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LOWER SNAKE RIVER
COMPENSATION PLAN OFFICE

Boise, Idaho

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INDEX

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 Lower Snake River Fish and Wildlife Compensation Plan was authorized by the Water Resources Development Act of 1976 (90 Stat. 2917). The LSRCP was developed 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.

Construction responsibility for the LSRCP was assigned to the Walla Walla District, U.S. Army Corps of Engineers (Corps), while responsibility for fisheries operation and maintenance 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, stating that the FWS would budget for and administer O&M for LSRCP fisheries programs (responsibility for administration and O&M for wildlife programs remains with the Corps).

The Corps' estimated-costs for development of the authorized Compensation Plan are $177 million for off-project fisheries features, while FWS estimated annual costs are $9.5 million for fish facilities O&M. All anadromous fisheries compensation and most resident fisheries compensation are allocated to project power costs and are reimbursed to the treasury from Bonneville Power Administration (BPA) power revenues.

The LSRCP legislation authorized 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 will operate four hatcheries, Oregon Department Fish and Wildlife three hatcheries, Washington Department of Game two hatcheries, Washington Department of Fisheries one hatchery, and Fish and Wildlife Service two hatcheries. Brief descriptions of individual hatchery operations follow (FY 86 hatchery fish production and other pertinent operational information is listed on Table 1):

Clearwater Anadromous Fish Hatchery - Idaho

This is the last of the 12 hatcheries to be built as part of the LSRCP. The hatchery will be operated by the Idaho Department of Fish and Game (IDFG) and is scheduled to be built across the North Fork of the Clearwater River from Dworshak National Fish Hatchery. The hatchery 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. With the exception of the water supply, preliminary design is complete. No design has yet been completed for a water supply system. Because two different temperatures of water are required at the same time for the two different species being reared (summer steelhead and spring chinook), original plans called for taking water to operate the hatchery from both the North Fork and mainstem of the Clearwater River. However, several modifications to the water supply design were proposed as a result of chronic steelhead losses at Dworshak NFH due to the virus disease, infectious hematopoietic necrosis (IHN).

Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service support a design calling for two small pipelines from the reservoir for early rearing and temperature control only, with production water to come from the North Fork Clearwater River. However, considering the IHN controversy and the recent IHN disease problems at Dworshak hatchery, the Corps has proposed the reservoir as a sole source for the entire hatchery water supply.

Proposals have been made to include the city of Orofino in planning, with the city's water supply to come from the same reservoir source pipeline as the hatchery. The city also has a preliminary permit to install hydroelectric generating equipment at the site to produce electricity from the fall of water to the hatchery.

Hatchery construction and water supply design is currently waiting approval for the reservoir water supply line from the Assistant Secretary of the Army for Civil Works. Construction money must also be appropriated for the project, which is currently scheduled for completion in September 1990. Three satellite fish facilities are associated with the hatchery: Red River, which was completed in November 1986; Powell, scheduled for completion in November 1988; and Crooked River, scheduled for completion in 1989.

Magic Valley Fish Hatchery - Idaho

Located on the Snake River near Buhl, Idaho, the hatchery will be operated by IDFG and is designed to produce 2,000,000 steelhead smolts weighing 291,500 pounds annually. Facility design is complete and construction is now underway. The hatchery is scheduled for completion in June 1987 at an expected cost of $10,753,000.

The hatchery is being 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 there in 1986 for the Magic Valley program). Sawtooth Hatchery and East Fork Salmon River satellite (both completed) will serve as juvenile release and adult trapping sites for the hatchery program.

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 returning adults in 1986. From these fish, the hatchery took over 2 million green eggs which is more than enough for the hatchery program. Additionally, the hatchery planted 970,000 brood year 1984 summer chinook salmon smolts in the South Fork Salmon River this past March, which is within 3 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 has a concurrent federally approved State trout program which is funded entirely by the Idaho Department of Fish and Game.

Sawtooth Fish Hatchery - Idaho

Operated by IDFG, the hatchery 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 producing 2,235,000 spring chinook salmon smolts weighting 149,000 pounds at Sawtooth, the staff operates a major satellite facility on the East Fork of the Salmon River. The satellite traps adult steelhead for the Hagerman NFH and Magic Valley Fish Hatchery programs, in addition to trapping adults spring chinook for Sawtooth.

The month of April 1986 was highlighted by a record steelhead return of 2,121 steelhead to Sawtooth FH, compared to 526 last year; the East Fork Satellite station trapped 443 steelhead, compared to 27 in 1985. Spring chinook trapping and spawning ended in September with a total of 1,769 chinook trapped; 876 of these were released to spawn naturally. The East Fork trapped 194 spring chinook adults and released 73 adults to spawn naturally.

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

The East Fork satellite clean-up contract was completed in March, and work is continuing on the Sawtooth Fish Hatchery clean-up contract.

