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ANNUAL REPORT
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LOWER SNAKE RIVER
COMPENSATION PLAN OFFICE

Boise, Idaho

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INDEX

	PAGE
I. INTRODUCTION	1
II. PROGRAM HIGHLIGHTS	2
III. FISH HATCHERY OPERATIONS	4
IV. LSRCP OFFICE OPERATIONS	10
V. EVALUATION STUDIES	10
VI. FWS COOPERATIVE PROGRAMS	15
VII. OTHER COOPERATIVE PROGRAMS	15
VIII. CONSTRUCTION ACTIVITIES	16
IX. MEETINGS	17
X. TRAINING	19
XI. STAFFING	20
XII. AVAILABLE REPORTS	20
Table 1. LOWER SNAKE RIVER COMPENSATION PLAN HATCHERY ACTIVITIES	29
Table 2. LOWER SNAKE RIVER COMPENSATION PLAN EVALUATION STUDY ACTIVITIES	30
Table 3. LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN FISH HATCHERY FACILITIES DATA	31
Table 4. ESTIMATED CONTRIBUTION OF THE LSRCP FROM 1982 THROUGH 1986	32
Figure 1. LOWER SNAKE RIVER COMPENSATION PLAN FACILITY MAP	33

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 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, and FWS; it stated that the FWS would budget for and administer O&M 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 of the Chief of Engineers, dated March 6, 1985. The Chief's report confirmed the 1977 NMFS/FWS agreement on Page 2, Section 4.d, "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 report noted 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 proposes to transfer fee title of LSRCP hatcheries and satellite fish facilities to the FWS as they are completed and fully operational.

The Corps' estimated-costs for construction of the authorized LSRCP off-project fisheries facilities (hatcheries and related facilities) are \$177 million; the FWS estimated costs for annual O&M are \$9.5 million. All anadromous fisheries compensation and most resident fisheries compensation are allocated to project power costs and are reimbursed to the U.S. Treasury from Bonneville Power Administration (BPA) power revenues.

EX-1001 1144 - July 31, 1984

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 requires expansion or construction of twelve hatcheries and eleven satellite facilities in Idaho, Oregon, and Washington. Idaho Department of Fish and Game (IDFG) will operate four hatcheries (when Clearwater Fish Hatchery is completed), Oregon Department 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 FY 1987

The LSRCP Coordinator and Evaluation Studies Coordinator attended the Irrigon FH dedication held on July 25, 1987. About 75 people attended the ceremonies that included speeches by Bill Shake (Acting FWS Assistant Regional Director - Fisheries Resources), Colonel Royce (Corps Walla Walla District Commander), Rollie Russo (ODFW Assistant Director), Ray Hill (ODFW Irrigon FH Manager), and a county official.

Visitor displays at most of the hatcheries are completed and "open for business". Sawtooth FH, located in Sawtooth National Recreation Area, may be the most heavily visited facility. In 1986 about 12,000 people signed the register; over 22,000 actually visited and toured the hatchery.

On October 20, 1986, LSRCP and R.O. FWS personnel met with representatives of the Steven's Treaty Tribes (Nez Perce, Umatilla, Yakima, Warm Springs) and the Columbia River Intertribal Fish Commission (CRITFC) to discuss the overall role of the tribes in the LSRCP Program. Although considerable interest was expressed by all four tribes and the CRITFC, funding is limited, and only those tribes with the majority of the compensation area in their ceded area (i.e. the Nez Perce and Umatillas) have become involved in the program.

Oregon evaluation personnel jaw-tagged about 240 Wallowa stock steelhead adults as they migrated past Lower Granite Dam to determine hatchery return rates and angler exploitation. About 12 percent returned to Wallowa FH and another 8 percent were returned by anglers (a \$5 award was given). Because of the concern for the substantial unaccounted for loss of fish (about 80 percent), ODFW and WDW will radio tag about 70 adults in fall and winter 1987 to determine when and where fish are moving above Lower Granite. Another concern is that Wallowa stock steelhead are not returning

providing a fishery. Wild Grande Ronde fish return in the early to mid-fall period and are thus more available to anglers.

Early in 1987 Rapid River and Imnaha spring chinook at Lookingglass FH were found to have cytoplasmic inclusions in their red blood cells and were diagnosed as having a VEN-like (viral erythrocytic necrosis) disease. The fish suffered from anemia and losses resulted from secondary infections of cold-water disease bacteria and fungus. Further study indicated the disease was not VEN but EIBS (erythrocytic inclusion body syndrome). ODFW personnel have found that after two weeks of warmer water (12°C) fish begin to recover, new red blood cells are produced, and those who survive have a life-long immunity. More wells at Lookingglass FH may be needed to combat the problem using this warm water therapy approach.

Manganese-induced toxicity is believed to be the cause of higher than normal mortality rates of fall chinook at Lyons Ferry FH. The losses are particularly high considering the light loading densities. WDF will experiment in 1988 with loading densities that would occur with the hatchery at full capacity to try to estimate the full potential of the manganese problem.

This was the first year of combined on-station vs. transported releases of yearling fall chinook from Lyons Ferry. Tagged yearlings were released directly into the Snake River in mid-April while other tagged fish were barged from the hatchery to below Ice Harbor. On-station and transported releases of "zero-age" fall chinook occurred in early June. Eventually the hatchery will determine whether zero, yearling, or a combination release is the best for the hatchery's operation.

An experimental release of "zero-age" spring chinook releases was made at Lookingglass FH. The 36 fish per pound lot were reared at Irrigon FH on 53 to 58° F well water and acclimated one week at Lookingglass FH before release.

An evaluation report from IDFG provided some data on LSRCP returns to Idaho's fishery. During the 1985 to 1986 sport season, adult steelhead originating from LSRCP facilities provided 44 percent of Idaho's total steelhead harvest and 78 percent of the Salmon River harvest. About 13,500 LSRCP-produced steelhead were harvested and 3,860 returned to hatchery racks.

This was the first year of spring chinook releases from the Lyons Ferry program. About 12,900 chinook migrated in early April from the adult holding pond (which serves as the final rearing pond) at Tucannon FH into the Tucannon River. The releases were entirely of progeny of wild, native stock. The smolts passed the WDF's juvenile trap 39 km downstream after four days.

Several LSRCP hatcheries recorded record adult returns in 1987. Dworshak NFH had a record return of 2,490 spring chinook adults back to their ladder but only one or two jacks. (Jack counts were

also very low at most other LSRCP spring chinook facilities.) McCall's summer chinook returns were the highest recorded with 2,321 adults and 384 jacks entering the trap; 867 of these were passed upstream to spawn naturally. In Oregon, Lookingglass FH also had a record spring chinook run of 2,545 adults. Of those, 1,600 were outplanted and 294 females were spawned. Fall chinook returns to Lyons Ferry were the highest since the program began with 3,267 adults and 543 jacks returning the hatchery or trapped at Ice Harbor Dam. The record egg take was about 6.9 million.

