ANNUAL REPORT

FISCAL YEAR 1985

DWORSHAK NATIONAL FISH HATCHERY

AHSAHKA, IDAHO

OCTOBER 1, 1984 - SEPTEMBER 30, 1985

Submitted By: Wayne H. Olson Title: Hatchery Manager Date: 1-13-86

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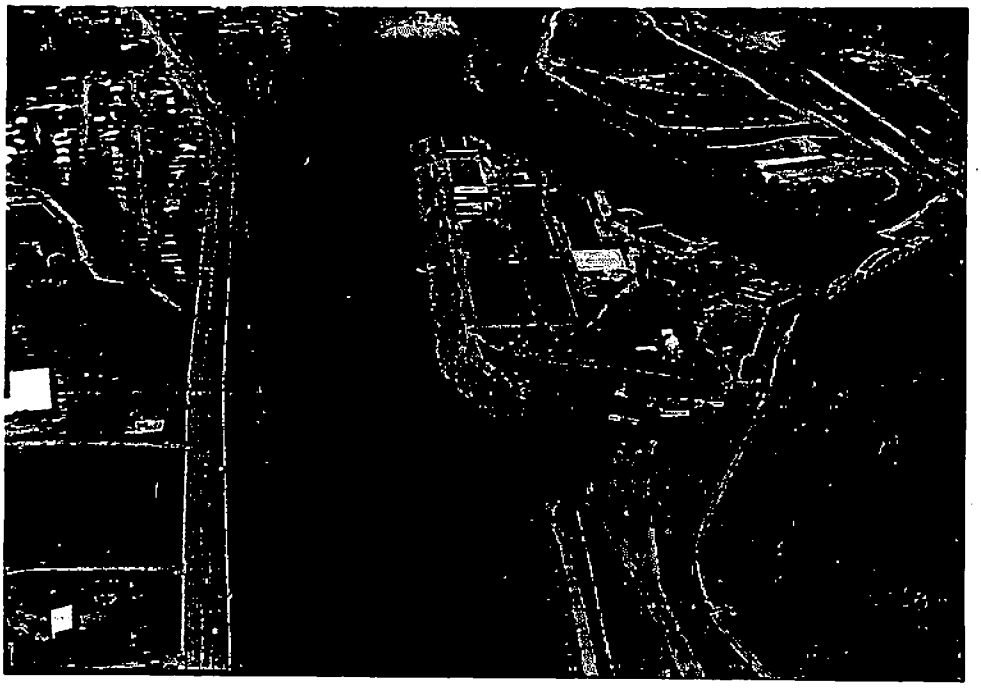
INTRODUCTION

Dworshak National Fish Hatchery is located at the confluence of the North Fork of the Clearwater River and the main stem Clearwater River near the unincorporated town of Ahsahka, in north central Idaho. The site is 3 miles west of Orofino (population 3,800) on the north bank of the Clearwater River, 1 mile downstream from Dworshak Dam.

The site was purchased by the U.S. Army Corps of Engineers in 1967 from several landowners. Title remains with the Corps.

Funds for developing the hatchery were allocated through construction of Dworshak Dam under Public Law 10 U.S.C. 2304 (a), Appropriation 96 x 3122, Construction, General, Corps of Engineers, Civil, Dworshak Dam and Reservoir.



Dworshak hatchery at confluence of Clearwater River and North Fork looking downriver.

View of facility showing steelhead ponds in foreground and hatchery building and nursery area to the right.

The hatchery was designed and constructed by the U.S. Army Corps of Engineers. It is administered and operated by the U.S. Fish and Wildlife Service. Rearing facilities consist of 84 recirculating-type ponds (17' x 75') for steelhead production, 128 inside nursery tanks (3' x 16') and 30 vertical stack egg incubators. In addition, there are nine adult holding ponds (17' x 75') of which six are modified into twelve 8' x 75' raceways to hold rainbow production. Thirty 8' x 80' concrete raceways rear spring chinook salmon.

Operations began in 1969 with completion of the first phase of construction. This provided a total reuse system for 25 ponds and a single-pass system for 59 ponds. A second phase in 1972 placed all ponds on recycled flow. Subsequent construction over the years modified some of the existing features, and new design concepts continue to be incorporated into the hatchery.

Further construction was completed in June 1982 to expand facilities for spring chinook salmon. Authorized and funded under the U. S. Fish and Wildlife's Lower Snake River Compensation Plan (LSRCP), site selection was approved in 1981 and construction began in September.

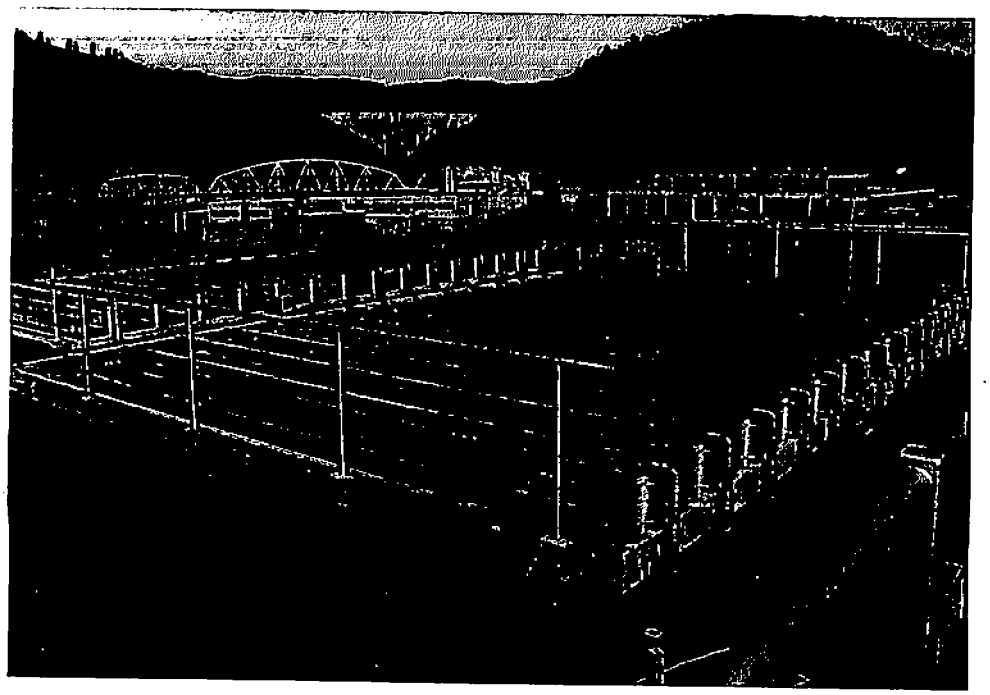
Steelhead and rainbow trout are mitigation production assigned to the hatchery with construction of Dworshak Dam. Steelhead are released into the Clearwater River drainage; rainbow into Dworshak Reservoir. Spring chinook smolts are presently being released at the hatchery site.

Total production capacity of Dworshak is:

Steelhead (smolts)	2.9 million	365,000 pounds
Rainbow (catchables)	0.3 million	75,000 pounds
Spring chinook (smolts)	1.2 million	70,000 pounds

Kooskia National Fish Hatchery, located 35 miles upriver, operates as a complex with Dworshak to produce spring chinook smolts and steelhead fingerling.

This report covers the period of hatchery activities from October 1, 1984 to September 30, 1985.



LSRCP raceways with Dworshak Dam in background.

STATION OPERATIONS

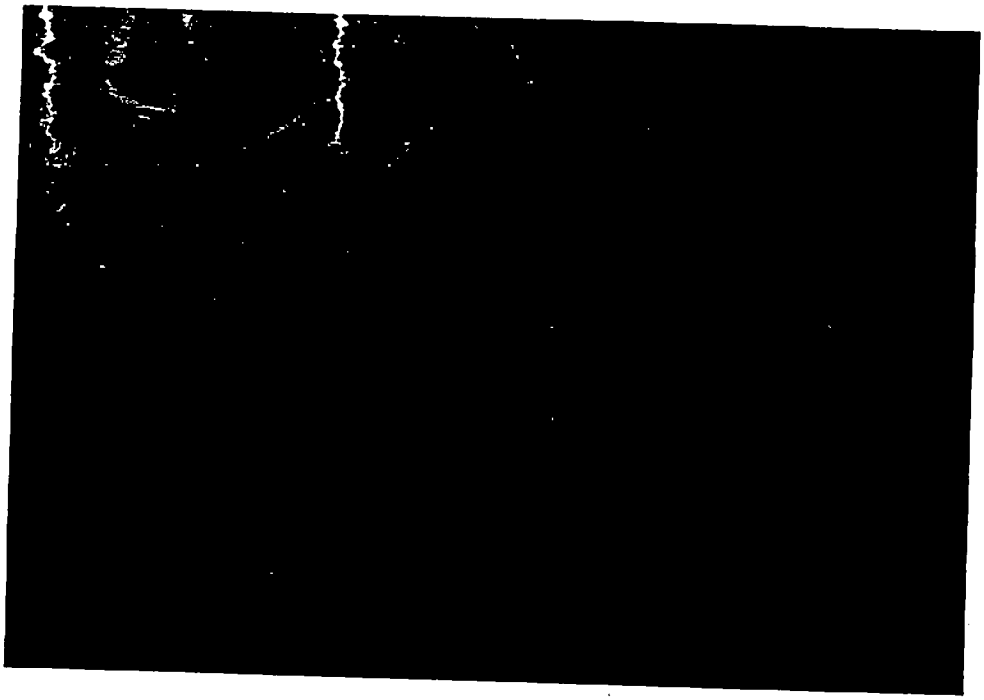
O&M funding from the Corps of Engineers (COE) included $952,466 (subactivity 1935) and $11,700 (subactivity 8610) quarters reimbursement. In addition, $34,000 was annual work planned to the Dworshak Fish Health Center (FHC). Funds totaling $153,800 were provided by the Lower Snake River Compensation Plan (LSRCP) for production of spring chinook salmon. The Youth Conservation Corps (YCC) contributed $15,560 towards labor costs for an 8-week summer program. Total O&M funding, exclusive of FHC and YCC was $1,117,966.

Cost per pound of all fish produced was $3.80, based upon a production gain of 294,539 pounds. This cost reflects equipment repair and maintenance, facility care, rehabilitation, travel and training, and direct production expenses. Production costs alone (labor, fish food, mineral addition, drugs and chemicals) were $586,000 or $1.99 per pound.

A total of 23.2 staff-years was used during the year for a 12,695 pound production gain per staff-year employed. Production each staff-year increased to 28,321 pounds when based upon direct production responsibilities.

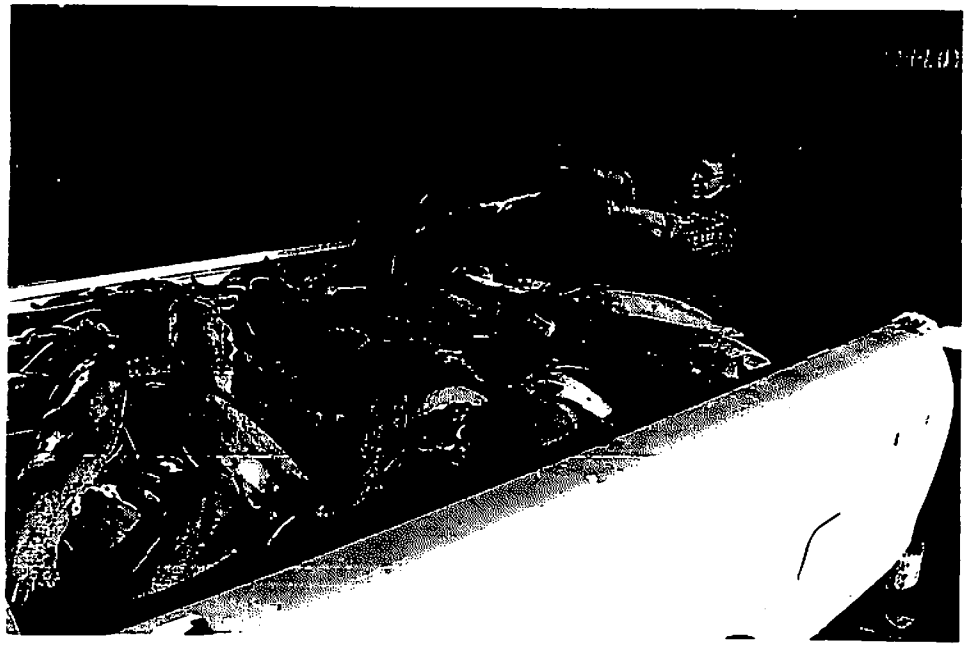
Food conversion (pounds of food to produce 1 pound of fish) was 1.56. This figure is calculated from 524,615 pounds of fish food used to produce a gain of 294,539 pounds.

A record number of 14,018 adult steelhead (previous high 12,727 fish in 1978) returned to Dworshak resulting in an excess of 7539 fish, weighing 115,000 pounds, for outplanting. Nearly 6.3 million eyed eggs were incubated resulting in 3.6 million transferred to Kooskia to start Dworshak's production program; Dworshak continuing to experience devastating losses to IHN virus.



A record run of 14,000 steelhead returned to Dworshak. Adult fish in holding pond prior to spawning.

