented to Vern Holloway for his innovative use of white vinegar for weed control on September 14, 1995.

Senior volunteers Clay McGill, Jess Lyda, and Gordon Thiessen contributed 192 hours of service during the year. The program, initiated in 1987, has provided the station with 695 hours of volunteer time. Most of this work involved assisting visitors viewing the hatchery's steelhead spawning activities.

The hatchery initiated a Clearwater Youth Program with Dave Owsley taking the lead. A youth program has been ongoing since 1977; earlier as the Young Adult Conservation Corps (YACC), followed later by the Youth Conservation Corps (YCC). One crew leader and six enrollees were employed in an eight-week program beginning June 5th and ending July 28, 1995. This year's program was administered by a cooperative agreement with Joint School District #171 covering work at Clearwater State Fish Hatchery and Dworshak Complex to give the six students at Dworshak Complex, plus one crew leader, and four students at Clearwater summer employment. An effort was made to give them a better understanding of fish habitat and fish culture, in addition to providing jobs.

On February 6, 1995, Jenifer Hole, an Orofino High School student, started an after school student help six-week program. Jenny worked alternating weeks between Dworshak Fish Health Lab, Production, and FRO.

A services contract was issued to Express Personnel Services for a Bio-Aide position to work in Production, and an Office Automation Clerk position in Administration. Kim Seldom filled the Bio-Aide position on August 11, 1995, and Linda Willoughby filled the Office Automation Clerk position on September 11, 1995.

Personnel Actions:

David Trainor's permanent full-time VRA appointment as a WG-4749-8 Maintenance Worker at Dworshak was effective October 2, 1994.

Wayne H. Olson, Supervisory Fishery Biologist, GM-482-14, retired from the position of Hatchery Manager effective January 3, 1995.

William H. Miller, Supervisory Fishery Biologist, GM-482-13, was selected as Acting Manager, effective January 8, 1995.

David C. Weigand, Fishery Biologist, GS-482-9, resigned March 3, 1995.

Jay Ahn, Fishery Biologist, GS-482-7, transferred to Carson National Fish Hatchery effective April 30, 1995.

Peter Long, Fishery Biologist, GS-482-9, transferred to Willard NFH effective July 9, 1995

William H. Miller, Supervisory Fishery Biologist, GS-482-14, was approved as Complex Manager, effective August 20, 1995.

Kay Cole, Office Automation Clerk, GS-326-4, (transferred with promotion to GS-5, Budget Assistant) to Spokane Ecological Services Office effective September 17, 1995.

Michelle Bouchard, Fishery Biologist, was promoted from GS-482-5 to GS-482-7, effective September 17, 1995.

Thomas Trock, Fishery Biologist, GS-482-11, from Private John Allen NFH (Region 4) was selected for the GS-9/11 Fishery Biologist position, effective October 29, 1995.

Brad Petry, Animal Caretaker, WG-4048-3, was detailed from Eagle Creek NFH to a 120-day appointment effective September 3, 1995.

All positions were in place ending the reporting year of September 30, 1995, with the exception of two positions. An Information and Education Specialist, GS-1001-5, has been advertised, selected, and is awaiting approval. Recruitment papers have been submitted for a replacement Office Automation Clerk, GS-326-3/4.

Dworshak Employees
- FY 95 -

Name	Position Title	Period of Employment	Status
Ahn, Jung J.	Fishery Biologist	10/17/94 04/30/95	Permanent
Bouchard, Michelle A.	Fishery Biologist	10/01/94 09/30/95	Permanent
Clifford, David E.	Work Supvr. (Maint.)	10/01/94 09/30/95	Permanent
Cole, Kay E.	Office Auto. Clerk	10/01/94 09/17/95	Permanent
Galloway, Mary Lou	Program Assistant	10/01/94 09/30/95	Permanent
Green, Glenn S.	Fishery Biologist	10/01/94 09/30/95	Permanent
Greene, Benny C.	Electrician	10/01/94 09/30/95	Permanent
Greenland, Rocky E.	Fish Culturist	10/01/94 09/30/95	Permanent
Holloway, Vernon C.	Laborer	10/01/94 09/30/95	Temporary
Izbicki, Adam H.	Fishery Biologist	10/01/94 09/30/95	Permanent
Jenks, Alfred H.	Maintenance Worker	10/01/94 09/30/95	Permanent
Long, Peter A.	Fishery Biologist	10/01/94 07/09/95	Permanent
Miller, William H.	Hatchery Manager	01/08/95 09/30/95	Permanent
Oatman, Ronald W.	Fish Culturist	10/01/94 09/30/95	Permanent
Olson, Wayne H.	Hatchery Manager	10/01/94 01/03/95	Permanent
Owsley, David E.	Environment Engineer	10/01/94 09/30/95	Permanent
Rosales, Raymundo A.	Maintenance Worker	10/01/94 09/30/95	Permanent
Sims, Hubert M.	Maintenance Mechanic	10/01/94 09/30/95	Permanent
Streufert, Jonathan M.	Assistant Manager	10/01/94 09/30/95	Permanent

Trainor, David A.	Welder	10/02/94 09/30/95	Permanent
Vargas, John J.	Fish Culturist	10/01/94 09/30/95	Permanent
Weeks, Terry C.	Fish Culturist	10/01/94 09/30/95	Permanent
Weigand, David C.	Fishery Biologist	10/01/94 03/03/95	Permanent
Wright, Benjamin A.	Fish Culturist	10/01/94 09/30/95	Permanent