Irrigon/Wallowa Hatcheries - Oregon

Irrigon Fish Hatchery is located on the Columbia River near Umatilla, Oregon. Operated by the Oregon Department of Fish and Wildlife (ODFW), the hatchery was completed in October 1985 at a cost of $8,117,000. The groundwater supply was not adequate for the entire program of 1,377,000 steelhead smolts, weighing 279,000 pounds, so an expansion of Oregon's Wallowa Hatchery was also necessary. The Wallowa expansion was completed in May 1985 at a cost of $2,206,000. Wallowa Hatchery will produce approximately 50,000 pounds of steelhead smolts for the Irrigon program and conduct steelhead trapping and spawning operations.

With the highest steelhead return on record (1,910), the Wallowa FH steelhead egg take was about 4 million eggs from 818 females. However, IHN was diagnosed in the spawning adult fish this past year. About 1,133,525 eyed eggs were transferred to Irrigon Hatchery.

Lookingglass Fish Hatchery - Oregon

The hatchery is located on Lookingglass Creek near Elgin, Oregon, and was completed in November 1982 at a cost of $6,324,000. The hatchery is operated by the ODFW and is designed to produce spring chinook smolts weighing 69,600 pounds. Two satellites, Big Canyon Creek, scheduled for completion in April 1987, and renovation of Oregon's Imnaha trapping site, scheduled for completion in November 1988, are a part of the hatchery program.

Adult spring chinook trapping went well this past year with approximately 71 adults collected at the Imnaha trap, and 249 adults and 57 jacks at the Lookingglass trap. The hatchery was informed in September that 11 of their chinook egg (family) groups have turned up positive with IHN virus.

A Corp-funded well construction program was completed in 1986. Previous ice collection problems on the water intake screen appear to be resolved with the addition of the warmer well water at the intake rack.

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 was completed in November 1983 and is being operated by Washington Department of Game (WDG). It is designed to produce 1,169,500 steelhead trout smolts weighing 116,400 pounds and 45,100 pounds of rainbow trout.

Phase II at Lyons Ferry was completed in November 1984 and is being operated by Washington Department of Fish (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 in order for WDG to rear an additional 41,000 pounds of rainbow trout. Its operation will be as a satellite of Lyons Ferry Phase 1. The remaining 7,000 pounds of rainbow trout production stipulated in the compensation plan is coming from stream enhancement structures funded by the Corps and constructed by WDG.

Constructed at a cost of $20,503,000, the hatcheries along with the satellite facilities at Cottonwood Creek, Dayton Pond, Curl Lake, and Tucannon hatchery are essentially complete. In regard to operations, a serious water supply pump failure occurred in 1986; fortunately, due to immediate action by the hatchery staff, no fish mortalities occurred. Magnesium oxide deposits in the raceways continue to be a problem for the hatchery, especially the salmon hatchery. Straying of Lyons Ferry steelhead adults also continues as a major problem for the steelhead program.

Adult fall chinook for the salmon hatchery were trapped this past year by University of Idaho personnel at Ice Harbor Dam and transported to Lyons Ferry Hatchery for holding and spawning. A total of 212 adult fall chinook and 23 jacks were collected at the dam. In addition to eggs from the trapped adults, eggs are transferred to Lyons Ferry from the Kalama Hatchery upriver bright fall chinook egg bank program.

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 pound and is operated by the FWS.

Spring chinook runs into the Clearwater River are showing an increase due to hatchery production, with 516 adult returning to the hatchery ladder in 1986. In addition to the hatchery egg take of 1.2 million green eggs, Rapid River SFH supplied 2.9 million green eggs for the Dworshak program. All Kooskia-Dworshak stock smolts will be released at Kooskia hatchery (located some 30 miles upstream of Dworshak) in the spring of 1988, and Rapid River stock smolts will be released at Dworshak Hatchery.

Incidence of bacterial kidney disease (BKD) in the spring chinook production was reduced from previous years. Improved diets and maintaining target smolts sizes at 20 per pound appears to have lessened the disease problem.

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 produce 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. The hatchery is currently producing steelhead trout in the FWS raceways for the LSRCP Magic Valley Fish Hatchery program while Magic Valley is under construction.

In June, Dworshak Fish Health Center biologists diagnosed IHN virus in steelhead trout fry at Hagerman NFH. This is the first positive determination of the presence of IHN at the hatchery. Fish mortalities as a result of the disease were minimal and, to date, all additional samples have been negative for IHN.

II. HIGHLIGHTS FOR FY 1986

Cooperative agreement management improvements in the past year are working extremely well. Consolidation of all hatchery operation and maintenance agreements for each agency under one cooperative agreement, and all evaluation studies for each agency under a second agreement, has substantially reduced our workload and has improved operations for everyone.

The Denver Finance Center (DFC) has continued to work very cooperatively with us in speeding up the payment process. Use of the DFC approved "Special" tags for billing purposes has continued to improve our cooperators billing-to-payment turn-around-time. With the excellent cooperation we are receiving from the Regional Office (CGS) and the DFC, the payment system should continue at a very high-level of efficiency.

