

***LOWER SNAKE RIVER***

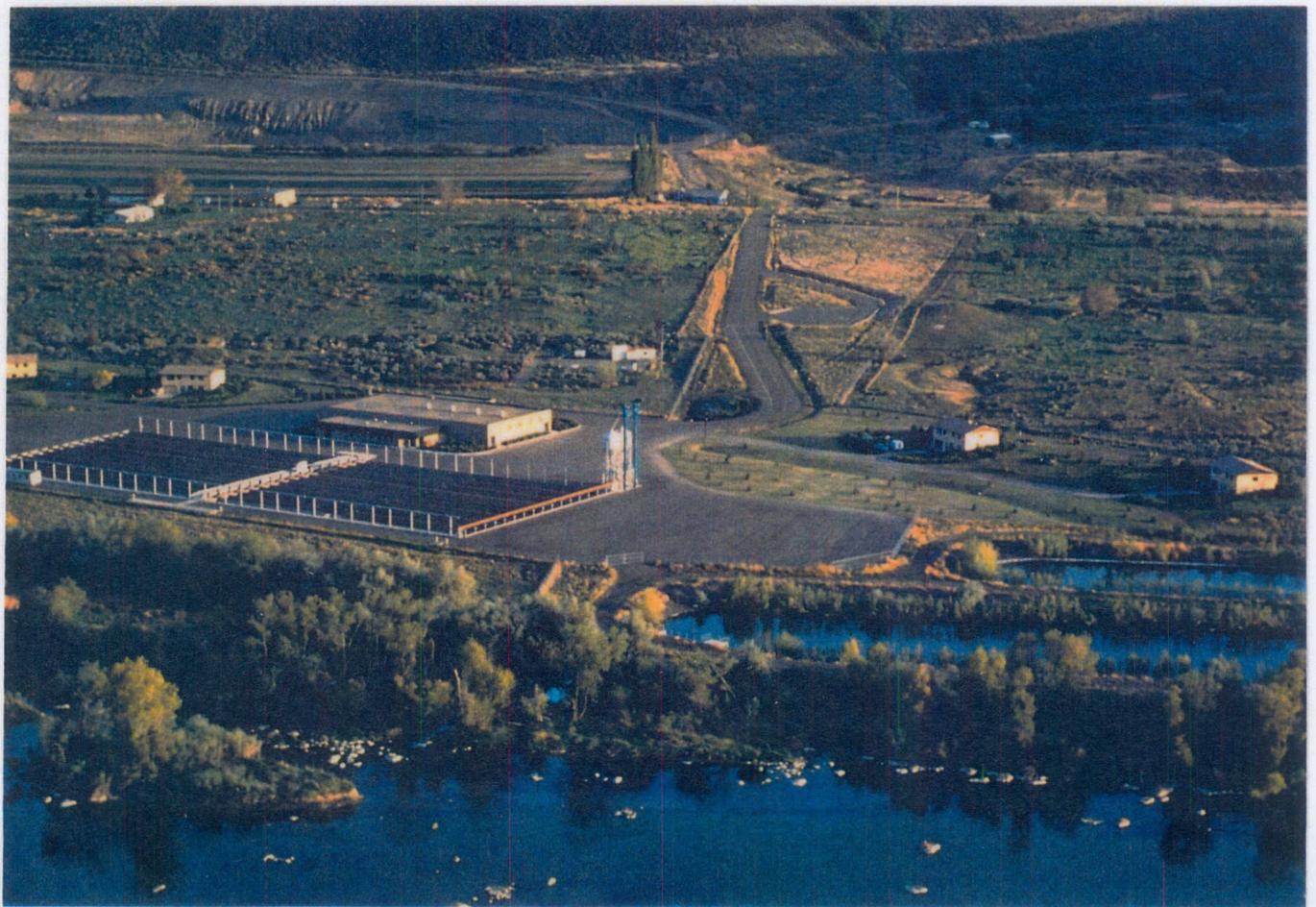
***COMPENSATION PLAN PROGRAM***

***ANNUAL REPORT***

***FISCAL YEAR 1992***

Boise, Idaho

October 1, 1991 - September 30, 1992



Cover Photo - Magic Valley Hatchery was reconstructed in 1986 - 1987 from an existing private hatchery and began production of steelhead in May 1987. As a part of the Lower Snake River Compensation Plan Program, the existing hatchery was purchased and reconstructed by the U.S. Army Corps of Engineers. Prior to the reconstruction, the hatchery site was purchased by the Corps of Engineers from private ownership. A number of earth ponds and concrete raceways were part of the original hatchery with water piped from Crystal Springs, across the Snake River to the hatchery site. In 1982, after the Corps of Engineers purchased the hatchery, personnel from Idaho Department of Fish and Game activated some of the raceways and started rearing steelhead. This practice was continued until April 1984 when the last of the early rearing of steelhead on the site was discontinued, preparing for reconstruction. The first phase of construction was done on the water collection system across the river in 1985. In 1982 to 1984, the hatchery underwent some name changes, originally named Crystal Springs Hatchery, then Buhl Steelhead Hatchery and then the final name of Magic Valley Hatchery. Production of both A and B strain steelhead is the responsibility of the facility under the LSRCP program.

Photo Below - Magic Valley FH gets its water from the 1,000 springs area of the Snake River aquifer. These springs, which provide an abundant supply of high quality water, have contributed greatly to the successful production of over 500,000 pounds of steelhead annually. Approximately 50,000 to 56,000 gpm of spring water is collected from this aquifer and piped across the Snake River to the hatchery.



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## I. INTRODUCTION

The Lower Snake River Compensation Plan Office was established with the closing of the Boise Area Office in September, 1982. The Office's primary responsibility is to administer U.S. Fish and Wildlife Service (FWS) operations and maintenance funds (O&M) for cooperator fisheries operations under the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP).

The LSRCP was authorized by the Water Resources Development Act of 1976 (90 Stat. 2917) to replace fish and wildlife losses caused by the construction and operation of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Lock and Dam projects on the lower 150 miles of the Snake River in Washington and Idaho. The plan described fish hatchery developments as well as improvements to the dams and powerplants to improve smolt passage. Construction responsibility for the LSRCP was assigned to the Walla District, U.S. Army Corps of Engineers (Corps), while responsibility for fish hatchery O&M funding was to be accomplished by "one of the Federal fisheries agencies." The question of O&M funding was settled in 1977 with the signing of an interagency agreement by the Corps, National Marine Fisheries Service (NMFS), and FWS; it stated that the FWS would budget for and administer O&M funds for LSRCP fish hatchery programs (responsibility for administration and O&M for fish passage and wildlife programs remains with the Corps).

Public Law 99-662, approved November 17, 1986, modified the Water Resources Development Act of 1976 in accordance with recommendations contained in a report from the Chief of Engineers, dated March 6, 1985. The Chief's 1985 report confirmed the 1977 NMFS/FWS agreement on Page 2, Section 4.d with a directive which stated: "The U.S. Fish and Wildlife Service should be designated to fund the operation and maintenance of all fish rearing facilities." Regarding ownership of property, the 1985 Report stated in Section 5.3: "Transfer of jurisdiction over all Compensation Plan fish hatcheries, appurtenant facilities and lands to the U.S. Fish and Wildlife Service for operation, maintenance, and replacement shall occur upon completion of construction by the Corps of Engineers." The Corps is currently conveying operational responsibility for constructed fish facilities to the FWS by Memoranda of Understanding for each facility (usually 5-year agreements). Consistent with the desires of the Administration and Congress, the Corps is also transferring fee title of LSRCP hatcheries and associated satellite facilities to the FWS as they are completed and fully operational. Ownership of several hatcheries and satellites has already been transferred to the FWS.

The Corps' estimated cost for construction of the authorized LSRCP off-project fisheries facilities (hatcheries and related satellite facilities) is \$177 million; the FWS costs for annual O&M now exceeds \$11 million. All anadromous fisheries compensation and most resident fisheries compensation are allocated to project power costs and are reimbursed to the U.S. Treasury with interest by the Bonneville Power Administration (BPA) from power revenues. The LSRCP legislation authorized what was believed to be sufficient anadromous fish hatcheries and associated trapping and holding facilities to produce

enough smolts to return 18,300 fall chinook adults, 58,700 spring and summer chinook adults, and 55,100 steelhead adults back to the project area, and sufficient resident fish hatcheries and stream enhancement projects to produce 93,000 pounds of trout annually to replace lost resident sport fisheries in Washington and Idaho. The program required expansion or construction of 12 hatcheries and 11 satellite facilities in Idaho, Oregon, and Washington. Idaho Department of Fish and Game (IDFG) operates four hatcheries, Oregon Department of Fish and Wildlife (ODFW) operates three hatcheries, Washington Department of Wildlife (WDW) two hatcheries, Washington Department of Fisheries (WDF) one hatchery, and FWS two hatcheries.

## II. Program Highlights for FY1992

The 1991-92 steelhead run above Lower Granite Dam was substantially higher than the previous years total of 57,000 with over 97,000 fish counted. A large percentage of the run was the result of hatchery releases in 1988, 1989 and 1990 and easily meets our adult steelhead mitigation goal of 55,100 steelhead adults back to the project area. In 1988 approximately 7.0 million steelhead were released from LSRCP hatcheries followed by releases of 6.5 million, 7.1 million and 6.3 million from these same facilities in 1989, 1990 and 1991. In keeping with the success of the LSRCP steelhead production program Magic Valley Fish Hatchery (FH) alone released approximately 2,160,000 steelhead smolts this year weighing 498,804 pounds, the second highest number and weight since they began operation six years ago. Nearly 6.3 million steelhead were released from LSRCP facilities in 1992.

The Clearwater FH, the last facility to be constructed under the LSRCP was completed in December 1991. The first fish, resident rainbow trout were brought to the hatchery for testing the physical plant in early 1992 and Dworshak National Fish Hatchery (NFH) supplied approximately 500,000 steelhead eggs for the first years shakedown of the facility.

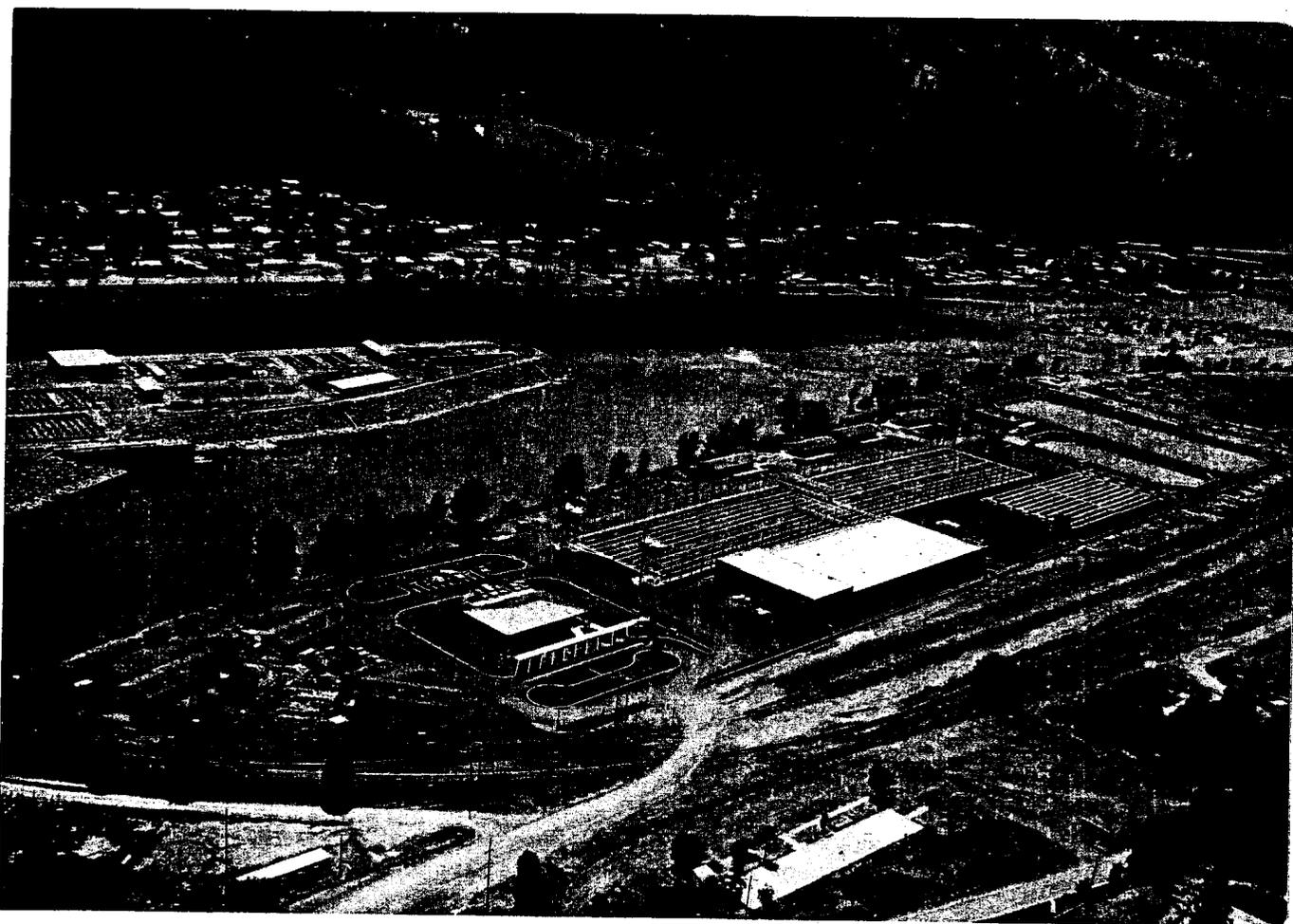
LSRCP facilities continue to produce and release large numbers of salmon, steelhead and resident trout as part of their mitigation responsibility. In FY1992 approximately 14,000,000 salmon, steelhead and rainbow trout weighing nearly 1.8 million pounds were released from LSRCP facilities.