Other Staffing
FY 95

Temporary

Bunten, Gary	Bio-Science Aid	03/05/95 06/17/95
Summers, Stephanie	Bio-Science Aid	03/05/95 09/02/95

Summer Youth Program

Arnold, Robert G.	Crew Leader	06/05/95 07/28/95
Baumer, Sam L.	Student Worker	06/05/95 07/28/95
Beard, Mark A.	Student Worker	06/05/95 07/28/95
Crutcher, Michelle M.	Student Worker	06/05/95 07/28/95
Fisbeck, Christi L.	Student Worker	06/05/95 07/28/95
Streufert, Anja E.	Student Worker	06/05/95 07/28/95
Wilson, Benjamin J.	Student Worker	06/05/95 07/28/95

Older Worker Program

Howard, Margaret C.	Production Worker	10/0194 08/08/95

Special Need Appointment

Vaughn, Joey A.	Welder	08/06/95 09/05/95

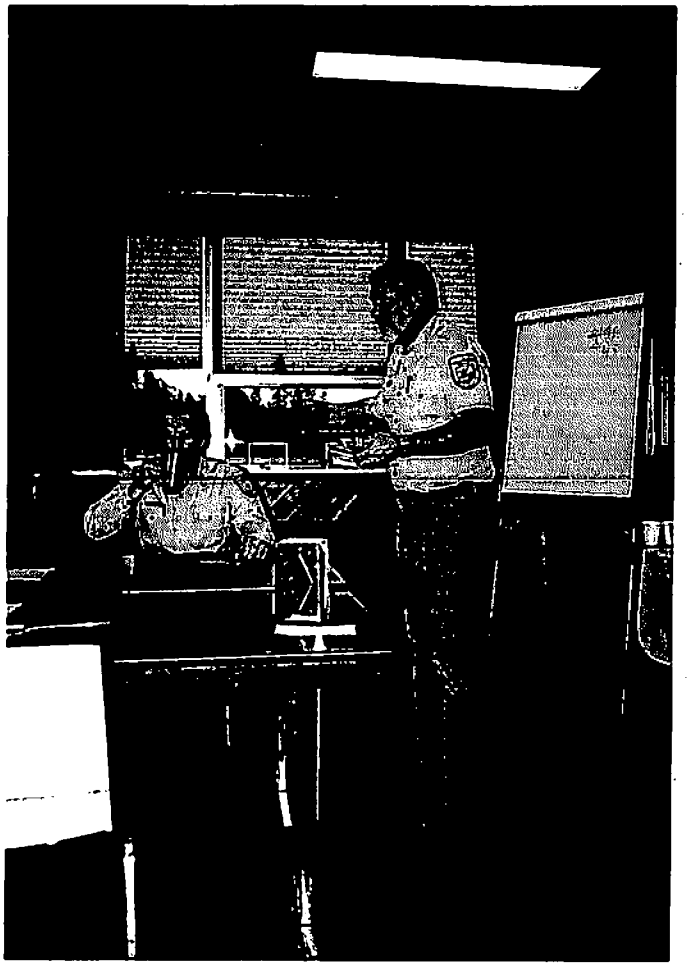
Cooperative Program

Ahrens, Mark A.	Fishery Biologist	07/09/95 09/16/95

Temporary Agency Contract

Seldom, Kimberly K.	Production	08/11/95 09/30/95
Willoughby, Linda D.	Administration	09/11/95 09/30/95

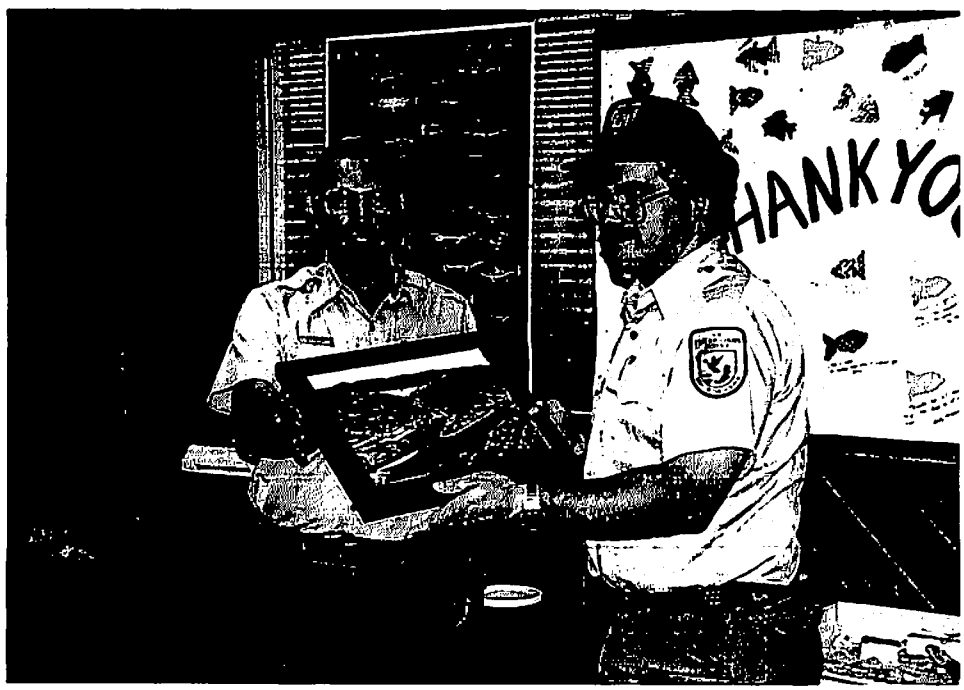
STAFFING/ACTIVITIES



Wayne Olson, Hatchery Manager, at his retirement party in January. Bill Miller, seated, assumed the manager post in July.