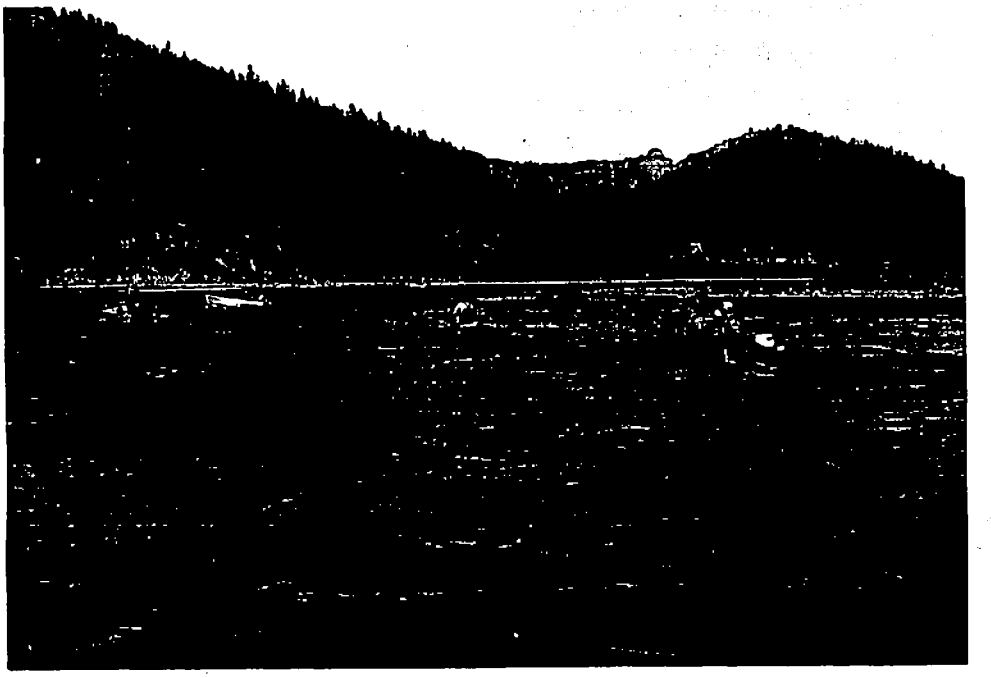
Valley Food Bank received from spawning 3415 carcasses for distribution to needy families within an immediate 5 county area; Nez Perce Tribe received 760 fish. Controversy occurred over disposing of 700 carcasses to a landfill. This action became necessary when the food bank program lacked funding to continue the processing.



Loading spawned-out steelhead for processing and distribution by Valley Food Bank.

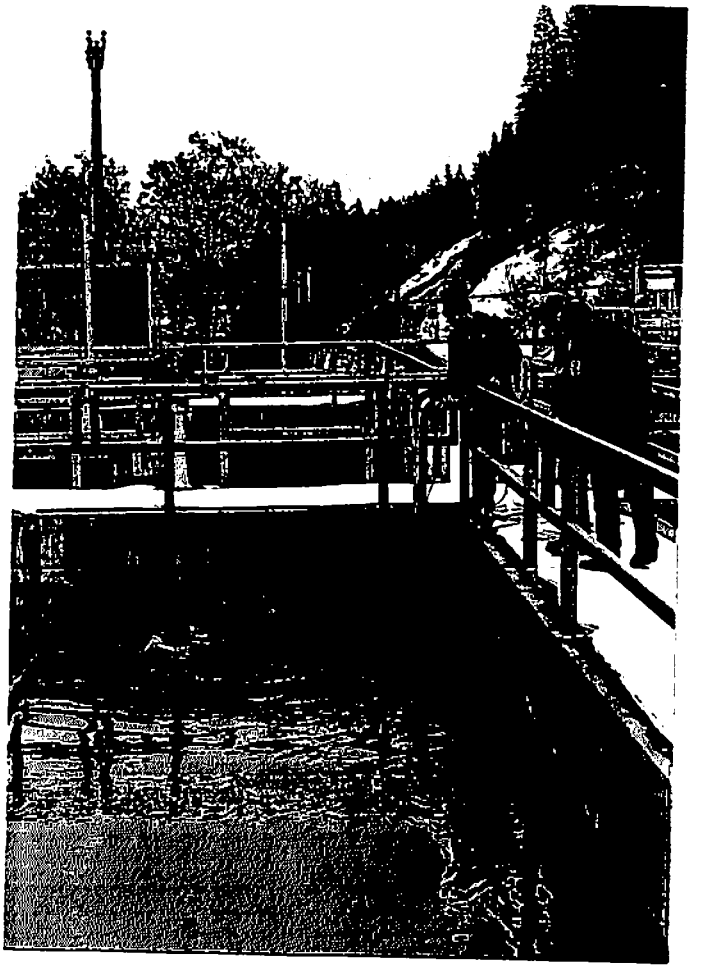
Ninety percent (90%) of the fish returning were 2-ocean age class, 9 percent 3-ocean, and 1 percent 1-ocean as sampled in Dworshak's spawning. Females made up 75 percent of the run. Spawning operations began on January 29 and were completed on May 7.

The high steelhead return provided an outstanding sport fishery in the Clearwater River. Both fall and spring seasons produced excellent catches. The North Fork fishery was extended 150 yards upriver from confluence with the main-stem Clearwater River by IDF&G, for additional access to the steelhead nearing the hatchery's ladder. This action became necessary toward reducing escapement numbers into the hatchery.



Spring fishing on the Clearwater during record return of steelhead.

Spring fishing activity on the Clearwater River during record run of returning steelhead.



Examining and collecting sediment samples from aeration chamber for IHN virus.

Steelhead eggs collected were again single parent (1 male and 1 female) incubated and culled for IHN findings. Despite efforts to remove all "dirty" eggs and retaining only "clean", the hatchery experienced 100 percent loss in nursery production. Managing around IHN by using Kooskia for Dworshak's early rearing, continues to prove successful. The Kooskia hatchery again reared Dworshak's early fingerlings, in absence of IHN, and returned 3.2 million at a size when resistance to the disease appeared greater.

The bright side in Dworshak's production programs occurred with spring chinook. Few problems were experienced in Brood Year 1983 fish to provide an excellent release of 1.1 million smolts in Spring 1985.

Another highlight to operation included a major study using ozone to disinfect a nursery water supply. The study, from March 15 to August 15, was quite successful in providing (needed) information

With a record return of steelhead into Dworshak came added security measures for protecting fish in the broodstock ponds. A contract was issued to Clearwater County Sheriff's Department for providing increased patrol of the hatchery facilities at a time when steelhead and spring chinook adults were in ponds. Despite increased enforcement, we again experienced isolated incidents of illegal entry. Further measures were taken later in the year to enclose the broodstock ponds with chain link fencing.

Spring chinook returns are increasing as shown by this year's 334 fish collected. This trend is expected to continue as more fish are released from the hatchery. The 1985 return was primarily based upon Dworshak's first major release in Spring 1983. Increased returns can be expected in 1986 and 1987 leading to a self sustaining broodstock program.

Steelhead rearing continues to be plagued with IHN disease problems. This year was no exception when considering only 1.6 million smolts were released from a 2.9 million hatchery capacity. Early losses in nursery tanks and later problems in outside rearing, primarily from IHN, resulted in the fewer number at release time.

Divers from Clearwater Search and Rescue Team preparing to examine water aeration chamber.

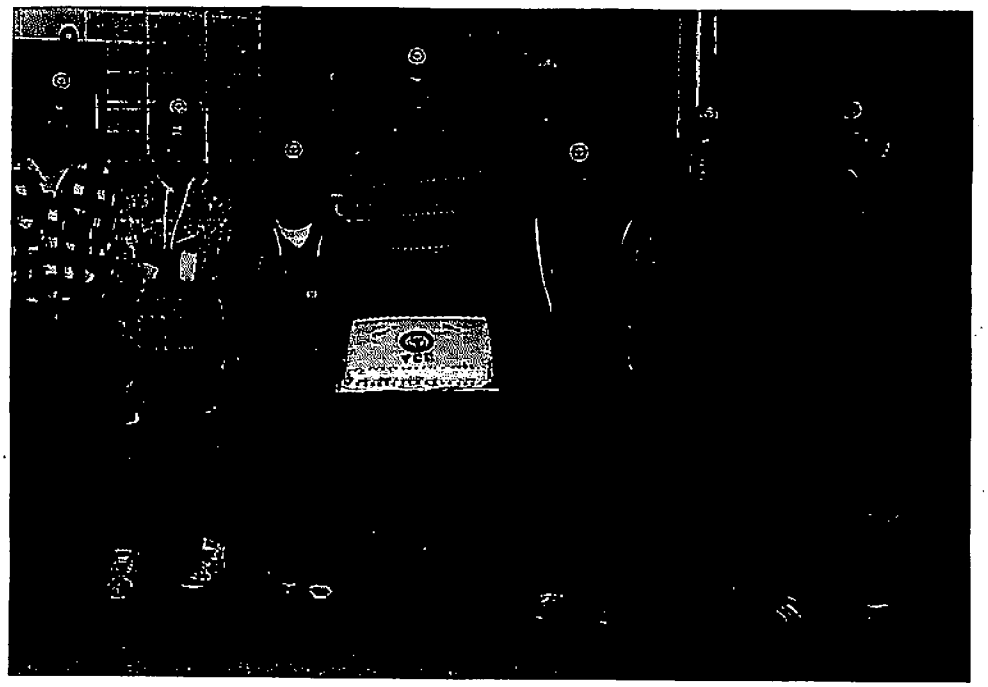
for future use. The work was a joint venture with IDF&G and COE for determining the effectiveness of ozone on IHN in treating a 600 gpm water supply. Results were favorable towards ozone when compared to the high losses recorded in fish reared on untreated water.

A reduction in mechanical breakdowns and equipment malfunctions was the result of renewed efforts by maintenance to improve upon recurring deficiencies. Funding was designated to address and correct a number of maintenance concerns. Alarm callbacks were greatly reduced.

Unusual cold weather conditions persisted for 3 months from December through February. River temperatures approached 37°F. during this period or 2-3° cooler than normal. The main Clearwater River, above Dworshak to Orofino, cleared of ice on February 24 after remaining frozen since December. Going from one extreme to another, summer temperatures set record highs. July and August were especially warm months.

Temperatures approach record setting highs in July to increase local fire danger. View along Ahsahka road in vicinity of hatchery.

The Youth Conservation Corps (YCC) consisting of 10 enrollees and 1 crew leader, was active for the 3rd successive year. The 8-week program began on June 10 and was completed August 2. Accomplishments of YCC were numerous in providing the hatchery many hours of productive labor in custodial maintenance, production, facility improvements, laboratory and fishery assistance assignments.



Chad Easterbrook, YCC Crew Leader, with enrollees (l to r): Shawn Winters, Wendy Lonsbury, Colleen Brown, Brian Jefferson, Chad Easterbrook, Doug Lambrecht, Tracy Kimberling, Mary "Denise" Perrin, and Richard Keen. Missing from photo is Victor "Bucky" Hulett and Staci Forest.

Special Achievement Awards were given during the year to station employees' Bob Austin, Dave Clifford and Roger Guinee in the respective amounts of $400.00, $400.00, and $250.00; Austin's for increased responsibilities assumed during an interim 3-month period (July-September 1984) while hiring a production supervisor; Clifford was recognized for added responsibilities held during a 5-month period (May-September 1984) at a time of changeover in key maintenance positions; Guinee was awarded for his work with the 1984 YCC program.

Special Achievement Awards presented to Bob Austin, Dave Clifford and Roger Guinee.

FISH CULTURE OPERATIONS

Steelhead Production

- BROOD YEAR 1984 -

Fiscal year 1985 began with 2.7 million steelhead (73,713 lbs.) on station. Reuse Systems I, II, and III held 838,137, 760,426, and 1,112,164 fish respectively.

SYSTEM I

This system was placed on heated reuse water with mineral addition (20 mg/l Na^+ and 8 mg/l K^+) on December 3. Performance and health had exceeded projections at that time. Based on this, cooler water temperatures were used, and some of the heated water was diverted to System III.

IHNV was confirmed in Pond 11 in January. Due to reuse water system problems, environmental conditions in the ponds deteriorated during February. Despite isolated IHNV, mortality remained low, however, ectoparasite loads increased. The average water temperature for January was 44.9^{o}F.

Osmoregulatory problems related directly to a mineral imbalance in the system resulted in a loss of 79,500 fish during March. By late February, blood ion levels indicated that physiological changes were complete, and that the system could be switched from reuse to raw water. On March 7, that switch occurred with a concurrent and dramatic increase in mortality. The system was placed back on reuse March 11 with mineral enrichment, but without heated make-up water. Mortality subsided significantly within 24 hours. However, mechanical problems with the mineral pumping system and logistics difficulties with mineral supply companies precluded attainment and maintenance of critical sodium/potassium ratios. The result was further significant mortality and secondary disease problems. The situation was still critical by March 31, but mineral levels were stable and chemical therapeutics appeared to control the secondary disease problems.

The effects of the March 1985 mineral imbalance were still evident in April. This system exhibited more external lesions, fin erosion, secondary Myxobacteria and IHNV than the other systems. Upon examination of adversely-affected fish, it was determined that 12 percent of the examined fish had one or more of the above signs.

Idaho Department of Fish and Game personnel conducted adipose fin clipping operations October 15-19. Steelhead in System I tolerated the program well.

SYSTEM II

Fish in System II suffered high mortalities during October due to IHN and secondary Myxobacterial infections. On October 26, water temperatures were increased to 52°F, providing a better growing environment and relieving the Myxobacterial stress.

OMP diet supplemented with TM-50 appeared to be effective in reducing levels of Myxobacteria. By December 1, mortality had decreased substantially in most ponds. The system was switched from raw to reuse water, with addition of minerals, on November 19.

System II fish performed dramatically better during December than in previous months. Mortality was low with some evidence of: 1) residual IHNV, 2) moderate-to-heavy Ichthyopthirius, and 3) fin clipping losses (adipose fin clipping occurred December 3-7, 1984). Physiological changes were more prevalent during December.

System II was taken off reuse and placed on raw water on April 24. Steelhead in this system continued to perform well and remained in excellent condition through release.