The majority of the LSRCP staff time in FY1992 was spent on Endangered Species Act (ESA) Section 7 and Section 10 consultation and preparation of biological assessments on hatchery production and release effects on listed Snake River spring/summer and fall chinook. Fish hatchery production was adjusted where appropriate to meet ESA requirements.

## III. STATION AND COOPERATOR OPERATIONS

The Boise LSRCP Office negotiated cooperative agreements with and administered funds to four state agencies, two Indian Tribes and the FWS for operation and

maintenance of fish hatcheries and to conduct hatchery monitoring and evaluation studies and fish health programs. A total of \$7,791,001 was obligated to WDF, WDW, ODFW, and IDFG or transferred to Dworshak NFH, Hagerman NFH, and Dworshak Fish Health Center (DFHC) for operation and maintenance and fish health monitoring of 12 hatcheries and 11 associated satellite facilities. An additional \$3,200,447 was obligated to the same four state cooperators, Nez Perce and Umatilla Tribes, Idaho Fisheries Resource Office (IFRO), Dworshak Fish Health Center, Seattle National Fishery Research Center (NFRS), and the Columbia River Coordinators Office for hatchery monitoring and evaluation studies, ESA tagging and Section 7 consultation work. A total of 13,120,278 salmon, steelhead and rainbow trout weighing 1,769,194 pounds were stocked from LSRCP facilities in FY1992. Below are brief summaries of hatchery and evaluation activities in FY1992. Tables 1, 2, and 3 provide further data on funds obligated, fish stocked, production targets, construction costs, and hatchery/trap returns.



Clearwater FH shown in the foreground, completed in early 1992, is the most recently constructed LSRCP fish hatchery. The hatchery is located across the North Fork of the Clearwater River from Dworshak National Fish Hatchery which is shown in the background.

## Clearwater Anadromous Fish Hatchery - Idaho

Clearwater Fish Hatchery is the last of the 12 hatcheries to be completed under the Corps' LSRCP construction program. The hatchery is operated by the IDFG and has been built across the North Fork of the Clearwater River from Dworshak NFH. It is designed to produce (with its three satellites) 1,369,500 spring chinook smolts weighing 91,300 pounds and 2,500,000 steelhead smolts weighing 350,000 pounds. The spring chinook adult return goal for the program is 11,915 salmon and the steelhead return goal is 14,000 adult returns to the Snake River basin.



The Clearwater FH was dedicated in August, 1992. Representatives of the FWS, IDFG, Morgan and Oswood Construction Company and the Corps cut the ceremonial ribbon officially opening the hatchery.

The Clearwater FH is located on land (17.5 acres) purchased by the Corps in 1989. Construction of Clearwater FH began in August 1989 and was completed by the end of 1991. The water supply line was tested in November 1991, and

steelhead eggs from Dworshak NFH and rainbow trout for resident fisheries program were supplied to Clearwater in 1992 for the first rearing cycle.

The Clearwater FH receives its entire water supply from Dworshak Reservoir via two pipes. The primary (and largest) line takes water from just below the reservoir's surface while a secondary (smaller) line receives cold water from an intake deep below the water surface. A distribution tank near the hatchery allows mixing of the water from the two lines to select proper temperatures for various uses at Clearwater FH and also provides a water supply line to Dworshak NFH.

Three satellite fish facilities are associated with the hatchery: Red River, which was completed in November 1986; Powell, completed in the summer of 1989 and Crooked River, completed in the spring of 1990. Red River, Crooked River and Powell are now being operated as rearing, release, and trapping facilities using excess fish from either Sawtooth FH or, more recently, Dworshak NFH.

Red River trapped 34 adult spring chinook and 5 jacks this year, nearly a two-fold increase over the 18 adults collected last year. Twenty-six of these adults were released to spawn naturally. A total of 265 adults and 5 jacks were trapped at Powell; and all adults captured were spawned. Crooked River was operational for the third year of trapping; a total of 215 adults and 13 jack were trapped, and all were released to spawn naturally. The Crooked River return was a large increase over the 18 adults, 12 jacks trapped last year. The Clearwater FH is now holding a total of 801,934 eyed spring chinook eggs for production and a 1993 smolt release from the satellite facility. A total of 354,713 chinook presmolts were released from the Red River pond in October 1992, 358,372 spring chinook presmolts were released in October from the Powell rearing pond and 119,856 presmolts were released from Crooked River in October.

#### **Magic Valley Fish Hatchery - Idaho**

Magic Valley FH is located on the Snake River near Filer, Idaho, and is operated by IDFG. It was completed in August 1987 and is designed to produce 2,000,000 steelhead smolts weighing 291,500 pounds annually. The return goal for Magic Valley FH is 11,660 adults back to the Snake River basin.

The hatchery was constructed on a commercial hatchery site that was purchased by the Corps in March 1981. Steelhead have been produced for the Magic Valley program since 1982. Until 1985, fish were produced onsite in a commercial facility; however, with the start of construction, fish production was transferred to unused raceways at Hagerman NFH (approximately 255,000 steelhead smolts were reared at Hagerman in 1986 for the Magic Valley program). Sawtooth FH and the East Fork Salmon River satellite (both completed) serve as the juvenile release and adult trapping sites for the hatchery program. Magic Valley FH completed its fifth rearing season this year, and released approximately 2,160,257 steelhead smolts in March and April 1992, weighing 498,804 pounds. The releases were distributed between the east fork of the Salmon, upper Salmon and the Little Salmon Rivers.

### McCall Fish Hatchery - Idaho

Operated by IDFG, McCall FH was completed in 1981 and is located along the North Fork Payette River near McCall, Idaho. The program's adult trapping facility and the smolt release site are located on the South Fork of the Salmon River near Warm Lake (salmon do not have access to the Payette River system). McCall FH is designed to produce 1,000,000 summer chinook smolts weighing 61,300 pounds. McCall FH is the only LSRCP summer chinook facility and its adult return goal is 8,000 adults to the Snake River basin. McCall FH also has a concurrent federally-approved trout production program which is funded entirely by the IDFG.

The hatchery has achieved considerable success with its summer chinook program, trapping 2,690 adults in 1986, 2,705 in 1987, and 2,393 in 1988. Typical of the lower chinook runs throughout the basin, McCall's returns decreased in 1989 and 1990 when 939 (444 adults and 495 jacks) and 969 fish (941 adults and 28 jacks) were trapped. In 1991, 1,212 fish (391 adults and 821 jacks) were trapped. This year a record number 2,848 (2,645 adults, 203 jacks) were trapped. This year's egg take 1,428,819, will be sufficient to produce the desired smolts for release in 1994. A total of 1,677 adult males and females were released to spawn naturally in 1992.

The McCall FH staff released 901,500 BY1990 summer chinook salmon smolts weighing 37,915 pounds in the South Fork Salmon River in March 1992; this is slightly below the hatchery's release target of 1,000,000 smolts. The fish were in good health throughout the rearing cycle and mortalities were low. McCall FH experienced excellent outmigrant survival to Lower Granite Dam (38% attributed mainly to the two feedings of feed medicated with oxytetracycline.

### Sawtooth Fish Hatchery - Idaho

Sawtooth FH, located on the upper Salmon River near Stanley, was completed in January 1985 and is operated by IDFG. In addition to its primary mission of rearing 2,235,000 spring chinook salmon smolts weighing 149,000 pounds and trapping steelhead ("A" strain) for Hagerman NFH and Magic Valley FH, the staff operates a major satellite facility on the East Fork of the Salmon River. The satellite traps adult spring chinook for Sawtooth FH and steelhead ("B" strain) for Hagerman and Magic Valley and also serves as a direct stream release site. The program's goal for returns back to the Snake River basin is 19,455 adults.

The adult steelhead returns to Sawtooth FH in 1992 was 1,705, substantially more than the 261 returning last year. Returns for the years 1988, 1989 and 1990 were 974, 994 and 1,056 respectively. The East Fork satellite facility trapped 156 steelhead, 37 more than in 1991 and 298 less than in 1990.

Spring chinook trapping and spawning ended in September with a total of 387 chinook trapped this year compared to 566 trapped in 1991 and 1,488 trapped in 1990. The East Fork trapped 65 spring chinook this year compared to 62 in 1991, 145 in 1990. Numbers of chinook trapped at both sites were either lower

or the same compared to previous years and were typical of the low numbers that returned basinwide.

Most BY1990 spring chinook were released in March 1992. Releases included 1,253,156 smolts into the Salmon River at the hatchery and 79,300 smolts into the East Fork. An additional 1,496 fingerlings were released in late September as part of a fall released study.

In addition to the LSRCF program, the State cooperates with the Shoshone-Bannock Tribe, BPA, NMFS, and other agencies in a FWS-approved sockeye salmon restoration project at Sawtooth FH. The project is funded by BPA and is an effort to recover the endangered sockeye run. This year a catchable trout holding and distribution program was instituted to stock local waters; that project was funded entirely by IDFG.

#### **Irrigon/Wallowa Hatcheries - Oregon**

Irrigon FH located on the Columbia River near Umatilla, Oregon; is operated by the ODFW and was completed in October 1985. Collector wells designed for 25,000 gallons per minute (gpm) supply water for the entire program of 1,677,000 steelhead smolts weighing 279,600 pounds. Irrigon FH's return goal is 11,200 adults back to the Snake River basin.

An expansion of ODFW's Wallowa State Hatchery was completed in May 1985; it serves as a final rearing, acclimation, and release site for about 600,000 steelhead smolts from Irrigon FH and has facilities for steelhead trapping and spawning. In 1992 a total of 2,644 steelhead returned to the Wallowa FH which was nearly 4½ times higher than the 576 steelhead that returned last year.

Two other advanced rearing and trapping sites, which are satellites of the Irrigon FH, were operational in 1992. Big Canyon satellite is located at the mouth of Big Canyon Creek on the Wallowa River. It was completed in April 1987 and is capable of holding and releasing 225,000 smolts. Two hundred and sixteen adult steelhead returned to Big Canyon satellite in 1989, 336 adults in 1990, 428 adults returned last year and 542 in 1992 which indicates a continual positive upward trend. Big Canyon also trapped 96 spring chinook this year.

The Little Sheep Creek satellite station in the Imnaha basin is used as an advanced rearing pond and release site for 250,000 steelhead smolts reared at Irrigon FH. The satellite was completed and became operational in August 1987. In 1987, 1988, and 1989, 730, 286, and 322 steelhead returned to the trap. In 1990, returns were high and 959 steelhead were trapped. The run declined in 1991, however, and only 395 steelhead were trapped. This year 789, approximately twice the number trapped last year, returned to Little Sheep Creek.

Releases for 1992 of Irrigon-reared fish included 668,920 Wallowa stock steelhead from the Wallowa FH rearing ponds, 277,704 Imnaha stock steelhead from the Little Sheep Creek site and 422,748 Wallowa stock from the Big Canyon

site. Wallowa FH also outplanted 413 adult steelhead from the Wallowa and Little Sheep Creek sites. Irrigon also released a total of 262,863 smolts and 243,941 fingerlings at various river sites in the Snake and Grande Ronde River basins.

#### **Lookingglass Fish Hatchery - Oregon**

This hatchery is located on Lookingglass Creek north of Elgin, Oregon, and was completed in November 1982. The hatchery is operated by the ODFW and is designed to produce 1.4 million spring chinook smolts weighing 69,600 pounds. Two satellites, Big Canyon Creek (discussed above) and a renovation of Oregon's Imnaha trapping site, which was completed in 1989, are part of the hatchery program. The Snake River basin return goal for the Lookingglass FH program is 9,070 adults.

Adult spring chinook trapping went well this year with a total of 844 fish collected at the Imnaha trap (767 adults and 77 jacks) and 806 adults and 11 jacks returning to the Lookingglass trap. An additional 89 chinook (85 adults and 4 jacks) were trapped at Big Canyon Creek facility. The Lookingglass and Imnaha stock returns were substantially better than 1991 returns. In 1991 a total of 491 chinook were trapped at Imnaha, 425 at Lookingglass and 38 at Big Canyon Creek facility. BY1990 spring chinook smolt releases from Lookingglass FH totaled 1,213,368. These releases included 950,868 Rapid River stock into Lookingglass Creek in April 1992 and 262,500 Imnaha stock from the Imnaha River satellite facility acclimation pond in March and April 1992.

Some rearing problems were experienced at Lookingglass FH which required facility modifications. A larger emergency generator to handle all critical power needs during power outages that occur frequently and chillers were installed to facilitate uniform size of chinook throughout the rearing cycle in 1991. The Corps, FWS LSRCP Office Coordinator, and ODFW personnel worked out the details for these modifications and some changes were necessary to insure dependable operation during 1992.

