ANNUAL REPORT

FISCAL YEAR 1981

DWORSHAK NATIONAL FISH HATCHERY

Submitted By: Wayne H. Olson Title Manager Date 12/23/81

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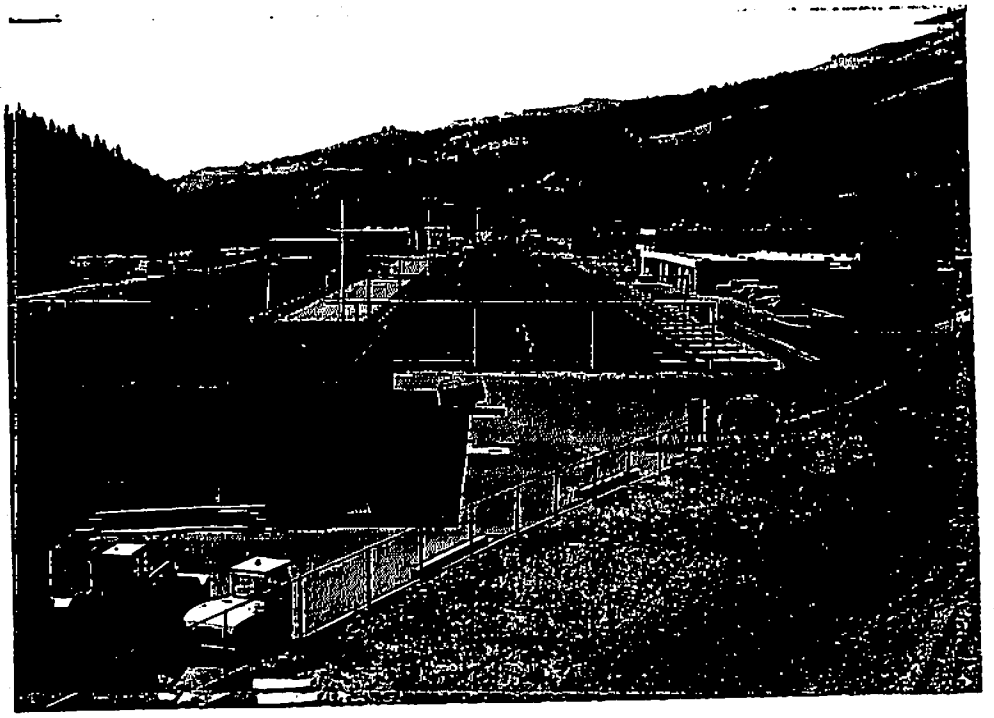
I N T R O D U C T I O N

Dworshak National Fish Hatchery, at Ahsahka, is located in north central Idaho. The hatchery, constructed and funded by the Army Corps of Engineers, is managed by the U.S. Fish and Wildlife Service to maintain fishery stock in the Clearwater River affected by construction of Dworshak Dam. The hatchery is operated as a complex with Kooskia National Fish Hatchery, located 35 miles upriver.



Successive years of good production from Dworshak will provide a more positive outlook toward the future of steelhead fishing in north central Idaho.

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In spring 1981, major construction began on modifications of System I at a cost of $3,765,000. Completion is anticipated by summer 1982 in time to place System I rearing ponds back on to reuse.

Construction site for System I modifications.

A contract was awarded in September at a cost of $1,486,000 to construct additional rearing facilities for spring chinook salmon. Thirty (30) new raceways are expected to be completed by April 1, 1982 in time to move 1.4 million fingerling chinook from the nursery tanks.

The use of response feeders in Dworshak's program proved highly satisfactory. Excellent results were reported from earlier tests warranting expansion of their use in FY 1982.

GENERAL

The Dworshak hatchery was again successful in the production and release of 2,632,861 steelhead smolts (279,189 pounds) in spring 1981. Included within this group were 500,000 fish transferred off-site to the South Fork of the Clearwater River.

In addition to the above production, the hatchery was responsible for releasing 1,224,000 rainbow trout (55,479 pounds); assisting Kooskia NFH by holding spring chinook adults, collecting eggs and rearing fingerling for their program; and holding adult fall chinook salmon, collected at Ice Harbor Dam, for spawning and transfer of eyed eggs to Hagerman NFH.

Success of Dworshak's steelhead production program was noted in the following news release prepared for distribution by the Fish and Wildlife Service on June 11, 1981.

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DWORSHAK NATIONAL FISH HATCHERY IN IDAHO
COMPLETES ANOTHER SUCCESSFUL STEELHEAD YEAR

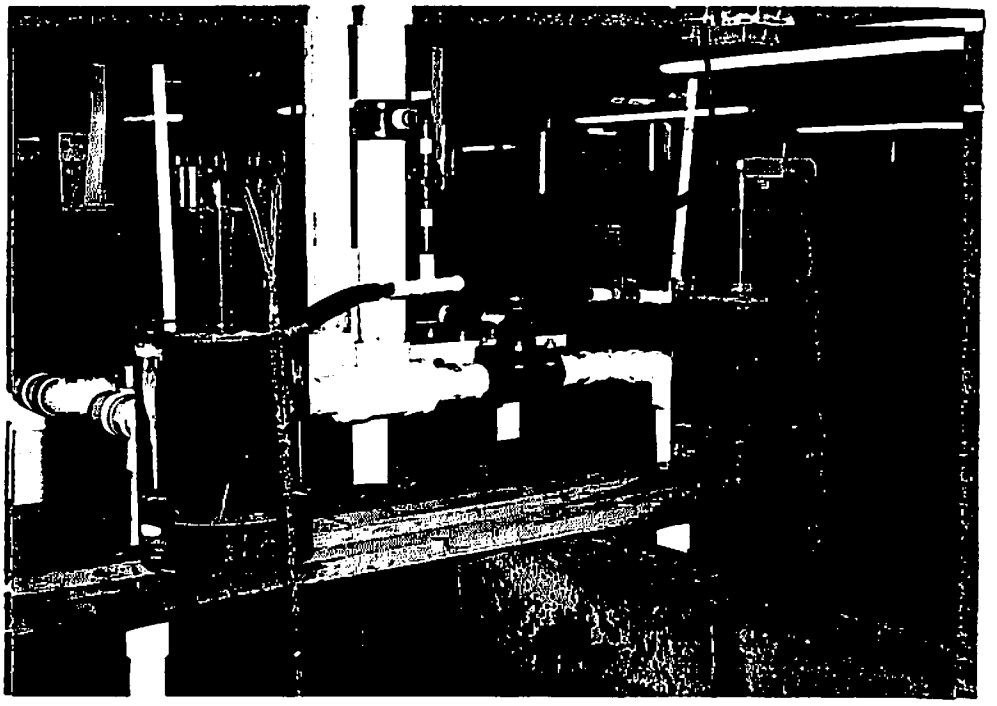
Dworshak National Fish Hatchery, near Orofino, completed another successful year of steelhead production with a release of 2.6 million smolts into the Clearwater River of Idaho. The young steelhead, averaging 7 inches, began leaving the hatchery on April 22 for their 500-mile seaward journey. Weekly plantings in the river continued until the last group of fish was released on May 18.

Under a program known as "Operation Fish Run", the Army Corps of Engineers, and National Marine Fisheries Service began collection of migrating steelhead at lower Snake River dams within a week following release from Dworshak. Fish were reported in top condition for barging and trucking to below Bonneville Dam; the last of 8 dams en route to the Pacific Ocean.

Facility modifications by the Corps, together with a number of studies conducted at the hatchery by the U.S. Fish and Wildlife Service, appear to have corrected the more serious operational problems of earlier years. High-quality fish production for the past 2 years is the result of those cooperative efforts between the two agencies.

Adult steelhead from last year's 2.5 million smolt release are expected to return in the sport fishery beginning in fall 1982 and continuing through spring 1985. This year's excellent out-migration of steelhead should assure continuation of returning fish in large numbers and size (12-15 pounds) into spring 1986.

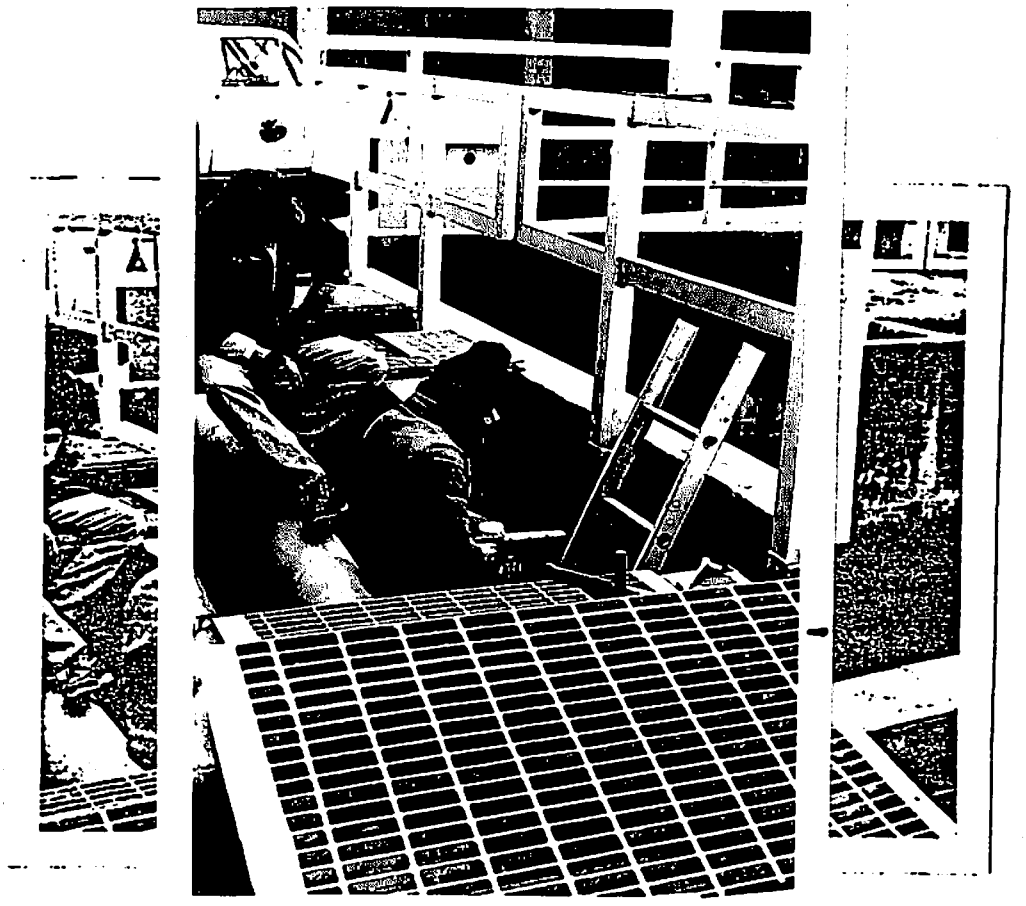
Jar incubators were also used more on steelhead eggs after earlier tests showed good results. Jars will be used extensively for the Broodyear 1982 program. Employee Rolf Simonsen received a $300 award for the design.