III. FISH HATCHERY OPERATIONS

Below are brief summaries of hatchery activities in FY 1987. Tables 1, 3, and 4 provide further data on funds obligated, fish stocked, and mitigation goals.

Clearwater Anadromous Fish Hatchery - Idaho

Clearwater Fish Hatchery (FH) will be the last of the 12 hatcheries to be built as part of the LSRCP. The hatchery will be operated by the IDFG and is scheduled to be built across the North Fork of the Clearwater River from Dworshak National Fish Hatchery. It is designed to produce 1,369,500 spring chinook smolts weighing 91,300 pounds and 2,500,000 steelhead smolts weighting 350,000 pounds.

To date, the Corps has purchased 17.5 acres of the 20.0 acres hatchery site. The design of the hatchery (except for water supply features) is well underway and construction is scheduled to begin August 1989. The water supply design has undergone preliminary design and review and must receive approval from the North Pacific Division. Assuming all goes well, a 90 percent design review will occur in August 1988, a contract to construct could be awarded by November 1989, and construction will be completed early in 1991.

As proposed, the Clearwater FH will receive its entire water supply from Dworshak Reservoir via two pipes. The primary (and largest) line will take water from just below the reservoir's surface while a secondary (smaller) line will receive cold water from an intake deep below the water surface. A distribution tank near the hatchery will allow mixing of the two lines to select proper temperatures for various uses at Clearwater FH and provide a water supply line to Dworshak NFH (assuming a partial water supply for that facility is approved).

The City of Orofino has a preliminary permit to study construction of hydroelectric power plant off the secondary (or smaller) line using water they have requested for municipal use. The City's plans can proceed independently of the hatchery design.

Three satellite fish facilities are associated with the hatchery: Red River, which was completed in November 1986; Powell, scheduled for completion in May 1989; and Crooked River, scheduled for completion in 1990. Red River is now being operated as a rearing,

release, and trapping facility using excess fish from either Sawtooth FH or Dworshak NFH. Powell and Crooked River will begin operation in a similar fashion even though Clearwater FH will not be on line when they are completed.

Magic Valley Fish Hatchery - Idaho

Located on the Snake River near Buhl, Idaho, the hatchery was completed in August 1987 at a cost of about \$10,800,000 and is operated by IDFG. It is designed to produce 2,000,000 steelhead smolts weighing 291,500 pounds annually.

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 the commercial facilities; 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 Hatchery and the East Fork Salmon River satellite (both completed) will serve as the juvenile release and adult trapping sites for the hatchery program. After its first rearing season, Magic Valley FH will release its full component of steelhead smolts in spring 1988 -- about 2 million. The hatchery dedication is scheduled for spring 1988.

McCall Fish Hatchery - Idaho

The hatchery was completed in 1981 at a cost of \$5,453,000. Operated by IDFG, it is located along the North Fork Payette River near McCall, Idaho, with adult trapping facilities on the South Fork of the Salmon River (salmon do not have access to the Payette River system). McCall is designed to produce 1,000,000 summer chinook smolts weighing 61,300 pounds annually.

The hatchery has achieved considerable success with its summer chinook program, trapping 2,690 adults in 1986 and 2,705 in 1987. In 1987 the hatchery took over 3.11 million green eggs which are more than enough for the hatchery program.

The hatchery planted 958,240 brood year 1985 summer chinook salmon smolts in the South Fork Salmon River in March 1987, which is within 5 percent of the hatchery's goal of 1,000,000 smolts. No unusual fish mortalities or serious fish health or other problems occurred this past year. McCall hatchery also has a concurrent federally-approved trout production program which is funded entirely by the Idaho Department of Fish and Game.

Sawtooth Fish Hatchery - Idaho

Sawtooth Hatchery is operated by IDFG and is located on the upper

Salmon River near Stanley, and was completed in January 1985 at a cost of \$9,322,000. In addition to 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 is a stream release site.

The adult steelhead return to Sawtooth FH in 1987 was 2,187, slightly more than the previous record steelhead return of 2,121 in 1986. The East Fork Satellite station trapped 224 steelhead, compared to 443 in 1986. Spring chinook trapping and spawning ended in September with a total of 1,344 chinook trapped; 506 of these were released to spawn naturally. The East Fork trapped 272 spring chinook adults and released 98 adults to spawn naturally.

All brood year 1985 spring chinook were released in March 1987. Releases included 1,081,400 smolts into the Salmon River at the hatchery; 195,200 smolts into the East Fork; 344,900 smolts into the Lochsa River near the Powell satellite site; 98,800 in the Red River; and 227,500 into the Crooked River. Brood year 1986 fall fingerling plants totaled 103,660 at Sawtooth FH and 696,120 to the Clearwater River satellite sites.

In addition to the LSRCF program, the state conducts a FWS-approved sockeye salmon restoration project at the federal-owned hatchery. That project is funded by the National Marine Fisheries Service.

Irrigon/Wallowa Hatcheries - Oregon

Irrigon Fish Hatchery is located on the Columbia River near Umatilla, Oregon; operated by the ODFW, the hatchery was completed in October 1985 at a cost of \$8,117,000. Collector wells supply water for the entire program of 1,677,000 steelhead smolts (weighing 279,000 pounds). An expansion of ODFW's Wallowa Hatchery was completed in May 1985 at a cost of \$2,206,000. It serves as a final rearing, acclimation, and release site for about 600,000 steelhead smolts from Irrigon and has facilities for steelhead trapping and spawning.

With the highest steelhead return on record (3,873), the Wallowa FH steelhead egg take in 1987 was about 3.4 million from 585 females. In addition, about 930 females and 1,215 males were outplanted. Although little IHN was diagnosed in the spawning adult fish in 1987, mechanical problems caused losses during incubation and only about 2.1 million eyed eggs were transferred to Irrigon FH.

Two other acclimation, advanced rearing, and trapping sites to be operated with Irrigon FH were completed in 1987. Big Canyon satellite is located at the mouth of Big Canyon Creek on the Grande Ronde River. It was completed in April 1987 at a cost of \$1.8 million and is capable of holding and releasing 225,000 smolts.

Phase II of Lyons Ferry was completed in November 1984 and is being 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.

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 lbs.) is to come from stream enhancement structures funded by the Corps and constructed by WDW. WDW personnel operate the Tucannon FH in cooperation with WDF as a satellite of Lyons Ferry Phases I and II.