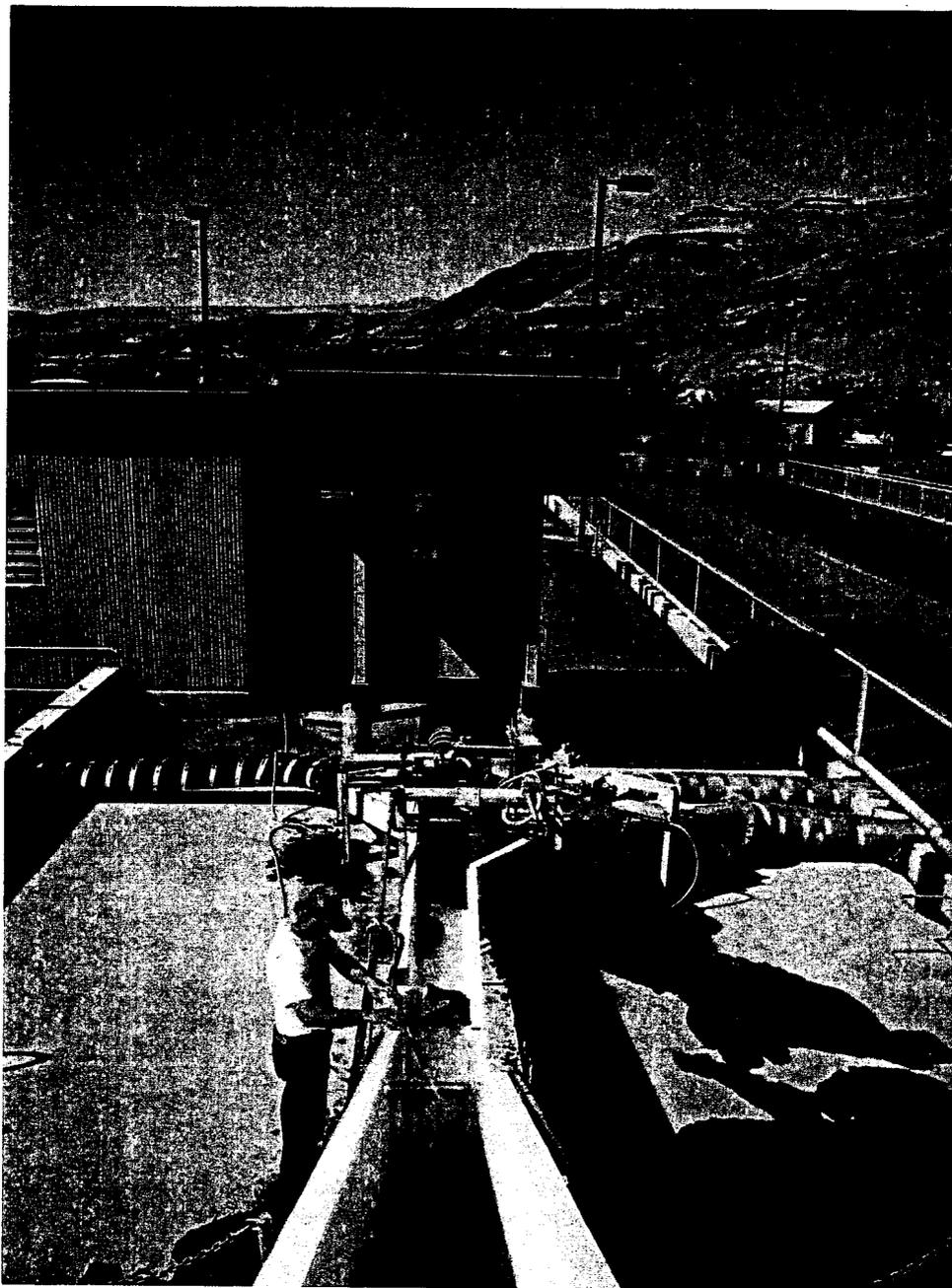
#### **Lyons Ferry/Tucannon Fish Hatchery Complex - Washington**

Located at the confluence of the Palouse and Snake Rivers, the Lyons Ferry facility is two hatcheries in one. Phase I, completed in November 1983, is operated by WDW. It is designed to produce 1,169,500 steelhead trout smolts weighing 116,400 pounds and 45,000 pounds of rainbow trout. Its adult return goal to the basin is 4,656.

Phase II of Lyons Ferry facility, completed in November 1984, is operated by WDF. It is designed to produce 9,162,000 fall chinook smolts weighing 101,800 pounds, and 132,000 spring chinook smolts weighing 8,800 pounds. Lyons Ferry FH's adult salmon return goals are 18,300 fall chinook and 1,148 spring chinook to the basin.

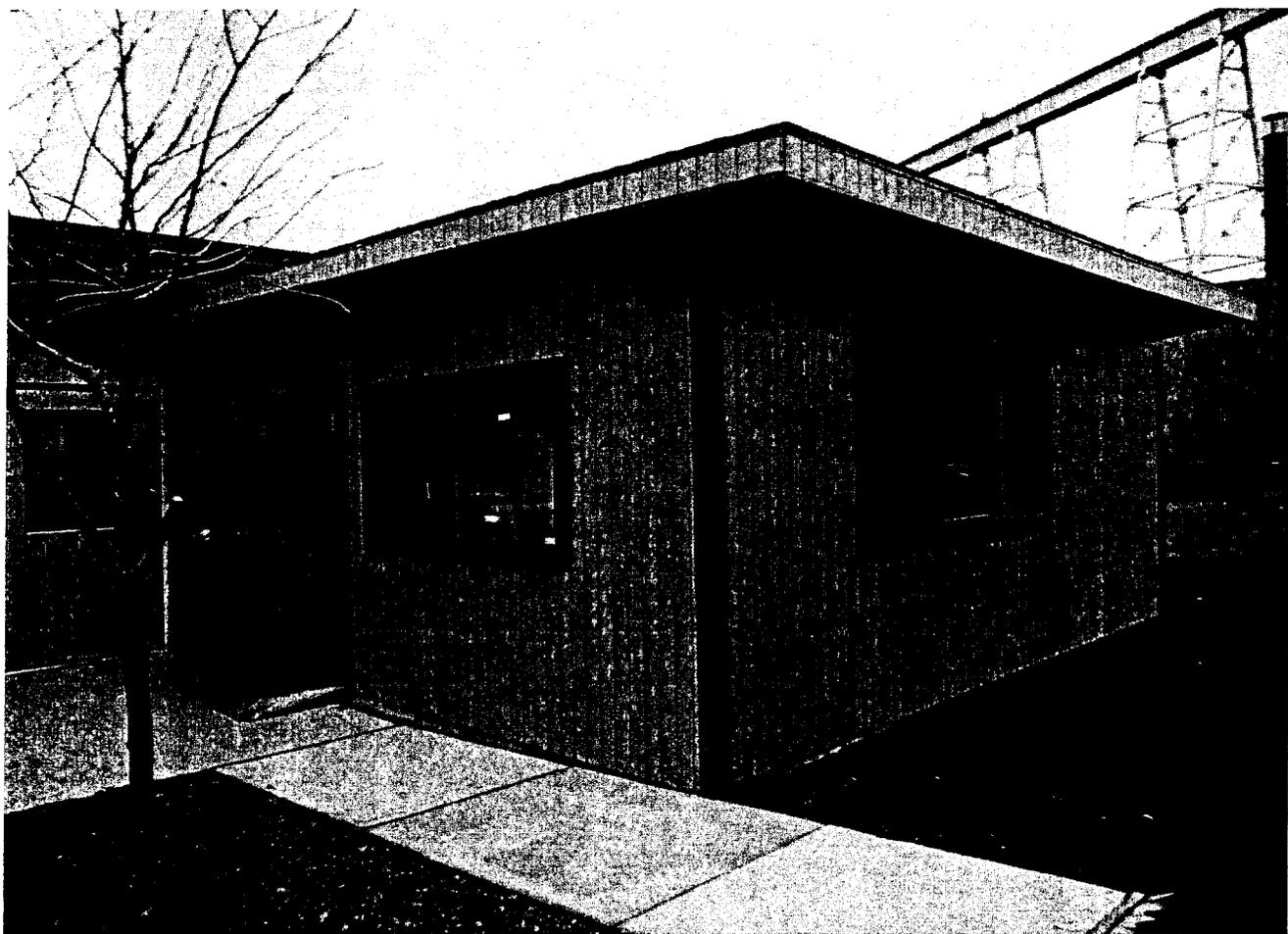
A renovation of Tucannon State Fish Hatchery was completed in November 1984 to rear an additional 41,000 pounds of rainbow trout for WDW and to serve as an

adult trapping and smolt release site for WDF's Tucannon River spring chinook program. The remaining 7,000 pounds of rainbow trout production stipulated in the compensation plan (the total requirement is 93,000 pounds) is to come from stream enhancement structures funded by the Corps. These structures were constructed by WDW in the early 1980's. The WDW personnel operate the Tucannon FH in cooperation with WDF as a satellite of Lyons Ferry Phases I and II.



This year the Corps modified the adult holding ponds shown on the right side of photo by building a dividing wall down the middle of the two ponds.

The hatcheries along with the Phase I (steelhead) satellite facilities at Cottonwood Creek, Dayton Pond, and Curl Lake were completed from 1983 to 1986. Some problems that existed, were addressed this year. The two fall chinook adult holding ponds were found to be unmanageable and were rehabilitated by the Corps this year. Both ponds were divided into two units by construction of a dividing wall down the center of each pond. This now provides much more versatility for handling and sorting adults. Additional office space at the Lyons Ferry Steelhead facility was constructed in 1992 by adding 400 square feet onto the administration building. This work was done by the WDW personnel. The road to the Marmes pump site, which was originally constructed with large cobbles was smoothed and graded by hatchery personnel.



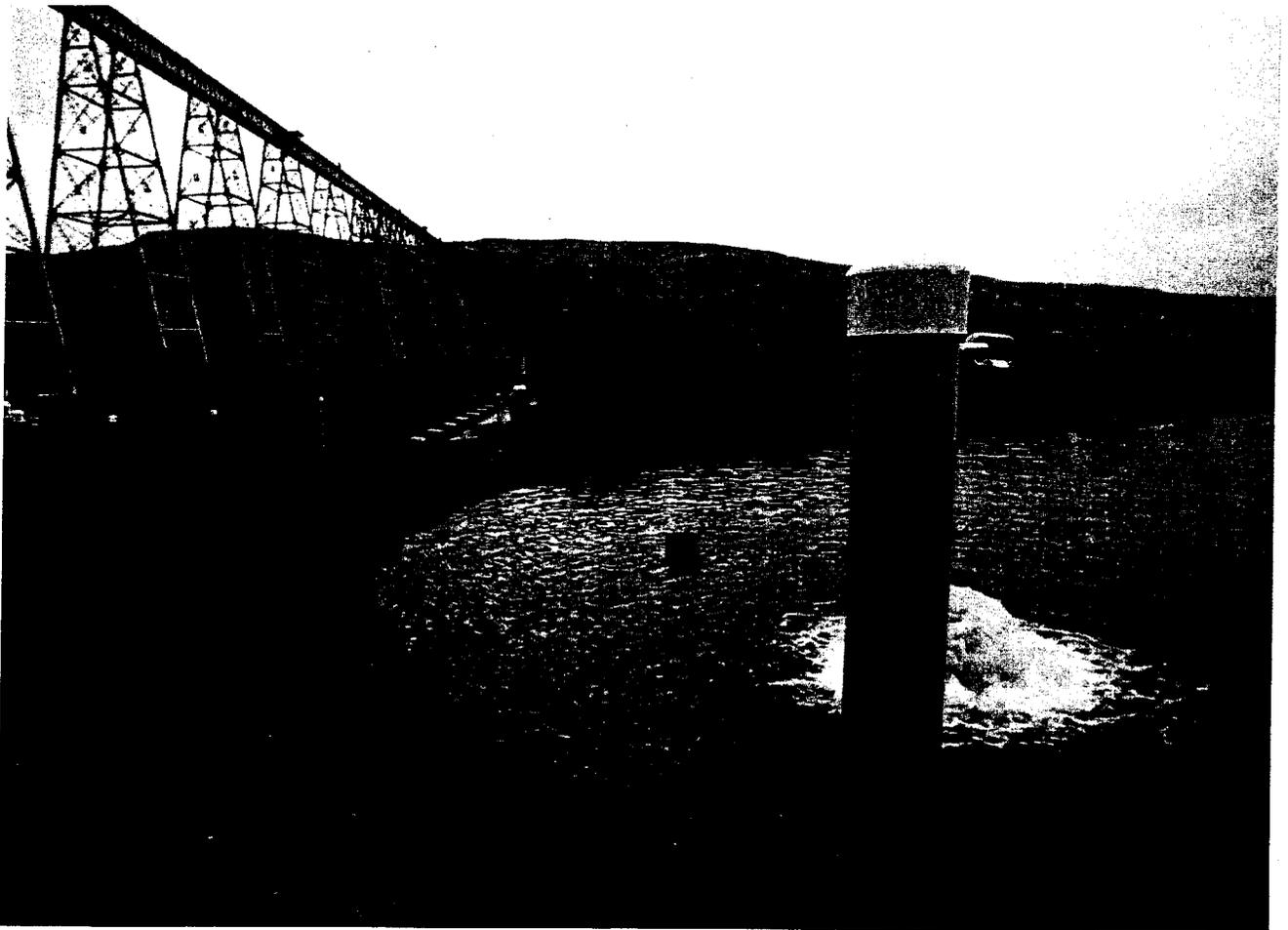
The Lyons Ferry FH staff constructed this 400 square foot room onto the existing hatchery building. The original building did not provide adequate office space for the staff.

Gull use of the large steelhead rearing ponds has increased greatly in recent years. The severity of the depredation problem was determined to be high and

the only feasible solution was installation of a bird deterrent system. A wire system was installed this year and has nearly eliminated the bird predation problem.

In 1991, Corps installed a new floating type weir on the Tucannon River at the hatchery site which was an improvement over previous weirs. The new Mitsubishi designed and manufactured weir is a tremendous improvement over past designs and works much better.

Spring chinook returns to the Tucannon trap and weir totaled 509 adults and 38 jacks in 1992, up substantially from the two previous years of 222 and 87 adults respectively. An additional 434 spring chinook (385 adults 49 jacks) were trapped at the states Rhinggold FH and transported to Lyons Ferry. Forty-six females were spawned resulting in an egg take of 137,757. This egg take will meet the target smolt release goal for 1994.



The Lyons Ferry FH staff contracted with U.S. Department of Agriculture predator control to construct a bird deterrent system over the three large steelhead ponds. Wires are suspended the entire length of the three 2.27 acre ponds from these steel posts. The system has been a tremendous success and the bird problem is now virtually non-existent.