Jars in use on nursery tanks for incubating steelhead eggs.

Cooperating agencies (Idaho Department of Fish and Game and Army Corps of Engineers) continued to give excellent support to the program. Assistance from the Corps in barging rainbow trout on Dworshak Reservoir allowed a broader distribution of the fish.

The Young Adult Conservation Corps (YACC) enrollees continued to provide excellent assistance to the hatchery. Several different projects were completed, and support was given to both maintenance and production. Enrollee numbers varied from four to eight with a work leader provided through July when the position was terminated.



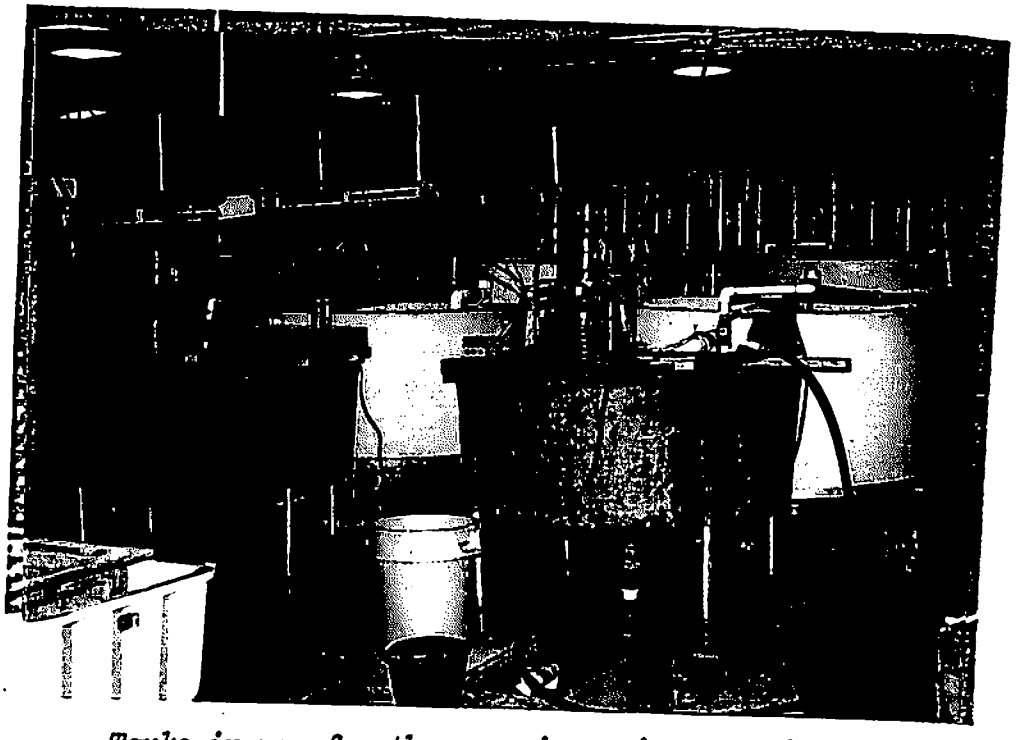
YACC enrollees installing safety barriers near the holding ponds.

The fiscal year ended on an optimistic look for improved steelhead runs in the Clearwater River. Despite having a fall 1981 catch-and-release fishery, agencies are forecasting greater numbers back to the river beginning with the 1982-83 program. For the third summer in succession, the hatchery completed a fingerling rearing program without losses to the parasite *Ichthyopthirius*. This is a record in itself towards another successful year. Healthy steelhead smolt releases, in combination with good downriver passage, should assure excellent returns in the future.

Manager Wayne Olson and Research Biologist Terry Bradley presented a paper, "The Role of Mineral Enrichment in Steelhead Production", at the 30th Annual Northwest Fish Cultural Conference, Courtenay, British Columbia.

Terry Bradley completed a paper, "Evaluation of Mineral Enrichment at Dworshak NFH (PY 1980-81)". This was the summary report of his work in monitoring the physiological parameters occurring in pre-smolting and smolting steelhead.

Terry Bradley and David Owsley, Sanitary Engineer, completed a study during the year titled, "Steelhead Trout Reared in an High Level Ammonia Environment".



Tanks in use for the ammonia environmental study.

Dave Statler, Fishery Biologist (trainee), was assigned to evaluate the use of steelhead production. A report was completed and reviewed for publication.

FISH CULTURAL OPERATIONS

STEELHEAD PRODUCTION

The fiscal year, beginning October 1, 1980, started with a total of 3.9 million steelhead (54,000 pounds) on the station.

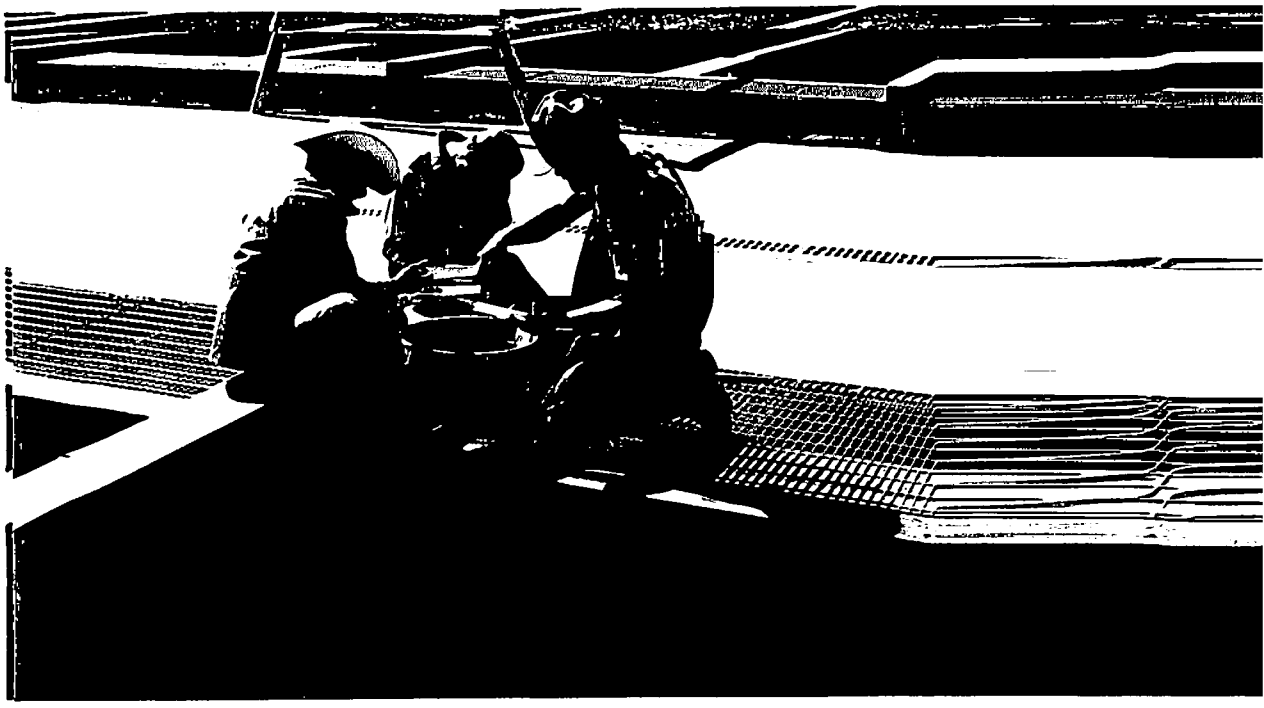
Raw water, System I, held 404,000 and 1.1 million fish from Broodyears 1979 and 1980, respectively, for 2-year rearing programs. System II carried 950,000 and System III, 1.4 million Broodyear 1980 fish on reuse.