Wayne Olson's retirement cake, complete with steelhead.

Joe Lientz, center, retired as supervisor of the Dworshak Fish Health Center in May.



Peter Long, Fishery Biologist, transferred to Willard NFH in July.

CLAY McGILL
DWORSHAK FISHERIES COMPLEX SENIOR VOLUNTEER

8–Clearwater Tribune - Orofino, ID - AUG. 31, 1995

OBITUARIES

Clayton H. McGill, 76

A funeral Mass was held Aug. 26 at St. Theresa's Catholic Church for Clayton H. McGill, who died of injuries received in a car accident near Lenore Aug. 22, 1995.

Fr. George King was celebrant and Gerri Lemmon and Larry Terherst were vocalists and Joanne Hutchinson was instrumentalist.

Casketbearers were Jim Scoles, Don Gilkey, Kenneth Lemmon, Dave Clifford, Wayne Olson and Steve Kaufman.

Cremation has taken place and inurnment will be at Riverside Cemetery at a later date.

Honorary bearers were Bob Spence, Nick Albers, Gordon Thiessen, Jesse Lyda, Steve Scoles, Paul Pippenger and Dave Owsley.

He was born February 8, 1919 at Libby, Mont., to Howard and Elsie Barr McGill.

He grew up and attended school in Libby and later worked at the lumber company there.

He married Mae Olson on Aug. 10, 1940 at Bonners Ferry, ID and was drafted into the Army in October of 1943. He served in the European Theater during World War II and was discharged in October 1945.

He became manager of a Safeway store at Davenport, Wash. and later worked routes for Nalley's and silverloaf Bread at Spokane.

In 1952 they moved back to Libby, where he drove a school bus and worked at the C & H Market. In 1956 they moved to Orofino, where he was grocery manager at Glenwood IGA store for over 27 years. He retired in 1984.

He was a charter member of the Knights of Columbus and a communicant of St. Theresa's. He served on the planning and zoning commission at Orofino and the board of the Orofino Community Credit Union.

Clayton McGill

He was a member of the Veterans of Foreign Wars Post 3296 and was active in the Retired Senior Volunteer Program and Clearwater Hospice, all at Orofino.

He was a volunteer guide at Dworshak National Fish Hatchery and drove a delivery van for Meals on Wheels for three years.

He enjoyed fishing for silvers and steelhead, berry picking and canning vegetables and fish. He especially enjoyed spending time with family members and friends.

Survivors include his wife, Mae McGill of Orofino; two sons, Mike McGill of Spokane and Steve McGill of Orofino; two brothers, Arnold McGill of Libby and Boake Carter of Spokane; one sister, Maxine Deditius of Marysville, Wash., and four grandchildren.

Memorials may be made to Clearwater Hospice; 301 Cedar St., Orofino, Idaho 83544.

Pine Hills Funeral Chapel was in charge of the arrangements.

OUTREACH AND VISITOR ACTIVITIES

OVERVIEW

During FY 95, Anne Rockhold and Ralph Roseberg, fisheries biologists with Idaho FRO, provided assistance with information and education related duties. Anne attended the CISPUS workshop in Randall, Washington, in March, and participated in several key outreach planning meetings. She assisted in planning and carrying out the Earth Day activities with inter-agency participation in April, conducting on-site tours of the hatchery, participated in the school district Career Day, the Junior High School Salmon Project, and conducted a 4-H entomology course. Ralph presented several programs to youth groups in the surrounding community. Pat Bigelow, Anne Rockhold, and Michelle Bouchard coordinated a display for the Clearwater County Fair. Several other complex employees assisted in visitor activities by staffing display booths, giving group tours, school talks, and participating in the annual open house.

Monthly highlights for outreach and visitor activities were as follows:

October: KHQ, Channel 6 television out of Spokane, Washington, interviewed Manager Wayne Olson on the low steelhead returns, for broadcast in November.

November: Broadcast of above interview with Manager Olson aired November 24.

December: Lewiston Morning Tribune and Clearwater Tribune interviewed retiring Manager Wayne Olson for news articles.

January: Dave Owsley conducted a tour for COE staff.

February: University of Idaho Professor Mike Falter and 30 graduate students toured the hatchery with Dave Owsley. Interim Complex Manager Miller was interviewed by a Lewiston Tribune reporter.

March: Dave Owsley gave a radio and television interview on returning steelhead and hatchery operations. Tours were given to Washington State University, University Of Idaho, and Idaho Department of Health and Welfare groups. Dave Owsley held his 15th annual Hunter Education course in Orofino for 48 students. Owsley and Hatchery Manager Miller attended a Retired Senior Volunteer Program (RSVP) luncheon honoring three hatchery volunteers.

April: Three reporters toured the complex for a story on salmon and steelhead; water releases for the "fish flush" were begun; University of Idaho professor Joe Cloud toured the hatchery with two foreign visitors; Complex Manager Miller toured the site with 14 COE management trainees. Anne Rockhold of Idaho FRO participated in Earth Week/Day activities in six area schools. Over 400 fourth and fifth grade students were reached.