This year adult fall chinook were trapped at the Lyons Ferry FH and at Lower Granite and Ice Harbor Dams and transported to Lyons Ferry FH for holding and spawning. A total of 1,610 adult fall chinook voluntarily entered the hatchery compared to a total of 1,123 last year. Because of the large number voluntarily entering the hatchery trap it was not necessary to trap large numbers at the dams. An additional 398 adults and 71 jacks were captured at



Complex spawning methods are now employed at Lyons Ferry FH on fall chinook to ensure that only known Snake River fish are spawned with each other. Coded wire tags must be read before fish are spawned with each other to ensure Snake River Fall chinook stock integrity.

the two dams. A total of over 3.0 million eggs were collected from 731 adults spawned. A considerable effort was necessary during spawning to ensure that only Snake River fall chinook adults were used for broodstock. All coded wire tags were read before spawning to ensure that the Snake River genetic stock is maintained. Strays from programs outside the basin were inadvertently used in past years. The new concerted effort to spawn only Snake River stocks with each other is of particular importance because the fall chinook are listed as threatened under the ESA.

Because of the potential for large numbers of stray steelhead that return to the Lyons Ferry ladder in the fall (when it remains open for fall chinook returns) and spring, all trapped steelhead are checked for Lyons Ferry brands. In FY1992, 1,348 females and 687 males returned to the hatchery. This year 240 females and 499 males were spawned yielding a total of 1,239,055 green eggs. IHN was again detected this year and occurred shortly after feeding began in two of five egg takes. These two lots were destroyed. IHN has now occurred three times, 1985, 1989 and 1992. The cause of the 1985 outbreak occurred in rainbow trout shipped in from Tucannon FH, which is on surface water, but the two steelhead outbreaks remain somewhat of a mystery as spawning protocol was followed and Lyons Ferry is on a closed well water system. The hard mineralized water is suspected and experiments will be conducted to verify this hypothesis.

Releases from Lyons Ferry FH were below the goals for fall/spring chinook and steelhead. The fall chinook release totaled 689,601 smolts (364,022 at the hatchery and 325,579 barged and released below Ice Harbor Dam). No fingerlings were released this year. A total of 85,797 spring chinook were released into the Tucannon River as yearlings.

About 782,400 steelhead smolts and subsmolts weighing 146,727 lbs were released from Lyons Ferry FH, hauled to the three satellite ponds, or trucked directly to streams. Lyons Ferry and Tucannon FH's combined, reared and released about 732,359 catchable (8 to 9 inch) and sublegal rainbow trout for Washington lakes and streams weighing 128,941 pounds.

#### Dworshak National Fish Hatchery Expansion - Idaho

Dworshak NFH is located at the confluence of the North Fork and Clearwater Rivers. An expansion of the existing Dworshak NFH steelhead facility for LSRCP spring chinook production was completed by the Corps in November 1982. The FWS facility is designed to produce 1,400,000 spring chinook smolts weighing 70,000 pounds. The adult return goal for Dworshak is 9,135 spring chinook to the Snake River basin. Starting in 1986 twelve raceways formerly used to rear resident trout were converted to rearing spring chinook. This increased Dworshak's chinook rearing potential by about 20,000 pounds, for a total of 90,000 pounds. This additional rearing effort will now be shifted to the Clearwater FH in FY1992.

Spring chinook runs in the Clearwater River in 1992 were comparable to 1991 returns with 675 adults returning to the Dworshak/Kooskia Complex compared to

632 last year but down substantially from the 3,183 trapped in 1990. The estimated hatchery egg take of 870,000 green eggs will not be sufficient for both the Dworshak and Clearwater programs.

In April 1992, Dworshak NFH personnel released approximately 959,369 BY1990 chinook smolts into the North Fork and main stem Clearwater River directly from the NFH. Approximately 246,457 BY1990 smolts were outplanted in March into Eldorado and Walton Creeks as part of Dworshak's outplanting program.

To assist the Clearwater program, Dworshak transferred 358,873 BY1991 fingerlings in March to the Powell and Red River satellite sites for an April release.

#### **Hagerman National Fish Hatchery - Idaho**

Hagerman NFH, located on a 59°F spring water supply from the Snake River aquifer east of Hagerman, Idaho, was expanded by the Corps to rear 1,400,000 steelhead smolts weighing 340,000 pounds. Hagerman NFH also retained the capacity to produce 100,000 pounds of fish for FWS production commitments for programs other than LSRCP. The expansion was completed in April 1984 and the hatchery, is operated by the FWS. Hagerman NFH has a goal of returning 13,600 adult steelhead to the Snake River basin.

Hagerman NFH received a total of 2.26 million BY1992 steelhead "A" eggs from Sawtooth and Pahsimeroi FH's this year. No Dworshak or East Fork "B" eggs were released this year.

In April 1992 Hagerman NFH released over 1.4 million BY1991 steelhead smolts weighing nearly 309,000 pounds into various streams in the Salmon River basin. An additional 298,500 steelhead weighing 5,151 pounds were transferred to a state operated Idaho Power facility. Fish health for the entire history of steelhead production for BY1991 was excellent.

#### **IV. LSRCP OFFICE OPERATIONS**

A total of \$11,175,241 was obligated for LSRCP programs in FY1992. This total included \$1,947,717 for cooperator monitoring and evaluation studies (\$502,331 from carry-over monies), \$280,000 for Boise LSRCP Office management and coordination, \$100,000 for Youth Conservation Corps (YCC) (salaries and benefits), \$369,257 for the Regional Office, \$249,060 for the marking of all hatchery releases for endangered species issues (from carry-over monies) and the balance (\$8,229,209) for hatchery operations and maintenance. Ten cooperative agreements were signed for FY1992 to distribute evaluation and operation and maintenance funding (\$9,276,446) to non-federal entities.

In FY1992 the LSRCP program continued to sponsor a YCC program at a cost of \$100,000. The program was conducted on 17 state and federal LSRCP hatcheries and evaluation study projects and included 49 YCC student enrollees and team leaders. Once again the program was well received by the cooperating

agencies, it not only accomplished necessary station work but also provided an environmental awareness experience and job training for local youths.

The LSRCP program information video, a cooperative venture with the National Fish and Wildlife Foundation (NF&WF) which was placed on hold during part of FY1991 pending announcement of Endangered Species status for several Snake River salmon species, was resumed this year. A decision was made between the FWS and NF&WF to incorporate ESA aspects and issues into the video. The video is back on track and an off line version (no professional narrator, music or final graphics was completed for review). The final version should be completed in early 1993.



The YCC program, supported by the LSRCP Office, continues to be one of the most popular and useful employment programs utilized by our cooperators. This year 49 YCC employees were used at 17 locations throughout the Northwest.

The LSRCP Office also contracted for two additional public information brochures this year, one for Lyons Ferry FH and one for Magic Valley FH.

These two brochures will be completed in the spring of 1993. The Corps has agreed to print 100,000 copies of each six page brochure in full color when completed. These brochures will be made available at each fish hatchery for distribution to the public.

## V. EVALUATION STUDIES

In 1992 all five operating agencies and two Indian Tribes had fully operational evaluation studies underway. By the end of the fiscal year, a total of \$1,947,717 had been obligated for 10 study agreements being carried out by the IDFG, ODFW, WDW, WDF, FWS (IFRO), and the Nez Perce and Umatilla Tribes. Below is an overview of the FY1992 evaluation program followed by a synopsis of state and tribal evaluation programs. The IFRO evaluation program is discussed in the next section, **FWS Cooperative Programs**. Results of 1992 and earlier studies are available in our cooperator's annual reports; a listing of reports is found in Section XIII of this document.

A pattern for regular Evaluation Study Committee (ESC) meetings was established in 1985 and continued in 1992. Although the ESC consists of a single representative from each operating agency and cooperating Indian Tribe, ESC meetings often include additional staff members from each agency and occasionally visitors. Two fully-attended ESC meetings were conducted in FY1992 along with several partial committee meetings to discuss specific topics and study proposals. Rob Jones, an endangered species biologist with NMFS in Portland, attended our summer meeting which was dedicated to discussing ESA and how it will affect LSRCP programs. Paul Sankovich, a University of Idaho student, who worked on an ICFWRU study we funded for 1990-92, attended our fall meeting and presented results of his studies of wild natural and hatchery adults spawning behavior above the South Fork and Sawtooth FH weirs.

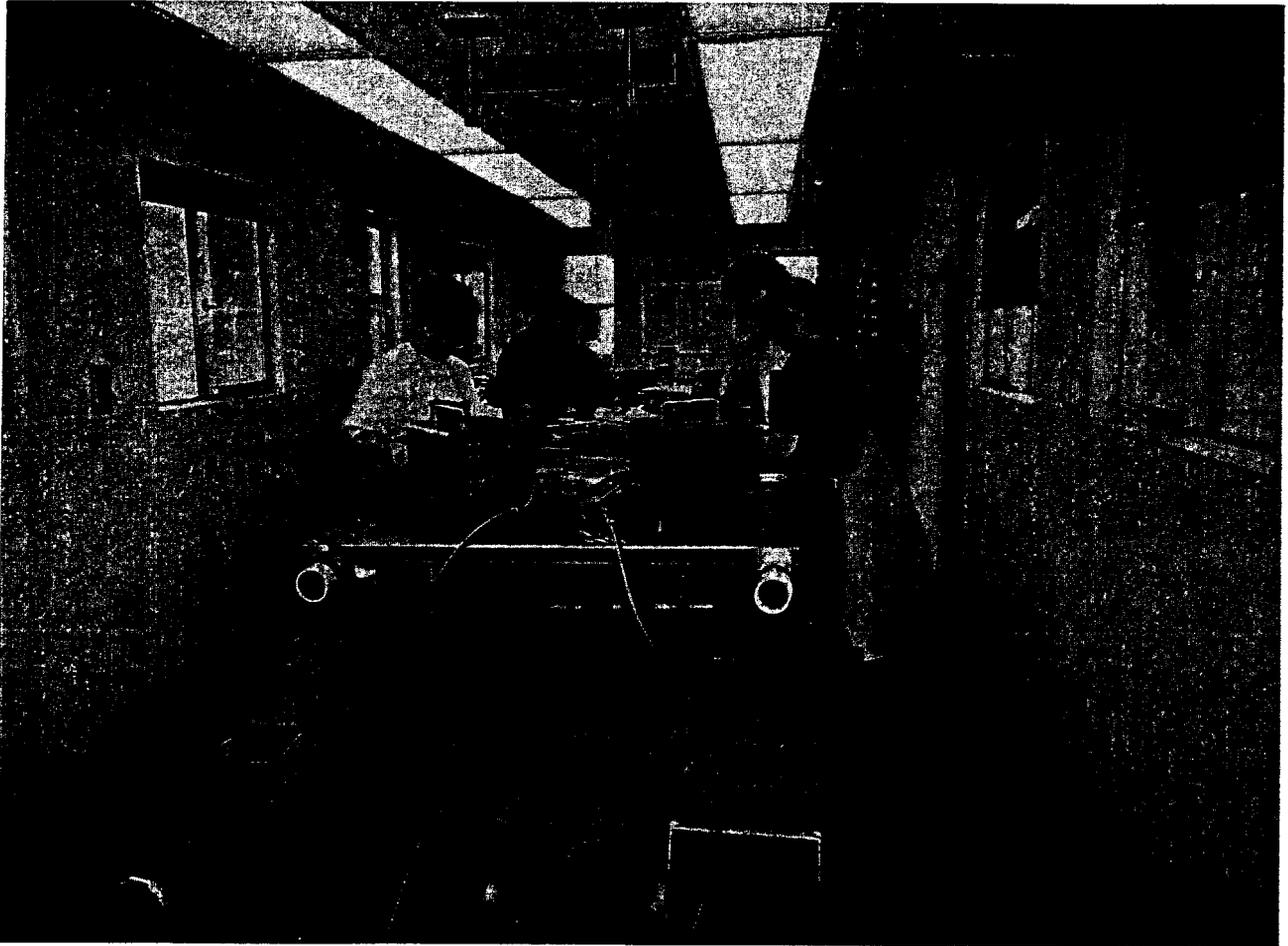
The LSRCP evaluation biologists dedicated a large amount of effort in 1992 to assisting the LSRCP office in meeting our responsibilities under the ESA. They assisted in developing applications for scientific and enhancement permits under Section 10 of the ESA and worked with our office to develop Section 7 documents before and after listing (on May 22, 1992). This effort will continue, and amplify, in 1993.

### **IDFG's Evaluation Study Program**

In 1992, IDFG began the year with a single study, **LSRCP Fish Hatchery Evaluations-Idaho**, which combines three projects--*Hatchery Evaluations*, *Hatchery-Wild Composition of the Idaho Steelhead Harvest*, and *Coded-Wire Tag Analyses*. Idaho's LSRCP studies were initiated in 1982 and are being conducted to 1) ensure that accurate and adequate monitoring of hatchery practices occurs so the most cost effective mode of operation for each hatchery is implemented, and 2) assess the LSRCP contribution to fisheries and escapement. The hatchery operation studies include monitoring and evaluation of hatchery rearing; size, time, and location of releases and adult returns.

These types of studies are long-term because constant monitoring is required to identify problems before they result in catastrophic fish losses and to determine which hatchery rearing and release practices will result in the best adult returns.