No health problems were encountered, and losses were kept to a minimum resulting in another excellent release the spring of 1981 as follows:

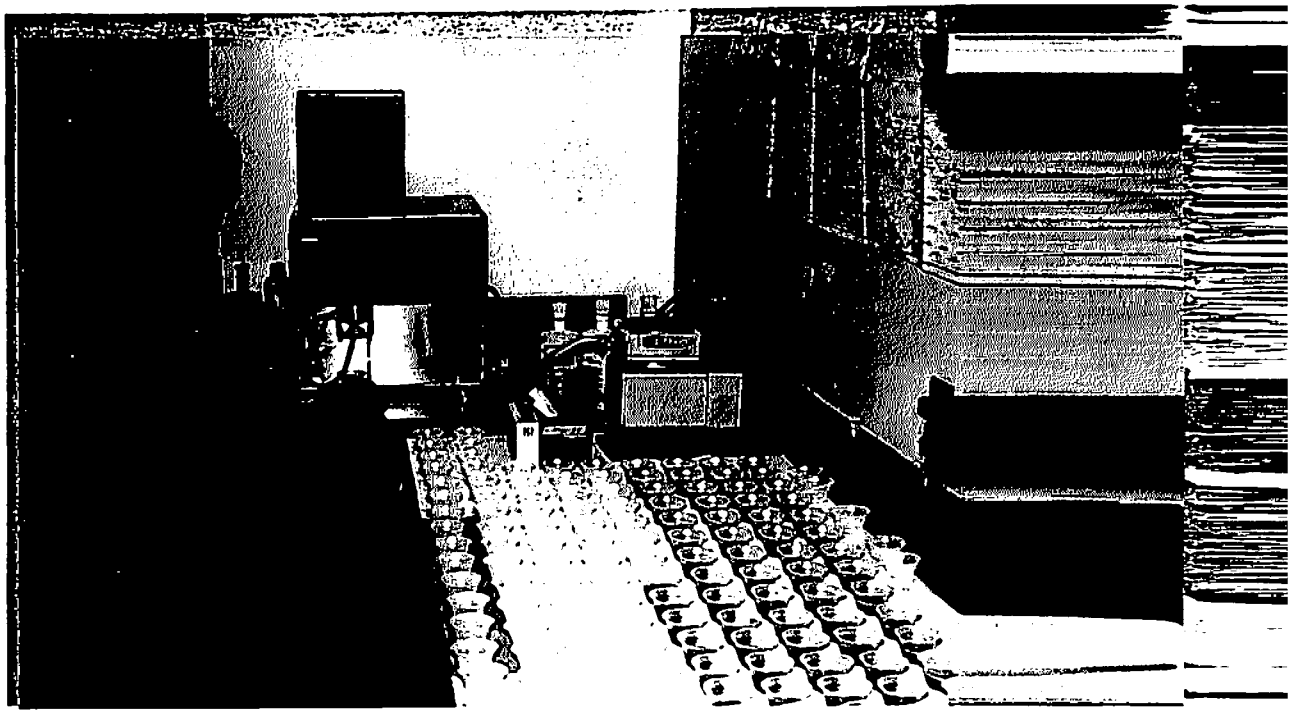
Lot	Number	Size(no/lb)	Weight(lbs)	Date	Remarks
System I					
9-DS-I	382,248	9.2 (172 mm)	41,574	4/22-5/04	2-year
System II					
0-DS-II-7	907,386	8.6 (178 mm)	106,159	4/23-5/04	1-year
System III					
0-DS-III-8	1,147,198	9.4 (173 mm)	121,648	4/24-5/07	1-year
0-DS-X	196,029	20.0	9,808	5/18	1-year
TOTAL	2,632,861		279,189		

Steelhead smolt releases began on April 22, and were completed on May 18. At release time, all groups were in excellent condition. With the exception of 433,000 and 73,000 (trucked to the South Fork Clearwater and Clear Creek, respectively), all remaining fish were released directly into the main stem Clearwater via the raw water waste line.

Physiological monitoring by Terry Bradley indicated that at time of release System II fish were functional smolts and outmigration should have been immediate. System III, on the other hand, did not appear (physiologically) to be functional smolts. Whether the migratory urge was triggered upon entering into the river or not is uncertain. Adult return data should supply that answer.



Measuring steelhead smolts at release time.



Research Biologist T. Bradley measuring various blood parameters from steelhead production.

Marking of 120,000 steelhead was completed on December 9 by IDFG. Three groups of 40,000 fish were coded-wire tagged. The groups represent System I on raw water (2-year rearing) and Systems II and III (1-year rearing).

Broodyear 1979 steelhead performed "normally" through their second winter on raw water with slow growth and an increasing incidence of precociousness.

Food-to-body-weight conversion improved significantly in five ponds equipped with Babington demand feeders in an experiment from November 1980 through April 1981.

Broodyear 1980 steelhead in System I raw water performed poorly for the first 10 months of the fiscal year with high mortality and poor growth. No single factor could be identified as the cause. It appeared that early nursery rearing problems had weakened the fish to where recovery was slow in the cool water. Improvement was noted in late July 1981 and continued through September.

From the encouraging results with demand feeders last winter, all ponds holding Broodyear 1980 steelhead were equipped with feeders in late September. It is hoped that a similar reduction in food-to-body-weight conversion will be realized next season.

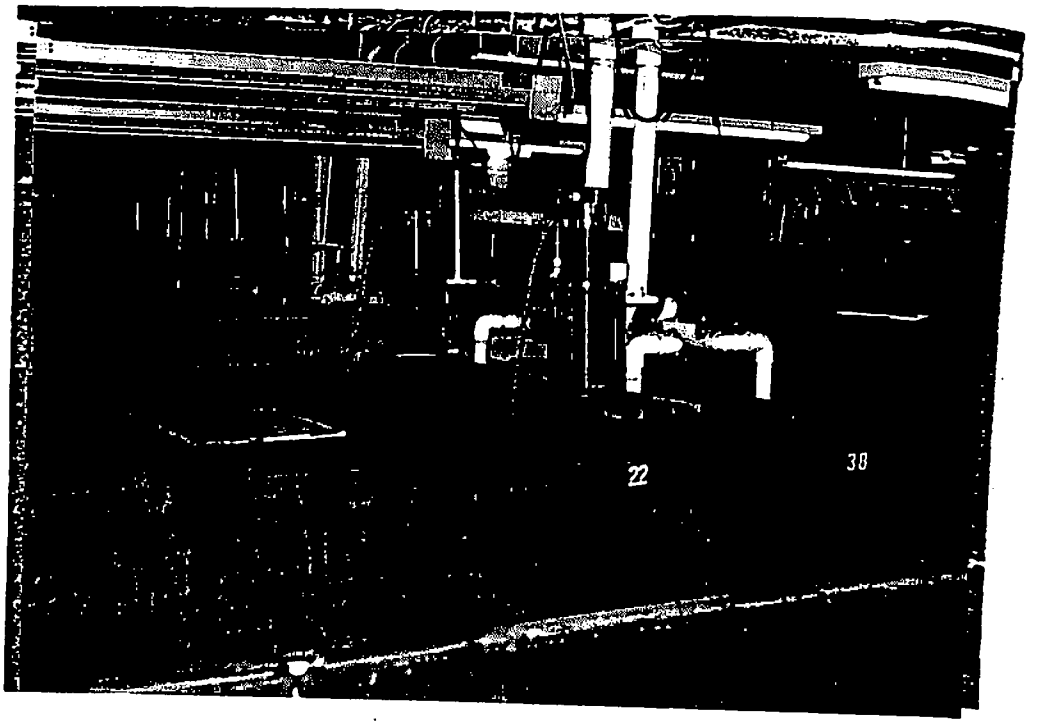
Three experimental raceways were loaded with Broodyear 1980 steelhead in June to test performance in a serial reuse system. University of Idaho CFRU personnel were responsible for the maintenance and monitoring of the experiment.

1981 Steelhead Spawning Summary

Ladder Opened	February 17, 1981
Ladder Closed	May 19, 1981
Spawning Began	March 10, 1981
Spawning Ended	May 19, 1981
Females Spawned	1,305
Female Mortality	86 (6.2%)
Green females returned to river	2
TOTAL FEMALES	1,393 (70.8%)
Males Spawned	468
Male Mortality	103 (17.9%)
Green males returned to river	4
TOTAL MALES	575 (29.2%)
TOTAL IN RUN	1,968
Green eggs taken	8,990,260
Eyed eggs	7,632,325 (84.9%)
Total egg/female	6,948

Steelhead carcasses purchased on contract by Allied Fisheries.

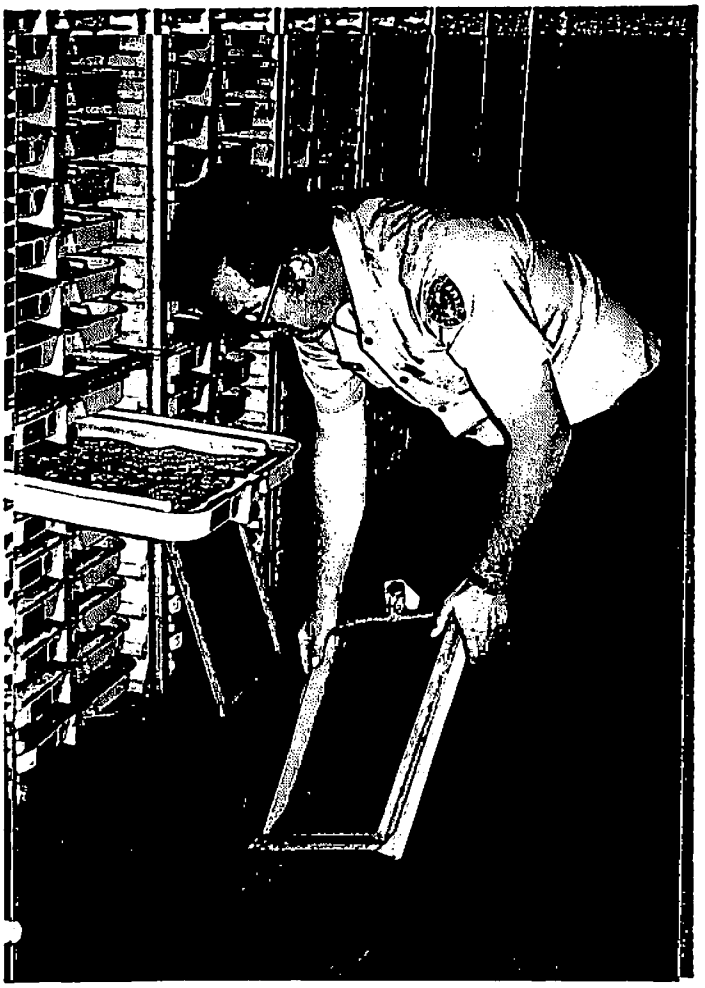
T. Taggart collecting steelhead eggs.