May: Miller and Owsley attended the Rotary luncheon, where Owsley had been nominated for citizen of the year in Orofino for his volunteer efforts. Dworshak staff gave a series of talks to Orofino Jr. High on their Pacific Salmon Project; eight students were involved. Over 600 people were contacted at the Soil Conservation Service Science Fair. Several staff biologists visited elementary students and gave a talk about the upcoming Open House event. Ralph Roseberg, Idaho FRO, participated in the COE Water Safety Fair and contacted over 1400 kids in two days.

June: Posters or formal presentations were given by staff fisheries biologists at: Pacific Fisheries Biologist meeting; at the American Fisheries Society meeting; at the Nez Perce Tribal Open House. Dworshak-Kooskia Complex Open House events drew over 1200 people to the hatchery on June 17. A new activity, **Gyotaku**, or Japanese fish printing, was very popular with the kids and adults. There were displays form the local DARE program, Booster Club, and area businesses donated many fine prizes for drawings throughout the day. Media coverage for the event was excellent. The local Special Education class again had a special day to visit the hatchery and fish in the trout pond.

July: Dave Owsley gave a VIP tour to Dr. Michael Ferguson and Wilfred Mitchell from Ireland; Mr. Mitchell operates one of two private trout hatcheries in Ireland. Corps of Engineer General Williams and Colonel Weller toured the complex with Manager Bill Miller.

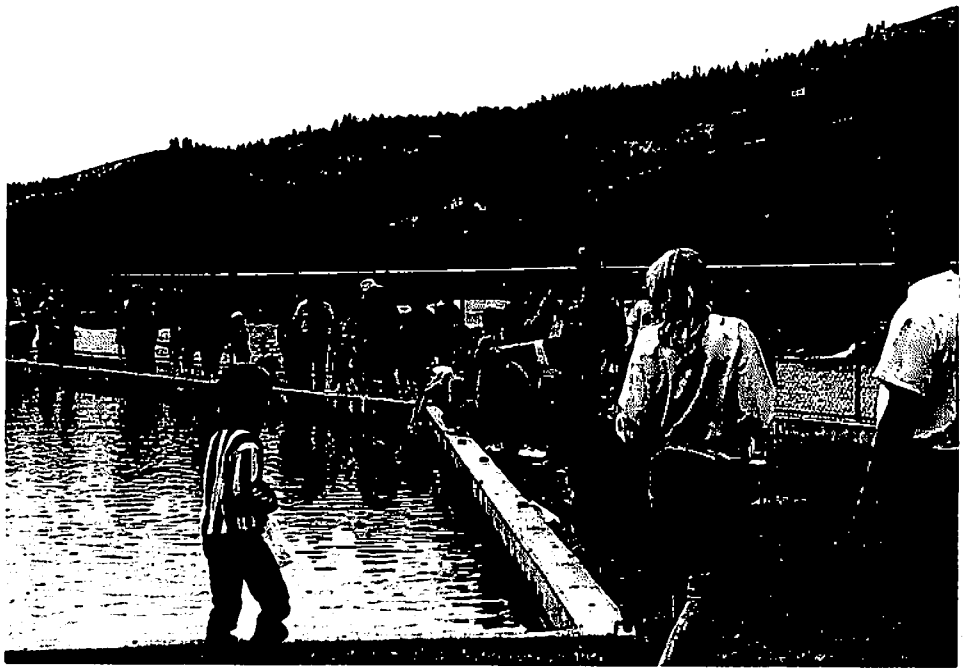
August: Anne Rockhold taught a 4-H entomology course, and attended outreach training guide meetings.

September: For the first time, Dworshak staff operated a display booth at the Clearwater County Fair, and contacted over 300 people. It was a challenge, for employees and visitors alike, with the controversial Dworshak reservoir drawdowns in effect. Bill Miller, Billy Connor, and Howard Burge of Idaho FRO met with Orofino Chamber of Commerce concerning the news release information on the effect of water flows aiding salmon smolts. Dave Owsley taught a second Hunter Safety class for 60 students with the assistance of three hatchery staff members. Don Windsor visited the complex to initiate a proposal for redoing the informational signs. Dave Owsley toured University of Idaho Professor Brandon and 25 aquaculture students throughout the complex. Ralph Roseberg gave a talk to the Orofino nursing home.

Visitor numbers for the year were as follows:

Total visitors to Dworshak Hatchery (non-group tour) (those signing in register only)	9750
Total number of group tour visitors	898
Total number attending Open House event	1200
Total Number of students contacted in outreach programs	4185
Estimated number of visitors to hatchery (not signing in)	9500
Total estimated visitor and outreach contacts for FY 95	25,535