Several evaluation studies initiated in previous years to address specific hatchery problems and needs were continued in 1992. PIT-tagged groups of salmon were released from all LSRCP rearing programs in 1992 to determine migration timing and initial survival. IDFG continued to collect scales from known chinook hatchery adults (i.e. those tagged as juveniles) and wild fish and provide them to ODFW biologists who are developing scale pattern models which may eventually be used to identify hatchery fish for broodstock and other management purposes. Steelhead size at release experiments continued with 1992 releases at Hagerman NFH to help identify the optimum size with the



This year all salmon and steelhead released from LSRCP hatcheries were coded wire tagged and adipose fin clipped. All steelhead were previously adipose fin clipped and ESA required the marking of all salmon with coded wire tags and fin clips.

greatest survival and lowest residualism rate. Survival implications of high, medium, and low density chinook rearing conditions continued another year at

Sawtooth FH. To assess effects of handling and CWTing, summer chinook in one pond at McCall FH were marked with TM-100 for comparison to CWTed fish in the adjacent pond. This mark handling study was initiated with BY1988.

Fall release studies were not being considered at Sawtooth FH until continued drought conditions and resulting low flows brought up concerns for overwinter survival of BY1991. After ESA-related concerns were addressed, over 70% of the brood's progeny were released in September and October. The releases contained PIT-tagged fish from each raceway and included the density study groups.

In late 1984 Idaho began an angler survey to assess the LSRCP contribution to Idaho's steelhead fishery, estimate the total escapement of LSRCP fish, recover information on marked fish, and obtain data for managing the fishery while protecting wild stocks. This survey is the major means of recovering adult steelhead tagged as fingerlings under other evaluation studies. These efforts were funded through 1992 and will be continued annually until compensation goals have been met, and periodically thereafter.

The process of reading tags and analyzing marks was funded in 1992 as part of the evaluation study, whereas actual marking costs remained a part of each hatchery's budget. In 1992 several thousand tags (many recovered under the Harvest Study described above) were removed from fish and decoded at IDFG's Lewiston lab.

In early spring 1992 IDFG designed and initiated a study 1) to estimate the number and location of hatchery-reared steelhead residualizing in the upper Salmon River (from Hagerman and Magic Valley releases), 2) to describe their physical characteristics, and 3) to determine their potential for steelhead predation on natural chinook salmon. The studies were conducted in the main Salmon River from the Sawtooth FH weir to the mouth of the East Fork.

#### **ODFW's Evaluation Study Program**

ODFW conducts nearly all of their evaluations under one "umbrella" study, **An Evaluation of the LSRCP Program in Oregon**. The ODFW began a few evaluations under this study in 1983 but full-scale studies did not begin until FY1984. Their evaluation program currently encompasses monitoring and evaluation of hatchery practices; size, time, and location of release studies; marking activities (CWTing, branding); assisting with disease monitoring efforts; and creel census studies to determine the LSRCP contribution to Oregon's steelhead fishery and to recover tagged fish. In addition to being the evaluation studies coordinator, the principal LSRCP investigator in Oregon also coordinates the broodstock selection, egg-taking programs, and outplanting program for all of Oregon's LSRCP program, currently the only anadromous hatchery program in NE Oregon.

In 1990 a study was initiated to develop a discriminate function model based on scale growth patterns to separate hatchery and wild-origin adult salmon at

Lower Granite Dam and points above. This effort was continued in FY1992 and incorporated Idaho's scale collection effort (as noted above).

ODFW conducted a second year of acclimated versus direct stream releases steelhead at Little Sheep and Big Canyon Creeks. Similar studies at Wallowa FH were completed with the release of smolts in 1991. Chinook acclimation versus direct stream release studies were initiated at Imnaha facility with BY1990 progeny released this year. Too few broodstock returned in 1991, so acclimated vs direct released smolt studies cannot continue with the 1993 releases.

Size at release experiments continued at Lookingglass FH for Rapid River (20 vs 12 fpp) and Imnaha (25 vs 15 fpp) stocks. Outmigration and adult return performances are being evaluated. Because of the low BY1991 returns, most Rapid River stock fish are being reared at 50 percent of normal densities at Lookingglass FH. A test group is being reared at normal density to compare the two conditions when they are released in 1993.

Two new evaluation projects were initiated by ODFW in 1992. The first was to develop a Snake River chinook life-cycle model to evaluate combinations of downstream migration, upstream migration, harvest, and production management measures with respect to rebuilding depressed runs. The study will take about three years to complete and will provide a means to analyze various recovery proposals for listed Snake River stocks.

ODFW's second new initiative was to identify characteristics and interactions of residual steelhead with natural chinook in N.E. Oregon. Although this study is similar to IDFG's new steelhead residualism project, ODFW's objectives this first year were 1) to define spatial and temporal distribution and abundance of juvenile chinook and residual steelhead and 2) to describe characteristics of steelhead which residualize.

#### **WDF's Evaluation Study Program**

The WDF field evaluation program was initiated in 1985 when a principal investigator was hired and stationed in Dayton, Washington. Their 1992 studies combine fall and spring chinook under one multiple-objective study including 1) monitoring and evaluation of hatchery practices, juvenile outputs, adult returns, and contribution to fisheries; 2) time, size, and location of release studies; and 3) evaluation of impacts of hatchery releases on wild chinook stocks. Because the hatchery program is being built entirely with the endemic fall and spring chinook stocks, special attention is being paid to quantifying and monitoring genetic variables in each population.

Due initially to the concern for status of declining Snake River chinook stocks, and subsequently to the proposal to list fall and spring/summer chinook stocks as threatened species, WDF initiated two LSRCP-funded studies in FY1991, both of which were funded under BPA in 1992. One was a radio tag tracking study of adult fall chinook captured at Ice Harbor Dam. The results



A new fish marking technique is being used on a trial basis on LSRCP evaluation programs. Color coded or numbered plastic strips are injected into the clear tissue behind the eye allowing the tag to be read visually without sacrificing the fish.

of this first year of effort were recently reported by Mendel et. al. (1991). The second was a Service, WDF, ICFWRU, and tribal study of Snake River fall chinook habitat and juvenile migration and survival. Although WDF's LSRCP-funded evaluation program still participates in spawning surveys, the rest of the funding now comes from the BPA.

As has been true for the last several years, major efforts were taken in 1992 by evaluation and hatchery staffs to identify the origin of fall chinook broodstock captured at Ice Harbor and Lower Granite Dams and returning to the Lyons Ferry ladder. WDF is trying to ensure that future broodstocks contain no non-endemic fish as has happened in some past years. All Lyons Ferry FH fall chinook releases are being marked so Lyons Ferry origin adults can be identified in future returns.

The BY1990 spring chinook hatchery returns were spawned with other hatchery fish and wild fish to compare with wild X wild crosses. The three crosses

(HxH, WxW, HxW) were released in 1992 and their survival will be evaluated from 1993 - 1995. BY1991 crosses were limited to HxH and WxW. As with the 1990 brood progeny, these crosses will be compared through the hatchery rearing period and uniquely marked to determine adult return rates. BY1991 was the first broodstock to contain 5-year-old, hatchery-origin returns.

A major activity initiated in 1989 and continued in 1992 involved radio tagging and tracking wild and hatchery adult spring chinook above the Tucannon FH weir to determine movement, spawning time, and location, survival, and spawning success. With the completion of a new weir in 1990, and further modifications in 1991, biologists have been able to enumerate all returns, both wild and hatchery, and select a predetermined proportion of both wild and hatchery-origin fish for the hatchery use and for upstream release.

Other studies initiated in previous years and continued in 1992 included fall chinook on-station vs barged (below Ice Harbor Dam) releases, natural production estimates and migration timing of spring chinook (Tucannon River), stock profile (meristic, morphometric, electrophoretic monitoring), and cryopreservation of spring and fall chinook milt.

#### WDW's Evaluation Study Program

The bulk of the WDW's evaluation program has been and will continue to be conducted under one study, Lyons Ferry FH Evaluation Study - Steelhead. This long term program includes objectives for evaluating both the steelhead and resident trout hatchery programs, with the steelhead objectives having the highest priority and requiring the most funding (over 90 percent of the total). A second study initiated in 1991 and continued in 1992 is similar to IDFG and ODFW efforts to investigate interactions of hatchery-reared steelhead and resident trout and natural chinook.

The hatchery evaluations and related field studies at Lyons Ferry FH's and Tucannon have been underway since 1983, when the steelhead and trout production programs were initiated. Major concerns which have surfaced as a result of evaluations have been the large numbers of residuals below some satellite release facilities, lower than expected returns to the Tucannon River (from Curl Lake releases), and poor fall/early winter returns to the Cottonwood pond area (Grande Ronde R.). In addition, surveys since 1986 showed large portions of the Lyons Ferry FH and Curl Lake-released fish are returning above Lower Granite Dam--well above their release sites. A WDW/ODFW radio tagging study confirmed that many Lyons Ferry and Tucannon River adult returns are wintering above Lower Granite; and, although some drop back to the dam, most fail to return to their release area.

In a study initiated in 1988 and continued in 1992, steelhead presmolts outplanted to conditioning ponds, were sampled before outplanting to the ponds, midway through the conditioning period, at release and during migration to determine the process and degree of smoltification. In 1992 the study continued at Curl Lake and incorporated direct stream releases at two sites on the Tucannon River. The hypothesis is that poor outmigration and homing may

be related to smolt condition. The direct stream releases underwent similar smoltification sampling, were marked, and will be compared to the conditioned fish when data are available on their outmigration success and their adult return and straying rates. A second direct vs acclimated study was conducted at Cottonwood Pond on the Grande Ronde.

Size may be another condition factor affecting homing. To test this, WDW is comparing smoltification, migration rates, and eventually straying and return rates of 4 and 6 fpp steelhead released from the Dayton conditioning pond. This study was initiated in 1990 and probably will continue for two more years.

Development of endemic wild broodstocks may also assist in improving homing. WDF captured wild broodstock on the Tucannon River in 1992 for rearing, release, and comparison to existing hatchery broods during migration (with PIT tags) and at adult return. This program was delayed on the Touchet River in 1992, but is expected to be pursued in 1993.

#### **Tribal Evaluation Study Programs**

In 1986 the LSRCP office initiated funding for tribal involvement in the LSRCP program. Because the Tribes do not operate any LSRCP facilities and because their primary concerns are for the compensation of tribal fisheries, their projects are oriented toward evaluating the implementation and success of the program rather than solving fish culture problems.

The Nez Perce Tribe (NPT) initiated their Nez Perce Tribe LSRCP Evaluation Study in 1986 and continued it in 1992 to develop tribal stocking and outplanting priorities, monitor tribal harvest, evaluate effects of hatchery plants on native production, and assist IDFG, ODFW, and FWS in their evaluation studies. The NPT's major initiative in 1991 was to develop a long-term plan for monitoring natural production in the Imnaha River. The plan was closely coordinated with ODFW and the CTUIR and was completed in late FY1991. While tribal planning, coordination, natural production and harvest monitoring efforts continued in 1992, their major field initiative this past year involved placement and use of screw traps in the Imnaha River to monitor juvenile chinook migration and early freshwater survival. Their main Imnaha River study objectives are to: 1) determine the timing of migration and travel time of natural vs hatchery-rearing chinook and steelhead and 2) compare survival rates between several life history stages and during migration of natural and hatchery produced juveniles. Some equipment and logistical problems slowed data collection in 1992.

The Confederated Tribes of the Umatilla Indian Reservations (CTUIR) became cooperators in the LSRCP Program for the first time in FY1987 (they were subcontractors of the Nez Perce in 1986). The CTUIR biologist, assigned to the LSRCP program, works for the LSRCP ODFW research coordinator because of the close coordination required for their joint studies in Oregon. The CTUIR initiated studies in late FY1989 and continued the same effort with 1992 funds to: 1) assess smoltification stresses of steelhead released at Wallowa FH and

spring chinook at Lookingglass FH and 2) develop scale analysis techniques with ODFW (discussed above).

The CTUIR's new initiative for 1991, which continued in 1992, involved the development of a program to evaluate the success of reestablishing a naturally reproducing population of spring chinook in Lookingglass Creek. A study plan was drafted in FY1992 and continues to undergo review and revision. The program was initiated, however, with the release of Lookingglass FH stock above the weir and the monitoring of their movements and spawning effort.

## VI. FWS COOPERATIVE PROGRAMS

The LSRCP program funded a variety of studies with other FWS stations. Most can be categorized as evaluation studies and were funded to investigate and solve specific hatchery production problems. A Seattle NFRC/IFRO study funded by the LSRCP in 1991 involved a major effort to define early life history and habitat use of juvenile Snake River fall chinook. Nearly all funding for the multi-year effort was consumed up by the BPA in FY1992, but the LSRCP program did provide some funding for equipment and supplies to the Willard Field Station.

The IFRO was funded by the LSRCP program in FY1992 to conduct hatchery monitoring and evaluation studies at Dworshak and Hagerman NFH's. IFRO's program was similar to those conducted by the state agencies; and they, in fact, closely coordinate all work with IDFG. Their study, *Evaluation and Technical Coordination for FWS LSRCP Hatchery Programs*, is a long-term effort designed to: 1) aid NFH's with the development and maintenance of a database system for hatchery management, 2) define and solve cultural and management problems affecting LSRCP success, 3) provide interagency coordination, and 4) determine fishery contribution and escapements of Dworshak and Hagerman NFH's LSRCP programs. The IFRO initiated a study in 1990 to determine optimum rearing densities for spring chinook at Dworshak NFH and continued with release of BY1990 smolts in 1992. Their study parallels IDFG's Sawtooth FH density study (discussed above under IDFG). The only new 1992 study involved a pilot study to determine the optimum time of release of Dworshak/Kooskia chinook production. Smolts were CWTed and PIT-tagged and released from early April to early May (at one-week intervals) from Kooskia NFH. Emigration was monitored and adult returns will be assessed through 1996. This study will continue next year from Dworshak.

LSRCP funds were provided to the Dworshak Fish Health Center for diagnostic activities at Dworshak and Hagerman NFH's and for health monitoring coordination between State and Federally-operated LSRCP hatcheries.