Steelhead eggs incubating in jars on nursery tanks. Swim-up fry voluntarily move to the tanks to begin feeding.

Egg and Fry (Fingerling) Distribution

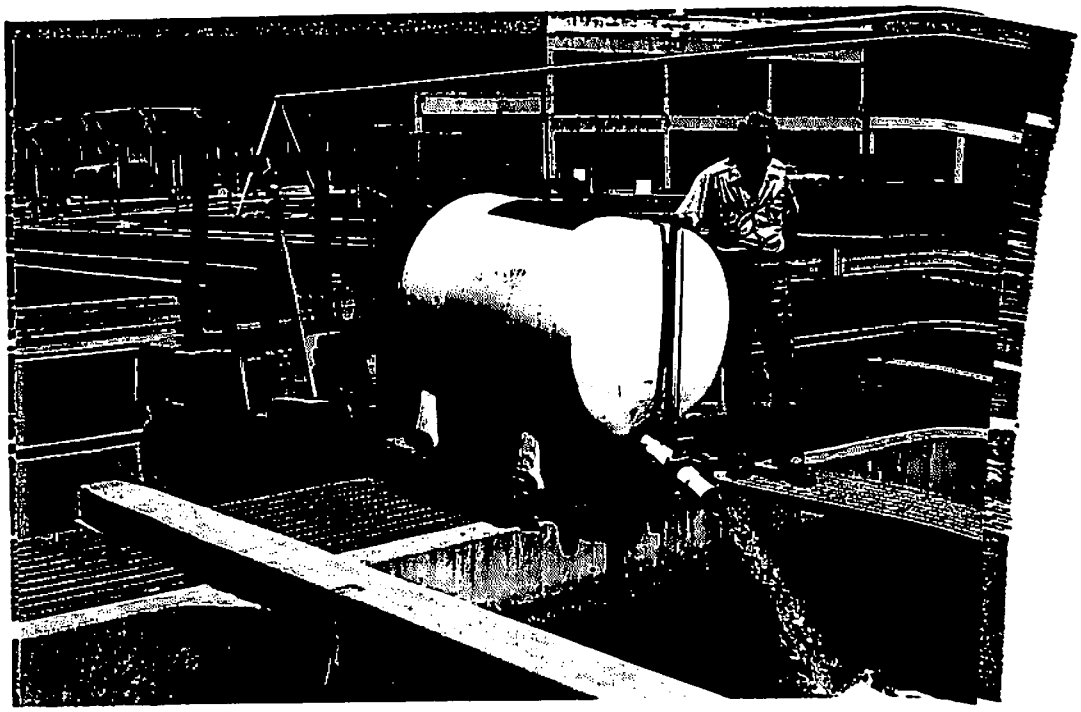
1,520,000 eyed eggs	IDFG
100,000 eyed eggs	Hagerman NFH
20,000 eyed eggs	Bozeman FCDC
30,000 eyed eggs	University of Rhode Island
3,472,000 fry-fingerling	IDFG
2,000 fingerling	University of Idaho
2,500,000 eyed eggs	Dworshak NFH (production fish)



State employee, Wes Cannon, transferrring excess eyed steelhead eggs to shipping boxes.

Early performance of Broodyear 1981 fingerling was excellent; however, on July 13, a sudden outbreak of a virus-like, *Epitheliocystis*-causing organism was evident in gills of the small fish. A significant increase in mortality was observed. The effect was most easily observable in the smallest fish of egg takes 7-9. Mortality remained high and growth rate was significantly affected for the remainder of the nursery rearing period.

Reuse Systems II and III were sterilized with sodium hypochlorite in early July and filter beds were pre-activated with ammonium hydroxide. Loading from nursery tanks to ponds was initiated on July 16.



R. Simonsen moving steelhead fingerling from nursery tanks to outside rearing ponds.

As a means of further testing the efficacy of mineral addition and its role in smoltification, the bulk of the earliest egg takes was used for System III (the control). The 2 previous years System II, receiving mineral addition, had been set up with the earliest takes.

The fact that System III fish did not smolt at the hatchery in production year 1980-81, whereas System II fish did, raises the question as to the significance of size in the phenomenon (although System II fish were only 5 mm larger than System III fish).

Use of the early egg takes in System III should provide the following information:

1. If the larger size is the significant variable in smoltification, System III fish should smolt before System II fish.

2. As growth projections indicate a larger fish being produced in PY 81-82, both systems should smolt and the effect of mineralization on the stresses of smoltification will be tested.

Nitrite levels began building somewhat in System II the week of July 20. A scheduled 3-hour power outage required reduced makeup in the reuse systems. By mid-afternoon, classic signs of nitrite toxicity began appearing in System II. When confirmation was made by Area Biologist Lientz, chloride ion (in the form of NaCl) was added to the system. By the next morning, the problem had dissipated; and mortality had been kept to a minimum. As a precautionary measure, chloride ion was added to System III and to the nursery building as the potential for the same problem existed in those systems.

It is apparent that in reuse systems, such as at Dworshak, young fish need protection against nitrite toxicity that chloride ion provides. It should become standard operating procedure to have chloride protection for fingerling from nursery rearing through early pond rearing (in reuse situations). This protection should also be available when the nitrite level approaches 0.02 mg/l. Any mechanical failure which would eliminate or reduce the makeup dilution factor could cause an immediate increase in nitrite and cause significant mortality.

Early pond rearing reflected the damage incurred in the tanks with slow growth and a higher food-to-body-weight conversion in the later takes. By the end of September, performance had improved in both systems; parasite loads were of no consequence to health, and growth data indicated a release of fish in excess of 180 mm.

One-half of the ponds in reuse Systems II and III were equipped with demand fedders to feed Abernathy dry diet. The remainder of the ponds will be hand-fed OMP diet.

Mineral addition (System II and the three control ponds in System III) is scheduled for December based upon results seen in the past year.

RAINBOW TROUT PRODUCTION

Shipments of eyed rainbow trout eggs began arriving in November. A total of 1.9 million eggs was received from three sources. One million eggs were received from White Sulphur Springs NFH, 400,000 from Ennis NFH and 500,000 from Jocko River State Fish Hatchery, Montana.

Two shipments were received from Ennis NFH in late December. They were from 2-year-old broodstock, were of very poor quality and sustained an estimated 60 percent loss.

A group of 500,000 was received from Jocko River Trout Hatchery (Montana Dept. Fish and Game) December 22. They were from 3-year-old broodstock and of excellent quality. This number was 200,000 more than originally requested; but due to the poor quality of the Ennis group, supplement was necessary.

Fingerling plants to the reservoir consisted of 532,000 from the White Sulphur and Ennis Groups. All fingerling plants were made via the COE barge on March 12 and 13.

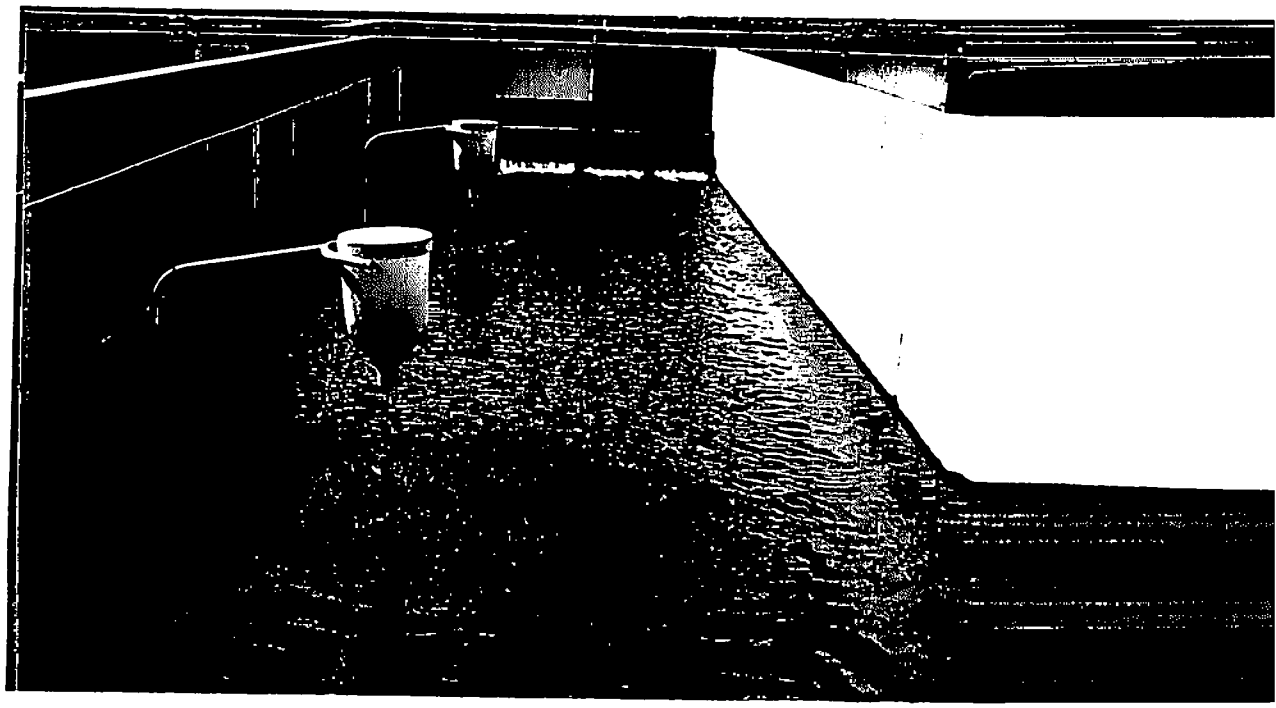
A total of 310,000 fingerling was retained for the catchable program. These fish were from the White Sulphur group. In June, BKD was diagnosed and mortality was observed through the summer from the disease.