During the year, Supervision of the LSRCP office was transferred from Fred Vincent, Deputy ARD for FR, to John Miller, FWS Division 2 Manager.

A LSRCP/Nez Perce biologist meeting was held in early October to discuss the tribes involvement in the LSRCP evaluation study program. As a result of that meeting and subsequent meetings between ARD-FR and Columbia River Intertribal Fish Commission (CRITFC) personnel, the FWS has agreed to fund a cooperative agreement with the Nez Perce Tribe which will include several studies jointly conducted by the Nez Perce tribe, CRITFC, and the Confederated Tribes of the Umatilla Reservation.

Idaho's harvest studies indicated that the LSRCP program produced an estimated return of 2,485 adult steelhead to Idaho during the 1984-85 season (approximately 50% harvested, 50% rack returns). In the Salmon River, 22 percent of the estimated harvest was from LSRCP stocks. Exploitation rates for Idaho's LSRCP-reared steelhead were 57 percent for one-ocean A-strain, 54 percent for two-ocean A-strain, and 45 percent for two-ocean B-strain fish. Additional LSRCP harvest information is shown in Table 4.

Consistent with the desires of the Administration and Congress, the Corps proposes to transfer title to all LSRCP hatcheries and satellite fish facilities to the FWS. 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. In part, the Chief's report stated 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"; and 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 upon completion of construction by the Corps of Engineers." The Corps is currently conveying operational responsibility for constructed fish facilities to the FWS by a Memorandum of Understanding.

Communication between IDFG, Corps, and FWS resulted in the Corps approval of an Idaho disease diagnostic laboratory expansion in-lieu of constructing laboratory facilities at several Idaho-operated LSRCP hatcheries. Idaho's Eagle Disease Laboratory facilities will be expanded to accommodate LSRCP disease diagnostic needs for the State-operated hatcheries. Construction is scheduled for April 1989.

III. OPERATIONS

A total of $5,455,619 was available to the LSRCP program in FY 1986, $5,388,619 in FY 1986 appropriated 4710 funds and $67,000 in FY 1986 appropriated 4730 funds. This total included $887,285 for LSRCP Evaluation Studies, $148,000 for Boise Office Management and Coordination, $67,000 for Youth Conservation Corps, $250,000 for the Regional Office, and the balance for hatchery operations and maintenance. Ten cooperative agreements were drafted and finalized during this fiscal year to distribute the evaluation and operation and maintenance funding.

A study plan and model were formulated by the LSRCP office to evaluate costs of operating LSRCP hatcheries. Cost and production data for individual hatcheries will be placed on the spreadsheet model which will compute production costs by activity (e.g. feeding only, labor only, etc.) as well as by combinations of activities. By looking at various combinations of costs, comparisons among hatcheries can be made fairly, even though some may have unusually high costs in certain areas (e.g. high power bills).

LSRCP personnel participated in a portion of a recent Corps-sponsored tour of all Compensation Plan facilities. The group consisted of personnel from the operating agencies (FWS, WDG, ODFW, and IDFG), NMFS, BPA, Nez Perce Tribe, and Corps. Abby Miller, FWS-PDF, Washington, D.C. was able to participate in the entire tour and learn first hand of the scope and complexity of the program. Fred Rettenmund, BPA, briefed the tour members on his role as manager of BPA's Boise office, asked questions about the LSRCP, and visited facilities in the Hagerman Valley.

During the month of January, the LSRCP staff investigated the effects the Gramm-Rudman-Hollings budget balancing law would have on the LSRCP program. The FWS Office of Program Development for

Fisheries requested a statement on the effects of a 4.3% reduction in funding at each hatchery/facility. Subsequently, the LSRCP office in Boise notified all operating agencies of an expected cut of 4.3% in FY 86 Cooperative Agreements due to the Gramm-Rudman law. This information was compiled into a budget package for submittal to Interior through the FWS. In mid-year the agencies were notified that LSRCP funds had, in fact, been reduced by 4.3%, and that the cuts were to be made uniformly by individual project down to the field station level. Consequently, all FY 86 funded projects received a 4.3% reduction in their Cooperative Agreements. As a result of the cuts, some work had to be either reduced or eliminated.

This past year, two LSRCP marking trailers were completed and are being used to mark fish (brand, CWT, fin clip) at Washington and Oregon LSRCP hatcheries.

IV. EVALUATION STUDIES

In 1986 all operating agencies and one Indian tribe had fully operational evaluation studies underway. Although $929,000 had originally been authorized for the FY 1986 LSRCP evaluation program, congressionally-mandated Gramm-Rudman budget reductions lowered the funding level by 4.3 percent to $889,050. By the end of the fiscal year, a total of $887,285 had been obligated for 13 studies conducted by the IDFG, ODFW, WDG, WDF, FWS, and the Nez Perce Tribe (Table 2). The following is an overview of the evaluation program in FY 1986 followed by a synopsis of each agency's evaluation program.