Constructed at a cost of \$20,503,000, the hatcheries along with the Phase I (steelhead) satellite facilities at Cottonwood Creek, Dayton Pond, and Curl Lake are complete. Some problems still exist, however, which need to be addressed. For example, suspended manganese in the water supply system at Lyons Ferry, particularly in the Phase II raceways, appears to be a problem for juvenile fall chinook. The manganese may be irritating the gills and causing gill hyperplasia and fusion. Pond losses in early spring under light loading densities have been over 8 percent in some raceways. WDF will conduct tests with various loading densities in 1988 to determine the cause of the losses and help define the potential impact of the problem. Straying of Lyons Ferry steelhead adults also continues to be a major problem for WDW's steelhead program.

The temporary weir on the Tucannon River at the Tucannon FH failed in May 1987 when high flows caused the streambed to scour beneath the rack. Concern over continued problems during high flows has caused the WDF and WDW to request the Corps to construct a more permanent facility. Discussions occurred in 1987 to try to define where the weir should be located and what type of weir should be constructed. No agreement was reached in 1987.

Spring chinook returns to the Tucannon trap and weir totaled about 203 in 1987. At least 40 adults remained below the weir, and undoubtedly some others passed upstream when the weir failed.

As in past years, adult fall chinook were trapped by University of Idaho personnel at Ice Harbor Dam and transported to Lyons Ferry Hatchery for holding and spawning. A total of 1,613 adult fall chinook and 47 jacks were collected at the dam. The first major adult returns to the hatchery ladder occurred in 1987, the numbers totaled 1654 adults and 543 jacks. The record returns to the dam and trap resulted in a total egg take of 6.9 million. The Kalama Falls egg bank return resulted a take of an additional 7,000 eggs. This is the last year of the egg bank program.

Because of the 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 steelhead are checked for Lyons

Ferry brands and a portion of the total returns (including branded fish) are selected for spawning. In 1987, 250 female steelhead were spawned for a take of 1.25 million eggs.

Releases from Lyons Ferry were below the goals for spring and fall chinook and near the goal for steelhead. The 1985 brood year spring chinook release into the Tucannon River was 12,922 yearlings. The fall chinook releases totaled 1,060,970; 386,918 yearlings and 674,052 zero-age fingerlings (ranging from 48 to 105 per pound). Some fall chinook were released directly from the facility while others were loaded onto barges and released below Ice Harbor Dam.

About 921,620 steelhead were released from Lyons Ferry, hauled to the three satellite ponds, or trucked directly to streams. Lyons Ferry and Tucannon FH's combined to rear and release about 212,050 catchable rainbow trout for Washington lakes and streams and about 4,800 pounds of fingerlings (about 100,000 fish) and catchables (about 7,000 fish) for Idaho waters.

Dworshak/Kooskia National Fish Hatchery Complex - Idaho

Dworshak NFH is located at the confluence of the North Fork and Clearwater Rivers. An expansion of the existing Dworshak NFH steelhead facilities for LSRCP spring chinook production was completed by the Corps in November 1982 at a cost of \$1,539,000. The facility is designed to produce 1,600,000 spring chinook smolts weighing 90,000 pounds and is operated by the FWS.

Spring chinook runs into the Clearwater River are showing an increase due to hatchery production, 2,017 adults returned to the hatchery ladder in 1987. The hatchery egg take of 3.3 million green eggs was sufficient for Dworshak's program. Only 5.6 percent of the were diagnosed as IHN positive.

Incidence of bacterial kidney disease (BKD) in BY 1985 spring chinook was evident through most of the production cycle but mortality was minimal. Improved diets and maintaining target smolts sizes at 18 to 20 per pound appears to have lessened the disease problem. Dworshak NFH personnel released a record 1.7 million BY 1985 chinook smolts into the North Fork Clearwater River April 1 and 2, 1987.

Hagerman National Fish Hatchery - Idaho

Hagerman NFH, located on a 59°F spring water supply east of Hagerman, Idaho, was expanded by the Corps to rear 2,400,000 steelhead smolts weighing 340,000 pounds, while retaining the capacity to produce 100,000 pounds of fish for FWS production commitments other than LSRCP. The \$6,980,000 expansion was completed in April 1984 and is operated by the FWS.

Hagerman NFH receives eggs from the Sawtooth FH and East Fork satellite trap. In 1987 Hagerman received 3.5 million "A" run steelhead eggs from Sawtooth and 445,000 "B" eggs from the East Fork. In 1987 the hatchery produced steelhead trout in the FWS raceways for the LSRCP Magic Valley FH program while Magic Valley was under construction.

Hagerman NFH hauled over 1.5 million BY1986 steelhead to various release sites in Salmon River basin. Additionally, about 168,800 fingerlings were released in fall in a Salmon River tributary.

IV. LSRCP OFFICE OPERATIONS

A total of \$6,376,000 was available to the LSRCP program in FY 1987, \$6,324,059 in FY 1987 appropriated 4710 funds and \$51,941 in FY 1987 appropriated 4730 funds. This total included \$923,000 for LSRCP Evaluation Studies, \$160,000 for Boise Office Management and Coordination, \$51,941 for Youth Conservation Corps (salaries), \$200,000 for the Regional Office, and the balance for hatchery operations and maintenance. Fourteen cooperative agreements were drafted and finalized during this fiscal year to distribute the evaluation and operation and maintenance funding.

The LSRCP YCC Program was the largest in the Region in 1987. The LSRCP office had 39 enrollees at ten facilities. A total of \$55,841 was spent on the program for salaries and supplies.

V. EVALUATION STUDIES

In 1987 all operating agencies and two Indian tribes had fully operational evaluation studies underway. Total of \$923,000 was authorized for FY 1987 for evaluation studies. By the end of the fiscal year, a total of \$922,989 had been obligated for 12 studies to be conducted by the IDFG, ODFW, WDW, WDF, FWS, and the Nez Perce and Umatilla Tribes (Table 2). Below is an overview of the evaluation program in FY 1987 followed by a synopsis of each Cooperator's evaluation program.

A pattern for regular Evaluation Study Committee (ESC) meetings was established in 1985 and continued in 1987. 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 ESC meetings were conducted in FY 1987 along with several partial committee meetings to discuss specific topics. In addition to these meetings, the LSRCP Office held combined operations/evaluations budget meetings in 1987 to help insure that operation and maintenance and evaluation studies budgets were well coordinated and contained no budget duplications. Efforts were also made to arrange three-party meetings which included LSRCP Office, operating agency, and Indian Tribe personnel to make certain that all parties were informed of the other's plans.

The five-year planning effort that was initiated in FY 1985 was continued in 1987. At the beginning of the fiscal year each operating agency had completed detailed study plans for FY 1987 and preliminary plans for the next four years (through FY 1991). We hope that long-range planning with an annual plan update will allow us to better manage the growing program under the constraints of reduced budgets.