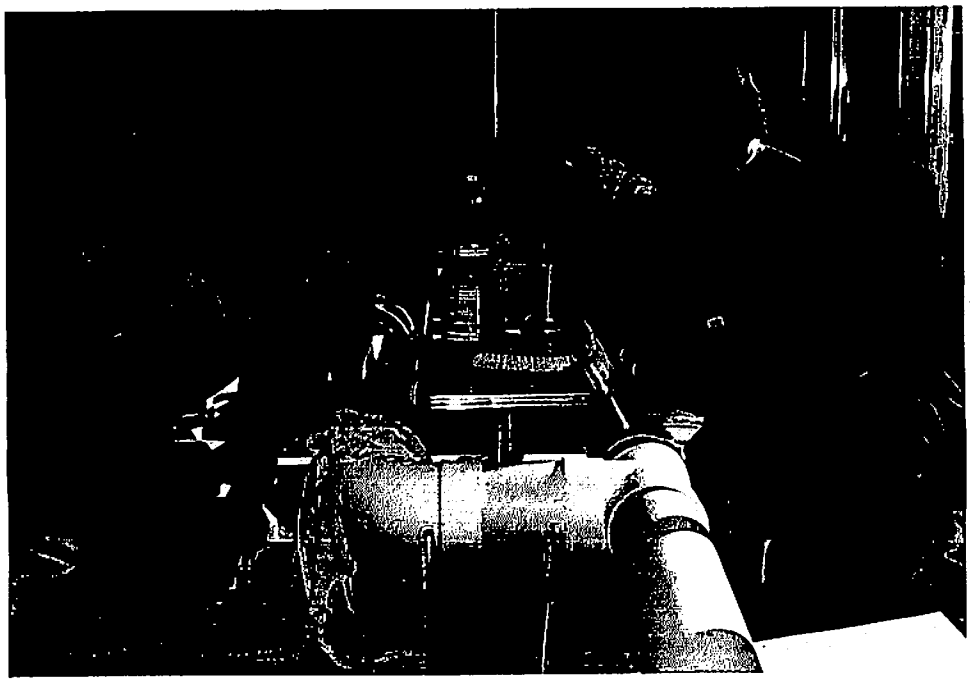
SYSTEM III

System III experienced the same high mortality during October as did System II, primarily from IHNV and secondary Myxobacterial infections. Terramycin (TM-50) feeding was started in November and appeared to be effective.

Approximately half the ponds in System III experienced high, chronic mortality due to IHN and secondary parasites. Reuse system start up, with addition of minerals, occurred November 20.

Steelhead in System III continued to perform poorly during December due to: 1) extremely high levels of "Ich", 2) residual IHNV, 3) adipose fin clipping losses (marked December 8-14, 1984), and 4) other external parasites. Water temperatures were lowered and formalin treatments (167 mg/l) were applied to the more severely infected ponds.

During January, losses exceeded 300,000 fish. Therapeutic efforts were apparently unsuccessful, but continued. System III steelhead had fewer fish with obvious physiological changes than other systems. By late February, losses were reduced, but "Ich" had resulted in the loss of 73,000 fish and caused gill damage. Consistent improvement to fish quality was observed by release time in April.



Ad-clipping steelhead fingerling for identifying hatchery stock upon adult return.

STEELHEAD RELEASES

Smolt releases occurred in April and May. The quality of System I and II fish was excellent. Smolts from System III were generally of poorer quality.

Steelhead in System III suffered a variety of problems throughout the production year, with mortality of 706,000 fish. Due to the magnitude of these losses, the sampling (counting) error was probably significant. Truck drivers from IDF&G counted (by weight displacement) 40 percent less fish onto their trucks than hatchery estimates. The adjusted release numbers and site locations are shown in the following table:

SYSTEM I LOT 4-Ds-I-18

Date	Number	No./lb.	Lbs.	Total Length	Receiving Water
5/2	165,976	7.97	20,815	180	Main-stem Clearwater R.
4/29-5/1	162,111	7.91	20,486	181	American River
4/30-5/2	145,206	7.87	18,442	181	Clear Creek
5/1	7,765	8.07	962	179	Crooked River
5/1-2	95,286	7.97	11,962	180	Newsome Creek
	576,344	7.93	72,667	181	

		SYSTEM II	LOT 4-Ds-II-19		
4/29-30	672,334	6.42	104,850	191	Main-stem Clearwater R.
		SYSTEM III	LOT 4-Ds-III-17		
5/3	197,263	8.10	24,342	171	Main-stem Clearwater R.
4/29-5/1	21,306	8.70	2,450	167	Crooked River
4/29-5/1	134,448	7.60	17,700	175	Eldorado Creek
	353,017	7.93	44,492	172	

OFF-SITE RELEASE

4/29-5/1	162,111	7.91	20,486	181	American River
4/30-5/2	145,206	7.87	18,442	181	Clear Creek
4/29-5/1	29,071	8.52	3,412	170	Crooked River
4/29-5/1	134,448	7.60	17,700	175	Eldorado Creek
5/1-2	95,122	7.97	11,962	180	Newsome Creek
Total	566,122	7.86	72,002	181	

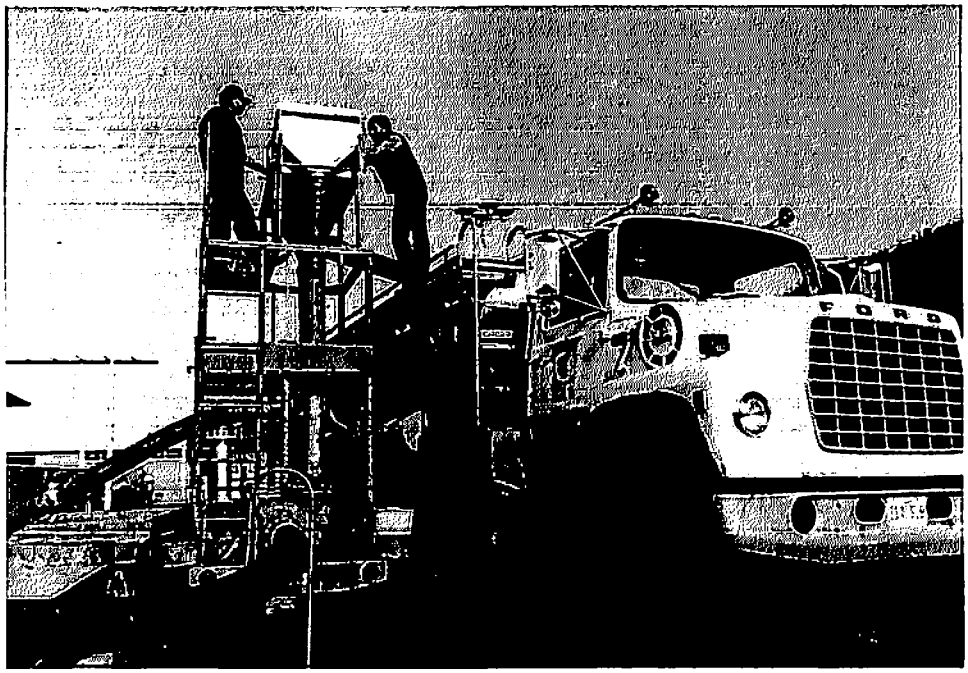
MAIN STEM CLEARWATER RELEASE

4/29-5/3	1,035,573	6.90	150,007	185 mm

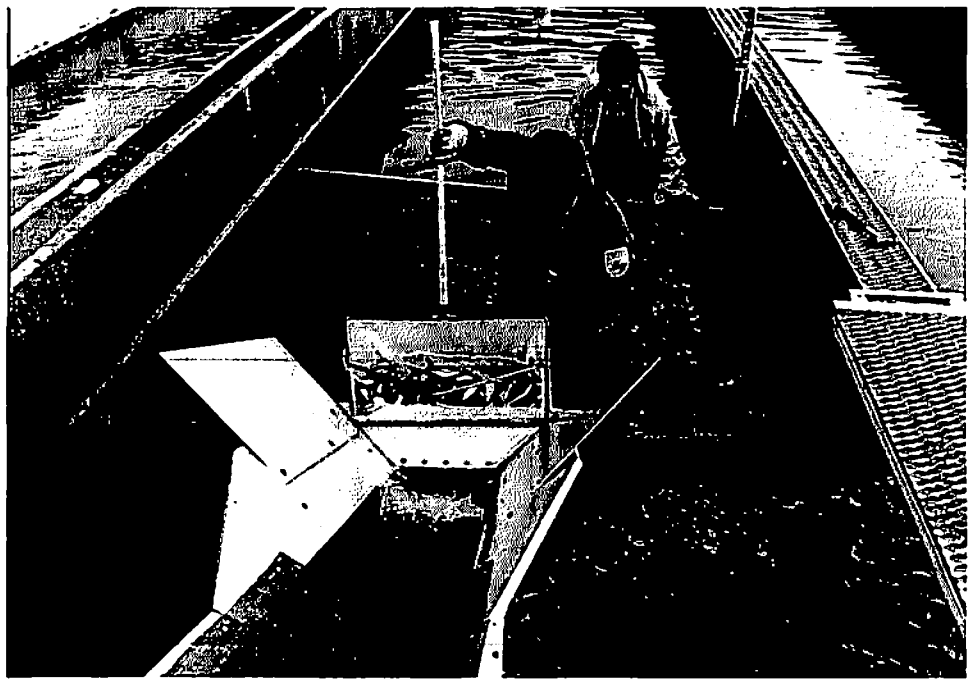
TOTAL RELEASED

4/29-5/3	1,601,695		222,009	183 mm

Crowding and releasing steelhead smolts from ponds.



Loading steelhead smolts for outplanting to South Fork of Clearwater River.



Netting steelhead smolts for loading to distribution trucks.

- BROOD YEAR 1985 -

STEELHEAD SPAWNING SUMMARY

Ladder Opened	January 2	
Ladder Closed	May 21	
Spawning Began	January 29	
Spawning Ended	May 7	
TOTAL FISH IN RUN	14,018	
Females Spawned	1,256	
Males Spawned	1,234	
Total Green Eggs		7,536,000
Total Eyed IHN-Negative Eggs		6,276,898

DISPOSITION OF EYED EGGS

Kooskia NFH	3,666,286
Dworshak NFH	1,696,262
Idaho Fish & Game	914,350
Destroyed (IHN Positive)	1,788,000

*Eggs culled upon confirmation of IHN status 8 days subsequent to spawning.

The number of steelhead (14,018) returned to Dworshak was a record. Eleven thousand (11,000) fish were excess to the program.

Fish were anesthetized with carbon dioxide since carcasses were destined for human consumption. The Valley Food Bank and the Nez Perce tribe received 3415 and 760 steelhead, respectively.

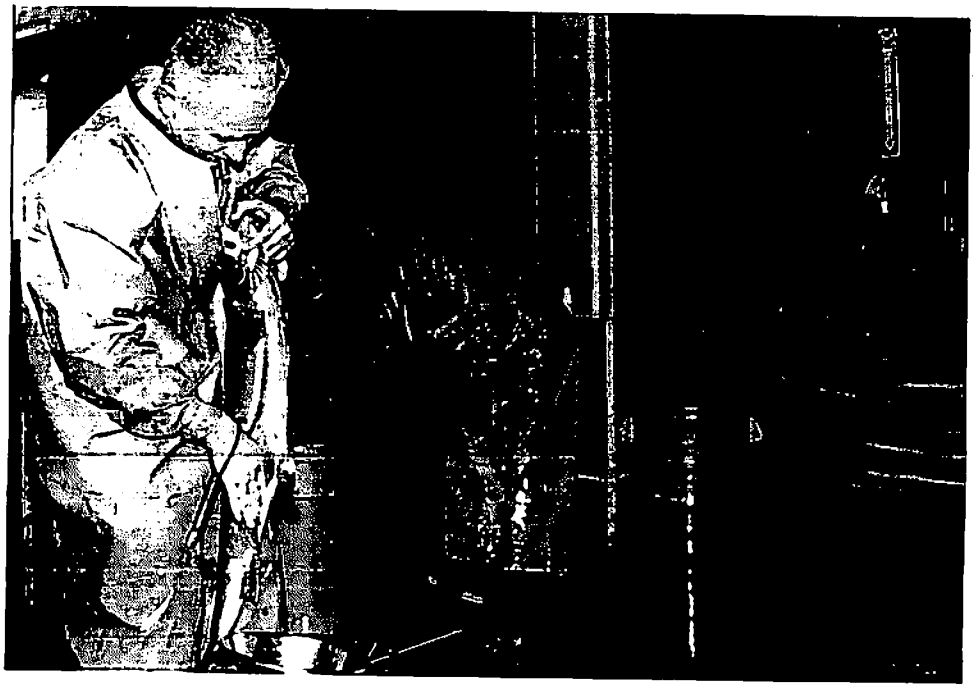
Excess steelhead were outplanted in a cooperative effort involving the U. S. Fish and Wildlife Service, Idaho Department of Fish and Game, Nez Perce Tribe, and U. S. Forest Service.

The program began March 27 and ran through May 2. The outplanting locations included areas on Potlatch River (1086 fish), American River (1891), Lawyers Creek (303 fish), Newsome Creek (2043 fish), Crooked River (2030 fish), and Lolo-Eldorado Creek (1150 fish). Included in the 8503 total fish transported were 964 trucked from Kooskia NFH.

Eggs from one female were fertilized with sperm from one male whenever possible. All spawned fish were sampled to determine IHNV status of progeny. Fertilized eggs were water-hardened in an iodophore solution (75 mg/l) for one hour and incubated individually in numbered colanders supplied with single-pass heated water (54°F). Positive eggs were destroyed for once the IHNV status was known. A total of 3.6 million eyed eggs were

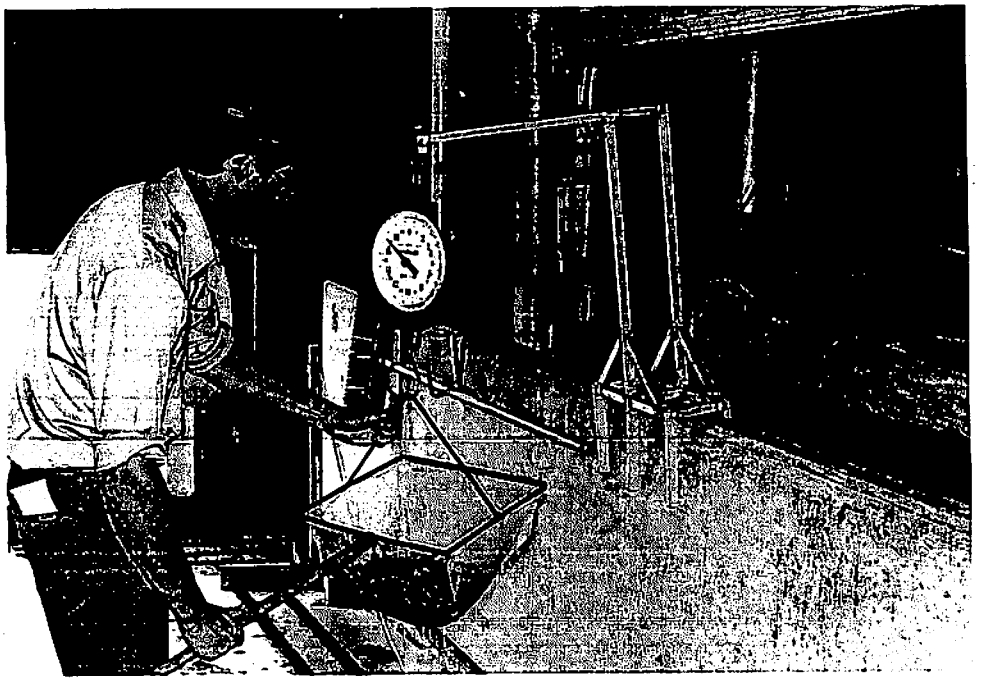
transferred to Kooskia for Dworshak's entire production program; Dworshak retaining 60,000 eyed eggs in hatching jars from each shipment to serve as a control. Eggs transferred to Idaho Fish and Game were placed in spawning channels.