Funds were also provided to IDFG, WDF, WDW and ODFW for pathology support at all LSRCP facilities in their respective states. BPA funded a disease monitoring program at all Columbia and Snake River hatcheries until FY1991. This responsibility for all LSRCP facilities was taken over by our office last year and continued in FY1992. A meeting of all LSRCP pathologists was held

this year to establish a standardized disease inspection protocol for all of our facilities.

#### VII. OTHER COOPERATIVE PROGRAMS

IDFG, the Shoshone-Bannock Tribe, BPA, NMFS, and others are attempting to restore sockeye salmon runs to Redfish Lake. To assist in the restoration effort, facilities at Sawtooth FH are being made available for the sockeye salmon propagation program which is funded by BPA. IDFG and the LSRCP Office also entered into an informal agreement which allowed the Sawtooth FH to act as a distribution point for catchable trout stocking in surrounding waters.

ODFW utilized several raceways at Irrigon FH to hold fall chinook salmon smolts scheduled for release in eastern Oregon and to serve as a catchable trout distribution point under the state's catchable trout program.

Cooperative agreements are in place with all State agencies for the temporary loan of equipment and vehicles between programs.

#### VIII. CORPS CONSTRUCTION ACTIVITIES

The Corps of Engineers has statutory responsibility to design and construct all LSRCP facilities. The LSRCP Office does not get deeply involved in this process although we do review designs and the Corps always seeks our advice, particularly on items which would affect operation and maintenance of a new facility.

Construction of the Clearwater FH, the last hatchery under the LSRCP, was completed this fiscal year. The Clearwater FH began operation by late winter and early spring of 1992. The manager moved on station October, 1991 and the staff moved on station shortly after October. The first water to the hatchery was turned on December 30, 1991 to test the system. Several problems were noted and corrected before fish or eggs were brought to the facility. On January 23, a test lot of rainbow trout eggs were brought into the hatchery. Several more problems, which were later corrected were noted. The first production lots of chinook and steelhead eggs were received in early spring and summer.

We have been negotiating with the Corps throughout the year to develop final clean-up contracts for all facilities that have been in operation 3 or more years. Completion contracts were advertised in FY1991 for Irrigon, Lookingglass, Imnaha, Wallowa, Little Sheep Creek, Big Canyon Creek, Lyons Ferry, Tucannon, and Magic Valley. A clean-up contract items will be developed for Clearwater FH after it has been operating for several years. Emergency clean up items were completed at Clearwater FH this year. The Corps also either began or completed the following clean up contract items:

Lyons Ferry FH

Constructed dividing wall in each of two adult holding pounds.

Wallowa FH

Repaired raceways, installed handrails, storage tank, completed miscellaneous electrical repair.

Big Canyon Satellite facility

Remolded existing building to create new storage area and shop, installed handrails and completed concrete repair.

Irrigon FH

Developed third well, add emergency power to building and well #1 and 2.

Lookingglass FH

Installed chiller

Imnaha Satellite facility

Installed hand rails, concrete curb, stop waste valve, roof cover over electrical panel, jib crane at river intake, holding pond screens, constructed road to river intake structures.

Magic Valley FH

Completed grading and landscaping, modify feed bins, miscellaneous electrical repairs.

Powell Satellite facility

Miscellaneous raceway modifications, new storage building, modify existing office, house and shop building.

Crooked River Satellite facility

Add new storage cabin near raceways, install drainfield, modify river intake, miscellaneous landscaping and electrical repairs.

Clearwater FH

Repair main water supply pipeline valve.

Construction of the Eagle Disease Diagnostic Laboratory, Eagle, Idaho was completed in 1991 and it began full operation in mid 1991. The official dedication ceremony was held this fiscal year on October 25, 1991. The lab provides diagnostic services to all IDFG-operated LSRCP facilities in Idaho.

Pertinent data relating to hatchery design and construction schedules and costs are included in Table 2. Approximate facility locations are identified on the LSRCP facility map (Figure 1).

## IX. STAFFING

A total of 5.0 permanent full time (FTE) staff years are now being utilized for operation of the LSRCP Office. The newest addition to our staff Joseph Krakker, fishery biologist, came on duty September 23, 1991 at the end of the last fiscal year.



The LSRCP staff from left to right Lori Arden, Dan Herrig, Ed Crateau, Joe Krakker, Tammy Froscher

**LSRCP Boise Office employees as of September 30, 1992**

Edouard J. Crateau, LSRCP Coordinator, GM-13  
Daniel M. Herrig, Evaluation Study Coordinator, GS-12  
Joseph J. Krakker, Fishery Biologist, GS-11  
Lori R. Arden, Cooperative Agreement Assistant, GS-7  
Tammy A. Froscher, Secretary, GS-5

**X. FUTURE OUTLOOK**

Although still in its infancy, the Lower Snake River Compensation Plan Program is well underway with the last hatchery, Clearwater, just completed. The Corps' contractor Morgan and Oswood, began construction of Clearwater FH the

in spring of 1990 with completion in late 1991. All satellite facilities serving to support full hatchery production, by providing broodstock trapping and holding capabilities and smolt acclimation and release ponds, have been completed.

The Corps has in most cases done an excellent job in constructing and equipping LSRCP hatcheries and satellite facilities and, where problems have been experienced, the Corps has been willing to make the necessary repairs and changes in an attempt to help them reach their full capability. With the exception of the new facilities, the Corps advertised clean-up contracts on 11 facilities in FY1991 and 1992 and major changes and repairs were completed this year.

The adult steelhead return goals to the Snake River basin set in the original LSRCP were met in 1992 when nearly 100,000 steelhead returned to the mitigation area above Lower Granite Dam. Some difficulty is being experienced however in poor returns in some steelhead programs. Also, getting steelhead to return back at the right time and to the right place has been a problem.

As evidenced by the listing of naturally-produced fall and spring/summer chinook this year, we are experiencing difficulties in achieving programmed rates of return for hatchery chinook salmon. Changes are being planned in rearing and release strategies which we hope will improve this situation, and research, to solve outmigration and disease problems that we hope will further improve our performance, is underway. Any efforts to save stocks of naturally-produced chinook salmon listed under the ESA will also help to increase hatchery adult return rates.

Hatchery monitoring and evaluation programs are being improved, redesigned, and refined each year to assist hatcheries in providing the best rate of return of released hatchery smolts. Funding for this phase of the LSRCP program was substantially improved in FY1990 and FY1991 and again this year. Further increases in this area will be needed to continue an adequate hatchery evaluation program while protecting and enhancing naturally reproducing populations.

The LSRCP is a relatively new program with the average age of hatcheries at only 7 to 8 years and satellite facilities about 6 years. This translates to less than two full chinook life cycles and about two for steelhead.

We are optimistic about the future of the LSRCP Program and the general trends indicate increases in the return rates of steelhead which may exceed model predictions. The chinook salmon return rates and adult returns to the basin are currently below the level used to design the LSRCP facilities. Improved adult chinook return rates are expected with changes in production release strategies, increased disease treatment and prevention, and improvements in smolt emigration.

**XI. MEETINGS ATTENDED IN FY1992**

- 10/1-3/91 FWS Columbia Basin Production and Chinook Workshop Meeting, Kennewick, WA (Ed, Dan, Joe)
- 10/3-4/91 Teambuilding Workshop and Team Meeting, Portland, OR (Lori)
- 10/23/91 Meeting with Kent Hauck, Warren Groberg and Joe Lientz (Ed)
- 10/24/91 Meeting with Bill Shake and John Miller in Boise (LSRCP Staff)
- 10/24/91 Meeting in Dayton, WA (Dan)
- 10/24/91 Meeting with Jerry Dinan and Lynn Mellmer of BPA (Ed)
- 10/25/91 Dedication of Eagle Lab, Eagle, ID (Ed, Joe)
- 10/28-30/91 Evaluation Studies Coordinators Meeting, Troy, OR (Ed, Dan, Joe)
- 11/7/91 Hearing on water rights for Magic Valley FH, Hagerman NFH (Ed)
- 11/12-14/91 Teambuilding Workshop and Team Meeting, Redding CA (Lori)
- 11/14-15/91 Dworshak Coordination Meeting, Dworshak NFH (Joe)
- 11/18-19/91 Hatchery Evaluation Vision Meeting, Little Canyon Lodge, ID (Dan)
- 11/26-27/91 Magic Valley FH and Hagerman NFH Inventories, (Tammy)
- 12/3-5/91 Chinook Workshop, Redding, CA (Joe)
- 12/11/91 Meeting with BPA (Ed, Dan)
- 12/13/91 Meeting with Evaluation people to discuss FY1992 studies of steelhead impacts on listed salmon, LaGrande, OR (Dan, Joe)
- 12/17/91 ESA Section 10 Meeting, Portland, OR (Dan)
- 1/9-10/92 Evaluation Team Meeting, LaGrande, OR (Joe)
- 1/15/92 Teach a class at the Fisheries Academy, Harpers Ferry, WVA (Ed)
- 1/22/92 Meeting with Dorothy Extein and WDF accounting personnel regarding payments, Olympia, WA (Lori)
- Conference call with Internal Conference Review Team - 1992 winter and spring season Columbia River fisheries (Ed)
- 1/23/92 Meeting with WDW accounting personnel, John Kerwin and Butch Harty regarding payments, Olympia, WA (Lori)

1/24/92 Idaho River Symposium, Boise, ID (Ed)

2/4-5/92 ESA Seminar with cooperators, Tribes and NMFS, Boise, ID (Ed, Dan, Joe)

2/5/92 Meeting with Dan Diggs, Boise, ID (Ed, Dan, Joe)

2/6/92 Vision Management Team Meeting, Portland, OR (Dan)

2/7/92 Vision Team Meeting, Pendleton, OR (Lori)

2/11-13/92 FWS Management Assistant Subactivity Team Meeting, Denver, CO (Ed)

2/18/92 Fish production meeting, LaGrande, OR (Ed)

2/19/92 Met with Ray Jones from IFRO, Boise, ID (Dan)

2/20/92 Hagerman Coordination Meeting, Hagerman NFH (Ed, Joe)

2/21/92 Meeting with Lynn Mellmer and Jerry Dinan, BPA regarding changes for FY1992, Boise, ID (Lori)

2/24-25/92 Recovery Team Meeting, Portland, OR (Dan)

2/25/92 Information meeting with cooperators on Irrigon FH and Umatilla NWR water system, Pendleton, OR (Ed)

Presentation to ESA Recovery Team, Portland, OR (Dan)

2/26-27/92 Chinook Smolt Survival Workshop, Moscow, ID (Dan, Joe)

Tour Clearwater FH with IDFG and COE, (Ed)

3/4/92 Meeting with Tom Rogers, IDFG Office, Boise, ID (Joe)

3/6/92 Meeting on chinook/coho workshop, Boise, ID (Joe)

3/11-13/92 American Fisheries Society meeting, McCall, ID (Dan, Joe)

3/16-18/92 FWS Management Assistance Subactivity Review Team, Denver, CO (Ed)

3/19/92 Attended Dworshak NFH Coordination meeting, Dworshak NFH (Joe)

3/23-27/92 Pacific Fisheries Biologist Meeting, Blaine, WA (Joe)

4/10-11/92 Idaho Steelhead and Salmon Unlimited Conference, Boise, ID (Ed, Dan, Joe)

4/13-17/92 Regional Project Leaders Meeting, Portland, OR (Ed, Dan)

4/27-5/2/92 FWS Management Assistance Subactivity Review Team, Minneapolis, MN  
(Ed)

Vision Team Meeting, Portland, OR (Lori)

Meeting with IDFG Research Chief, Boise, ID (Dan)

4/28/92 Meeting with Mike Bowen on brochure contract, Portland, OR (Lori)

4/29/5/1/92 Conduct a class for Module II at Fisheries Academy, (Joe)

Meeting with IDFG, IPCo, BPA to discuss ESA tagging costs, Boise,  
ID (Dan)

5/4-5/92 Meeting with RO personnel, Portland, OR (Dan)

5/5/92 Vision Management Team Meeting, Portland, OR (Dan)

5/6/92 Meeting with RO Personnel, Portland, OR (Ed)

Meeting with IDFG personnel on Powell weir, Lewiston, ID (Dan)

5/7/92 Attend Vision Teambuilding Training Class, Clarkston, WA (Ed, Dan,  
Joe, Tammy)

5/11-16/92 FWS Management Assistance Subactivity Review Team, Boston, MA (Ed)

5/26/92 Meeting with CRITFC, Portland, OR (Ed, Dan, Joe)

6/1-5/92 FWS Management Assistant Subactivity Review Team, Washington, D.C.  
(Ed)

6/2/92 Employee Counseling Service meeting, Boise, ID (LSRCP Staff)

6/8-10/92 Tour of South Fork Trap, Bear Valley Creek, Sawtooth FH and East  
Fork (Dan, Joe)

6/11/92 BPA PIP meeting, Boise, ID (Ed, Dan, Joe)

6/15/92 Meeting with coho-chinook symposium, Boise, ID (Joe)

6/17/92 Eagle Lab property inventory (Tammy)

6/18/92 Columbia River Coordinators Meeting, Portland, OR (Ed)

6/22/92 Tour Wallowa & Lookingglass FH's and met at Irrigon FH on water  
supply problems with all agencies (Ed, Joe)

6/22-24/92 Irrigon, Lookingglass, Wallowa FH property inventories (Lori)

6/26/92 Visit Imnaha satellite facility, Nez Perce Tribe fish traps and attend ESC meeting, Imnaha, OR (Dan)

6/29-30/92 Hatchery Evaluation Vision team meeting, Portland, OR (Dan)

7/1-2/92 Meeting with RO personnel and NMFS, Portland, OR (Ed, Dan, Joe)

7/6/92 COE drawdown workshop, Boise, ID (Ed, Dan, Joe)

7/9/92 Meeting with Dave Alfs on brochures, Boise, ID (Ed)

7/14/92 COE drawdown meeting, Boise, ID (Ed, Dan, Joe)