Several major equipment purchases were made by coordinators during FY 1987. Operating agency programs which had not acquired all microcomputer hardware in 1986 purchased hard disks to upgrade their equipment and additional software. Although software and computer brands vary, all computers are IBM compatible and we will eventually require that data report formats be similar to allow easy comparison of data among agency programs. Interchange of data (Dbase III files, primarily) has been occurring and will continue. Other equipment expenses included, digital stream temperature gages, wet suits, and an electronic balance.

IDFG's Evaluation Study Program

Because of the large production program in Idaho and large geographic area encompassed by the LSRCP, IDFG has chosen to divide their study program into several statements of work and budgets. The *Hatchery Evaluation Study* was initiated in 1982 and is being conducted to ensure that accurate and adequate monitoring of hatchery practices occurs so the best, most cost-effective mode of operation for each hatchery is implemented. The major tasks include monitoring and evaluation of hatchery loading and size, time, and location of release studies. These studies are long-term because constant monitoring is required to identify problems before they result in catastrophic fish losses and to determine what hatchery rearing and release practices resulted in the best adult returns. Results of recent size of release studies indicate larger (2.1 per pound) steelhead returned three to four fold better than smaller (5.3 per pound) steelhead in two release years. Residualism was higher with larger smolts (15 to 16 percent versus 1 to 2 percent) however. Consideration of effects of smolt size on transportation with smaller chinook will have to be made before larger smolt size goals are selected. The FY 1987 report contains more data on recent studies and is available from the LSRCP Office; reports from previous years are listed in Section XII of this report.

In late 1984 Idaho began an angler survey to assess the LSRCP contribution to Idaho's steelhead fishery, to estimate the spawning escapement of LSRCP fish, to recover information on marked fish, and to obtain data for managing the fishery while protecting wild stocks. This survey is the major means of recovering fish tagged as fingerlings under other evaluation studies. The study, called *Hatchery-Wild Composition of the Idaho Steelhead Harvest*, was funded through 1987 and will be continued annually until compensation goals have been met, and periodically thereafter. An

analysis of 1985-86 angler data indicated LSRCP facilities provided 44 percent of Idaho's steelhead sport harvest and 78 percent of the Salmon River harvest. The reports available for this study are listed in Section XII.

In 1986 two studies funded in past years with evaluation study funds were shifted to the operation and maintenance program. The two studies, *Identification of LSRCP Stocks and Health, Nutrition, and Hatchery Management*, were absorbed for administrative and personnel reasons into IDFG's individual LSRCP hatchery budgets. In 1987 the process of reading tags and analyzing marks was funded as a separate evaluation study while the actual tagging costs remained a part of each hatchery's budget. The new study, entitled *Coded Wire Tag Analyses*, will be an ongoing study element even though it may be combined with the overall hatchery evaluation study in 1988 or 1989.

ODFW's Evaluation Study Program

In contrast to IDFG's program, ODFW conducts nearly all of their evaluation under one "umbrella" study, *An Evaluation of the LSRCP Program in Oregon*. ODFW began a few evaluations under this study in 1983 but full-scale studies did not really begin until FY 1984. Their evaluation program encompasses monitoring and evaluation of hatchery practices; size, time, and location of release studies; marking activities (CWT, branding); some disease monitoring efforts; and creel census studies to determine LSRCP contribution to Oregon's steelhead fishery and to recover tagged fish. In addition, the principal investigator for this study coordinates the broodstock selection, egg-taking procedures, and outplanting program for Oregon's LSRCP program, currently the only anadromous hatchery program in NE Oregon. As noted in the highlights section, recent ODFW studies have documented a very low return of Wallowa stock steelhead to the hatchery and fishery. Investigators have not been able to determine where the fish are going once they pass Lower Granite Dam. To help answer this question, radio tags will be implanted in branded Wallowa stock fish at Lower Granite to allow tracking the fish during the winter of 1987 and 1988. Copies of the reports of the FY 1984 and 1985-funded programs are available at the LSRCP office (Section XII). The FY 1986 program report is being drafted; the FY 1987-funded studies will end on March 31, 1988.

Two short-term studies were initiated by ODFW in 1984 and continued through 1987: *Evaluation of the Benefits Provided by Presmolt Releases in the Grande Ronde* and *Evaluation of Benefits Provided by Reprogramming Spring Chinook Smolts from Lower Columbia Hatcheries*. Both are short term (about 4-year) studies involving CWTing, tag recovery, and analyses of returns. The presmolt study will help determine the efficacy of releasing fry and presmolts in the summer and fall. In 1987 about 100,000 fingerlings were tagged and available for release. The reprogramming study will help determine the efficiency of bolstering the LSRCP program by releasing Carson

stock smolts in the Grande Ronde and Imnaha River systems. Because of the availability of Upper Snake River stocks, no Carson stocks were released in 1987. All activities with this project were related to CWT recovery and analysis. The reports on FY 1984 and 1985-funded activities for these two studies are available from the LSRCP office (see Section XII). The 1986 program reports are being drafted; the 1987 activities are funded through March 31, 1987.

WDF's Evaluation Study Program

The Department of Fisheries field evaluation program was initiated in 1985 when a principal investigator was hired and stationed at Lyons Ferry FH. As a result, their *Lyons Ferry Evaluation-Salmon* program had its first full year of activities in 1986. The program has continued in much the same fashion in 1987. WDF's evaluation program is similar to Oregon's in that all major evaluations are being conducted under one multiple-objective study including monitoring and evaluation of hatchery practices, juvenile outputs, adult returns, and contribution to fisheries; time, size, and location of release studies; and impacts of hatchery releases on wild chinook stocks. Because the hatchery program is being built entirely with native fall and spring chinook stocks, special attention is being paid to quantifying and monitoring genetic variables in each population.

A smolt trap, first constructed and operated on the Tucannon River (jointly with WDW) in 1986 to monitor the numbers and timing of outmigrating spring chinook and steelhead, was moved upriver to improve its operation in 1987. Among other major activities conducted in 1987 was a yearling versus zero and on-station versus barged release study. The study's results should help determine the most efficient time, size, and mode of release scheme for Lyons Ferry fall chinook. Reports for activities prior to FY 1987 are available at the LSRCP office (see Section XII). The 1986-funded report will not be available until later this year.

WDW's Evaluation Study Program

Much like ODFW and WDF, the bulk of the Department of Wildlife'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).