Cutting and removal of eggs from adult steelhead.

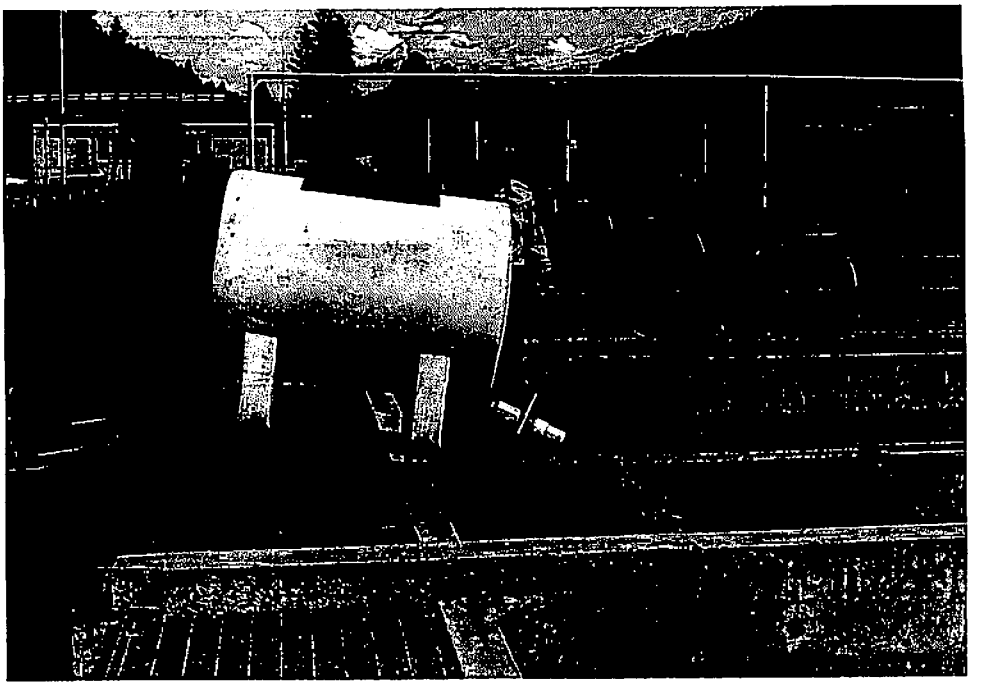


Steelhead spawning operation.

Steelhead in spawning rack prior to collecting eggs.



Weighing steelhead fingerling from nursery tanks for transfer to outside ponds.



Transferring steelhead fingerling to outside rearing units.

The IHNV incidence, which had remained low during most of the spawning year, increased to nearly 70 percent during the last two weeks. As a result, approximately 24 percent of the eggs (1.8 million) were culled, leaving more than 5.2 million eyed eggs for the Dworshak production program.

Steelhead fry reared at Kooskia experienced excellent performance, health, and survival (86%) from swim-up to transfer as fingerlings to Dworshak's outside ponds. As in past years, IHNV was not detected in fish at Kooskia.

Nursery rearing of 1,742,837 fry, representing Egg Takes 2 and 8-14, was initiated in tanks during April. Takes 9, 12, and 14 were part of this year's ozone study (refer to special studies section of annual report). Loss to IHN was 65 percent, or 1.2 million in the Dworshak nursery. However, when excluding the test groups in ozonated water, losses in fish reared in Dworshak's untreated water experienced a 100 percent mortality.

The Brood Year 1985 production plan called for fingerlings to be reared at Kooskia to a size of 250 fish per pound, at which time they would be trucked to Dworshak for pond rearing. Fish were to be ponded in the following order, with the indicated numbers: System I (1,072,500), System III (1,402,500), System II (914,176).

During initial pond loading, every other pond was stocked, allowing for thinning the fish when reaching 50 fish per pound. A temperature of 53°F, combined with an accelerated feeding rate, ensured larger fish at an earlier date and shortened the period that reuse water would be required.

During June, steelhead fingerlings were transported to Systems I and III from Kooskia NFH. The fish performed well at the near optimal rearing temperatures provided this year. Mortality was extremely low and pathogen loads were minimal.

System II was stocked with ozone experiment survivors and survivors of an off-site rearing experiment with exception of three ponds. The system was filled to capacity by August 6.

During August, System I had one pond (49) with confirmed IHN. Other ponds in the system performed well. System II's performance was generally poorer than the other systems. System III exhibited excellent growth and fish health.

Systems I and III continued to perform well through September 30. Fish health was generally very good, with light Ichthyopthirius levels present. System II suffered substantial mortality in ten ponds during September, but overall, growth was good and performance was acceptable. In general, there were more steelhead at a larger average size on September 30 than any of the three recent years (Table 1).

Total steelhead on station September 30, 1985:

System I (5-Ds-I-21)	1,051,978 @ 24.56/lb.	=	42,833 lbs.
System II (5-Ds-II-23)	875,405 @ 40.48/lb.	=	21,626 lbs.
System III (5-Ds-III-22)	1,436,823 @ 35.85/lb.	=	40,079 lbs.
Total:	3,364,206	=	104,538 lbs.

Three year comparative sizes as of September 30:

	1983	1984	1985
System I	25.10	39.83	24.56
System II	68.46	48.63	40.48
System III	20.20	84.08	35.85
Average Size	37.92	57.51	33.63

Brood Year 1985 has shown the best growth overall when compared to the previous two years. Brood Year 1983 was an exception, it exhibited excellent growth in Systems I and III, but total numbers were considerably less than in 1984 (2,149,500 and 3,364,206), respectively. Warmer than usual raw water temperatures were an important factor in Brood Year 1985 performance.

Anticipated release for Spring 1986 is 2.9 million smolts.

Spring Chinook Salmon Production

- BROOD YEAR 1983 -

Fiscal year 1985 began with three lots of spring chinook salmon (SCS) being reared in the Lower Snake River Compensation Plan (LSRCP) raceways. The lots included two (3-Lw-2a and 3-Lw-2b) from Little White Salmon NFH, and one (3-Le-2) from Leavenworth NFH. The populations and weights of the SCS on October 1, 1984 were:

Lot No.	Number		Size (No./lb.)		Weight
3-Lw-2a	58,119	@	25.28/lb.	=	2,299 lbs.
3-Lw-2b	752,432	@	45.51/lb.	=	16,533 lbs.
3-Le-2	375,982	@	42.89/lb.	=	8,766 lbs.
Total SCS	1,186,533				27,598 lbs.

As part of a diet study, SCS were fed Biodiet, supplemented with 6.5 percent Erythromycin in five raceways on September 20 to assess its efficacy in controlling BKD. A second feeding of Erythromycin reinforced Biodiet to five raceways was terminated on October 11 after 20 days. Other raceways were fed Abernathy dry diet, with some switched to OMP during the winter.

Overall, excellent performance was observed in all lots of Brood Year 1983 SCS. Fish health remained good, with only low levels of ectoparasites noted. Overall, BKD incidence remained low, but mortality was higher in fish fed the Abernathy dry diet. By January, physiological changes characteristic of smoltification were common among all lots.

A team of Idaho Department of Fish and Game biologists assessed the quality of SCS in mid-March and reported zero percent de-scaling and generalized excellent condition.

All Broodyear 1983 SCS were released into the North Fork Clearwater River during the evenings of April 3 and 4. Final SCS release information is summarized below:

Lot	Number	Size (No./lb.)	Weight (lbs.)	Fork Length (mm)
3-Lw-2a	57,513	14.41	3,992	144
3-Lw-2b	713,835	23.53	30,338	123
3-le-2	365,791	20.74	17,636	127
Total Release	1,137,139	21.88	51,966	132

- BROOD YEAR 1984 -

On October 12 and 26, 900,000 and 250,000 eggs were received, respectively, from Leavenworth NFH (Lot 4-Le-3). Fry, the progeny of both BKD-negative and BKD-positive adults, were on feed January 12. No significant health problems were detected, although very low levels of coagulated yolk (white spot) and ectoparasites were noted.

Mortality increased in early February, apparently associated with an internal fungus. This mortality trend was reduced to low levels by the end of February.

Mortality rose significantly in April. The progeny of BKD^+ parents fed Oregon Moist pellet (OMP) experienced higher mortality than those of BKD- parentage fed BioMoist food. The symptoms observed were characteristic of dropout syndrome. BKD incidence in examined fry was insignificant and probably was not responsible for the increased mortality. All production fry were immediately switched from OMP to BioMoist food with a resultant drop in mortality observed within a few weeks.

This lot was moved from the nursery to the raceways in early June. Diet-study populations were retained in the nursery until July 1.

During the third quarter, SCS experienced water temperatures ranging from 40° to $55.9^{o}F$, and showed increased appetite and activity. Reduced feeding was used to control growth. Feed was administered at 1.75 to 1.8% body weight, checked by sample counts and adjusted to keep the lot on schedule for the target size of 15-20/lb. at release.

During raceway rearing, health was excellent with only low levels of ectoparasites and some gill debris present.

STUDIES

OMP was compared to OMP with additional vitamin and mineral supplements, and Biodiet as part of an early rearing study

coordinated by the Cortland Nutrition Laboratory. Results showed higher dropout and mortality in fry fed both OMP diets than in those fed Biodiet.

BioMoist-X diet was compared to the Oregon Moist pellet as a part of a growth control program. Early findings indicate that there was a slightly higher conversion rate for BioMoist-X fed fish during the early portion of the test. As time progressed, however, both diet groups performed similarly.

- BROOD YEAR 1985 -

Spawning Operations

Transfer of 521 adults from Kooskia NFH was completed on July 16, 1985 adding to the 334 returned to the Dworshak NFH fish ladder. Spawning occurred between August 19 and September 6 with twice-weekly spawn-taking efforts. A total of 1,587,600 green eggs was collected from 378 females. All green eggs were sent to Kooskia NFH for hatching and rearing. Adults spawned were examined for BKD, IHN, and VEN by the Fish Health Center with positive egg lots culled from the spawning population.

Between August 26 and September 6, green eggs from Rapid River State Fish Hatchery were transported along with ovarian samples, to Dworshak NFH. Approximately 3.3 million eggs were shipped in egg baskets or water coolers. All eggs were treated in iodophore baths (1:150 for 15 minutes) and placed into Heath trays (2,650,000 eggs) for chilled water incubation or placed in egg jars on nursery tanks (742,600 eggs) and reared on raw water. These eggs make up Dworshak's spring 1987 planned release of 1.6 million fish. Additional fingerling releases are planned for Spring 1986 from expected surplus production.

RAINBOW TROUT PRODUCTION

Due to the persistent IHN problem, Dworshak remained without a rainbow trout program. Catchable trout (120,000 @ 3 per pound) were planted in Dworshak Reservoir in early summer from IDF&G hatcheries at American Falls and Mackay. Dworshak, in turn, reimbursed Hagerman NFH $14,400 for their assistance in providing a trade with the State to make possible fish for the reservoir.

U.S. Fish and Wildlife Service

RECEIVED
OCT 17 1985
HATCHERY
Dworshak-Kooskia NFH Complex

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

HATCHERY PRODUCTION SUMMARY

Station: DWORSHAK NFH

Period Covered: October 1, 19 84 through September 30, 1985

Density Index: 0.097 | Flow Index: 0.488 | Total Flow: 53,000

Species and Lot	Fish on hand End of Month			Fish shipped this F.Y.	Gain this F.Y.	Fish Feed Expended		Conversion	Unit Feed Cost		T.U. Per Inch	T.U. to Date	Length increase 30 day month
	Number	Weight	Length	Number	Weight	Pounds	Cost		Per lb.	Per 1000			Inches
1	2	3	4	5	6	7	8	9	10	11	12	13	14
SCS 3-LW-2A	0	0	6.109	57.5	1,693	2,190	894.94	1.29	0.53	15.78	24.11	113.22	0.000
SCS 3-LE-2	0	0	5.494	365.8	8,870	10,553	2,722.93	1.19	0.31	7.64	25.10	102.43	0.000
SCS 3-LW-2B	0	0	5.278	714.8	13,843	20,322	7,170.65	1.47	0.52	10.63	26.65	103.02	0.000
STT 4-DS-III-17	0	0	6.731	353.0	30,455	81,290	23,376.02	2.67	0.77	85.40	21.50	122.03	0.000
STT 4-DS-I-18	0	0	7.094	576.3	49,598	106,712	25,507.91	2.15	0.51	51.84	17.99	86.10	0.000
STT 4-DS-II-19	0	0	7.498	672.3	85,682	133,533	31,853.29	1.56	0.37	50.33	18.14	94.78	0.000
TOTALS													
AVERAGES													

RI-117

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

HATCHERY PRODUCTION SUMMARY

Station: DWORSHAK NFH

Period Covered: October 1, 19 through September 30, 1985

Density Index				Flow Index				Total Flow					
Species and Lot	Fish on hand End of Month			Fish shipped this F.Y.	Gain this F.Y.	Fish Feed Expended		Conversion	Unit Feed Cost		T.U Per Inch	T.U. to Date	Length increase 30 day month
	Number	Weight	Length	Number	Weight	Pounds	Cost		Per lb.	Per 1000			Inches
1	2	3	4	5	6	7	8	9	10	11	12	13	14
SCS 4-LE-3	883.9	22,304	5.030	0	21,334	23,322	9,939.35	1.09	0.47	11.37	181.44	70.06	0.000
STT 5 DS-I-2	956.3	38,946	4.576	0	34,981	54,373	16,315.65	1.55	0.47	17.10	19.04	44.00	0.598
STT 5-DS-III-22	1,306.2	36,434	4.587	0	31,897	60,147	20,439.53	1.89	0.64	15.59	16.10	38.96	0.857
STT 5-DS-II 23	795.8	19,659	3.859	0	16,186	32,173	11,811.71	1.99	0.73	15.16	20.05	32.48	0.740
TOTALS	3,942.3	117,343		2,739.8	294,539	524,615	150,031.98						
AVERAGES			4.537					1.78	0.51	22.45	37.01	80.71	0.549

RI-117

Sentinel Experiments

To assess the role of parent-to-offspring (vertical) transmission of IHN, a nursery rearing experiment was initiated using IHN-free rainbow trout.