7/17/92 BY1992 chinook egg allocation meeting, Clearwater FH (Dan)  
Meeting with Bill Hutchinson regarding Salmon River project

7/20-24/92 FWS Management Assistance Subactivity Review Team, Denver, CO (Ed)

7/21/92 Meeting at Clearwater FH to discuss FY1992 broodstock collection (Dan)

7/28-31/92 WDF and WDW property inventories (Tammy)

7/29-31/92 Hatchery Evaluation Coordinator's summer meeting, Imnaha, OR (Dan, Joe)

8/4/92 Meet with Joe McMichael (COE) to discuss process for a facility at S pt. Creek, Walla Walla, WA (Ed)

8/5/92 Columbia River Coordinators Meeting, Portland, OR (Ed)

8/6/92 NMFS ESA Coordination Meeting, Portland, OR (Ed, Dan)

8/12-14/92 McCall and Sawtooth FH property inventories (Tammy)

8/17-21/92 FWS Management Assistant Subactivity Review Team, Washington, D.C. (Ed)

8/22/92 Clearwater FH Dedication, Orofino, ID (Dan, Lori, Tammy)

8/26/92 Meeting with Bill Hutchinson, Dave Cannamela, Ed Bowles regarding upcoming meeting with NMFS in Portland, OR (Ed, Dan, Joe)

8/31/92 Meeting with ESA Recovery Team at NMFS, Portland, OR (Ed, Dan, Joe)

9/1-3/92 BPA Meeting, Portland, OR (Ed, Dan, Joe)

9/14/92 Chinook/Coho workshop at IDFG, Boise, ID (Joe)  
Meeting with IDFG regarding Section 7, Boise, ID (Ed, Dan, Joe)

9/15/92 Hagerman NFH Coordination Meeting, Hagerman, ID (Ed)

9/16-17/92 Section 7 Meetings with WDF and WDW, Olympia, WA (Ed, Dan, Joe)

9/21-25/92 FWS Management Subactivity final review meeting, Washington, D.C.  
(Ed)

9/23/92 Early Mortality Work Group, LaGrande, OR (Dan, Joe)

9/24/92 ESA Section Meeting with NPT, IFRO, CTUIR, Lewiston, ID (Dan)

9/28-30/92 Chinook, Coho Workshop, Boise, ID (Ed, Dan, Joe)

### **XIII. TRAINING**

Dan Herrig

Instructor Training, Phoenix, AZ - 2/10-14/92  
CPR Training - 3/20/92

Lori Arden

Introduction to Microcomputer, BSU - 10/21-23/92  
Cooperative Agreement Training, Denver, CO - 12/18-20/92  
CPR Training - 3/20/92  
Long Range Career and Retirement Planning, Reno, NV - 4/14-16/92

Tammy Froscher

Dbase III Plus, Boise, ID - 2/12/92  
CPR Training - 3/6/92  
Financial Management Workshop, Dallas, TX - 8/31/92

### **XIII. AVAILABLE REPORTS**

**U.S. Fish and Wildlife Service - Operation & Maintenance**

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- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1981 (81127). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
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- Bjornn, T. C. and R. R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1985. Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
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- Bruhn, D. 1983. Annual Report, FY 1983, Hagerman National Fish Hatchery. U. S. Fish and Wildlife Service, Hagerman, Idaho. 8 pp.
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- Bruhn, D. 1987. Annual Report, FY 1986, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho.
- Bruhn, D. 1988. Annual Report, FY 1987, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 13 pp.
- Bruhn, D. 1988. Annual Report, FY 1988, Hagerman National Fish Hatchery. U.S. Fish Wildlife Service, Hagerman, Idaho. 18 pp.

- Bruhn, D. 1989. Annual Report, FY 1989, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 19 pp.
- Bruhn, D. 1990. Annual Report, FY 1990, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 18 pp.
- Bruhn, D. 1991. Annual Report, FY 1991, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 20 pp.
- Hesson, C.P., J. C. Lientz, G. Pratschner, and R. B. Roseberg. 1986. ELISA/FAT Comparisons for Bacterial Kidney Disease (BKD). U.S. Fish and Wildlife Service, Dworshak National Fish Hatchery, Ahsahka, Idaho. 12 pp.
- Lientz, J. 1988. Annual Report FY 1987, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 30 pp.
- Lientz, J., C. Hesson, and E. Steiner. 1988. Annual Report FY 1988, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 10 pp.
- Lientz, J. 1989. Annual Report FY 1989, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 53 pp.
- Lientz, J. 1990. Annual Report, FY 1990, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 65 pp.
- Olson, W. 1982. Annual Report, FY 1981, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 47 pp.
- Olson, W. 1983. Annual Report, FY 1982, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 47 pp.
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- Olson, W. 1985. Annual Report, FY 1984, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 50 pp.
- Olson, W. 1986. Annual Report, FY 1985, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 51 pp.
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- Olson, W. 1988. Annual Report, FY 1988, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 65 pp.

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- Olson, W. 1991. Annual Report FY 1991, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 41 pp.
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- Bjornn, T.C., C.M. Moffitt, J.D. Varley, D. Diggs, R. Austin, J. McClain, and J. Lientz. 1984. Annual Progress Report, Bacterial Kidney Disease in Chinook Salmon as Related to Hatchery Practices and Methods, 1982-1983 (0009-1514). U.S. Fish and Wildlife Service, Boise, Idaho. 68 pp.
- Ketola, G. 1985. Study of the Etiology of Early Mortality in Spring Chinook Salmon (0009-1500). Tunnison Lab. Fish Nutrition. U.S. Fish and Wildlife Service, Cortland, New York. 50 pp.
- Miller, W. 1989. Annual Report, FY 1988, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 30 pp.
- Miller, W. 1989. Annual Report, FY 1989, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 37 pp.
- Miller, W. 1990. Annual Report, FY 1990, Idaho Fishery Resource Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 35 pp.
- Miller, W. 1992. Annual Report, FY 1991, Idaho Fishery Resources Office, U.S. Fish and Wildlife Service, Ahsahka, Idaho. 21 pp.
- Miller, W.H. and D. Diggs. 1985. Annual Report, FY 1984, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 4 pp.
- Miller, W.H. and D. Diggs. 1985. Annual Report, 1985, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 6 pp.
- Miller, W.H. and D. Diggs. 1986. A Review of Coded-wire Tagged Fish Released From Dworshak, Kooskia, and Hagerman NFH's, Idaho, 1976-1986. U.S. Fish and Wildlife Service, Dworshak Fisheries Assistance Office, Ahsahka, Idaho. 101 pp.
- Miller, W.H. and S.M. Noble. 1985. IHN-Water Supply Study, Dworshak National Fish Hatchery, 1985. U.S. Fish and Wildlife Service, Fisheries Assistance Office, Ahsahka, Idaho. 20 pp.

Miller, W., Coley, T., and R. Roseberg. 1988. Annual Report, FY 1987, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho 32 pp.

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Moffitt, C.M. and J.A. Schreck. 1988. Accumulation and depletion of orally administered erythromycin thiocyanate in tissues of chinook salmon. Transactions of the American Fisheries Society. 117:394-400.

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Ainsworth, B. 1988. Magic Valley Steelhead Hatchery, Annual Report, 1986 Brood Year. Idaho Dept. of Fish and Game, Filer, Idaho. 4 pp.

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Alsager, R. 1989. Sawtooth Fish Hatchery, Annual Report FY 1989. Idaho Dept. of Fish and Game, Stanley, Idaho. 8 pp.

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- Frew, T. 1986. Annual Report, McCall Summer Chinook Salmon Hatchery, 1984 Brood Year. Idaho Dept. of Fish and Game, McCall, Idaho. 26 pp.
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- Hutchinson, W. G. 1983. Annual Report, McCall Hatchery, 1 Oct. 1982 - 30 Sept. 1983, (80002). Idaho Dept. Fish and Game, McCall, Idaho. 3 pp.
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- Hutchinson, W. G. 1985. Annual Report, McCall Summer Chinook Hatchery, 1 Oct. 1981 - 30 Sept. 1982 (80002). Idaho Dept. Fish and Game, McCall, Idaho. 30 pp.
- McGehee, J. 1989. Clearwater Fish Hatchery, Annual Report, FY 1989. Idaho Dept. of Fish and Game, Kamiah, Idaho. 4 pp.
- McGehee, J. 1990. Clearwater Fish Hatchery, Annual Report, 1990. Idaho Dept. of Fish and Game, Kamiah, Idaho. 11 pp.
- McGehee, J. 1991. Clearwater Fish Hatchery, Annual Report, 1991. Idaho Dept. of Fish and Game, Kamiah, Idaho. 4 pp.
- McPherson, D. 1989. McCall Summer Chinook Hatchery Annual Report, FY 1989. Idaho Dept. of Fish and Game, McCall, Idaho. 6 pp.
- McPherson, D. 1990. McCall Summer Chinook Hatchery, Annual Report, FY 1990. Idaho Dept. of Fish and Game, McCall, Idaho. 4 pp.
- McPherson, D. 1991. McCall Summer Chinook Hatchery, Annual Report, FY 1991. Idaho Dept. of Fish and Game, McCall, Idaho. 4 pp.
- Moore, B. 1983. Annual Report, FY 1982, Sawtooth Salmon Trap. Idaho Dept. Fish and Game, Stanley, Idaho. 5 pp.
- Rogers, T. L. 1984. Annual Report Sawtooth Hatchery, 1 Oct. 1982 - 30 Sept. 1983 (83103). Idaho Dept. Fish and Game, Boise, Idaho. 10 pp.
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- Rogers, T. L. 1986. Sawtooth Fish Hatchery and East Fork Satellite, 1984 Chinook Salmon Brood Year Report and 1985 Steelhead Brood Year Report. Idaho Dept. Fish and Game, Stanley, Idaho. 22 pp.
- Rogers, T. 1988. Sawtooth Fish Hatchery and East Fork Satellite, 1985 Spring Chinook Salmon and 1986 Steelhead Brood Year Reports. Idaho Dept. of Fish and Game, Stanley, Idaho. 26 pp.
- Vaughn, R. L. 1984. Annual Report, FY 1983, Magic Valley Steelhead Hatchery. Idaho Dept. Fish and Game, Filer, Idaho. 5 pp.
- Vaughn, R. L. 1985. Annual Report Magic Valley Steelhead Hatchery, 1 Oct. 1983 - 30 Sept. 1984 (84044). Idaho Dept. Fish and Game, Boise, Idaho. 6 pp.
- Vaughn, R. L. 1986. Annual Report, FY 1985, Magic Valley Steelhead Hatchery. Idaho Dept. Fish and Game, Filer, Idaho. 4 pp.
- Wimer, L. 1985. Annual Report, McCall Summer Chinook Salmon Hatchery, 1 Oct. 1979 - 30 Sept. 1980 (80002). Idaho Dept. Fish and Game, McCall, Idaho. 25 pp.

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- Ball, K. 1986. Evaluation of Hatchery - Wild Steelhead Harvest for September 1, 1984 through November 30, 1984 (84133). Idaho Dept. Fish and Game, Salmon, Idaho. 38 pp.
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- Ball, K. 1988. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest for October 1, 1985 to December 31, 1986 (86505). Idaho Dept. of Fish and Game, Salmon, Idaho. 99 pp.
- Ball, K. 1989. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest for October 1, 1986 to December 31, 1987 (87501). Idaho Dept. of Fish and Game, Salmon, Idaho. 84 pp.
- Ball, K. 1990. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1987 to December 31, 1988 (88501). Idaho Dept. of Fish and Game, Salmon, Idaho. 75 pp.
- Ball, K. 1991. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, Oct. 1, 1988 to Dec. 31, 1989 (89501). Idaho Dept. of Fish and Game, Salmon, ID. 73 pp.

- Ball, K. 1992. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1989 to December 31, 1990 (89501). Idaho Dept. of Fish and Game, Salmon, Idaho. 112 pp.
- Cannamela, D., S. Elam, and T. Cochnauer. 1991. Fish Hatchery Evaluations- Idaho, October 1988 through September 1989 (89501). Idaho Dept. of Fish and Game, Boise, Idaho. 64 pp.
- Cannamela, D. 1991. Fish Hatchery Evaluations - Idaho, October 1, 1989 through September 30, 1990 (90502). Idaho Dept. of Fish and Game, Boise, Idaho. (Draft).
- Cochnauer, T. and S. Elam, 1990. Fish Hatchery Evaluations - Idaho for July 1, 1987 through September 30, 1988 (87501 and 88501). Idaho Dept. of Fish and Game, Boise, Idaho. 53 pp.
- Cochnauer, T. and J. Norton, 1990. Coded Wire Tag Recovery - Idaho (88501). Idaho Dept. of Fish and Game, Lewiston, Idaho. 228 pp.
- Elam, S. and T. Cochnauer. 1990. Coded Wire Tag Recovery - Idaho, July 1, 1988 to Sept. 30, 1989 (89501). Idaho Dept. of Fish and Game, Lewiston, Idaho. 271 pp.
- Hall-Griswold, J. and T. Cochnauer, 1989. Identification of LSRCP Hatchery-Reared Fish Stocks, Annual Report, FY 1987 (87501). Idaho Dept. of Fish and Game, Lewiston, Idaho. 132 pp.
- Hutchinson, W. G., and A. J. Chacko. 1985. Evaluation of Five Diets on the Occurrence of the Spring Thing. Idaho Dept. Fish and Game, McCall, Idaho. 15 pp.
- Hutchinson, W. G. 1986. McCall Summer Chinook Nutrition Evaluation Study, Final Report. Idaho Dept. Fish and Game, McCall, Idaho. 9 pp.
- Partridge, F. E. 1984. Fish Hatchery Evaluations - Idaho, Oct. 1982 - Sept. 1983 (83268). Idaho Dept. Fish and Game, Boise, Idaho. 52 pp.
- Partridge, F. E. 1985. Effects of Steelhead Trout Smolt Size on Residualism and Adult Return Rates (83065). Idaho Dept. Fish and Game, Boise, Idaho. 26 pp.
- Rohrer, R. L. and F. E. Partridge. 1985. Fish Hatchery Evaluations Idaho, 1 Sept. 1983 - 30 Sept. 1984 (84098). Idaho Dept. Fish and Game, Boise, Idaho. 24 pp.
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- Rohrer, R. 1986. Fish Hatchery Evaluations - Idaho for October 1, 1985 through June 30, 1986 (86505). Idaho Dept. of Fish and Game, Boise, Idaho. 19 pp.
- Rohrer, R. 1988. Fish Hatchery Evaluations - Idaho for July 1, 1986 through June 30, 1987 (86505 and 87501). Idaho Dept. of Fish and Game, Boise, Idaho. 27 pp.
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- Thurow, R. 1987. Evaluation of the South Fork Salmon River Steelhead Trout Fishery Restoration Program, Completion Report (86505). Idaho Dept. of Fish and Game, Boise, Idaho. 155 pp.
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- Bauer, J. 1986. FY 1985 Report of Operations of Irrigon, Wallowa and Lookingglass FH's. Oregon Dept. Fish and Wildlife, Portland, Oregon. 5 pp.
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Carmichael, R.W., R.T. Messmer, and B.A. Miller. 1990. Annual Progress Report, Evaluation of LSRCP Facilities in Oregon, July 1, 1987 to June 30, 1988 (87513). Oregon Dept. of Fish and Wildlife, Portland, Oregon. 42 pp.