Because the steelhead and trout programs have been underway at Lyons Ferry since 1983, the hatchery evaluations and related field studies are also well underway. Major concerns which have surfaced as a result of recent evaluations have been the poor brood stock returns to the Lyons Ferry ladder, large numbers of residuals below satellite release facilities, and low returns to the Tucannon

River. Studies were initiated in 1986 and continued in 1987 to determine what is needed to improve homing of adult fish back to the ladder and to release sites. Surveys to determine contribution of WDW-reared, LSRCP steelhead to Washington fisheries have shown large portions of the Tucannon-released fish are returning above Lower Granite Dam--well above their release site. WDW will collaborate with ODFW in conducting the radio tagging study mentioned above and try to determine where the Tucannon River released adults are wintering. Some reports for past studies are available from the LSRCP office (see Section XI).

In lieu of 7,000 pounds of hatchery capacity for resident trout, WDW was funded by the Corps to build instream improvement structures for natural fish propagation. In FY 1984 and ending in FY 1985 the LSRCP Office and the Corps jointly funded an evaluation of the status of the structures and of their success in compensating for resident trout losses. This type of evaluation will be conducted periodically (every 4 to 6 years) until sufficient data are available to ensure that the 7,000 pound compensation goal for natural trout production has been met. No instream habitat improvement evaluation studies were funded in 1987. A report is available at the LSRCP office on the 1984-1985 studies (see Section XII).

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 was funded to conduct two studies in 1987. The first study, entitled *A Review, Development and Comparison of Anadromous Salmonid Production Plans for the Salmon River Subbasin Under the Lower Snake River Compensation Program*, was funded to assess the LSRCP program in the Salmon River basin, to compare it to the tribes concerns and plans, and resolve differences.

The tribe's second study is similar and is being conducted 1) to develop a tribal plan for implementing the LSRCP in the Grande Ronde and Imnaha River basins in Oregon, 2) to compare the tribal plan with the LSRCP efforts in the basin, 3) to identify where conflicts occur between the plans, and 4) to recommend ways to resolve the conflicting approaches. The reports on the Clearwater and Salmon River basins are available from the LSRCP office and the Grande Ronde and Imnaha River basins are being drafted.

The Confederated Tribes of the Umatilla Indian Reservations (CTUIR) became direct cooperators in the LSRCP Program for the first time in 1987. (They were subcontractors for the Nez Perce in 1986). The CTUIR were funded for one study in 1987 with the objective to

assist ODFW and WDF in their field work under the evaluation program. Specially, the CTUIR assisted ODFW with handling of adult returns to LSRCP facilities and development of broodstock guidelines and WDF with adult trapping at the Tucannon weir, spawning ground censuses, and operation of the smolt trap.

VI. FWS COOPERATIVE PROGRAMS

The LSRCP program funded a variety of studies with other FWS stations. All these were categorized as evaluation studies and most were funded to investigate and solve specific hatchery production problems.

The Dworshak Fisheries Assistance Office (DFAO) was funded by the LSRCP program in FY 1987 to conduct hatchery monitoring and evaluation studies at Dworshak (spring chinook) and Hagerman NFH's. DFAO's program was similar to those conducted by the state agencies (see Section IV). Their study, *Evaluation and Technical Coordinator for FWS LSRCP Hatchery Programs*, is a long-term effort designed 1) to aid NFH's with the development of a data base system for hatchery management, 2) to define and solve cultural and management problems affecting LSRCP success, 3) to provide interagency coordination, and 4) to determine fishery contribution and escapements of Dworshak and Hagerman NFH LSRCP programs. LSRCP funds were also 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.

Two LSRCP-funded studies were conducted by the Idaho Cooperative Fisheries Unit during 1986. *An Evaluation of Hatchery Practices and Methods to Control Bacterial Kidney Disease (BKD) in Hatchery Stocks of Snake River Chinook Salmon* was initiated in 1982 with FY 1982 funds and will continue through 1988. No 1987 funding was used for this study. Cooperative Unit personnel were provided BY 1987 monies to fund a program for trapping fall chinook salmon at Ice Harbor Dam for the WDF Lyons Ferry program. Latest reports on the BKD study and the fall chinook trapping are available at the LSRCP office (see Section XI). The fall chinook trapping program may be conducted by WDF sometime in the future now that Lyons Ferry is fully operational.

VII. OTHER COOPERATIVE PROGRAMS

The State of Idaho is attempting to restore sockeye salmon runs to Redfish Lake. To assist in the restoration effort, facilities at Sawtooth are being made available for the IDFG sockeye salmon program which is funded by the National Marine Fisheries Service.

The State of Oregon utilized several raceways at Irrigon Fish Hatchery to hold fall chinook salmon smolts scheduled for release in eastern Oregon.

Wallowa hatchery shipped 500,000 eyed steelhead eggs to Lyons Ferry Hatchery in Washington as part of ODFW's cooperative LSRCP effort with WDW in the Grand Ronde Basin.

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

VIII. CORPS CONSTRUCTION ACTIVITIES

Construction was completed on the Big Canyon Creek satellite facility in 1987. The release and trapping facility is operating as part of the Irrigon/Wallowa and Lookingglass FH programs for both steelhead and spring chinook propagation.

During the year construction was also completed at Little Sheep Creek, a satellite facility of Irrigon Fish Hatchery. Although the satellite became operational in August 1987, modifications need to be done under a cleanup contract which will extend into FY 1988. The release and trapping facility is being operated as part of the Irrigon/Wallowa program for steelhead propagation.

As noted above in Section III, Clearwater Fish Hatchery design is currently underway and construction is scheduled to begin in August 1989. The water supply facilities are in preliminary design and could begin construction by November 1989. Design and/or construction activities have continued on all three of the hatchery's three satellite facilities. Construction was completed on the Red River satellite in November 1986. A Design Memorandum for the Powell Satellite was issued in June 1987 and construction of this facility is scheduled for completion in November 1988. The Crooked River Satellite is in the preliminary design stages.

Magic Valley Fish Hatchery, Idaho, was completed in August 1987 and received fish for rearing and release in spring 1988. Some work remains to revegetate the spring collection facility. A dedication will occur in 1988.

A construction clean-up contract initiated in 1986 at Hagerman NFH was completed in FY 1987. A major item of the contract was construction of a 36-inch pipeline from the main spring to the steelhead raceways.

During the year, site selection report was completed for the Eagle Disease Diagnostic Laboratory, Idaho. Design is underway and the facility is scheduled for construction in April 1989.

Pertinent data relating to hatchery design and construction schedules are included in Table 3; approximate facility locations are identified on the LSRCP facility map (Figure 1).