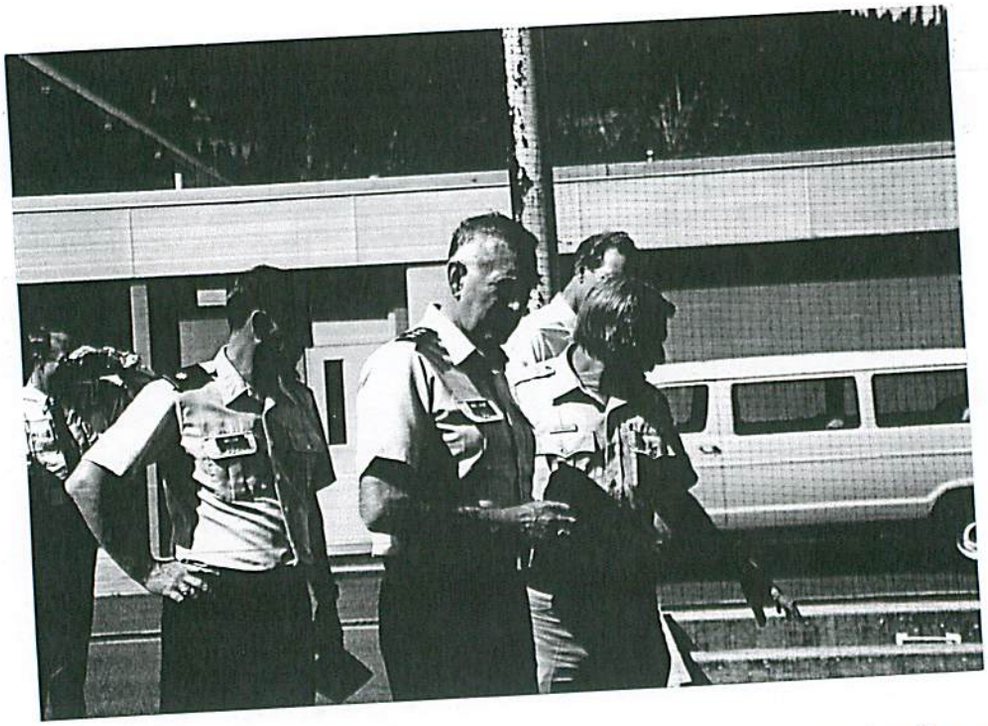
OUTREACH AND VISITOR ACTIVITIES



Kids and parents enjoy the "Free Fishing" day at the 6th annual Open House.

Madia Lopez shows off her catch with help from Ray Rosales, Hatchery maintenance employee.

Dr. Michael Ferguson and Wilfred Mitchell, from Ireland, toured the hatchery.



Army Corps of Engineers, General Williams and Colonel Weller touring the hatchery with Hatchery Manager, Bill Miller.

Earth Day was celebrated at five schools in April. Alyse Cadez, National Park Service and Anne Rockhold, Idaho Fisheries Resource Office, were among eight agencies participating.

Tuesday, April 18, 1995/Lewiston Morning Tribune 9A

Earth Day 1995: Kids learn about homes and habitat

"Habitat" is one of those words kids sometimes have a little trouble putting in perspective.

But tell them, "Home is where the habitat is," the Earth Day theme, and eight state and federal agencies will help them relate to a worm or fish or bird's need for a special place just like they have.

The agencies are taking a hands-on explanation of the prairie, soils, ocean, fresh water and forest into five different elementary schools in the region, said Mary Nedoma, forest practices adviser with the Idaho Department of Lands at Orofino.

The first was Juliaetta Elementary Monday. They will go to Pierce Elementary with Pierce and Weippe fourth- and fifth-graders today, Kamiah sixth-graders Friday and Orofino fourth-graders next Monday.

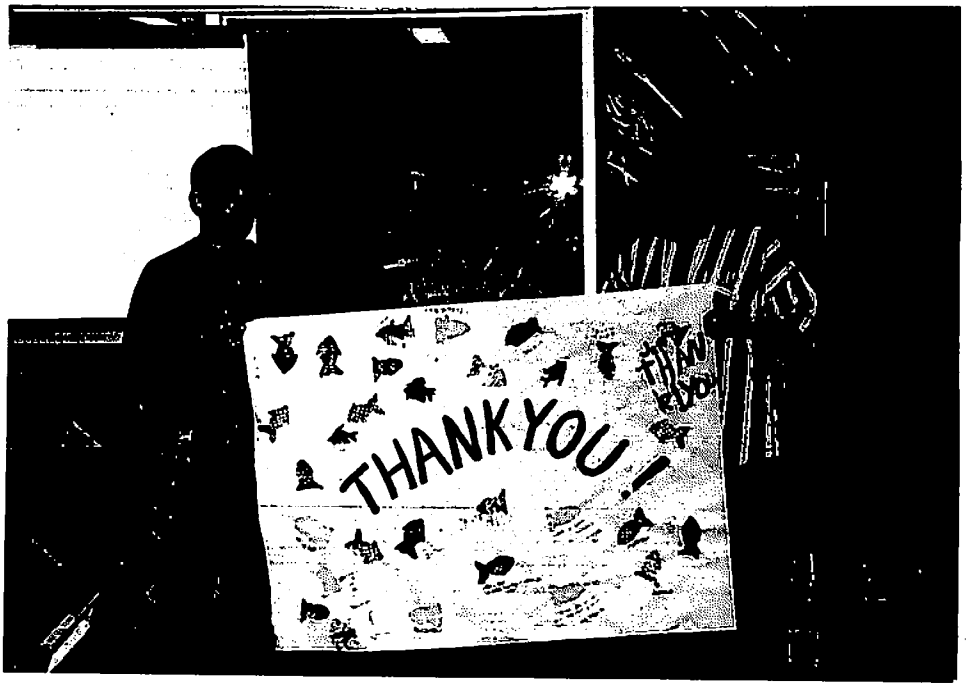
The soil people will let them dig into soil samples and look for critters with hand magnifying lenses and do other "touchy-feely" things to investigate habitat from the roots to tree tops, Nedoma said.