The Evaluation Study Guidelines, which were drafted in 1983 to provide the overall direction for evaluation studies, were put in final draft form and adopted by the Evaluation Studies Committee in 1985. Because of the change from contracts to cooperative agreements and a few other changes, the guidelines will be modified in 1987 to reflect the most current procedures. A copy of the current guidelines may be obtained from the LSRCP Office.

A pattern for regular Evaluation Study Committee (ESC) meetings was also established in 1985 and continued in 1986. 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 1986 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 1986 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 1986. By the end of the fiscal year each operating agency was drafting an updated five-year plan for evaluating the portion of the LSRCP program under their jurisdiction. The latest five-year plans contained detailed studies 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 1986. Those operating agency programs which had not acquired microcomputers completed most of their hardware and software purchases in 1986. 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.

Trailer shells that were purchased in 1985 were outfitted with piping, tanks, wiring, and tagging units in early FY 1986 and were used to adipose clip, brand, and coded-wire tag (CWT) in Washington and Oregon by WDG, WDF, and ODFW. Although most costs for the trailers were borne by the evaluation budget, some of the trailer fixture costs were shared by O&M cooperative agreements since production adipose fin clipping is not an evaluation tool.

Other major equipment expenses included completing construction of a juvenile scoop trap by WDF personnel for use on the Tucannon River for joint chinook and steelhead emigration studies. Finally, a jet boat and trailer were purchased by IDFG for angler use/mark return studies on the Salmon, Snake, and Clearwater Rivers.

IDFG's Evaluation Study Program

Because of the large production program in Idaho and large geographic area encompassed by the LSRCP, IDFG's study program consists of several statements of work and budgets. The *Hatchery Evaluation Study* 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 practices resulted in the best adult returns. The *Hatchery Evaluation Study* was intitated in 1982 and will be funded to some degree through the life of the program. The FY 1986 report is not yet available; reports from previous years are listed in Section XI of this report.

In late 1984 Idaho began a creel study to assess the LSRCP contribution to Idaho's steelhead fishery, to estimate the spawning escapement of LSRCP fish, and to obtain data for managing the fishery while protecting wild stocks. This creel study 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 1986 and will be continued annually until compensation goals have been met, and periodically thereafter. The reports available for this study are listed in Section XI.

The *South Fork Salmon River Fishery Restoration Study* was initiated in FY 1984 to determine if the wild South Fork steelhead population should be supplemented with LSRCP hatchery plants. The study was scheduled to be completed by FY 1987. However, due to overall budget reductions, the IDFG decided to curtail this study rather than reduce efforts in higher priority studies. As a result, the South Fork study was wrapped up by March 15, 1986, and will not be restarted in 1987. Although the final report is not available, interim reports are available and are listed in Section XI.

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 will be funded as a separate evaluation study while the actual tagging costs will remain a part of each hatchery's budget. Fish health and nutrition monitoring will eventually be conducted by Idaho's new central disease laboratory at Eagle, Idaho, which the LSRCP program will partially fund.

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); 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. A copy of the report of the FY 1984-funded program (from 1 April 1984 to 31 March 1985) is available at the LSRCP office (Section XI). The FY 1985 program report is being printed; the FY 1986-funded studies will end on March 31, 1987.

Two short-term studies were initiated by ODFW in 1984 and continued through 1985: *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. The reprogramming will help determine the efficacy of bolstering the LSRCP program by releasing Carson NFH smolts in the Grande Ronde and Imnaha River systems. The reports on FY 1984-funded activities for these two studies (from 1 April 1984 through 31 March 1985) are available from the LSRCP office (see Section XI). The 1985 program reports are being printed; the 1986-funded segments 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. 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 was completed and operated on the Tucannon River (jointly with WDG) in 1986 to monitor the numbers and timing of outmigrating spring chinook and steelhead. Some FY 1986 funding was used to complete the marking trailer and buy five CWT machines. Reports for activities prior to FY 1986 are available at the LSRCP office (see Section XI). The 1986-funded report will not be available until later this year.

WDG's Evaluation Study Program

Much like ODFW and WDF, the bulk of the Department of Game'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 and large number of residuals below satellite release facilities. Studies were conducted in 1986 to determine if chemical treatments will be needed to improve homing of adult fish back to the ladder. 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, WDG 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 1986. A report is available at the LSRCP office on the 1984-1985 studies (see Section XI).

Nez Perce Tribe Evaluation Study Program

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 three studies in 1986. The first study, entitled *A Method for Evaluating the Progress of the Lower Snake River Compensation Plan in Meeting its Goals*, was funded to aid the Evaluation Studies Committee in developing a model to assess the LSRCP program's progress in meeting its adult return goals. The model allows the user to track smolt releases from the hatcheries through the river system (inserting known survival rates) to their return as adults and to compare their actual survival rates and returns with those projected for the program. The tribe's report and two models (one in LOTUS format and another written in BASIC) are available at the LSRCP Office (Section XI).