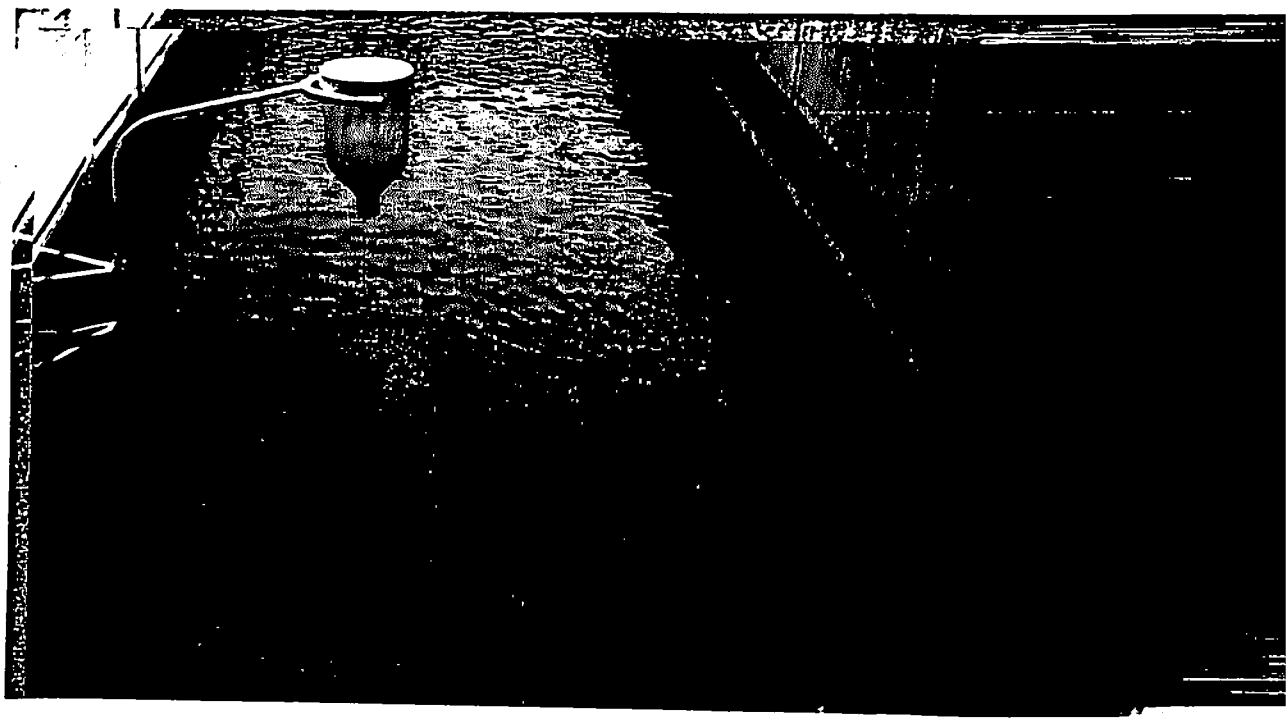
Plants of catchable rainbow from March 9 through June 4 provided a total release of 175,000 (50,000 pounds) at three major boat ramps and in Merry's Bay via COE barge.

Rainbow trout distribution for Fiscal Year 1981 is summarized as follows:

Number	Size(no/lb)	Weight(lbs)	Date	Planting Site
175,000	3.48	50,300	3/9-6/4/81	Dworshak Reservoir
532,000	205	2,595	3/14-13/81	Dworshak Reservoir
*200,000	200	1,000	3/27/81	Salmon River
*162,000	200	810	4/1/81	Snake River
*155,000	200	774	4/2/81	Clearwater River
1,224,000		55,479		

*Confirmed BKD carriers (Arlee strain from Jocko R. group).





Response feeders operating on the modified adult ponds holding rainbow trout.

CHINOOK PRODUCTION

Fall Chinook Spawning

Fall chinook salmon (206) were transported to Dworshak from Ice Harbor Dam in September (FY 80) and October to be held, spawned and the eyed eggs transferred to Hagerman NFH. Extremely heavy losses were taken with severe fungusing the major problem. Mortality prior to first spawning was 65.5 percent.

Egg-taking operations, began October 30, were completed on December 1. From 34 females spawned, 146,000 green eggs resulted in a transfer of 122,000 eyed eggs to Hagerman NFH in December and January.

Spring Chinook

Spring chinook fingerling held at Dworshak for Kooskia NFH yearling program were far ahead of projected size at the beginning of FY 81. Smolt-like changes began taking place in October. Shortly after an inventory on October 30, the incidence of BKD jumped sharply and mortality increased. Quality deteriorated greatly over the next 3 months until a decision was made to release early the remaining production. Fish were released to the main stem Clearwater River on February 6.

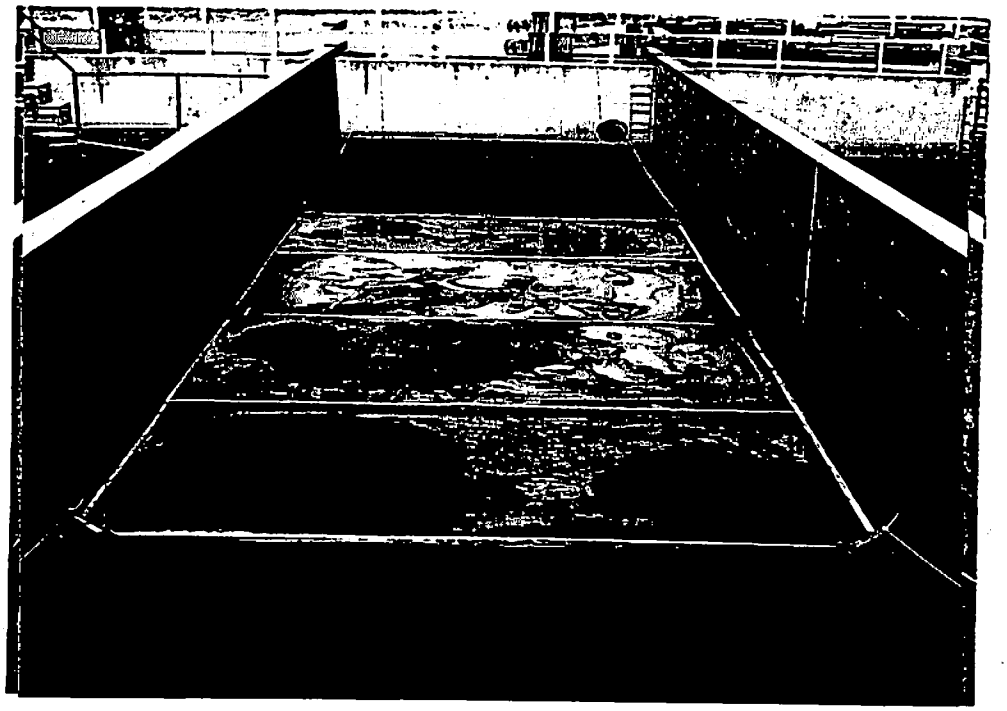
Carson spring chinook fry were moved to tanks in late November and early December. Of the 1.6 million total, 700,000 were placed on reuse for accelerated growth. In mid-January, they were moved to Kooskia for the final 3 months of rearing before the April 0-age release. A total of 625,000 was transferred.

The remaining 850,000 (on raw water from the beginning to slow their growth rate) are being held for the yearling program to be released in spring 1982. BKD-diagnosed mortality increased sharply in this group in March. Poor performance resulted from the cool water and BKD infection. The fish were moved to System I ponds in April to prepare the tank room for Broodyear 1981 steelhead program. With increasing water temperatures in May and June, losses to BKD diminished and overall quality improved. On June 10-12, 560,000 were transferred to Kooskia NFH leaving 200,000 to be reared at Dworshak. With the upcoming chinook expansion at Dworshak, it was believed that another group should be held to gain more information for management of the program.

Spring Chinook Spawning

From May 20 through July 31, a total of 242 adult spring chinook was trapped at Kooskia NFH and transported to Dworshak holding facilities. The fish held beautifully this year with 10.3 percent mortality prior to the first spawning. An estimated 404,000 green eggs were taken from 101 females.