A shipment of 100,000 eyed trout eggs was received from Mt. Lassen (California) Trout Farms on April 3. The eggs were disinfected with iodophore (10 minutes at 67 mg/l) upon receipt and placed in "up-welling" Dworshak hatching jars (25,000 eggs per jar). The jars were installed at the head of four randomly selected nursery tanks. Concurrently, 100,000 eyed steelhead eggs (take 7, March 12, 1985) were placed in four hatching jars in a manner identical to the trout eggs. All eggs were incubated and reared according to standard hatchery procedures.

IHN-related mortality was defined as "mortality beginning on the date of IHN sampling which was subsequently confirmed positive for the virus and continuing until the experiment was terminated." Results of this experiment are summarized accordingly:

Tank #	Species	Number	Date On Feed	IHN Mortality	Date Confirmed	TU When IHN Confirmed
79	STT	25,000	5/23/85	0	----	--
80	STT	25,000	5/23/85	2,762	7/1/85	1,570
95	STT	25,000	5/23/85	1,049	6/3/85	1,060
96	STT	25,000	5/23/85	8,028	6/3/85	1,060
111	RBT	25,000	5/31/85	5,474	6/13/85	1,165
112	RBT	25,000	5/31/85	0	----	--
127	RBT	25,000	5/31/85	12,424*	6/10/85	1,050
128	RBT	25,000	5/31/85	684	6/11/85	1,060

*Mortality in this tank accounts for 67% of all IHN mortality in the rainbow trout test groups.

Rainbow trout and steelhead were apparently equally susceptible to the virus. Statistical analysis failed to detect a significant difference for mortality between groups. Curiously, one tank of steelhead and one tank of rainbow trout never experienced detectable IHN.

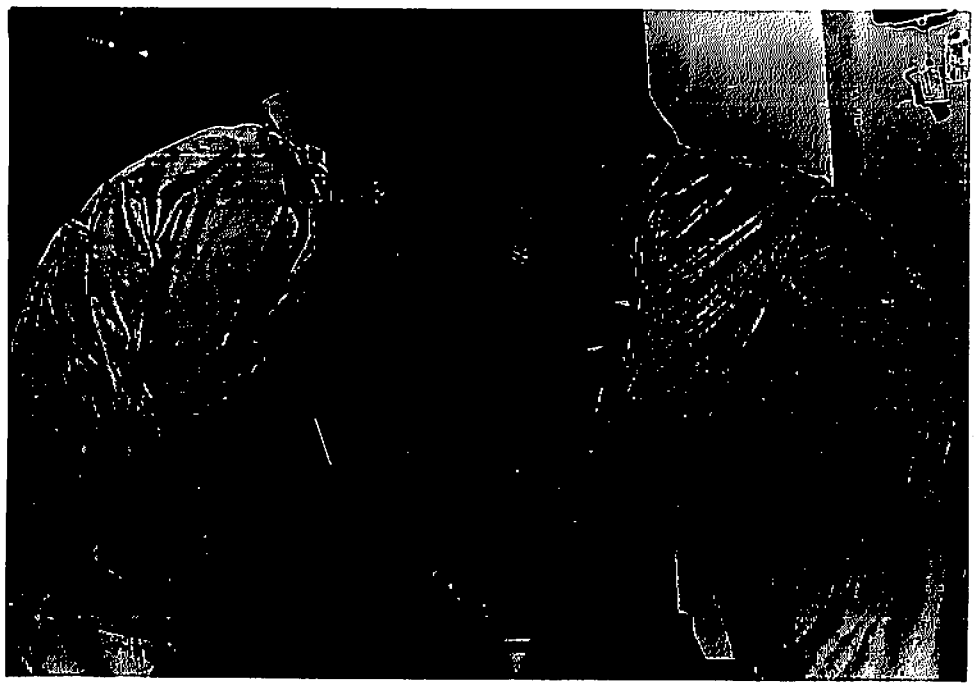
Results of this experiment suggest that horizontal transmission was the primary source of infection or that environmental virus may have been present. Since the entire nursery was twice thoroughly disinfected (250 mg/l active chlorine), it is doubtful that environmental virus played a major role.

During 1986, rainbow trout sentinel experiments will continue. A portion of each egg lot will be placed in the Dworshak nursery and a portion in tanks installed in the main pumphouse. The intended

purpose is to assess the river water supply for contamination with IHN and to investigate a potential positive correlation between the number of actively spawning adult steelhead in the North Fork and IHN incidence in the nursery. The first such experiments began in September.

Ozone Experiments

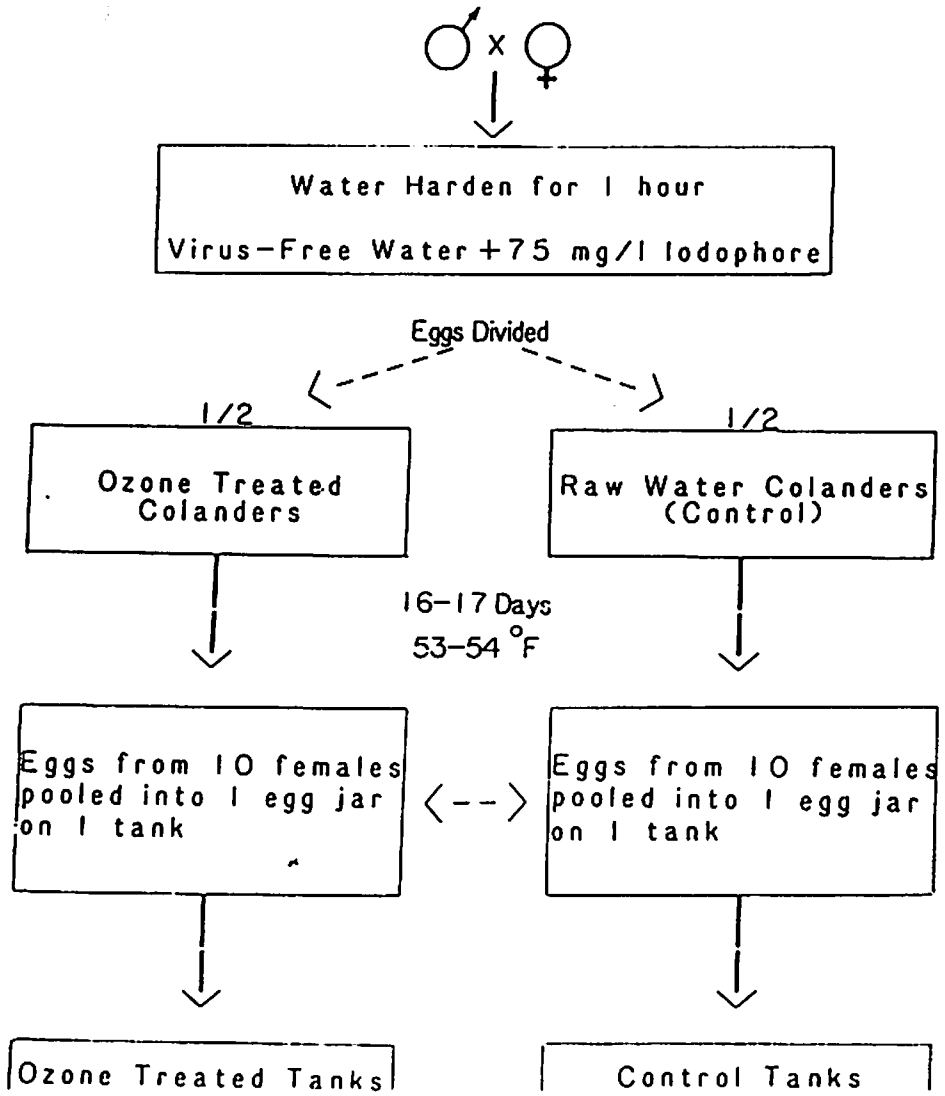
To test the efficacy of ozone water treatment on the control of IHNV epizootics in steelhead, three incubation and early rearing experiments were conducted between March 26 and August 5.



Transferring eggs from single female steelhead to collanders for incubation in ozonated treated water.

Individual egg lots from approximately ten IHN-free steelhead females were evenly divided between two rearing tanks as shown. Half were incubated and reared in tanks supplied with ozone-treated river water (test tanks) and half were incubated and reared identically in tanks supplied with untreated river water (controls). The experiments, representing three distinct egg takes or spawning days, were replicated in 28 total nursery tanks (14 test:14 control).

Experimental Design Schematic



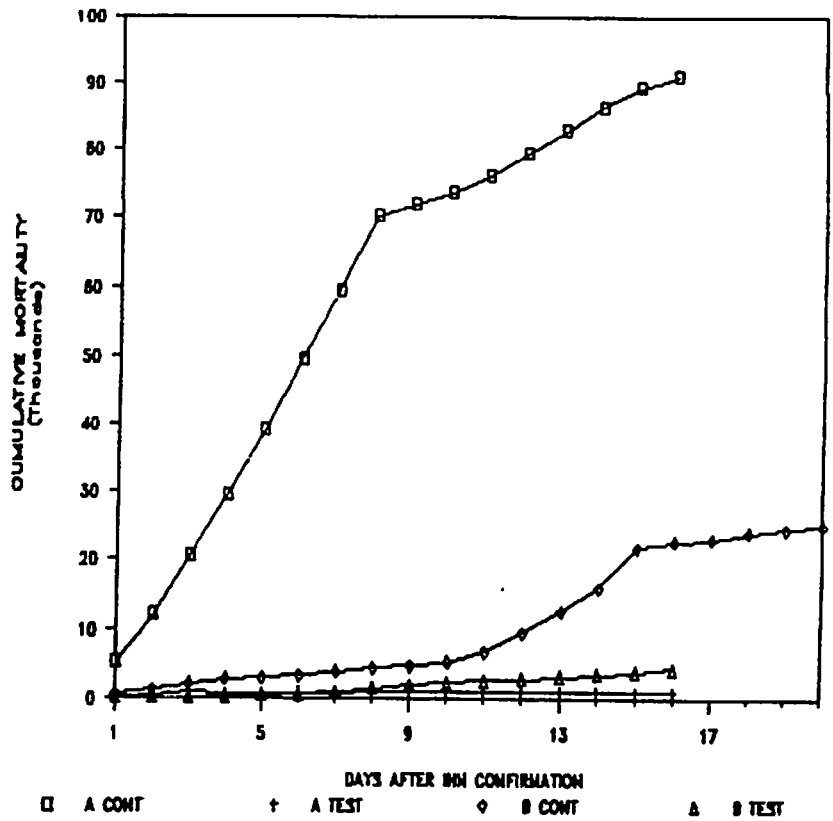
The following table summarizes the relevant factors and results of these experiments. Nearly 20 times more steelhead were lost to IHN reared in control tanks than in test tanks.

A summary of the relevant experimental parameters of the 1985 ozone experiments.

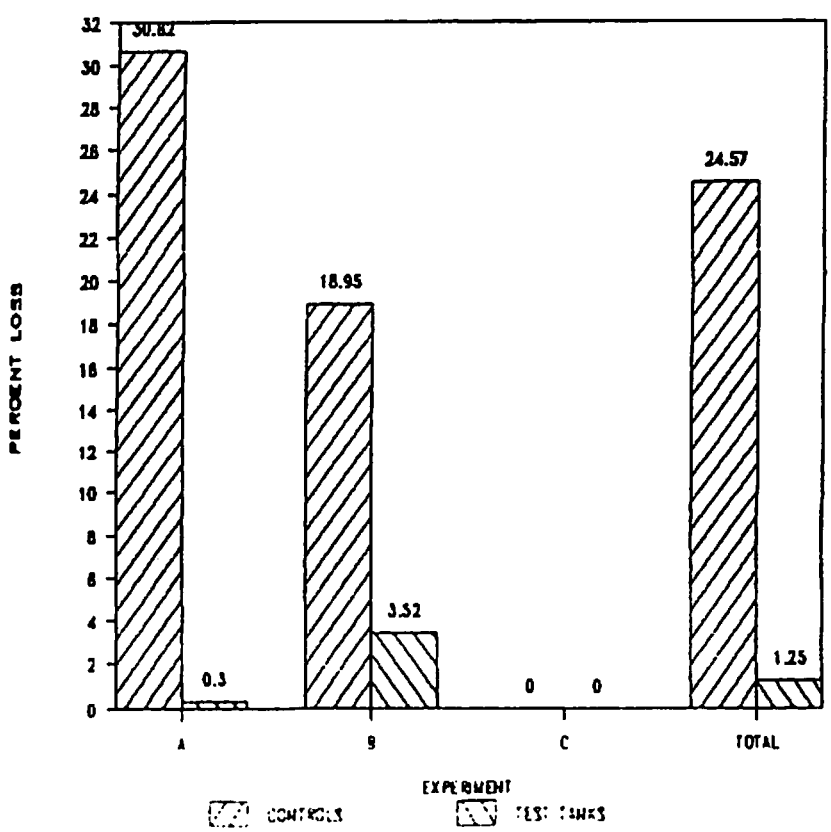
	EXPERIMENT					
	A		B		C	
	O_3	CONT	O_3	CONT	O_3	CONT
SPAWNING DATE	MAR 26		APR 16		APR 30	
SPAWNING PAIRS	100		50		50	
EGG LOTS CULLED	2		1		36	
TANKS INVOLVED	8	8	4	4	2	2
AVERAGE FISH/TANK(K)	29.1	37.2	30.5	32.9	23.0	21.5
IHN MORTALITY(K)	0.7	91.2	4.3	25.0	0	0
NO TANKS WITH IHN	4	8	1	3	0	0
PERCENT LOSS TO IHN	0.3	30.62	3.52	18.95	0	0

The results are graphically displayed accordingly. The results, within the constraints of these experiments, imply that ozone may efficiently prevent high losses in the very early life history of Dworshak reared steelhead.