The tribe's second study is being conducted 1) to develop a tribal plan for implementing the LSRCP in the Clearwater Basin in Idaho, 2) to compare the tribal plan with any developed by the IDFG, 3) to identify where conflicts occur between the plans, and 4) to recommend ways to resolve the conflicting approaches. In 1987 the tribe will be looking at other basins in the Lower Snake River Project area in a similar fashion. The report on the Clearwater River basin has been drafted and will be available from the LSRCP Office in 1987.

The final tribal effort funded by the LSRCP program allows the Nez Perce Tribe and the Confederated Tribes of the Umatilla Reservation (as subcontractors) to develop 5-year plans for their participation in the LSRCP Program. The Umatilla Tribes became interested in the LSRCP program late in the fiscal year and opted to become involved as a subcontractor to the Nez Perce in order to begin their involvement quickly.

V. CORPS CONSTRUCTION ACTIVITIES

Design is completed and construction was started on Big Canyon Creek, a satellite facility of Lookingglass Fish Hatchery, Oregon. The facility is scheduled for completion in April 1987.

During the year, design was completed, and construction was initiated on Little Sheep Creek, a satellite facility of Irrigon Fish Hatchery. The facility is scheduled for completion in August 1987.

Dayton Pond a satellite facility of Lyons Ferry, Phase I, (WDG) was completed in October 1986. With the completion of this satellite, the Lyons Ferry construction program is complete.

Clearwater Fish Hatchery design is currently on hold pending approval of a reservoir water supply from the Assistant Secretary of the Army for Civil Works. However, construction activities continued on two of the hatchery's three satellite facilities. A contract was awarded and construction was started on Red River satellite, the facility is expected to be complete in November 1986. Additionally, a station report on site selection and design memorandum was prepared for Powell. Construction of this facility is scheduled for completion in November 1988.

Construction activities at Magic Valley Fish Hatchery, Idaho continued at a rapid pace during the fiscal year, the hatchery is scheduled for completion in June 1987.

A construction clean-up contract was initiated at Hagerman NFH during the fiscal year; however, due to complications of working around the station's fish production program, the work will not be completed until FY 87.

During the year, a preliminary construction report was completed for the Eagle Disease Diagnostic Laboratory, Idaho. The facility is scheduled for construction in April 1, 1989.

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

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 in FY 1986 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 Coordination 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 inter-agency 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 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 intitated in 1982 with FY 1982 funds and will continue through 1988. No 1986 funding was used. Cooperative Unit personnel were provided FY 1986 monies to fund a program for trapping fall chinook salmon at Ice Harbor Dam for the WDF Lyons Ferry program. Status 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

A cooperative effort with Portland BPA staff which was initiated in 1985 resulted in the loan of CWT tagging machines and field detectors from BPA to the LSRCP office. The four tagging units (injectors and quality control devices), valued at over $10,000 each, and four field detectors, valued at about $2,400 each, are being used in Oregon, Washington, and Idaho. Because we were able to borrow the equipment, both newly completed LSRCP marking trailers were fully operational soon after they were constructed and problems with transfer and disinfection of machines were avoided.

Dworshak NFH received 2.9 million green spring chinook salmon eggs from Idaho Power Company's Rapid River Hatchery. A cooperative agreement between FWS and IDFG is in place for exchange of LSRCP and Idaho Power Company program eggs.

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.

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

Wallowa hatchery shipped 450,000 eyed steelhead eggs to Lyons Ferry Hatchery in Washington as part of ODFW's cooperative LSRCP effort with WDG in the Grand Ronde Basin.

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

VIII. MEETINGS

Meetings and Tours of FY 86

10/07-10/85	Toured LSRCP facilities with Corps, WDG, NMFS, BPA, ODFW, FWS (Washington D.C.) personnel (Dan Herrig)
10/22-24/85	Met with WDF and WDG evaluation and hatchery personnel at Lyons Ferry (Dan Herrig)
11/04-07/85	Assisted Dworshak FAO with field studies and met with Hagerman NFH personnel (Dan Herrig)
11/26/85	Met with Nez Perce Tribe fisheries personnel in Boise to discuss FY 86 projects (Dan Herrig)