Puppet shows, slides and role playing to let the students get the feel of being a certain kind of animal are incorporated into the all-day programs. The final activity will be to introduce the human animal and show how people affect the habitat of other animals.

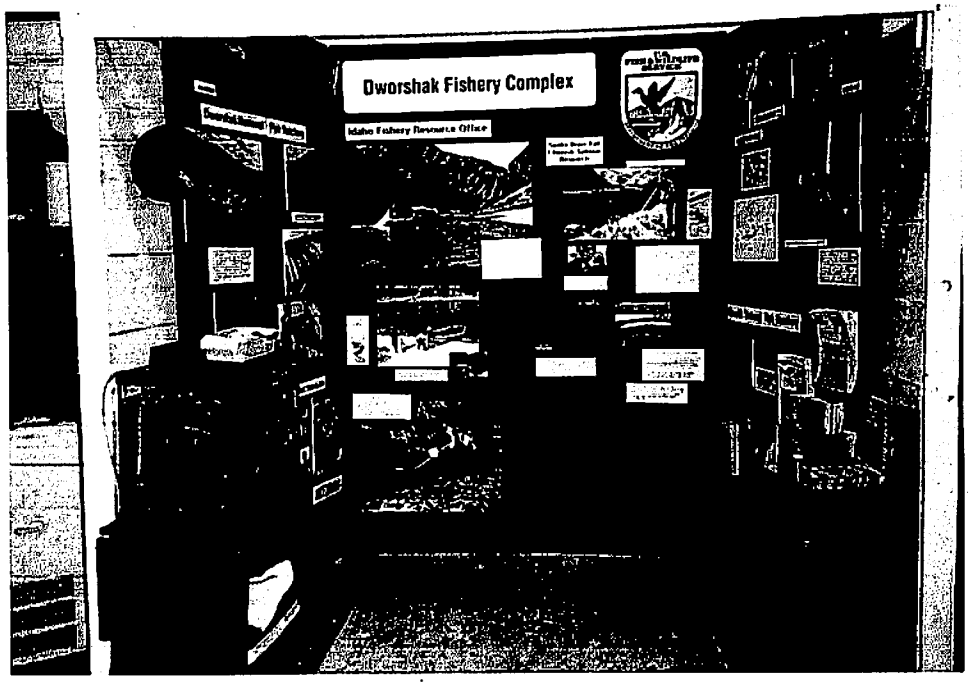
"Hopefully, with what they learn through the day, they will make management decisions that will help keep the habitat in good shape," Nedoma said.

Participating agencies are the U.S. Fish and Wildlife Service, National Resource Conservation Service, National Parks Service, U.S. Forest Service, Idaho Department of Lands, U.S. Army Corps of Engineers, Idaho Parks and Recreation Department and Idaho Department of Fish and Game.

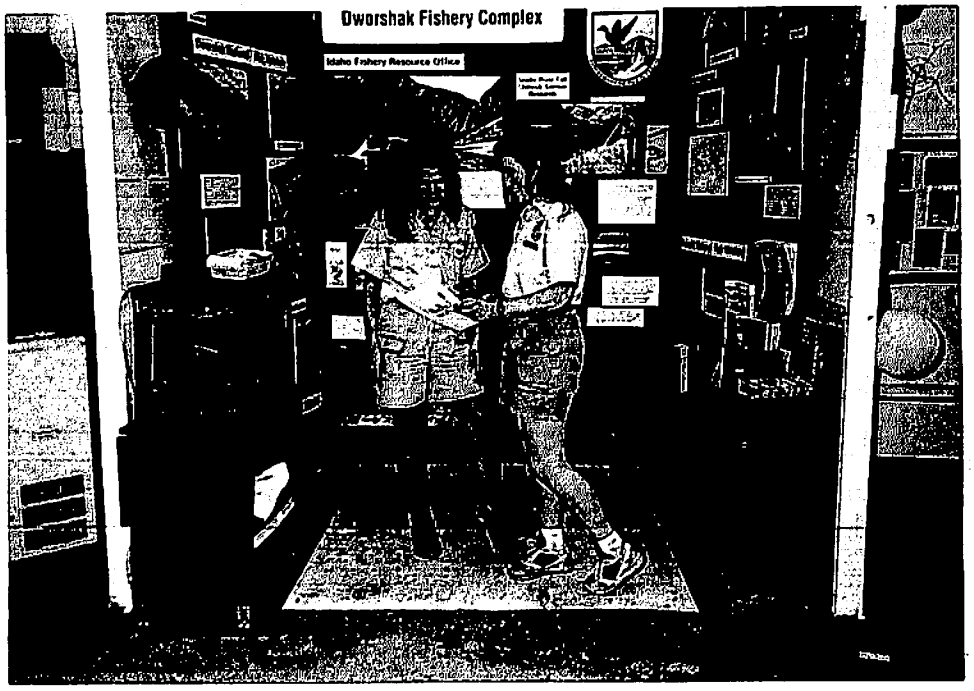
Senior Volunteer, Clay McGill, explaining steelhead spawning to a school group.



Summer youth employees, Mark Beard and Christi Fisbeck, and Diane Praest, Secretary, with a "thank you" poster made by Special Education children.



Dworshak Complex employees, Michelle Bouchard and Pat Bigelow, staffed a booth at the Clearwater County Fair.