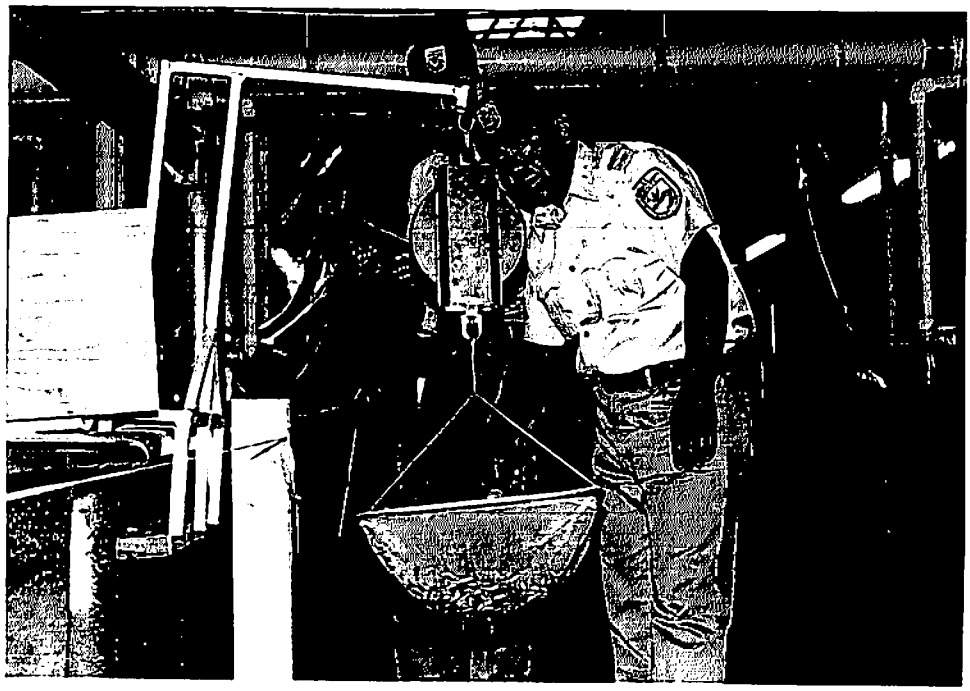
CUMULATIVE IHN MORTALITY



PERCENT LOSS TO IHN



Single incubation of steelhead eggs for IHN virus study.



Weighing steelhead fingerling test groups for transfer from nursery tanks to outside rearing ponds.

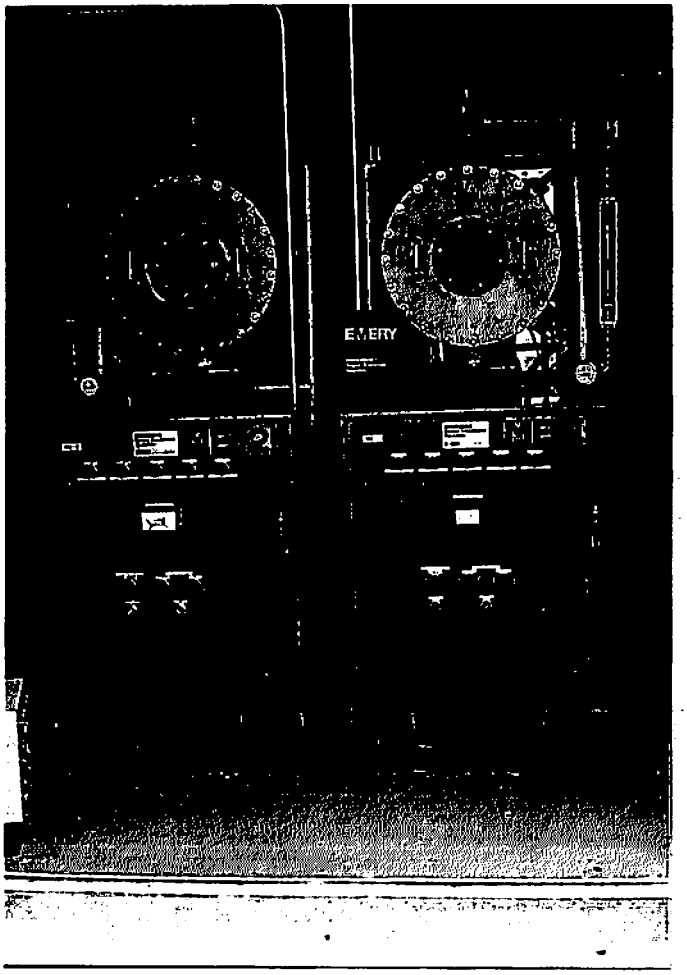
REPAIRS/IMPROVEMENTS/NEW EQUIPMENT

Numerous work projects totaling $28,725 were completed during the year. Several of the more noted included: remodeling of the electrical shop into a production office and computer room, $2500; sidewalks and handicap ramps, $4100; security fencing around broodstock ponds, $2500; landscaping improvements, $3450; a maintenance shop office, $200; completion of a chemical storage room, $600; replacement of road covers over valve boxes, $1000; boilers I and II rehab, $6250; hatchery displays, $1600; System II sludge scraper replacement, $2700; and 32 information signs (LSRCP outside funding) installation costs $125.

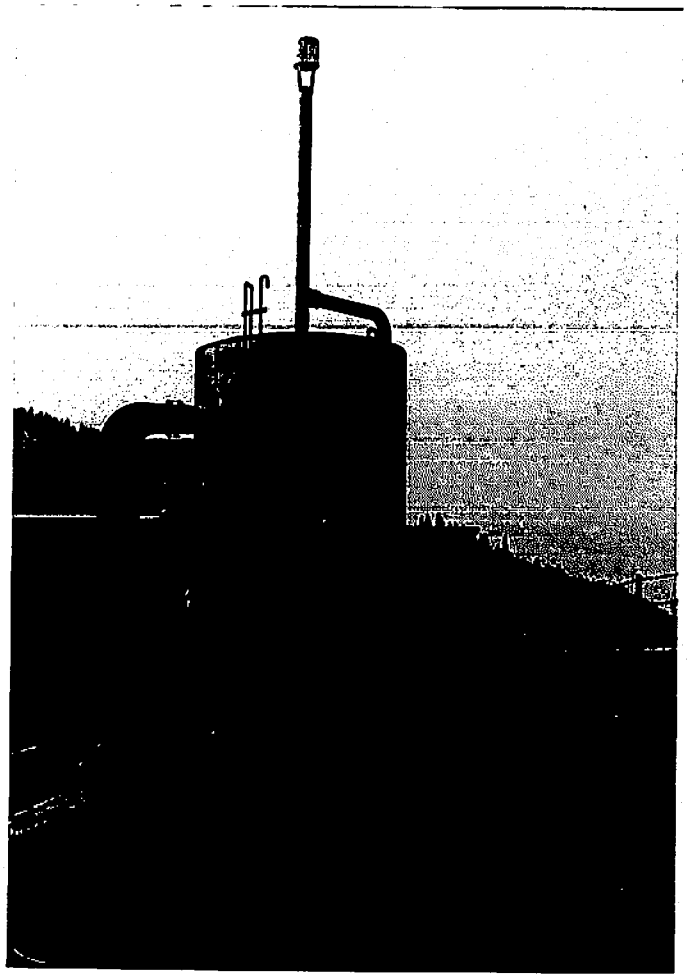
Major purchase orders totaling $50,250 were issued in the following amounts for various items as shown:

Replacement of a leased telephone system with purchased phone ($8800 obligated in FY 1984)	$10,000
Major pump replacement	9,325
Fencing broodstock ponds (material/labor)	2,450
Fencing of dumpster (material/labor)	900
Electrical breaker maintenance	6,600
Flow meters	3,150
Temperature recorders	4,800
Thermal covers for System II & III weirs	2,050
Quarters improvements and repairs (material/labor)	
Exterior painting #1, 2, 3	1,160
Kitchen cabinets	965
Miscellaneous	3,300
Coded-wire tag for fish marking studies	4,200
Sump pumps	1,350

In addition to the above, an ozone system, furnished by the Walla Walla COE District, was installed and operated by the hatchery. Costs to the project totalled $34,000 of which one-half was for oxygen and the balance for expenses associated with rearing units, incubators, plumbing, disinfection, etc. The study was completed over a 5-month period to determine the effectiveness of ozonated water on IHN virus.

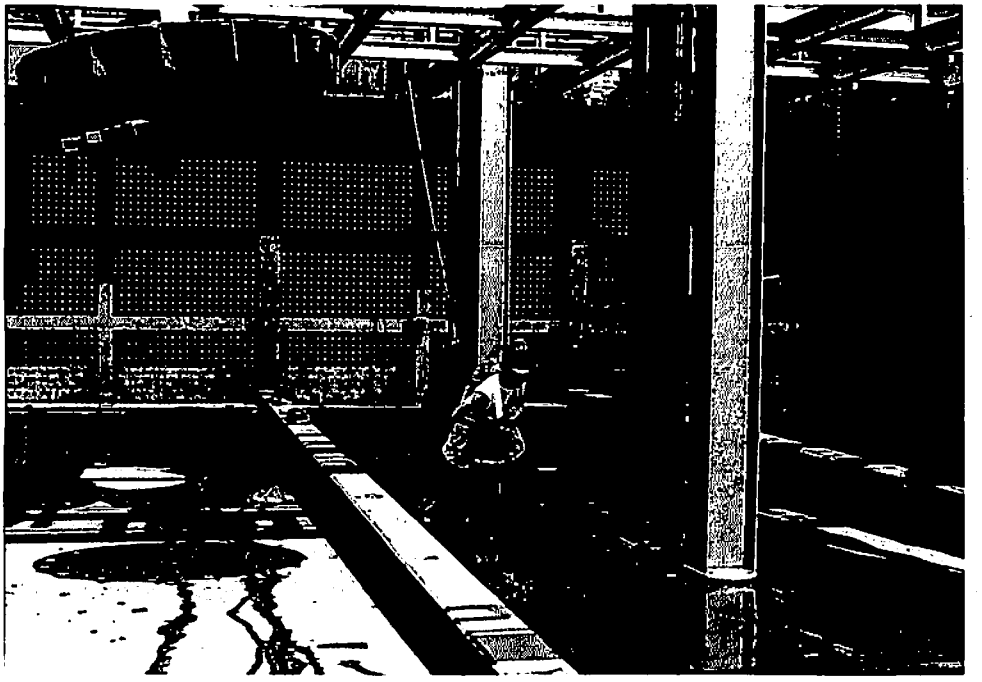


Ozone generators installed and operating for testing effectiveness of removing IHN virus from water supply.



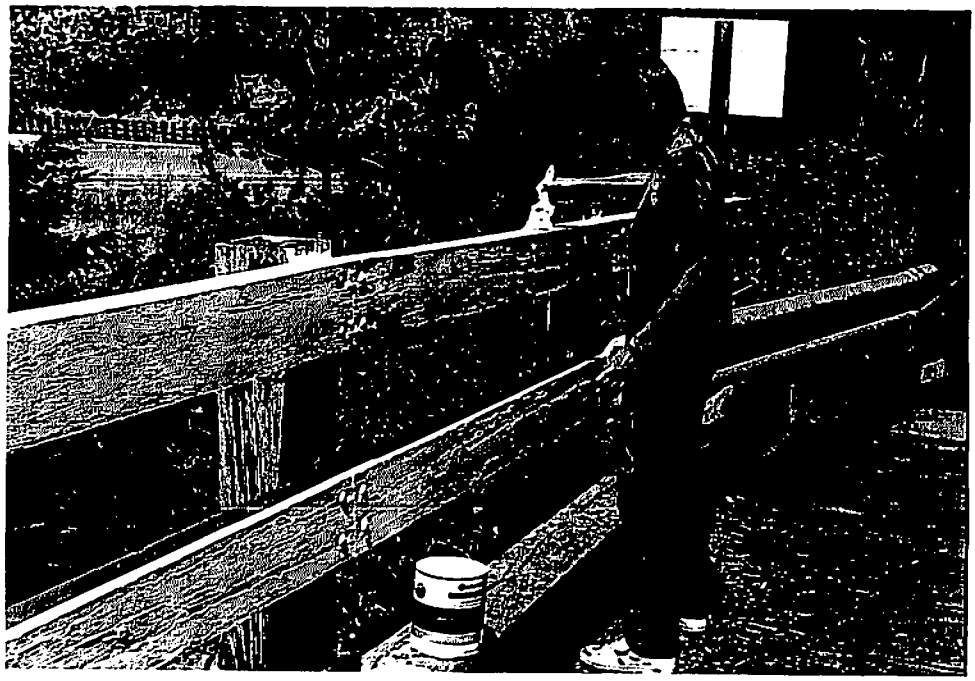
Ozone contact chamber capable of treating 600 gpm of water for nursery test tanks.

The main water intake structure was emptied and cleaned in an effort to remove any sediment and debris collected since last drained in 1977.