IX. MEETINGS

Meetings and Tours of FY 86

- 10/8-9/86 Evaluation Studies Coordinator's meeting at the Billy Creek Ranch, Snake River (Dan Herrig, Tammy Froscher, Yvonne Phillips)
- 10/8/86 Attended Annual Meeting of the Idaho Cooperative Fish and Wildlife Research Unite at Moscow, Idaho (Ken Higgs)
- 11/14/86 Meeting with Steven's Treaty Tribes, Intertribe and Regional Office personnel at Umatilla Tribal Office (Dan Herrig, Ken Higgs)
- 11/20/86 Attended Dworshak Coordination Meeting at Ahsahka, Idaho (Ken Higgs)
- 11/24/86 Met with Dworshak FAO personnel regarding LSRCP budgets and program in Boise (Dan Herrig, Ken Higgs)
- 11/24/86 Attended Regional Office Meeting regarding water supplies for the Clearwater FH and Dworshak NFH (Ken Higgs)
- 12/2-4/86 Attended Fish Culture Conference and presented paper on LSRCP (Dan Herrig)
- 1/7/87 Interagency Rape Control Meeting in Boise (Tammy Froscher, Cassie Fowler)
- 1/7/87 Presented slide show of LSRCP Program to Ada County Fish and Game League in Boise (Dan Herrig, Ken Higgs)
- 2/19/87 Attended Hagerman NFH Coordination Meeting at Hagerman (Ken Higgs)
- 3/4/87 Attended BPA's Fish Health Monitoring Committee Meeting in Boise (Dan Herrig)
- 3/12-13/87 Attended American Fisheries Society Meetings in Boise (Dan Herrig, Ken Higgs)
- 3/26/87 Attended Dworshak NFH Coordination Meeting in Ahsahka (Ken Higgs)
- 4/10/87 Met with Nez Perce fisheries director in Boise regarding funding (Dan Herrig)
- 4/28/87 Met with FWS Regional Director in Boise (Tammy Froscher, Dan Herrig, Ken Higgs)

5/6-8/87 Toured Michigan fish hatcheries with oxygen injection systems with Corps, CRITFC, ODFW, FWS (Dan Herrig)

5/21/87 Attended Magic Valley Construction Meeting at Magic Valley FH (Ken Higgs)

5/26-29/87 Met with Rich Carmichael (ODFW) re: evaluation studies at Lookingglass FH (Dan Herrig)

6/3/87 Attended Pacific N.W. Fish Protection Committee Meeting in Portland (Dan Herrig)

6/10/87 Met with IDFG personnel at Magic Valley with B. Hutchinson (Dan Herrig)

6/16/87 Conducted Hagerman NFH property inventory (Tammy Froscher, Cassie Fowler)

6/22-25/87 Met with B. Bugert (WDF), M. Schuck (WDW), B. Hill (NPT) while visiting Washington and Idaho facilities (Dan Herrig)

7/14-15/87 Evaluation Studies Coordinator's meeting in Boise (Dan Herrig)

7/20-22/87 Conducted Lyons Ferry (WDF, WDW) and Tucannon FH's property inventories (Tammy Froscher, Cassie Fowler)

7/25/87 Attended dedication ceremonies for Irrigon FH (Dan Herrig, Ken Higgs)

7/28/87 Met with Regional personnel in Vancouver and Regional Office (Ken Higgs)

7/31/87 Presented summary of LSRCP Program to Annual Meeting of Idaho Steelhead and Salmon Unlimited in Boise (Dan Herrig)

8/3-7/87 Attended Regional Fisheries Meeting in Reno, Nevada (Dan Herrig, Ken Higgs)

8/12/87 Tagging Coordination Meeting at Dworshak NFH (Dan Herrig)

8/13/87 Magic Valley construction inspection (Ken Higgs)

8/11-13/87 Conducted Irrigon, Lookingglass, Wallowa FH property inventories (Cassie Fowler, Tammy Froscher)

8/14-15/87 Float trip sponsored by Nez Perce Tribe with CRITFC, BIA, ODFW, FWS, WDF, IDFG, Congressional staffers to discuss LSRCP Program (Dan Herrig)

8/17/87 FY 1988 budget meeting with IDFG personnel from hatcheries and evaluations (Dan Herrig, Ken Higgs)

8/24/87 FY 1988 budget meeting with ODFW personnel in La Grande (Dan Herrig, Ken Higgs)

8/26-28/87 Budget meeting with Regional personnel in Portland (Ken Higgs)

8/31-9/3/87 Met with Rich Carmichael (ODFW) on ODFW evaluation program and to conduct redd counts (Dan Herrig)

9/2/87 Attend Hagerman NFH Coordination Meeting at Hagerman (Dan Herrig, Ken Higgs)

9/16/87 Presented summary of LSRCP Program to Gem State Fly Fishers in Nampa (Dan Herrig)

9/21-23/87 Conducted tour of LSRCP facilities for Joe Webster (CO, FWS) and J. Miller, F. Vincent, B. Shake (RO, FWS) (Dan Herrig, Ken Higgs)

9/29/87 Met with IDFG and COE on joint funding of Eagle Fish Health Lab (Dan Herrig, Ken Higgs)

IX. TRAINING

Training was provided to the following employees:

Tammy Froscher, Introduction to Financial Accounting, Boise State University, January 15 through March 1, 1987, Boise, Idaho.

Tammy Froscher, Basic Elements of Property Management, GSA Training Center, July 13 through 17, 1987, Salt Lake City, Utah.

Tammy Froscher, Cassie Fowler, Pay-Pers Training, FWS Regional Office, April 10, 1987, Boise, Idaho.

Tammy Froscher, Cassie Fowler, Ken Higgs, Safety Training, FWS, April 11, 1987, Boise, Idaho.

Tammy Froscher, Dan Herrig, Ken Higgs, Multi-Media First Aid Training, February 10 and 11, 1987, Boise, Idaho.

Dan Herrig, Basics of First Line Supervision, Boise State University, October 30 through November 20, 1986, Boise, Idaho

Dan Herrig, Defensive Driving, Video Tape, Boise, Idaho.

Dan Herrig, Introduction to Fish Health, FWS Fisheries Academy, March 23 through 27, 1987, Gresham, Oregon.

XI. STAFFING

A total of 3.75 permanent FTE staff years were employed during FY 1987. No temporary employees and one student aid was employed (0.5 FTE) in addition to full time permanent personnel.

Yvonne R. Phillips went on leave without pay on 1/4/87 and resigned on 7/4/87. Cassie Fowler, a Boise State University business student, was hired to aid and then retained to replace Yvonne until a permanent replacement could be selected.

In 1987 the LSRCP sponsored a YCC program at a cost of \$55,841. The program was administered by 10 state and federal LSRCP hatcheries and evaluation study projects and included 39 YCC student enrollees. With the exception of minor enrollee payroll problems in the FWS payroll system, the program went smoothly. The program is well received by the operating agencies because it not only accomplishes needed station work, but also provides environmental awareness and training to local youths.