11/28-12/05/85	Met with state agency LSRCP evaluation Coordinators in Tacoma, Washington, and attended the NW Fish Culture Conference (Dan Herrig)
01/15-17/86	Met with Nez Perce, CRITFC, and IDFG personnel Lewiston to discuss 1986 programs (Dan Herrig)
01/25-28/86	Assisted WDG with creel census on the Snake River (Dan Herrig)
01/28-30/86	Met with R.O. fisheries personnel to discuss funding and personnel (Ken Higgs)
02/10-11/86	Attended CRITFC sponsored briefing on the Pacific Salmon Treaty in Portland (Dan Herrig)
02/12/86	Attended coordination meeting at Hagerman NFH (Ken Higgs, Dan Herrig)
02/27/86	Met in Boise with Dworshak FAO project leader Bill Miller to discuss LSRCP studies (Ken Higgs, Dan Herrig)
03/06/86	Met in Boise with Division Manager John Miller and Fred Vincent (R.O.) to discuss LSRCP Program (LSRCP office staff)
03/07/86	Attended American Fisheries Society Meeting in Boise (Ken Higgs, Dan Herrig)
03/12-14/86	Attended Coordination meeting at Dworshak NFH and met with McCall FH personnel (Dan Herrig, Ken Higgs)
03/18-20/86	Attended BPA fisheries program review in Portland (Ken Higgs, Dan Herrig)
03/25/86	Met in Boise with IDFG research and hatchery personnel to discuss modifications in FY 86 budgets (Ken Higgs, Dan Herrig)
04/02/86	A safety inspection and meeting was conducted by R.O. safety personnel (LSRCP staff)
04/10/86	Site visit at Magic Valley FH (Ken Higgs)
04/22-24/86	Conducted evaluation studies coordination meeting's with Nez Perce Tribe at Lewiston and with WDF/WDG personnel at Lyons Ferry and Tucannon FH's (Dan Herrig)
04/28-05/01/86	Assisted Dworshak FAO with spawning and outplanting work at Dworshak NFH, discussed FY 86 LSRCP studies (Dan Herrig)
04/29-05/02/86	Inspected federal property at LSRCP hatcheries in Washington (Yvonne Phillips, Tammy Froscher)

05/12-13/86	Met with ODFW personnel and conducted inventories at Lookingglass, Irrigon, and Wallowa FH's (Yvonne Phillips, Tammy Froscher)
06/02-06/86	Toured LSRCP facilities with R.O. and IDFG personnel (Ken Higgs)
06/18-20/86	Reviewed LSRCP program and visited Idaho facilities with Washington D.C. FWS personnel (Ken Higgs)
06/20/86	Met with CRITFC and Nez Perce tribe biologists in Portland to review and revise FY 86 program (Dan Herrig)
06/30-07/03/86	Attend Division Meeting in Reno (Ken Higgs, Dan Herrig)
07/23/86	Attended Abernathy Salmon Cultural Development Center meeting in Longview (Ken Higgs)
07/28/86	Met with R.O. and BPA representatives to discuss the LSRCP office's reporting procedures for BPA's FY 86 treasury repayment (Ken Higgs, Yvonne Phillips)
08/07/86	Attended Hagerman FH coordination meeting (Ken Higgs)
08/08/86	Met in Boise with Dworshak NFH and IDFG personnel to discuss progress on Clearwater FH (Ken Higgs, Dan Herrig)
08/21/86	Met in Boise with IDFG hatchery and evaluation personnel to discuss and negotiate FY 87 statements of work and budgets (Ken Higgs, Dan Herrig)
08/26-28/86	Met ODFW, WDF, and WDG hatchery and evaluation personnel in LaGrande and at Lyons Ferry FH, respectively, to discuss and negotiate FY 87 statements of work and budgets (Ken Higgs, Dan Herrig)
09/24-25/86	Attend IHN research coordination meeting with R.O., research, and Dworshak NFH personnel at Dworshak (Ken Higgs, Dan Herrig)

IX. TRAINING

Training was proved to the following employees:

Yvonne Phillips, Tammy Froscher, Federal Supply and Service Seminar, January 14-15, 1986, GSA Training Center, Boise, Idaho

Dan Herrig, Tammy Froscher, EEO Seminar, February 20, 1986, FWS's Regional Office staff, Boise, Idaho

Yvonne Phillips, Telephone Seminar, February 20, 1986, GSA Regional Staff, Boise, Idaho

Yvonne Phillips, Basics of Property Management, April 1-4, 1986, GSA Training Center, Denver, Colorado

Tammy Froscher, Federal Travel Regulations, July 8, 9, 1986, Concepts of Travel, Inc., Boise, Idaho

Tammy Froscher, Yvonne Phillips, Image and Communication Skills for Women, September 26, 1986, National Seminars, Inc., Boise, Idaho

Tammy Froscher, Small Purchases, July 21-25, 1986, Management Concepts, Inc., Portland, Oregon

X. STAFFING

A total of 4.0 permanent FTE staff years were employed during FY 1986. No temporary employees or student aids were employed.

There were no employee appointments or employee resignations during the year.

In 1986, the LSRCP sponsored a YCC program at a cost of $67,000. The program was administered by 11 state and federal LSRCP hatcheries and evaluation study projects and included 42 YCC student enrollees. With the exception of persistent enrollee payroll problems in the FWS payroll system, the program went smoothly. The program is well received by the operating agencies for it not only accomplishes needed station work, but also provides environmental awareness and training to local youths.