Green eggs were delivered to Kooskia after each egg take to be held until fish are ready for feeding. At that time, they will be returned to Dworshak for nursery rearing and later transferred back to Kooskia to be held for a yearling release in 1983.



Shade cover provided protection to Kooskia's adult spring chinook held at Dworshak.

Two million eyed spring chinook eggs were received from Little White Salmon NFH in September. These eggs will be part of Dworshak's and Kooskia's program; Dworshak beginning production of chinook for the Lower Snake River Compensation Plan.

IMPROVEMENTS

Two adult holding ponds at Dworshak, modified by station personnel and YACC enrollees, were added to the four ponds already in rainbow production. This allows for an annual release of 180,000 catchables from a facility that normally was used for holding excess adult broodstock.

Considerable savings in production costs and manpower were realized when Systems II and III oyster shell tanks were modified to accept bulk deliveries of salt. Previous shipments of sacked salt resulted in higher costs and additional time in handling.

Sandblasting of eight fiberglass nursery tanks was completed and the tanks repainted with an epoxy coating. These tanks will be studied to determine if fiberglass tanks (64) are causing increased mortalities in small fingerling when compared with fish reared in concrete tanks.

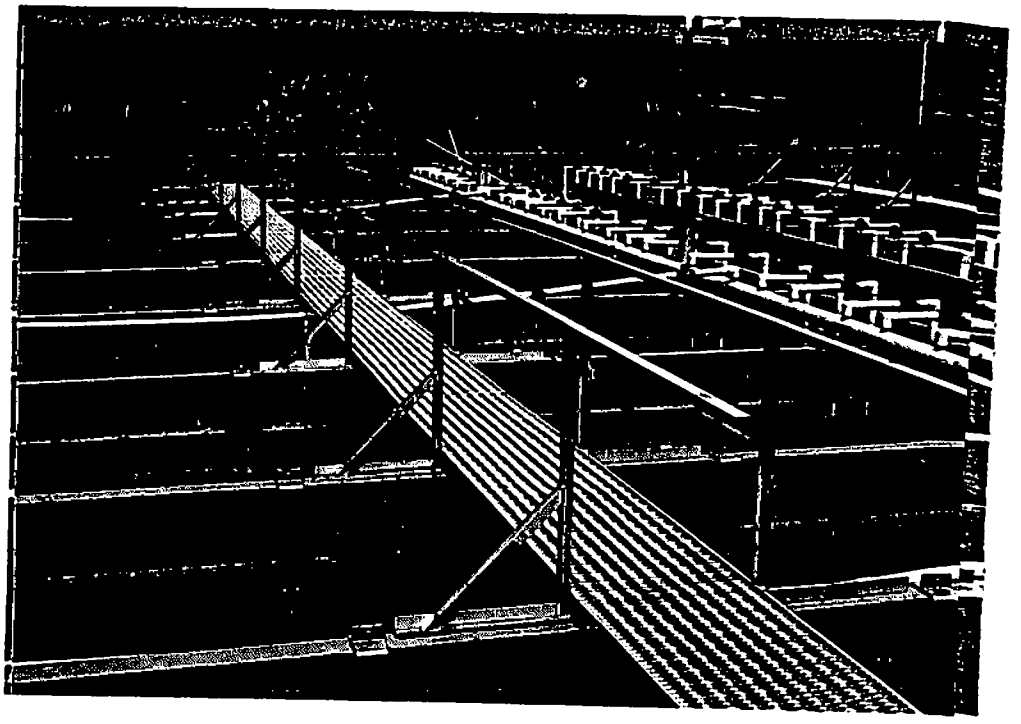
Two hundred pond screens with 3/16-inch openings were purchased to replace smaller size screens. These screens, at a cost of $5,480, were installed to eliminate further changing of sizes throughout a production season.

Authorization was recived from the COE to dismantle and scrap the automated feed system. Removal was based upon the system no longer being utilized because of serious feeding problems experienced. YACC enrollees completed the work.

Fencing was completed in the area of Dworshak's fish ladder for safety reasons. The fence, at a cost of $1,049, secures the top of the ladder and eliminates public trespass.

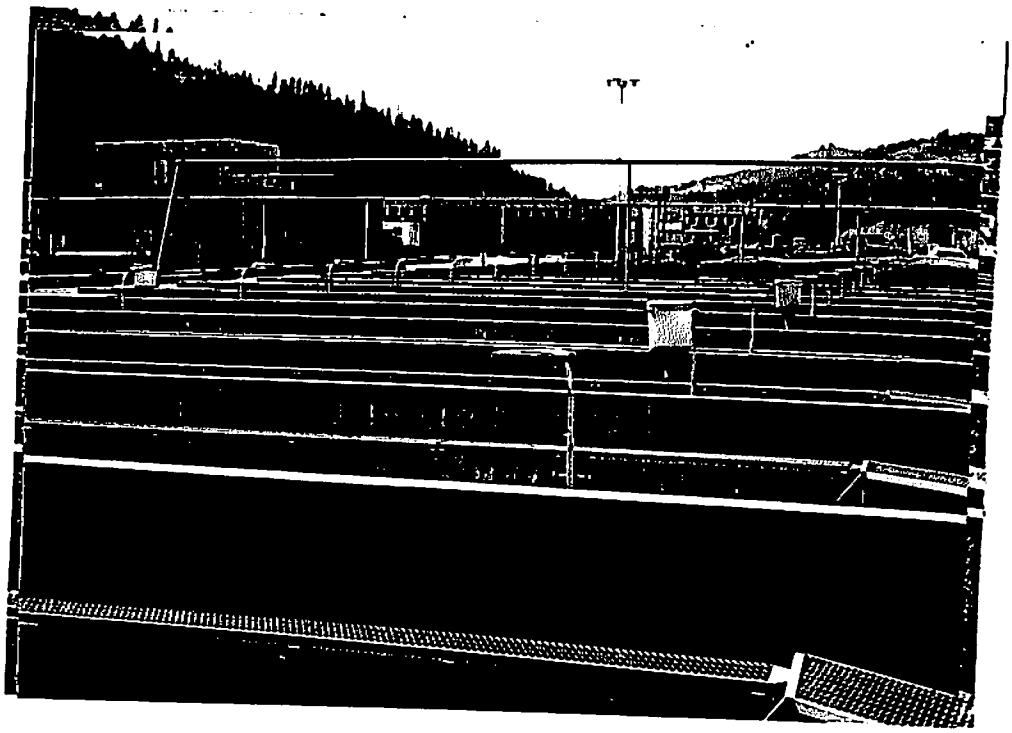
Fence installed in area of fish ladder to provide public safety.

Work was completed by YACC enrollees to install metal grip strut walkways over Systems II and III filter beds. Material cost $3,111.



New grip strut walkways in place over Systems II and III filters.

YACC enrollees completed installation of feeder mounts and demand feeders on rainbow and steelhead ponds. Cost of the mounts was $5,163; and for the 102 feeders, $5,793. Six modified adult holding ponds have 2 feeders each for rainbow production. All 25 ponds in System I are equipped with the feeders as well as 30 ponds in Systems II and III, leaving 29 ponds in the latter two systems on hand feeding.



Supports in place on System III ponds for mounting response feeders.

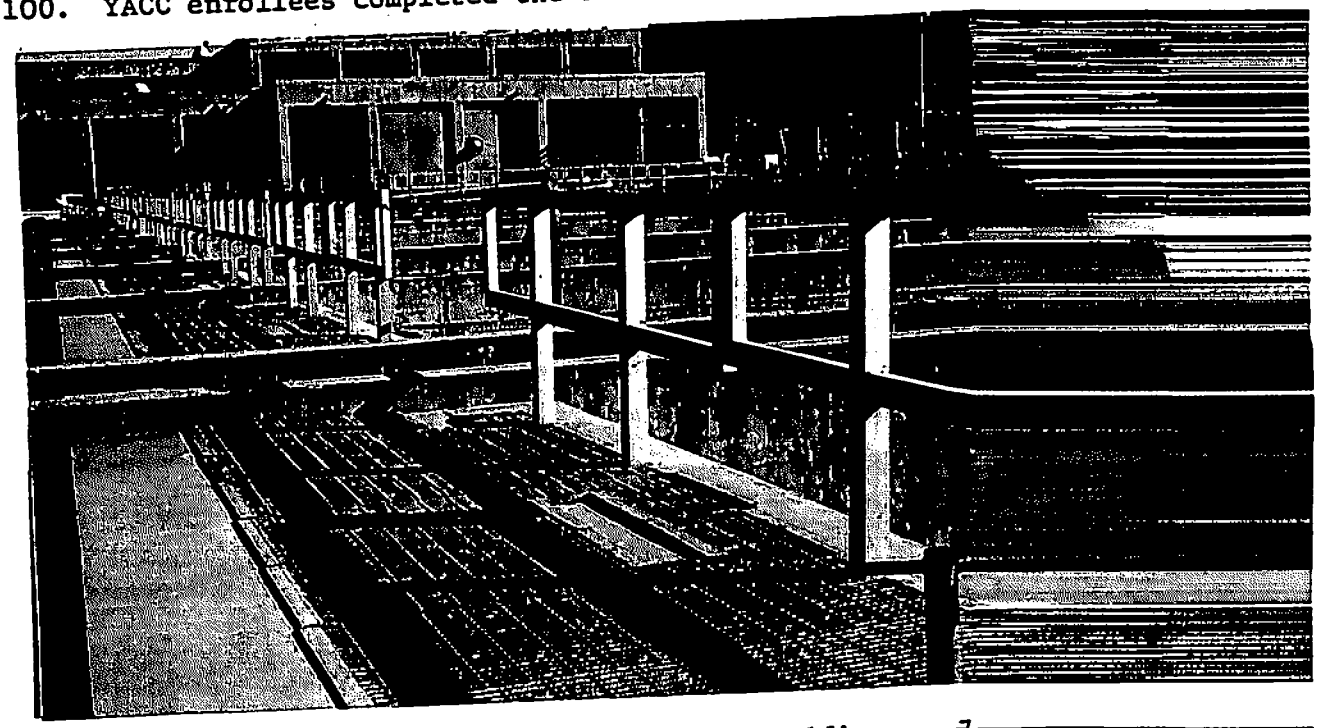
All four residences had exterior painting completed at $1,975. Quarters No. 4 was painted inside at a cost of $440. Landscaping of Quarters No. 2, with old sod replaced and new grass planted, was completed at $1,086. Quarters No. 4 was reroofed at $1,980.