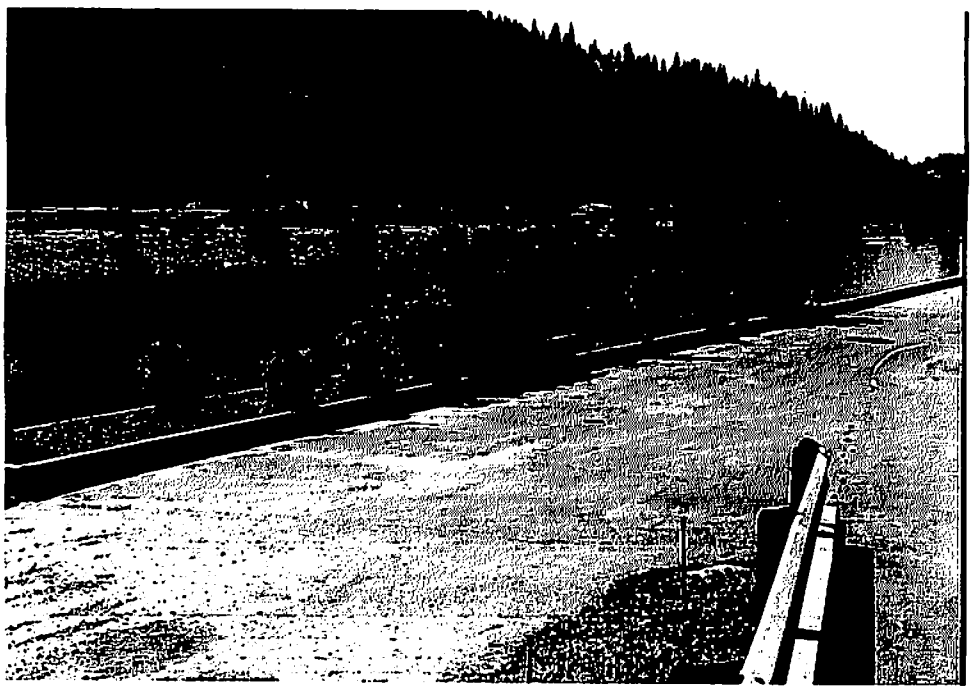


YCC enrollees removing debris and sediment from main water intake structure.

The Youth Conservation Corps enrollees assisted on many work projects during an 8-week period from June 10 to August 2. Custodial type maintenance forced a major part of their work assignments. Station appearance was excellent as the result of their continual efforts on several major cleanup projects.



YCC enrollees painting bridge railing; one of many work projects completed during 8-week summer program.



A landscape project including cleaning, trimming shrubbery, and placing decorative bark in planters was completed by YCC enrollees.

Major equipment purchased during the year included the following at a total cost of $43,732:

Shop Crane	$1,335
Production scales	1,380
Electrical calibration instrument	1,050
Radios for outside communication system	4,330
Computer w/printer, etc., (for production office)	9,400
Dissolved O_2 probe	1,445
Video camera, VCR, etc.	1,975
Fish pump	8,800
Slide projector for visitor display	663
Steam cleaner - shop	937
Hydraulic puller set - shop	2,537
Office furniture	1,022
1984 Dodge truck 4x4 (FY 1984 funding)	8,868

Additional shop improvements included initiating procurement with a vendor to furnish cabinets and bins for various hardware items (nuts, bolts, etc.) and to stock replacements on a regular basis.

MEETINGS/TRAVEL/TRAINING

Employee training was given to the following:

Bob Austin - Supervision and Groups Performance, Seattle, January 14-18

Hamilton McCleary - Coldwater Fish Culture, Spearfish, South Dakota, February 25-March 8

Mary Lou Galloway - Basic Procurement, Portland, March 12-13

Mary Lou Galloway - Seminar, GSA Procurement Procedures, Spokane, April 24

Ray Rosales - Seminar, GSA Procurement Procedures, Spokane, April 24

In addition, 15 station employees were enrolled in two computer courses (CALCSTAR and WORDSTAR) offered by Lewis-Clark State College and held at Dworshak. A total of 22 hours was provided during 2-week period from December 10-21.

Several workshops were attended during the year regarding spring chinook production. These included:

Nampa, Idaho - October 10 - Bob Austin

Portland - September 10-11 - Bob Austin

Dave Owsley, Environmental Engineer, participated in a smoltification workshop, May 20-23, hosted by Bonneville Power Administration at Warm Springs, Oregon. Mr. Owsley was also involved in a regional planning team regarding the Coleman NFH water supply.

Fish culture papers were presented by the following:

Ralph Roseberg - Idaho AFS meeting, Boise, March 8-9

Bob Austin - Idaho AFS meeting, Boise, March 8-9

Manager Wayne Olson attended the 35th Annual N.W. Fish Culture Conference, Kennewick, Washington, December 4-6; Hagerman NFH Coordination Meeting, August 25; attended and presented a paper, "Computers Aren't for Everything", at the 115th Annual American Fisheries Society Meeting, Sun Valley, Idaho, September 9-11.

Travel by Greg Pratschner, Olson and Owsley on November 28-29 included visits to the Regional Office; Little White, Spring Creek and Warm Springs NFH's; and a tour of Round Butte State Hatchery, near Madras, Oregon.

Several meetings were attended by Olson and Owsley with COE officials in Walla Walla, Washington regarding construction contracts and general hatchery operations.

Various meetings with IDF&G and COE personnel, were held at Dworshak, concerning the hatcheries ozone study.

PROGRAM INFORMATION

Among those visiting the hatchery in 1985 were:

- Delegation of engineers from China on March 26 to view facilities and fish spawning, with special interest in fish ladder operation.
- Jerry Conley, Director, IDF&G, March 26.
- KLEW-TV (Lewiston) on January 23 to report Dworshak's ozone study for IHN virus control.
- KBCI-TV (Boise) on March 7 for a story on the steelhead run; its impact on the local economy.
- KLEW-TV (Lewiston) on March 19 to report spawning operations with special emphasis on the ozone study.
- KLEW-TV (Lewiston) in April to update spawning activities and IHN disease problems.
- Rotary Group Study Exchange team of six members from Japan in April.
- Exchange students (15) representing several different countries in Orofino for a Rotary function in April.
- Sunset magazine, with photographer Doug Wilson on April 16 for a feature article on hatchery activities.
- Beaver Motor Home Rally (33 visitors) on May 18.
- "Forestry Tour" of 6th grade students (100) in June.
- Col. Jim Royce, District Engineer, COE, Walla Walla, on September 9.

News media in the area gave full coverage of Dworshak's spawning activities including the IHN disease problem, ozone study, and carcass disposal. Radio stations KOZE (Lewiston) and KLER (Orofino) and the Lewiston Morning Tribune and Clearwater Tribune newspapers, provided reports.

Steelhead spawning continued to attract numerous visitors from area schools. Trips to Dworshak Dam were included on their schedule.

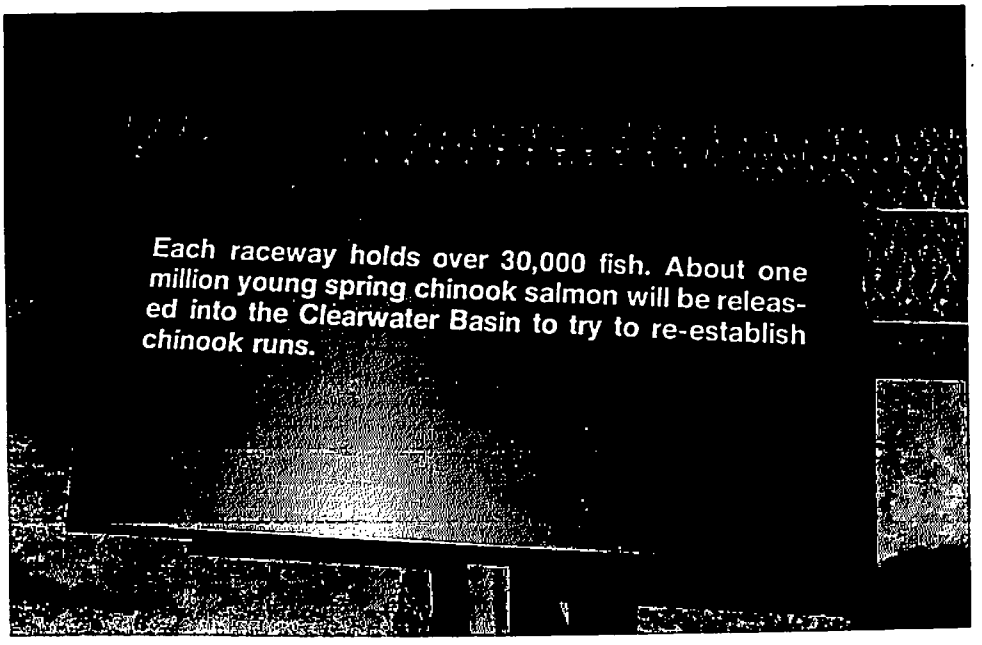
Several programs were presented off-station during the year to various groups, including visits to the local elementary and high school. Among the programs were:

- Clearwater Realtors Group - Orofino, November 1
- Orofino Rotary - December 27
- Orofino Kiwanis Club - January 8
- Palouse Unit of Idaho AFS Chapter, in Moscow on April 18
- Orofino Chamber of Commerce - June 5

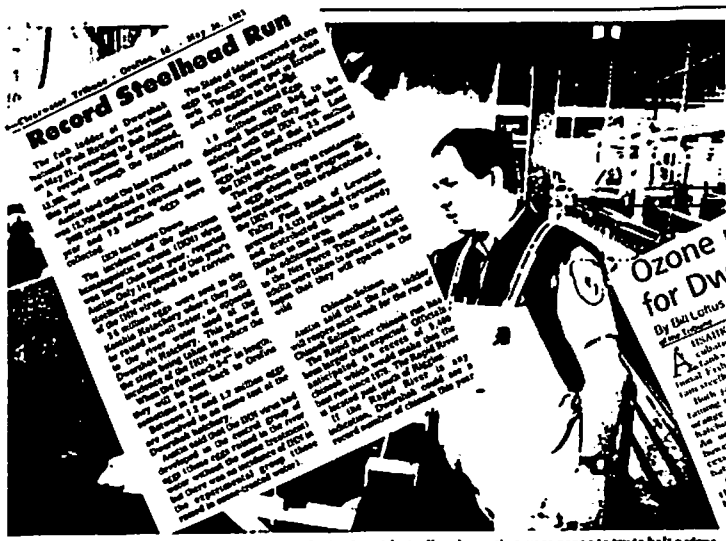
The Orofino Elementary 5th and 6th grades painted a diorama for one of the station's aquariums. The 60 students and their teachers were given a tour of the hatchery following a brief ceremony in which their work was recognized. A fishing scene was painted and was designed by the group as a special project, initiated by the hatchery. The Clearwater Tribune newspaper was at the station on March 28 to report the event.

New informational signs (33) were received during the year and were installed along a self-guided tour route. The attractive metal signing with etched lettering replaced the "temporary" wooden signs installed for the 1970 hatchery dedication.

Total number of visitors was estimated at 28,000.



One of the 32 informational signs installed along a visitor's self-guided route.



A Dworshak Hatchery worker examines an incubation jar with steelhead eggs that uses ozone to try to halt a virus

Tiny virus, but big problem

Steelhead disease becomes a cause for concern at hatchery

By BILL LOFTUS
For The Associated Press

AHSAHKA — Dworshak National Fish Hatchery here is touted as one of the nation's largest steelhead hatcheries. And when a new disease swept through the hatchery it struck in a big way, too.

Last year, virtually all the millions of young steelhead reared at Dworshak died while small and vulnerable to the disease. Only an end run by the U.S. Fish and Wildlife Service allowed Dworshak to approach its goals for raising young fish.

But, officials say, there is no reason to hope that move will preserve them forever from Infectious Hematopoietic Necrosis.

The uncertainties surrounding IHN, now at infects young fish for example make a makeshift solution as uncertain officials add.

To answer at least whether water treatment stands to under

A major report

Ozone is a widely used water purification agent in Europe just as Americans use chlorine. It can turn a cup of coffee clear in minutes by attacking the organic matter in it.

Researchers hope ozone will attack IHN virus the same way. The ozone plan depends on the theory that IHN attacks the young fish through the water supply.

But scientists believe the virus also can be passed from parents to offspring in some

The virus may attack still another

Daniel Mulcahy, research

tional Fishery Research Center

The third and newly

may be through a

in mud within

disease, Mulcahy said.

But scientists believe all three routes for the disease may occur under different circumstances, Mulcahy said.

One factor that indicates culling may be helping is that fewer adult steelhead that

preserve are returning to Dworshak

manager Wayne Olson said less the

testing positive

said, 25 percent

Olson said

Record Steelhead Run

Ozone may mean life for Dworshak steelhead

By Bill Loftus

Steelhead

Record run tallied spawned fish dum

Wednesday, April 17, 1985 Lewiston Tribune 5B

Steelhead keep pouring into Dworshak hatchery

By Bill Loftus

ANSAHKA — Dworshak National Fish Hatchery's crew found itself swimming in steelhead again Tuesday.

By the time workers quit at 7 p.m., they had counted 2,983 steelhead that had entered the hatchery during the past week.

The hatchery last week received its largest weekly total of the sea-run rainbow trout since it began operating in 1972 — 2,008.

Hatchery manager Wayne Olson said a record could probably have been set if workers had had time to round up stray fish in the raceways and tanks.

Because of the lack of daylight, however, some fish undoubtedly escaped being counted, Olson added. The tally tomorrow for the same reason, he said.

Dworshak has attracted about 9,800 steelhead during the 12 weeks of spawning operations.

"Everybody was, that when they start ing, they were all come at once," Olson

Biologists have large fish and smaces last fall

raised from

With

Olson

Dworshak could be awash in fish

Record Number Of Fish Enter Hatchery

Hatchery workers start study of steehead-killing disease

Steelhead crowd Dworshak hatchery

Fishermen Flock Into Ahsahka

Twice as many fish may flood into Dworshak National Fish Hatchery at Ahsahka as the last large steelhead run of 1983-84. Above: Jody Carver of Pierce loads fish into a pickup for delivery to big hobby ponds in March 1985.