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**Washington Department of Fisheries - Operations and Maintenance**

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Table 1. LOWER SNAKE RIVER COMPENSATION PLAN ACTIVITIES FOR FY 1992.

INSTALLATION/PROGRAM	FUNDING LEVELS	SPECIES	TYPE	FISH RELEASED	
				NUMBERS	POUNDS
<b>STATE OF IDAHO</b>					
McCall FH	\$484,236	SuCS			
South Fork Satellite			Smolts	901,500	37,915
Sawtooth FH	\$832,726	SpCS	Smolts	1,332,456	42,982
			Fingerlings	1,496	34
East Fork Satellite		SpCS	Smolts	79,300	3,224
Magic Valley FH	\$711,965	STT	Smolts	2,160,257	498,804
Clearwater FH	\$1,066,329				
Satellite Facilities		SpCS	Fingerlings	832,941	26,158
Eagle Lab	\$232,462				
<b>STATE OF OREGON</b>					
Lookingglass FH	\$732,340	SpCS	Smolts	950,868	55,692
Imnaha Satellite			Smolts	262,500	16,267
Irrigon FH	\$1,123,867	STT	Smolts	262,863	50,709
		STT	Fingerlings	243,941	3,719
Wallowa FH		STT	Smolts	668,920	139,065
Little Sheep Creek		STT	Smolts	277,704	47,146
Big Canyon Satellite		STT	Smolts	422,748	86,133
<b>STATE OF WASHINGTON</b>					
Lyons Ferry FH (WDF)	\$709,303	SpCS	Smolts	85,797	7,798
		FCS	Smolts	689,601	81,677
Lyons Ferry FH (WDW)	\$1,001,073	STT	Smolts	621,044	142,551
		STT	Fingerlings	161,416	4,176
		RBT	Catchables	98,826	55,735
			Fingerlings	389,187	16,608
Tucannon FH Satellite	\$331,236	RBT	Catchables	145,226	56,157
			Fingerlings	99,120	440
		STT	Smolts	9,958	2,075
<b>FISH AND WILDLIFE SERVICE</b>					
Hagerman NFH	\$553,700	STT	Smolts	1,453,058	314,255
			Fingerlings	298,525	5,151
Dworshak NFH	\$285,180	SpCS	Smolts	1,564,199	93,752
Dworshak FHC	\$57,820				
Columbia River Coord.	\$38,500				
Seattle NFRC:					
FCS Migrant Study	\$35,000				
ESA Tagging	\$249,060				
Dworshak SpCS Tagging (ESA)	\$33,470				
YCC Program	\$100,000				
Regional Office	\$369,257				
LSRCP Management/Coord.	\$280,000				
<b>EVALUATION STUDIES</b>	<b>\$1,947,717</b>				
<b>TOTAL OBLIGATED</b>	<b>\$11,175,241</b>				
				<b>SPECIES SUMMARY:</b>	
		FCS	Smolts	689,601	81,677
		SuCS	Smolts	901,500	37,915
		SpCS	Smolts	4,275,120	219,715
		SpCS	Fingerlings	834,437	26,192
		STT	Smolts	5,876,552	1,280,738
			Fingerlings	703,882	13,046
		RBT	Catchables	244,052	111,892
			Fingerlings	488,307	17,048
<b>TOTALS</b>				<b>14,013,451</b>	<b>1,788,223</b>

RBT - rainbow trout/FCS - fall chinook salmon/SpCS - spring chinook salmon/SuCS - summer chinook salmon  
 STT - steelhead trout.

Table 2. Pertinent Data for Lower Snake River Fish and Wildlife Compensation Plan Fish Hatchery Facilities.

Hatchery (Operator) <sup>a</sup>	Fish Type	Pound	Total Cost (\$1,000)	Satellite Facilities	Date of Completion
Lookingglass (ODFW)	Spring Chinook	69,600	\$ 8,993	Big Canyon Ck. Imnaha	Nov. 82
			\$ 2,763		Apr. 87
			\$ 1,525		Jul. 89
Irrigon/Wallowa (ODFW)	Steelhead	279,600	\$15,646	(Wallowa) <sup>b</sup> Little Sheep Ck (Big Canyon Ck)	Oct. 85
			\$ 3,230		May 85
			\$ 2,545		Aug. 87
Lyons Ferry:			\$31,831 <sup>c</sup>		
Phase I (WDW)	Steelhead	116,400			Nov. 83
	Trout	45,000			
Phase II (WDF)	Trout	41,000	\$ 801	Cottonwood	Feb. 85
			\$ 1,182	Dayton Pond	Oct. 86
	Trout	41,000	\$ 4,235	Tucannon FH	Nov. 84
			\$ 230	Curl Lake	Feb. 85
Phase II (WDF)	Fall Chinook	101,800			Nov. 84
	Spring Chinook	8,800			
Sawtooth (IDFG)	Spring Chinook	149,000	\$13,543	E.Fk. Salmon R.	Jan. 85
			\$ 2,067		Nov. 83
Dworshak (FWS)	Spring Chinook	70,000	\$ 2,234		Nov. 82
Clearwater (IDFG)	Steelhead	350,000	\$37,128	Red River Crooked River Powell	Dec. 91
			Spring Chinook		91,300
	\$ 2,054	May 90			
	\$ 2,320	Aug. 89			
Magic Valley (IDFG)	Steelhead	291,500	\$19,520	(Sawtooth ) (East Fork)	Aug. 87
Hagerman (FWS)	Steelhead	340,000	\$ 9,801	(Sawtooth) (East Fork)	Apr. 84
McCall (IDFG)	Summer Chinook	61,300	\$ 5,741	S.Fk. Salmon R.	Sep. 81
			\$ 1,149		Jul. 80
Eagle Lab (IDFG)	Disease Diagnostic		\$ 1,300		Apr. 89

<sup>a</sup> ODFW - Oregon Department of Fish and Wildlife  
 WDW - Washington Department of Wildlife  
 WDF - Washington Department of Fisheries  
 IDFG - Idaho Department of Fish and Game  
 FWS - U.S. Fish and Wildlife Service

<sup>b</sup> Parentheses used when dual-use hatchery/satellite is listed a second or third time.

<sup>c</sup> Total cost of Lyons Ferry Phases I and II

Table 3. Hatchery or trap rack returns to LSRCP hatcheries operating in 1992.

Species/Hatchery	Hatchery/Trap Returns	
	Adults	Jacks
Summer Chinook		
McCall FH/South Fork	2,645	203
Spring Chinook		
Clearwater FH <sup>1</sup>	514	23
Sawtooth FH	361	26
East Fork Trap	51	14
Lookingglass FH	806	11
Imnaha Trap	767	77
Big Canyon Trap	85	4
Dworshak NFH <sup>2</sup>	675	
Lyons Ferry/Tucannon FH	509	38
Fall Chinook		
Lyons Ferry FH <sup>3</sup>	968	593
Steelhead Trout		
Irrigon FH:		
Wallowa FH	2,644	
Little Sheep Trap	789	
Big Canyon Trap	542	
Lyons Ferry FH <sup>4</sup>	2,035	
Hagerman NFH/Magic Valley FH <sup>5</sup>	1,861	

<sup>1</sup> Returns to Powell, Red River and Crooked River traps only.

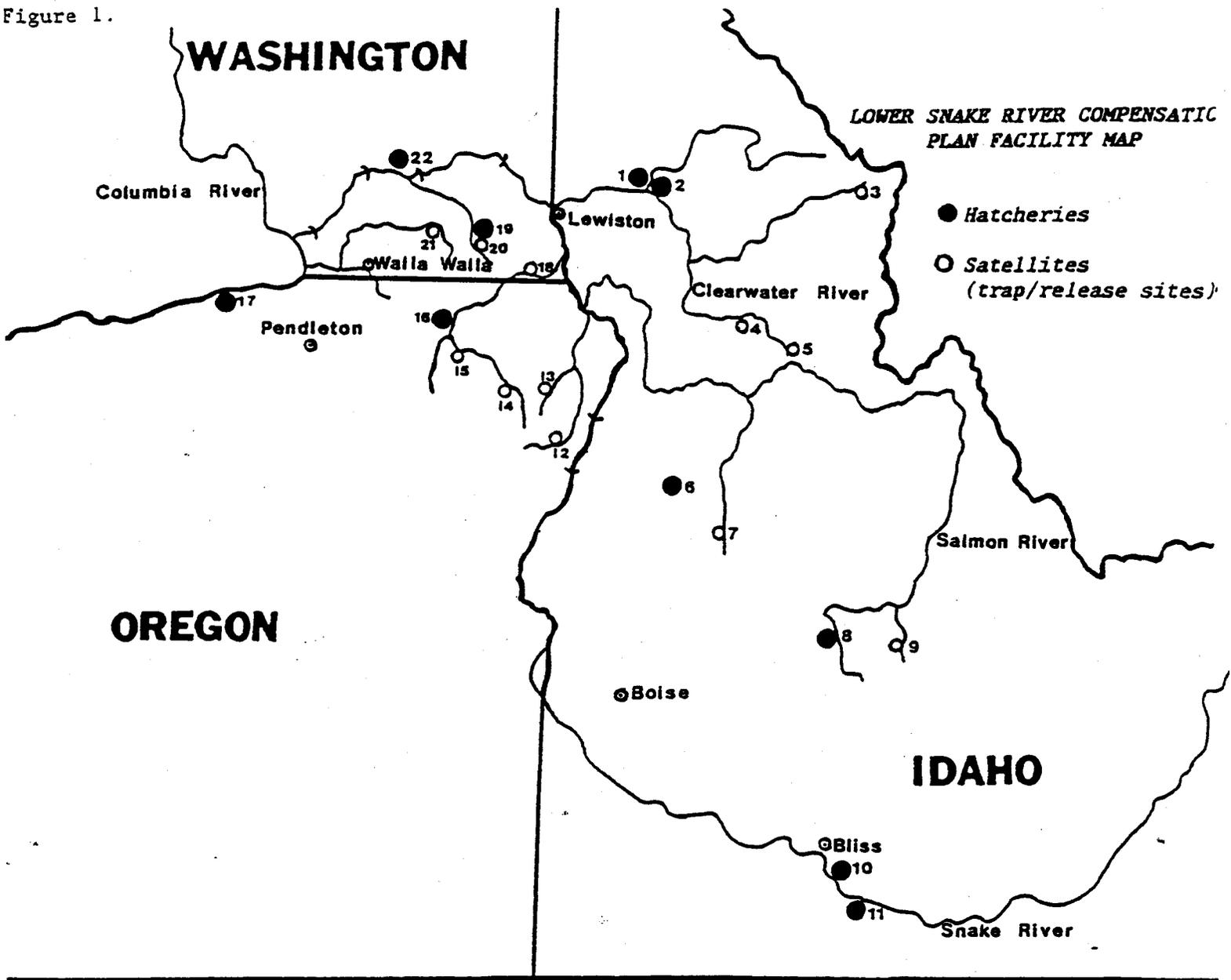
<sup>2</sup> Dworshak and Kooskia returns.

<sup>3</sup> Includes ladder returns plus Ice Harbor and Lower Granite trapping.

<sup>4</sup> Ladder is only open for short period, many captures are strays.

<sup>5</sup> Includes returns to East Fork, Sawtooth FH racks.

Figure 1.



Operating Agencies

Idaho Department of Fish & Game

Oregon Department of Fish & Wildlife

- 1. Clearwater FH
- 3. Powell
- 4. Crooked River
- 5. Red River
- 6. McCall FH
- 7. South Fork Salmon River
- 8. Sawtooth FH
- 9. East Fork Salmon River
- 11. Magic Valley FH

- 12. Imnaha
- 13. Sheep Creek
- 14. Wallowa FH
- 15. Big Canyon
- 16. Lookingglass FH
- 17. Irrigon FH

Washington Department of Fisheries

- 22. Lyons Ferry FH - Salmon

U.S. Fish and Wildlife Service

Washington Department of Wildlife

- 2. Dworshak NFH Expansion
- 10. Hagerman NFH

- 18. Cottonwood Creek
- 19. Tucannon FH
- 20. Curl Lake
- 21. Dayton Pond
- 22. Lyons Ferry FH - Steelhead