Three ponds in System III reuse were hydraulically separated to allow wastage of water. This was completed to test mineral enrichment in the three ponds against the remaining ponds in the system operating without minerals. Cost for this modification was $2,500.

Heated waste water from Mechanical Building II was routed to the adult holding ponds at a cost of $3,940. This change-over increases temperatures during the period of adult steelhead holding and may shorten the maturation period.

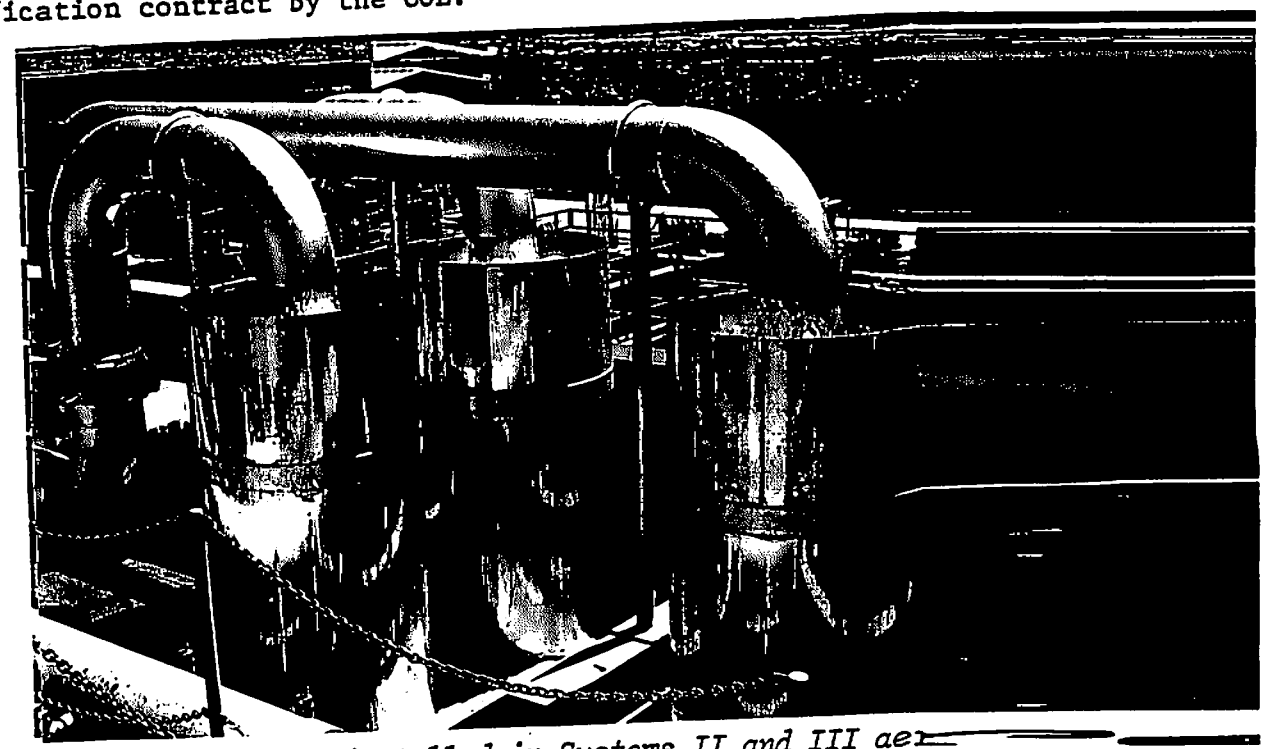
Another 50 jar incubators were added to the program providing a hatching jar for each of the 128 nursery tanks. Cost was $2,115.

Guard rails were placed along the large holding ponds at a co
$5,100. YACC enrollees completed the installation.

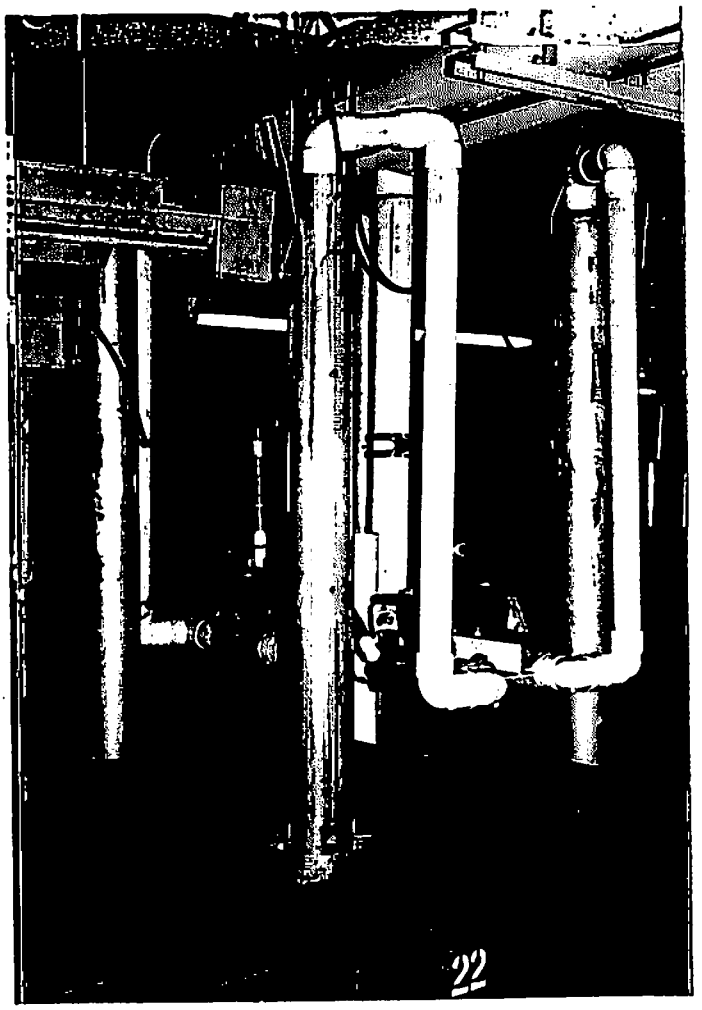


New guard rails installed at end of deep holding pond

Column degassers were installed on each of the 128 nursery t
in the Systems II and III aeration tower to add oxygen and t
nitrogen gas from the water supply. Work was completed in t
modification contract by the COE.



Column degassers installed in Systems II and III ae
tower replacing aspirators.



Small column degassers on each nursery tank water supply.

A sewer plant was constructed on the hatchery site to service the hatchery, Dworshak Dam and the town of Ahsahka. The Ahsahka Water and Sewer District will operate the system. The hatchery's own system was replaced when the new plant began operating in early September.

Construction of the Ahsahka Water and Sewer Plant located on hatchery site.

PERSONNEL

The following personnel actions were made during the year resulting in several changes in permanent employees:

Sharon Russell was appointed to the Administrative Assistant position, effective October 20, upon resignation of Jeanette Herbert.

New Fishery Biologists (Trainees) to Dworshak included:

Phyllis Barney from Fort Morgan Fish Disease Control Center, Colorado, February 26.

Greg Kindschi from Abernathy Salmon Cultural Development Center, Washington, March 9.

Jon Gravning from Hawaii Islands Refuge Complex, March 23.

Charles Musiel, Gardener, retired on March 7 (no replacement).

Richard Keith, Utility Systems Operator, resigned effective August 22 (no replacement).

Jon Gravning, Fishery Biologist, transferred to Alaska August 22 (no replacement).

Dwain Carlson, Biological Technician, reveived a disability retirement, effective February 13 (replaced by a Fishery Biologist).

Rolf Simonsen and Tom Taggart were converted over from a Biological Technician position to Animal Caretakers, effective June 14.

The YACC program continued to play an active part in the hatchery operation. From four to eight enrollees were employed; replacing any temporary workers normally hired. Larry Marchant was terminated as a Work Leader, effective July 25. Mr. Marchant was given a 1-year appointment in the hatchery program as a Maintenance Worker, effective July 26.

Two seasonal tour guides were hired for the summer months; one less than in previous years as a Fishery Biologist (Trainee) assisted with the program.

Seasonal help was limited due to hiring freezes. Administrative furloughs of 2 weeks each affected eight career-seasonal employees. The tightening of personnel ceilings and the layoffs resulting from a career-seasonal appointment are beginning to hamper overall operations.

Training was limited because of the freeze placed on travel. Although several employees were scheduled for different sessions, only Jerry McClain, Staff Assistant-Production, was able to complete 80 hours of Supervisory training.