COOPERATIVE PROGRAMS

The complex facilities at this site (Dworshak National Fish Hatchery, Dworshak Fish Health Center, and Idaho Fishery Resources Office) worked closely with the following agencies and groups to accomplish various activities.

- -Idaho Department of Fish and Game (IDFG)
  - Boise Office
  - Lewiston Office
  - Salmon Office
  - Clearwater State Hatchery
- -National Biological Service Center - Seattle
- -Corps of Engineers (COE)
  - Walla Walla District
  - Dworshak Dam and Reservoir Project
- -Cooperative Fishery Research Unit (CFRU) - University of Idaho
- -Nez Perce Tribal Fisheries
- -National Marine Fisheries Service (NMFS)
- -University of Idaho
- -Washington State University
- -Clearwater National Forest
- -Clearwater County Sheriff Office
- -Clearwater Management Council
- -Older Worker Program
- -Senior Citizen Volunteer Program
- -Joint School District #171

Steelhead carcasses were, as in recent years, received by a local processor on spawning days to be processed, frozen, and made available to several commodity programs administered through the Idaho Department of Education. The hatchery provides cold storage space for the processed fish until transferred for distribution.

Eggs and small fish were furnished other agencies and university groups, as approved for study purposes, i.e., environmental testing, genetic experiments, and ongoing bacterial kidney disease monitoring.

Two semi-annual coordination meetings were held at Dworshak with Idaho Department of Fish and Game, Nez Perce Tribe, Corps of Engineers and other Service groups to review hatchery production and to discuss Clearwater River fishery activities. A meeting in November 1994 was followed by another in March 1995.

Three senior volunteers contributed over 100 hours of service to assist visitors viewing Dworshak's steelhead spawning operations in the spring.

Environmental Engineer Owsley continued to assist both federal, state and private agencies on water treatment, holding design and other related facility operations. Numerous information mailings, telephone calls, personal contacts and site visits were made throughout the year. Mr. Owsley participated on several task forces and was involved in formal presentations and work groups as requested.

A Stewardship Initiative Proposal was funded during the year to the Idaho FRO project. Funds were allotted from FRO to the hatchery as a cooperative participant for work involved in rearing and tagging steelhead for use in several study groups of fish.

One of the hatchery's fish distribution trucks was on loan again for two months to the University of Idaho's fisheries program for transferring adult spring chinook to their research lab.

The hatchery participates in the Older Worker Program administered by Lewis-Clark State College. This program has been used actively by the Complex since initiated on March 23, 1989; Kooskia having one senior worker in the program until June 1991 and Dworshak assuming the position since 1991. Senior worker resigned August 8, 1995. Funding in the program has been reduced and we are not able to get a replacement.

Distribution trucks and drivers from the COE assisted the hatchery in hauling steelhead smolts upriver from the hatchery. This assistance has been ongoing since 1982 when the hatchery first began releasing fish offsite.

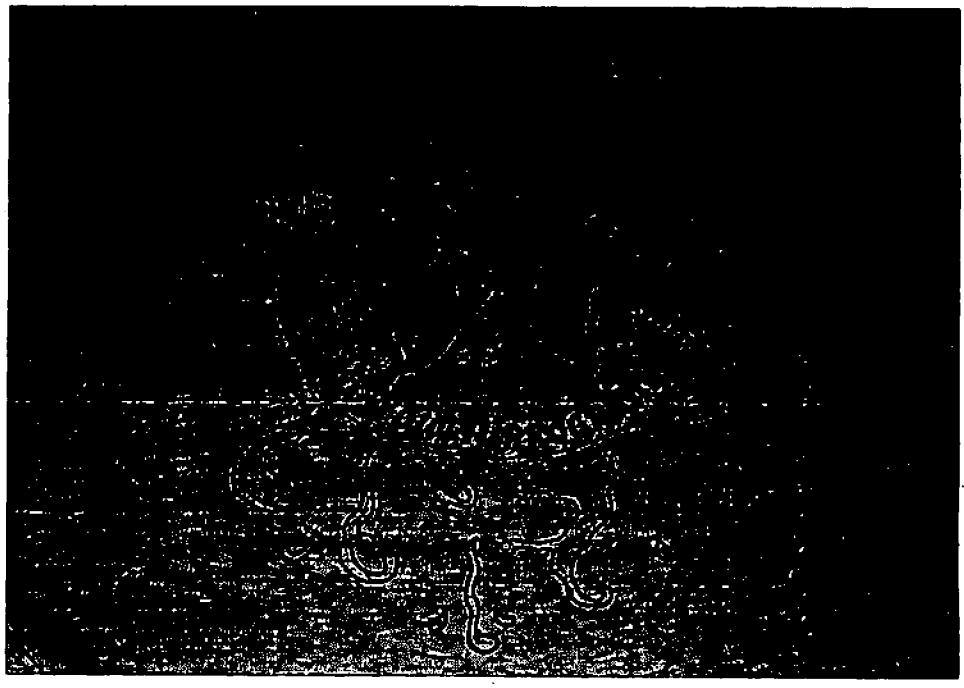
The hatchery works closely with IDFG Clearwater Hatchery in the operation of the reservoir pipelines furnishing water to the two hatcheries. Temperature monitoring and valve operations were closely communicated to assure both parties were understanding of each other's needs.

Separate weekly spawning dates were set aside to collect eggs for NBS's Seattle (Reisenbichler) research study. Temperature modifications and egg incubation space were made available at Dworshak to accommodate the study.