PRESENT EMPLOYEES:

Kenneth R. Higgs, LSRCP Coordinator, GS-13
Daniel M. Herrig, Evaluation Studies Coordinator, GS-11
Yvonne R. Phillips, Contract Specialist, GS-7
Tammy A. Froscher, Clerk-Typist, GS-4

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Table 1. LOWER SNAKE RIVER COMPENSATION PLAN ACTIVITIES

INSTALLATION/PROGRAM	1986 FUNDS	SPECIES[a]	POUNDS OF FISH PRODUCED	NUMBER OF FISH PRODUCED	ADULT RETURNS[b]	ADULT MITIGATION GOALS
STATE OF IDAHO						
McCall SFH	$286,000.00	SuCS	45,835	1,161,540	NA	8,000
South Fork Satellite	-	-	NA	NA	2,690	-
Sawtooth FH	$633,600.00	STT			2,121	
		SpCS	17,074	456,171	1,769	19,232
East Fork Satellite/LSRCP Mgt.		STT			443	
		SCS			194	
Magic Valley FH[c]	$185,900.00	STT	57,155	255,482	NA	11,660
Clearwater Anadromous[d]	$128,544.00	SpCS				12,200
	-	STT				14,004
STATE OF OREGON						
Lookingglass FH	$277,541.00	SpCS	103,009	1,514,497	249	9,072
Imnha Satellite	-	-	-	-	71	-
Irrigon FH	$686,233.00	STT	61,220	314,420	-	11,184
Wallowa SFH[e]	-	-	57,707	250,203	1,910	-
Little Sheep Satellite	-	-	-	-	72	-
STATE OF WASHINGTON						
Lyons Ferry FH (Dept. of Fish)	$306,037.00	SpCS	-	-	-	1,152
		FCS	84,130	2,271,000	245[f]	18,300
Lyons Ferry FH (Dept. of Game)	$648,123.00	STT	148,723	827,528	378	4,656
Tucannon SFH Satellite	$244,988.00	RBT	94,192	261,615		
FISH & WILDLIFE SERVICE						
Hagerman NFH	$490,000.00	STT	286,112	1,271,852	NA	13,600
Dworshak NFH	$175,000.00	SpCS	33,081	671,606	516	9,000
Dworshak FHC	$ 19,000.00					-
YCC Program	$ 67,000.00					
Regional Office	$250,000.00					
LSRCP Management/Coord.	$148,000.00					
Evaluation Studies	$887,285.00					
Contingency Funds	$ 22,368.00					
Totals	$5,455,619.00					

[a] RBT-Rainbow Trout/FCS-Fall Chinook Salmon/SpCS-Spring Chinook Salmon/STT-Steelhead Trout
[b] Returns to hatchery rack only.
[c] Fish reared at Hagerman NFH for Magic Valley Stock Program.
[d] Not constructed, fish produced and released at satellite locations for program.
[e] Reared at Irrigon for release at Wallowa SFH.
[f] Trapped at Ice Harbor Dam, an additional 1,125 jacks also returned to the hatchery rack.

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Table 2. LOWER SNAKE RIVER COMPENSATION PLAN EVALUATION STUDIES

State/Study	1986 Funds	Species Studies
Idaho Dept. of Fish and Game		
Hatchery Evaluations	$ 59,720	Chinook, Steelhead
Hatchery-Wild Study (creel)	104,901	Steelhead
S. F. Salmon River	26,898	Steelhead
Subtotal	$191,519	
Oregon Dept. of Fish and Wildlife		
Hatchery Evaluation	$206,670	Chinook, Steelhead
Pre-smolt Release (tagging)	13,424	Chinook
Reprogramming Smolts (tagging)	13,775	Chinook
Subtotal	$233,869	
Washington Dept. of Fisheries		
Lyons Ferry Evaluation	$179,993	Chinook
Washington Dept. of Game		
Lyons Ferry Evaluation	$145,150	Steelhead (incl. res. trout)
Nez Perce Tribe		
Evaluation Method for LSRCP	$ 30,313	Chinook, Steelhead
LSRCP Production Plan (Clearwater Basin)	20.499	Chinook, Steelhead
Five-Year Plan for LSRCP Implementation	13,307	Chinook, Steelhead
Subtotal	$ 64,119	
Dworshak Fisheries Assistance Office (FWS)		
Hatchery Coordination	$ 52,635	Chinook, Steelhead
Idaho Coop. Fish and Wildlife Res. Unit (FWS)		
BKD Study	0[a]	Chinook
Fall Chinook Trapping	$ 20,000	Chinook
TOTAL	$887,285	

a Studies conducted in 1985 with funds appropriated in previous years.