MEETINGS/TRAVEL

Several design review meetings were held between the State, Walla Walla District (COE) office and hatchery regarding the chinook expansion construction. Also, reviews were ongoing during the year between hatchery, COE and contractor concerning System I modifications.

Olson, McClain and McLeod toured downriver hatcheries on October 22-24. Spring Creek, Little White, Willard, Carson, Eagle Creek, Bonneville State Hatchery and Tucannon State Hatchery were visited. Of special interest were new fish cultural techniques, lining of adult holding ponds at Bonneville, and holding of fall chinook at Tucannon.

Area Biologist Lientz with Terry Bradley, Research Biologist, presented a talk on 'fish health and mineral enrichment' at the Fourth Smolt Workshop, held in Newport, Oregon, on November 7-8. The workshop was sponsored by Oregon State University.

Dave Owsley, Sanitary Engineer, made several trips to Boise on 1-day meetings with Idaho Health and Welfare personnel. Mr. Owsley represents the FWS on a Technical Advisory Committee (TAC) to establish a criteria for sedimentation loads in Idaho waters.

Olson attended the 30th Annual Northwest Fish Cultural Conference held in Courteney, British Columbia, during the week of December 1. A paper was presented on "The Role of Mineral Enrichment in the Steelhead Production at Dworshak NFH."

Jerry McClain and Dave Statler attended a 2-day A.F.S. Idaho Chapter meeting held in McCall on January 19-20.

A Coordination Meeting was held at Dworshak on February 4 for the purpose of reviewing hatchery programs with State, COE and FWS representatives.

Olson attended a meeting on March 4 with several members of the Nez Perce Tribal Executive Committee in Lapwai. The purpose of the meeting was to introduce new FAO employees John Varley and Dan Diggs to the Tribe and to review fishery operations.

A meeting March 24 with Dr. Tom Meade, University of Rhode Island, reviewed work under contract with the Fish and Wildlife Service regarding the mineral enrichment program at Dworshak.

A "Hatchery Effectiveness Workshop" was held in the Regional Office, Portland, on May 5 and 6, with Manager Olson attending.

PROGRAM INFORMATION

Estimates of 30,000 visitors toured the facilities. People from 33 states and 12 countries signed the guest register during a 2-month period of June and July. Tour guides were again available in the summer months to provide guide service at the facility.

A total of 1,090 students and teachers (39 groups) visited the hatchery and were given formal tours during the steelhead spawning season (March-May).

Manager Olson presented a number of news subjects regarding hatchery operations on the local (Lewiston, Grangeville, Orofino) 4-K radio stations. Several 30-minute interviews were made on KLER (Orofino) "Open Line".

A number of news items were carried in area newspapers on steelhead spawning activities and smolt releases.

Station personnel presented programs off-site to the Clarkston, Washington, Rotary Club; Orofino Lions Club; Orofino Chapter of Beta Sigma Sorority; "Career Days" at Lewis-Clark State College, Lewiston; and Lewiston Campfire Girls.

Personnel of the Clearwater National Forest attended USFS training sessions held in the hatchery's conference room. These same facilities were made available to other government agencies.

A new brochure was prepared by the hatchery and printed in color by the Corps of Engineers. The attractive informational leaflet updates the one completed in 1973.

Among the many groups visiting Dworshak, the following are of special note:

> Ten engineers from the Peoples Republic of China on December 9; a six-person Rotary study exchange group from the Philippines on June 15; and 45 ethnic minority high school students, attending a Summer Engineering Institute at Washington State University, were given a 2-hour tour of the facilities with special emphasis given to the mechanical systems.

Official visitors represented the Army Corps of Engineers, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, University personnel of Washington State and Idaho, a delegation of State congressional representatives and others.

CONSTRUCTION

Two major construction programs were initiated during the year. System I modification involves hydraulic separation of the nursery tanks from the 25 System I rearing ponds; replacing the rock and oyster shell bio-filters with new column fluidized sand filters; modifying existing filter chambers into clarifiers; providing treatment to System I water effluent and also to the sand backwash cycle prior to discharging from the hatchery site. Sletten Construction, Great Falls, Montana, is the contractor at a cost of $3.7 million. Work should be completed by summer 1982 to start System I on reuse.

Under the Lower Snake River Compensation Plan (LSRCP), Dworshak was selected to rear a portion of the spring chinook smolts for the Clearwater River. Award was made by the COE, for $1.5 million, to Simes Construction, Kenniwick, Washington, to construct thirty 8-foot by 30-foot raceways. Work was to begin in October 1981 for completion by April 1982. Existing hatchery facilities will add support for broodstock collection, egg incubation, and nursery rearing.

HATCHERY BIOLOGIST ACTIVITIES

Production and release of quality steelhead and chinook smolts was again a primary responsibility this year. An intensified water quality and fish health monitoring program was the major laboratory contribution. Monitoring support services to various studies and cooperative tests were given.

COOPERATIVE STUDIES

University of Idaho

Dr. Bjornn - Collection of adult return data. Fish health monitoring of adult returns and experimental raceway tests was completed. Water quality monitoring of the raceway test groups was compiled.

Dr. Klontz - Consultation and cooperation relating to bacterial kidney disease problems.

Dr. Jim Chaco - Consultation and support were given for histological examinations, fish parasite problems and photography of fish health problems.

Carla Nagel - Water analysis services.

Idaho Fish and Game Department

Cooperated with Rodney Duke in adult mark return data collection and fish health monitoring as related to various marking programs.

Close working relationship maintained with Harold Ramsey, Idaho State fish disease biologist.

Extension services provided to the Idaho Fish and Game Department concerning fish health problem at the McCall State Fish Hatchery and Red River holding facility.

National Marine Fisheries Service

Data collection of marked adult returns and fish health of downstream migrants.

U.S. Fish and Wildlife Service

Abernathy FCDC - Cooperative investigations using substrate for egg incubation in Heath trays. Nutritional information and reuse system discussions.

Fort Morgan FDCC - Cooperative agreement for implementation of the National Fish Disease Inspection policy. Information exchange of fish health problems and observations.

Bozeman FCDC - Histological services rendered. Exchange of information and finding concerning fish health and fish cultural observations.

Fish disease biologists - Exchange of information concerning fish health. Review of various monitoring procedures.

LaCrosse National Fisheries Research Center - Cooperative study for collection of samples pertaining to use of malachite green. (Dr. Fred Meyer)

Fisheries Assistance Offices - Dworshak and Reno. Discussion of fish health and management problems. Support services concerning fish health and water quality monitoring.

Other Support Services

Pyramid Lake Indian Tribal Enterprises - A close working relationship maintained and fish health studies initiated. Extension services given their facilities, and a cooperative agreement concerning fish health compiled.

Laboratory support services extended to the U.S. Forest Service, Army Corps of Engineers and Idaho Fish and Game personnel.

Extension Service

Services and information concerning fish health presented to visitors, private fish groups and the interested public.

Diagnostic Services

Fish health inspections, examinations and consultation performed for four federal fish hatcheries. Diagnostic services extended to the Idaho Fish and Game Department, National Marine Fisheries Service, commercial trout farms in Idaho, England and Canada.

Meetings

Participated in various seminars, workshops, coordination meetings, and group discussions. A paper was presented at the Newport, Oregon smoltification workshop.

Training Sessions

The cooperative program with Dworshak production trainees was continued this year. Each trainee works in the laboratory for a 2-month period of training in water quality monitoring, fish health, reuse understanding, and disease treatments. Time with personnel at the other federal hatcheries serviced spent explaining the role of a disease biologist and discussing fish health problems.

MAJOR RESPONSIBILITIES

Water Quality Monitoring

A minimum of 2 days per week were spent in monitoring the production facilities. EPA compliance, sampling nitrogen gas readings, collection of samples for special water tests and maintenance of laboratory equipment were performed by the laboratory.

Fish Health Monitoring

Fish health examinations were conducted weekly. Specific samples were collection for various ongoing tests, and support to production was given. The wet lab was utilized for control groups of fish lots for comparisons.

Spawning Activities

Mark return data was collected as well as fish health checks conducted on returning adults of steelhead, spring and fall chinook. Recorded data was forwarded to cooperating agencies and samples were obtained for specific tests.

MAJOR CONTRIBUTIONS

1. Support monitoring of fish health for:

   a. Physiological investigations
   b. Test fish groups (station projects)
   c. University studies
   d. State marking programs

2. Maintain base line data on:

   a. Water quality parameters
   b. Fish health changes
   c. Adult returns

3. Comply with National Fish Disease Policy:

   a. Federal hatcheries (Idaho and Nevada)
   b. Title 50 examination for shipment of eggs to England

4. Tests conducted:

   a. Testing of fungicides on fish eggs
   b. Use of substrate in Heath trays for incubating eggs
   c. Monitor fry quality from new hatching box designs
   d. Test compounds for reducing stress during handling and transportation

5. Extension services, training, and delegated Area Office projects

6. Parameters to determine smolt quality

MAJOR FINDINGS

1. *Epitheliocystis* organism in fry held in the nursery building. Amount of loss undetermined at this time.

2. IHN virus in rainbow trout holding ponds.

3. Eye fluke in wild fish from the Decker Flat area of Idaho.

COOPERATION

Again an integrated team effort produced a quality smolt release. Production breakthroughs (demand feeders, loadings, feeding pattern) and keen interest in producing a quality smolt should reap benefits to the fishery in years to come.

Assistance extended by the YACC personnel was very good. They deserve credit for helping in various production and laboratory assignments.