Outdoors

The North Fork

Crowds of fish, f have y

Steelhead Capital of the World

OROFINO, IDAHO

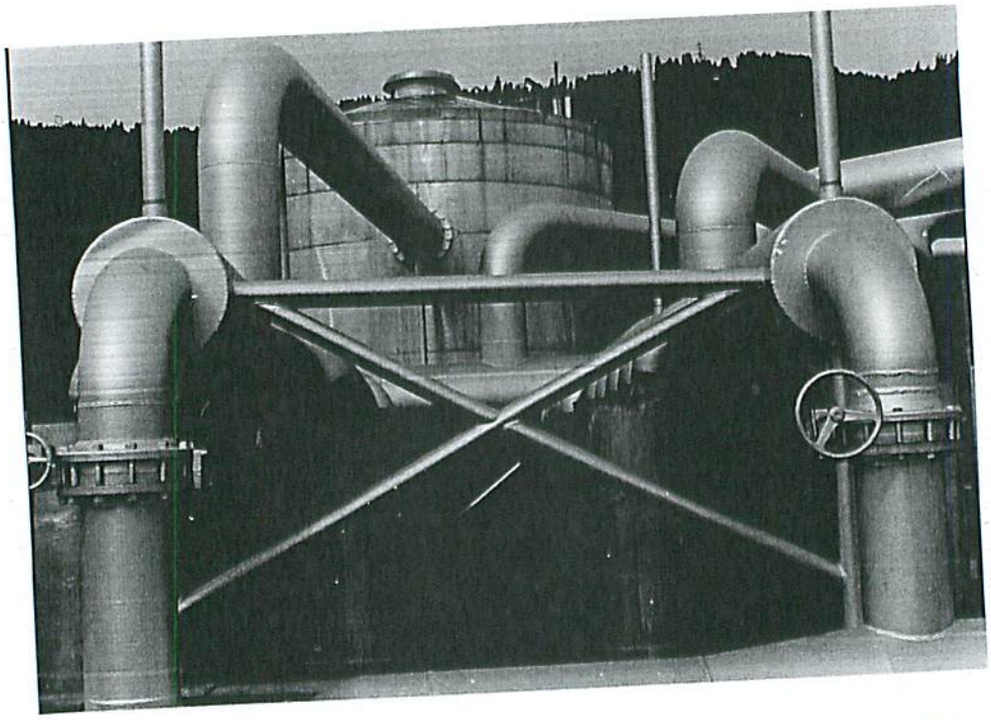
CLEARWATER TRIBUN

CONSTRUCTION

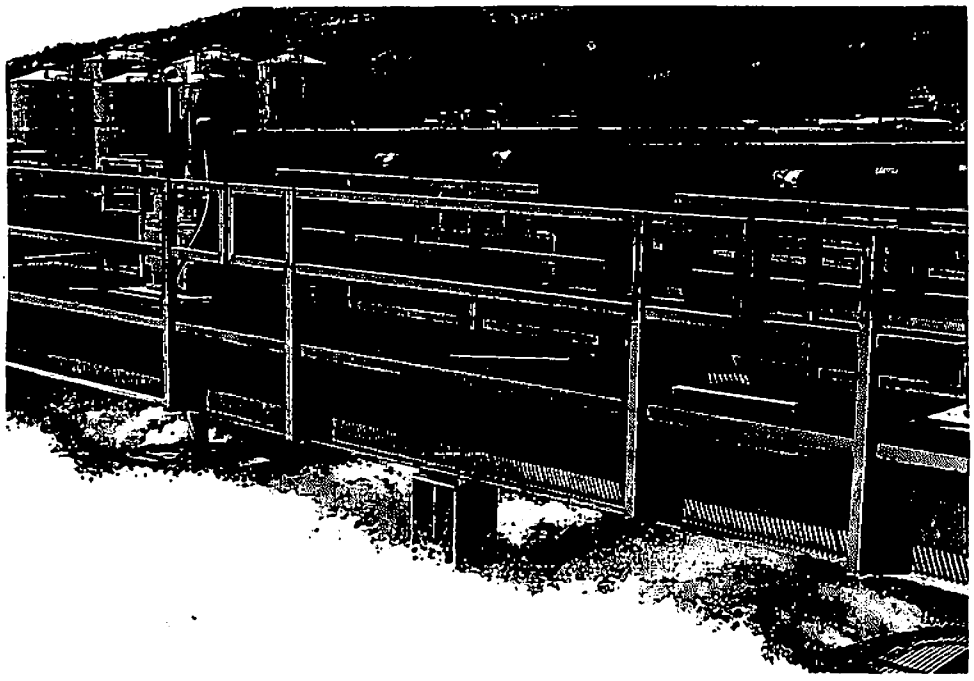
The construction firm ADSCON of Renton, Washington, was awarded a contract by the Walla Walla District, Corps of Engineers, for nearly $1 million for an energy rehab program. Work included several major piping changes, packed columns at the main water intake, replacement of an oil-fired boiler with an electric heating system, pump changes and several other related energy reducing modifications. Completion of contract was September 30.

Serious pumping problems were identified upon completion of the degassing system at the main aeration chamber. It was apparent, upon completion, that sizing of the pumping system is in error with the existing head pressure. Work will be necessary in FY 1986 to correct the deficiencies.

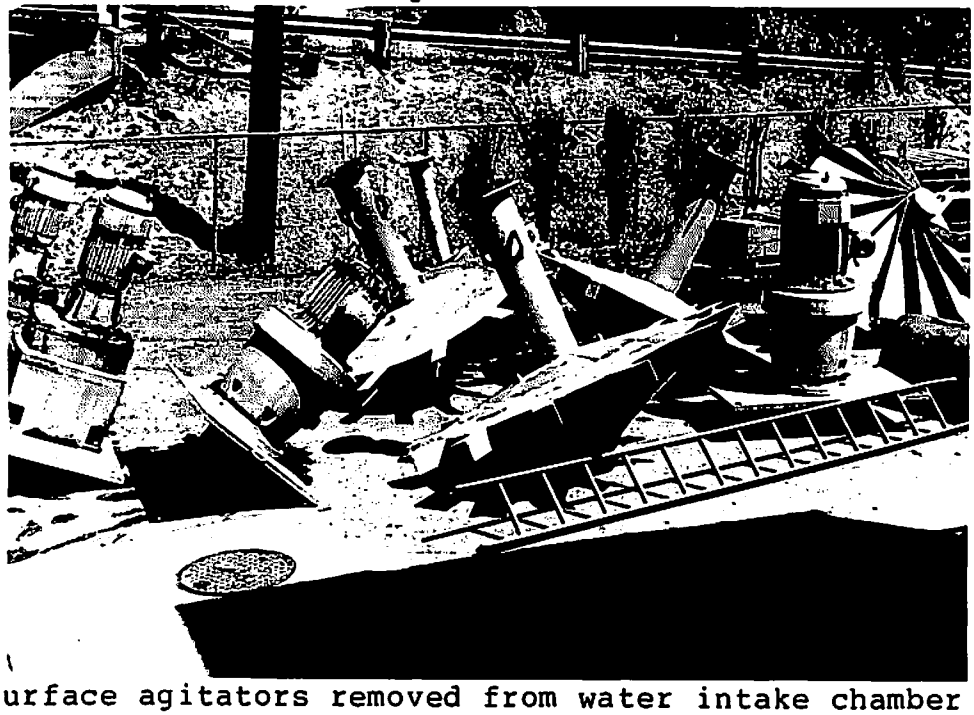
The above contract ends an era of construction money from the Corps for various hatchery improvements. Major contract work will, in the future, be funded from station O&M dollars.



System I bio-reactors with piping and aeration in operation.



New piping at aeration chamber replaces surface agitators with packed columns.



Surface agitators removed from water intake chamber - replaced with column degassers.

STAFFING

Sixty personnel actions were initiated by the station including recruitments, new hirees, terminations, resignations, and promotions. These actions involved YCC enrollees, student aides, temporary laborers, seasonal hirees and permanent staffing.

A major organizational change occurred in maintenance, resulting in abolishment of a WS-9 Maintenance Supervision position filled by Jim McCall. Prior to this, Greg Pratschner was reassigned to Assistant Manager on December 11 from Production Supervisor. Notification was received in September of Mr. McCall's selection and pending transfer to another government agency, effective October 1985. A temporary promotion to a Work Leader WL-8 was given Dave Clifford from July through October pending disposition of the Maintenance Supervisor action.

Efforts were directed towards employing Nez Perce Tribal member Ron Oatman in a position using the Indian Hiring Authority. Despite working closely with the Nez Perce Tribe for assistance our request for use of this authority was denied at the Departmental level. Ten months from start of action, we were successful in making the appointment through competitive hiring procedures.

Permanent staffing changes included:

Gary Bertellotti, Animal Caretaker, WG-4, resignation, effective December 19, 1984.

Tom Taggart, Animal Caretaker, promotion from WG-5 to Work Leader WL-4, effective December 23, 1984.

Roger Guinee, Fishery Biologist, GS-9, transferred to Habitat Resources, Sacramento, effective May 1985.

Ralph Roseberg, Fishery Biologist, GS-7, transferred to Dworshak FAO, effective April 14, 1985.

Cindy McMurray, Clerk-Typist, GS-3 transferred to Bureau of Reclamation, Salt Lake City, effective May 11, 1985.

Richard Mueller, Fishery Biologist, GS-5, transferred from Jones Hole NFH, effective May 26, 1985.

John Arevalo, Fishery Biologist, GS-5, transferred from Jones Hole NFH, effective May 26, 1985.

Dave Clifford, Maintenance Mechanic, WG-10, temporary promotion to Work Leader, WL-8, effective July 7, 1985.

Diane Praest, permanent appointment to Clerk-Typist, GS-3, effective July 7, 1985.

Richard Mueller, Fishery Biologist, GS-5, promoted to GS-7, effective August 4, 1985.

John Arevalo, Fishery Biologist, GS-5, promoted to GS-7, effective August 4, 1985.

John Vargas, Animal Caretaker, WG-3, reassigned from Little White NFH, effective September 15, 1985.

Ron Oatman, TAPER appointment to Animal Caretaker, WG-2, effective September 29, 1985.

As in past practice, the hatchery continued to employ high school student aides on a 15-20 hour per week schedule. Five local students were employed in the program providing some 3700 hours of work at minimum hourly wages. Various assignments included routine custodial maintenance, clerical duties, and feeding and care of fish. Weekend production activities were again covered by two student employees supervised by one permanent person. This offered additional permanent staffing for Monday through Friday.

Other temporary hiring included:

Gordon Paulson, Carpenter, WG-9, effective appointment May 11 through August 10.

Gary Jefferson, Laborer, WG-2 effective appointment May 4 through August 31.

Alfred Jenks, Laborer, WG-2, effective appointment October 1, 1984 through September 30, 1985.

John Parks, Animal Caretaker, WG-2, effective appointment March 25 through September 30, 1985.

A YCC program was active for an 8-week period beginning June 10, and ending August 2. The group consisted of 10 enrollees and one crew leader.

Length of Service Awards were received by the following employees:

Doug Lawson - 10 years

Greg Pratschner - 10 years

Larry Strong - 10 years

Tom Taggart - 20 years

Mary Lou Galloway - 10 years

COOPERATIVE PROGRAMS

The hatchery continues to work closely with the following agencies and groups in the accomplishment of various work activities:

- -- Idaho Department of Fish and Game:
  - Boise Office
  - Nampa Office
  - Lewiston Office
- -- Seattle National Fishery Research Center (NFRC)
- -- Corps of Engineeers
  - Walla Walla District
  - Dworshak Dam and Reservoir Project
- -- Cooperative Fishery Research Unit (CFRU) - University of Idaho
- -- Nez Perce Tribal Executive Committee:
  - Fish and Wildlife
  - Enforcement
- -- National Marine Fisheries Service (NMFS)
- -- University of Idaho
- -- Washington State University
- -- Clearwater National Forest
- -- Clearwater County Sheriff

Dworshak Fish Health Center and Dworshak Fisheries Assistance Office share facilities with the hatchery. Training assignments for personnel include various work with the two offices. The three service groups are highly involved, together, in FWS activities on the Clearwater River.

Manager Wayne Olson continues as an active participant on the Steelhead Impact Committee. This committee represents a 5-county area working with problems regarding steelhead fishing on the Clearwater River.

The hatchery distribution truck was again made available to the Cooperative Fisheries Research Unit, in Moscow, for hauling fall chinook broodstock to the Lyons Ferry State Hatchery in Washington.

Two coordination meetings were held with Idaho Department of Fish and Game, at Dworshak, on November 15 and March 22. Hatchery activities of Kooskia and Dworshak were reviewed, and fishery concerns of the Clearwater River area were noted. Other representatives at the meetings included Dworshak FAO, Dworshak FHC, Portland Regional Office, COE, Nez Perce Tribe, Seattle National Fishery Research Center, University of Idaho CFRU, and Boise LSRCP.

An organization was formed within the local Orofino area of all federal project heads to meet quarterly to discuss their programs of interest. Manager Olson, representing the Dworshak hatchery, hosted a noon luncheon and informal discussion for this group on June 19.

A number of meetings were held between IDF&G and FWS for the purpose of reviewing the ozone study plan and to later present results of the study. These efforts between State and hatchery to test and evaluate ozone for controlling IHN virus are most valuable for designing the new Clearwater Hatchery.

The hatchery again participated with Valley Food Bank, in Lewiston, for receiving steelhead carcasses made available from the spawning process. The program benefitted by making disposition of 3400 fish, approximately 40,500 pounds, to needy people in the area.

Dave Owsley, Environmental Engineer, was made available to the Regional Office to assist engineering on several project assignments. Trips to Coleman and Lahontan NFH's were made to provide help on particular water supply problems.

Greg Pratschner, Assistant Manager, instructed at a Leetown Cold Water Fish Culture course held in Traverse City, Michigan, on November 26-27.

Outplanting of 8500 excess steelhead adults was a combined effort by the hatchery, Dworshak FAO, Nez Perce Tribe and IDF&G in successfully completing the distribution.

The Combined Federal Campaign (CFC) was initiated in the area with participation by hatchery employees in money contribution to the program.

Excellent cooperation continues between the Corps of Engineers (Dworshak Dam) and hatchery in equipment exchange, use of facilities and services.