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

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

* ODFW - Oregon Department of Fish and Wildlife
WDG - Washington Department of Game
WDF - Washington Department of Fisheries
IDFG - Idaho Department of Fish and Game
FWS - U.S. Fish and Wildlife Service
( ) - Used when dual use hatchery/satellite is listed a second time.

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Table 4. A preliminary estimate of the contribution of LSRCP to ocean fisheries and the Columbia River run from 1982 through 1986.

Species/Hatchery	Contribution from 1982-1986	
	Ocean	Columbia River
Summer Chinook		
McCall FH		7,900
Spring Chinook		
Sawtooth FH	500	3,300
Lookingglass FH	150	950
Dworshak NFH	300	2,400
Total Spg. Ck.	950	6,650
Fall Chinook		
Lyons Ferry FH	1,200	4,700
Steelhead Trout		
Irrigon/Wallowa FH		5,950
Lyons Ferry FH		50,000
Hagerman NFH	120	24,000
Total Sthd.	120	79,950

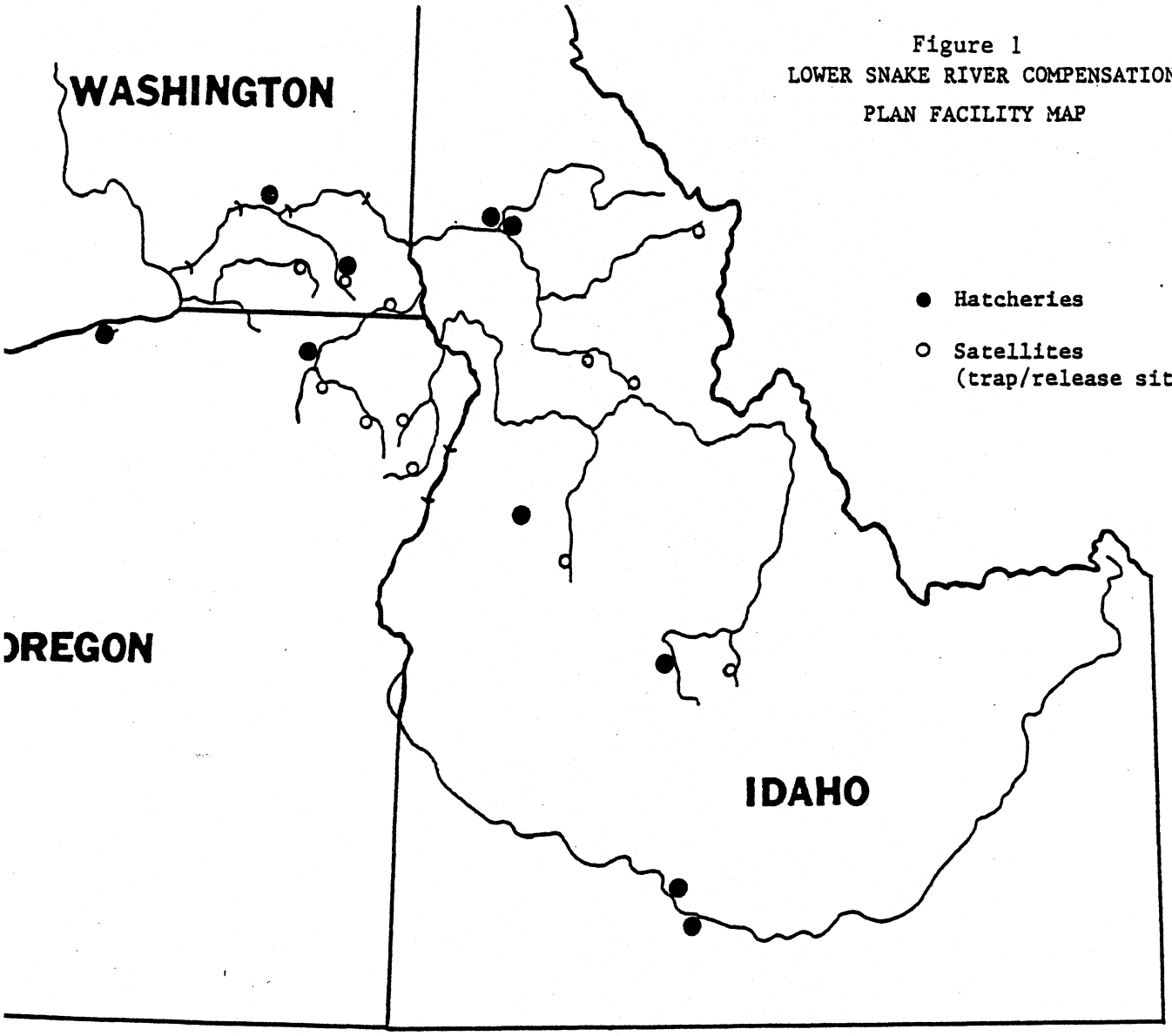

Figure 1
LOWER SNAKE RIVER COMPENSATION
PLAN FACILITY MAP

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