EMPLOYEES AS OF SEPTEMBER 30, 1987:

Kenneth R. Higgs, LSRCP Coordinator, GS-13
Daniel M. Herrig, Evaluation Studies Coordinator, GS-11
Tammy A. Froscher, Clerk-typist, GS-4
Cassie L. Fowler, Clerk-typist, GS-4 (Student Aide)

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Table 1. LOWER SNAKE RIVER COMPENSATION PLAN ACTIVITIES FOR 1987

INSTALLATION/PROGRAM	FUNDING LEVELS	SPECIES ^a	TYPE	NUMBER OF FISH STOCKED ^b	POUNDS OF FISH STOCKED
STATE OF IDAHO					
McCall SFH	\$331,700	SuCS			
South Fork Satellite			Smolts	958,290	47,440
Sawtooth FH	\$657,100	SpCS	Smolts	1,081,400	47,175
			Fingerlings	103,661	4,146
East Fork Satellite		SpCS	Smolts	195,000	7,804
Magic Valley FH/LSRCP Mgt.	\$475,500	STT		^c	^c
Clearwater Anadromous	\$ 87,500	SpCS ^d	Smolts	671,200	26,848
			Fingerlings	696,120	24,861
STATE OF OREGON					
Lookingglass FH	\$345,788	SpCS	Smolts	843,880 ^e	61,557
			Fingerlings	347,705	12,283
Imnaha Satellite			Smolts	123,530	15,010
Irrigon FH	\$761,683	STT	Smolts	695,186 ^f	142,550
Wallowa FH	-	STT	Smolts	615,594	130,637
Little Sheep Satellite	-	STT	Smolts	93,738	18,780
Big Canyon Satellite	-	STT	Smolts	224,150	45,818
STATE OF WASHINGTON					
Lyons Ferry FH (Dept. of Fish)	\$370,370	SpCS	Smolts	12,922 ^g	2,172
		FCS	Smolts	386,919 ^h	56,450
			Smolts	674,052	10,080
Lyons Ferry FH (Dept. of Wildlife)	\$769,835	STT	Smolts	921,620 ^e	168,737
		RBT	Catchables	90,440 ^f	37,724
Tucannon FH Satellite	\$147,250	RBT	Catchables	128,606 ^f	37,273
		RBT	Fingerlings	100,000 ^f	1,667
FISH & WILDLIFE SERVICE					
Hagerman NFH	\$547,000	STT	Smolts	1,535,351 ^g	336,604
		STT	Fingerlings	168,832	7,110
Dworshak NFH	\$190,000	SpCS	Smolts	1,710,710	92,633
			Fingerlings	252,000	2,250
Dworshak FHC	\$ 25,000				
YCC Program	\$ 55,841				
Regional Office	\$200,000				
LSRCP Management/Coord.	\$160,000				
Evaluation Studies	\$922,827				
Total Obligated	\$6,047,394				
Unobligated Fund	\$328,606				
Totals	\$6,376,000	FCS	Yearlings	386,919	56,450
			Zero-age	674,052	10,080
		SuCS	Smolts	958,290	47,440
		SpCS	Smolts	4,638,812	253,199
			Fingerlings	1,399,486	43,540
		STT	Smolts	4,085,639	843,126
			Fingerlings	168,832	7,110
		RBT	Catchables	219,046	74,997
			Fingerlings	252,000	2,250

- ^a RBT-Rainbow Trout/FCS-Fall Chinook Salmon/SpCS-Spring Chinook Salmon/SuCS-Summer Chinook Salmon/STT-Steelhead Trout
- ^b Releases are from facilities listed unless otherwise noted.
- ^c Fish reared at Hagerman NFH for Magic Valley Stock Program.
- ^d Fish were produced at Sawtooth FH and released at Red, Crooked, and Lochsa satellite locations.
- ^e Includes zero-age spring release of 173,971 chinook at 36 per lb.
- ^f Hauled offsite for release.
- ^g Released at Tucannon FH.
- ^h Yearling smolts.
- ⁱ Released at three satellite locations.
- ^j Released at Sawtooth FH, East Fork, and Lower Salmon River sites.

Table 2. LOWER SNAKE RIVER COMPENSATION PLAN EVALUATION STUDIES

Cooperator/Study	1987 Funds	Species Studies
<u>Idaho Dept. of Fish and Game</u>		
Hatchery Evaluations	\$ 65,130	Chinook, Steelhead
Hatchery-Wild Study	142,816	Steelhead
Coded-wire Tag Analysis	41,754	Chinook, Steelhead
Subtotal	\$249,700	
<u>Oregon Dept. of Fish and Wildlife</u>		
Hatchery Evaluation	\$223,511	Chinook, Steelhead
Pre-smolt Release (tagging)	13,528	Chinook
Reprogramming Smolts (tagging)	5,507	Chinook
Subtotal	\$242,546	
<u>Washington Dept. of Fisheries</u>		
Lyons Ferry Evaluation	\$141,253	Chinook
<u>Washington Dept. of Wildlife</u>		
Lyons Ferry Evaluation	\$148,828	Steelhead, resident trout
<u>Nez Perce Tribe</u>		
LSRCP Production Plan Evaluations:		
Salmon River	\$25,816	Chinook, Steelhead
Grande Ronde/Immaha Rivers	24,684	Chinook, Steelhead
Subtotal	\$50,500	
<u>Umatilla Confederated Tribes</u>		
LSRCP Evaluation Project	\$16,000	Chinook, steelhead
<u>Dworshak Fisheries Assistance Office (FWS)</u>		
Hatchery Coordination	\$ 54,000	Chinook, Steelhead
<u>Idaho Coop. Fish and Wildlife Res. Unit (FWS)</u>		
BKD Study	0 ^a	Chinook
Fall Chinook Trapping	\$ 20,000	Chinook
TOTAL	\$922,827	

^a Studies conducted in 1987 with funds appropriated in previous years.