Several hatchery employees assisted Idaho FRO with fish monitoring and sampling activities.

A cooperative arrangement was made with the Dworshak COE Project for their assistance in providing several months of work to construct and assemble cabinets and shelving in the office area and some additional maintenance work.

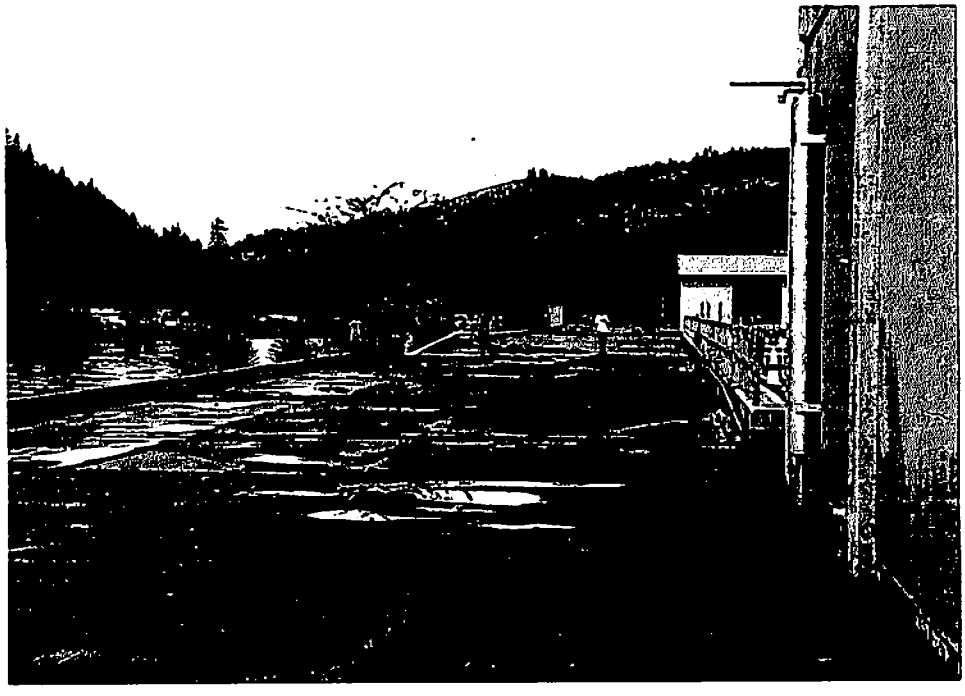
COOPERATIVE PROGRAMS



Clearwater River Youth Program emblem and logo on T-shirt.

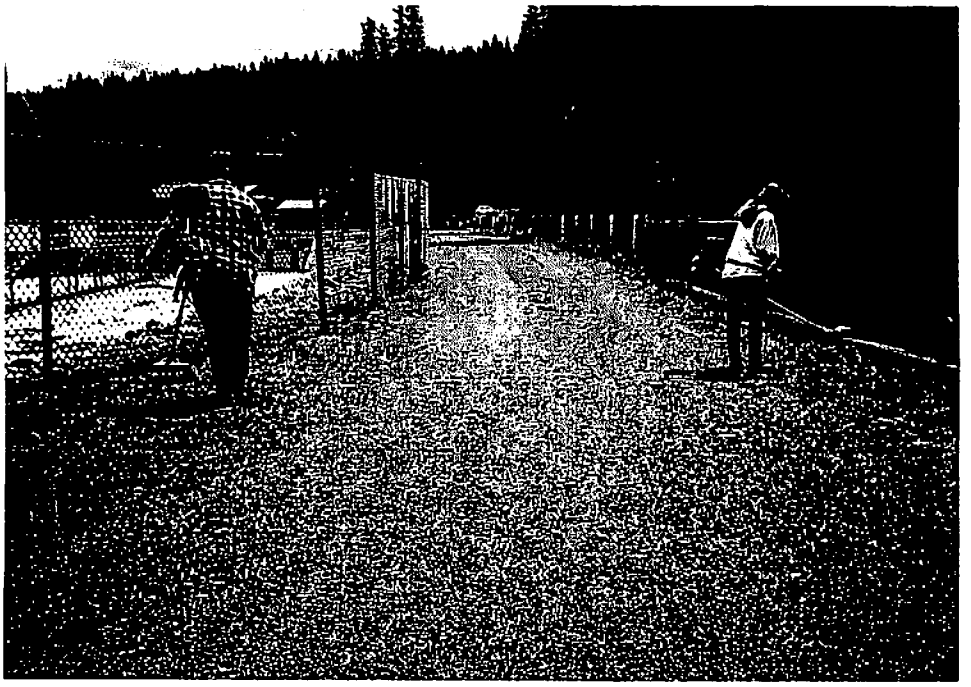
Clearwater River Youth Program employees end of program party. Left to right: Christi Fisbeck, Anja Streufert, Mark Beard, Sam Baumer, and Michelle Crutcher in front. Missing is Ben Wilson.

Clearwater River Youth Program employees seining and helping remove rainbow trout from Open House fishing pond for outplanting.



Clearwater River Youth Program employees washing the south hatchery roadway in preparation for Open House.

Kim Agee and Amber Holt, Kooskia YCC, clear rocks at Red River satellite station.



Kami Kiele, Kooskia YCC and Anja Streufert, Clearwater River Youth Program, perform grounds maintenance at Red River Satellite Station.