Table 3. Pertinent Data for Lower Snake River Fish and Wildlife Compensation Plan Fish Hatchery Facilities

Hatchery (Operator) ^a	Fish Type	Pounds	Construction Cost (\$1,000)	Satellite Facilities	Date of Completion
Lookingglass (ODFW)	Spring Chinook	69,600	6,324	Big Canyon Creek Imnaha	Nov. 82
			1,805		Apr. 87
			818		Jul. 88
Irrigon/Wallowa (ODFW)	Steelhead	279,600	8,117	(Wallowa) ^b Little Sheep Creek (Big Canyon Creek)	Oct. 85
			2,206		May 85
			1,780		Aug. 87
			1,809		
Lyons Ferry:			20,503 ^c		
Phase I (WDW)	Steelhead	116,400		Cottonwood	Nov. 83
			Trout		45,000
	Trout	41,000	540	Dayton Pond Tucannon Hatchery Curl Lake	Oct. 86
			828		Nov. 84
			2,775		Feb. 85
			143		
Phase II (WDF)	Fall Chinook	101,800			Nov. 84
	Spring Chinook	8,800			
Sawtooth (IDFG)	Spring Chinook	149,000	9,322	East Fork Salmon R.	Jan. 85
			1,386		Nov. 83
Dworshak (FWS)	Spring Chinook	70,000	1,539		Nov. 82
Clearwater (IDFG)	Steelhead	350,000	20,500	Red River Crooked River Powell	Sep. 91
			Spring Chinook		91,300
			759		May 90
			2,177		May 90
			1,239		
Magic Valley (IDFG)	Steelhead	291,500	10,753	(Sawtooth) (East Fork)	Aug. 87
Hagerman (FWS)	Steelhead	340,000	6,980	(Sawtooth) (East Fork)	Apr. 84
McCall (IDFG)	Summer Chinook	61,300	4,615	South Fork Salmon R.	Sep. 81
			838		Jul. 80
Eagle Lab (IDFG)	Disease diagnostic		1,300		Apr. 89

^a 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

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

^c Total cost of Lyons Ferry Phases I and II

Table 4. Adult return goals and hatchery or trap rack returns of LSRCP hatcheries operating in 1987 (total return estimates to the Snake River basin are not available).

Species/Hatchery	Adults Return Goals	Hatchery/Trap Rack Returns ¹
Summer Chinook		
McCall FH/South Fork	8,000	2,705
Spring Chinook		
Sawtooth FH/East Fork	19,232	1,616
Lookingglass FH/Imnaha	9,072	2,663
Dworshak NFH	9,000	2,017
Lyons Ferry/Tucannon	1,152	203
Fall Chinook		
Lyons Ferry FH ²	18,300	3,857
Steelhead Trout		
Irrigon/Wallowa FH ³	11,184	4,626
Lyons Ferry FH	4,656	⁴
Hagerman NFH ⁵	13,600	2,345

¹ Chinook returns include jacks

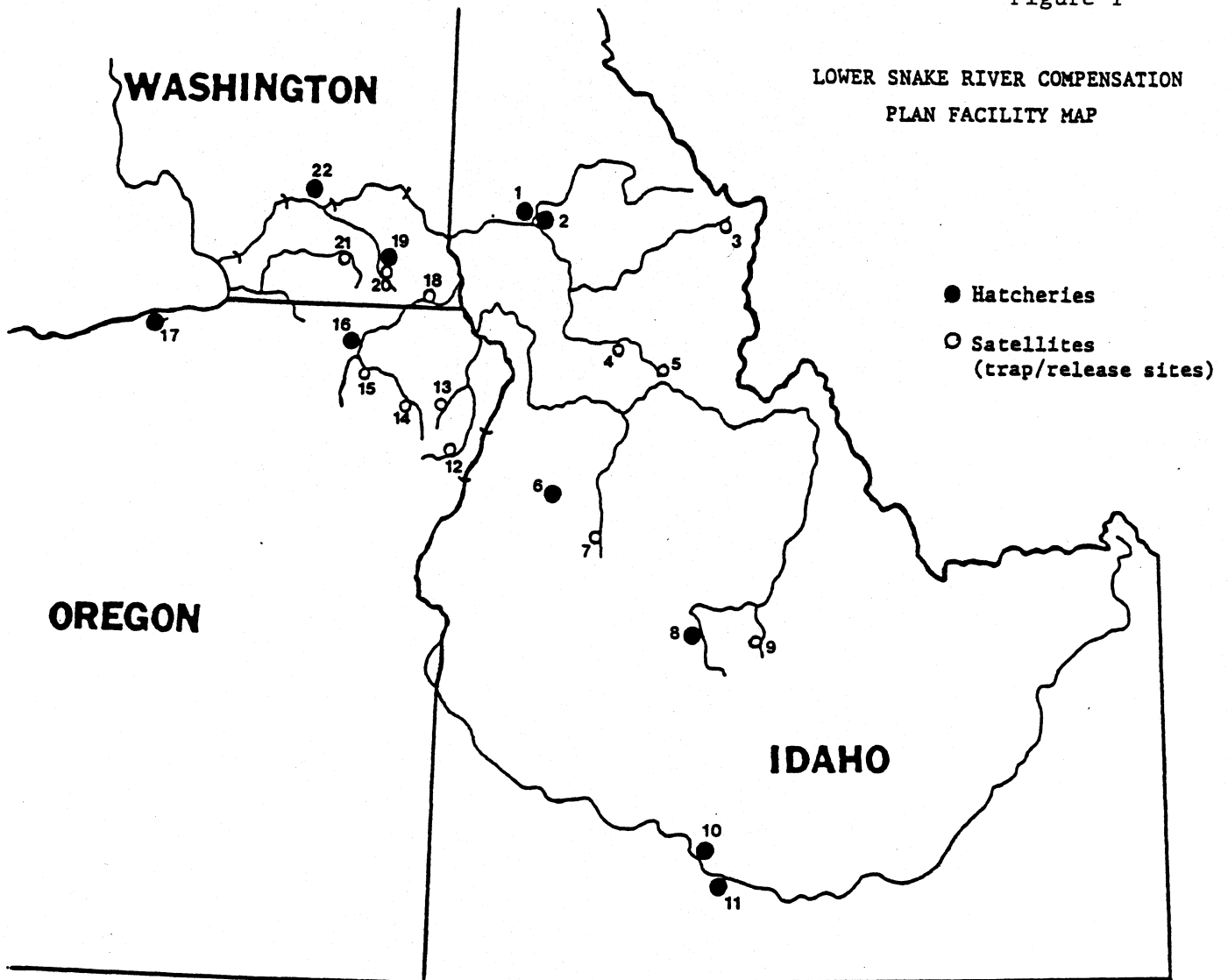
² Includes ladder returns plus Ice Harbor trapping results.

³ Includes returns to Wallowa, Big Canyon, Little Sheep traps.

⁴ Ladder is only open for short period, many captures are strays.

⁵ Includes returns to East Fork, Sawtooth FH racks.

Figure 1



OPERATING AGENCIES

Idaho Department of Fish & Game

- 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

U.S. Fish and Wildlife Service

- 2. Dworshak NFH Expansion
- 10. Hagerman NFH

Oregon Department of Fish & Game

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

Washington Department of Fish

- 22. Lyons Ferry FH - Salmon

Washington Department of Game

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

