

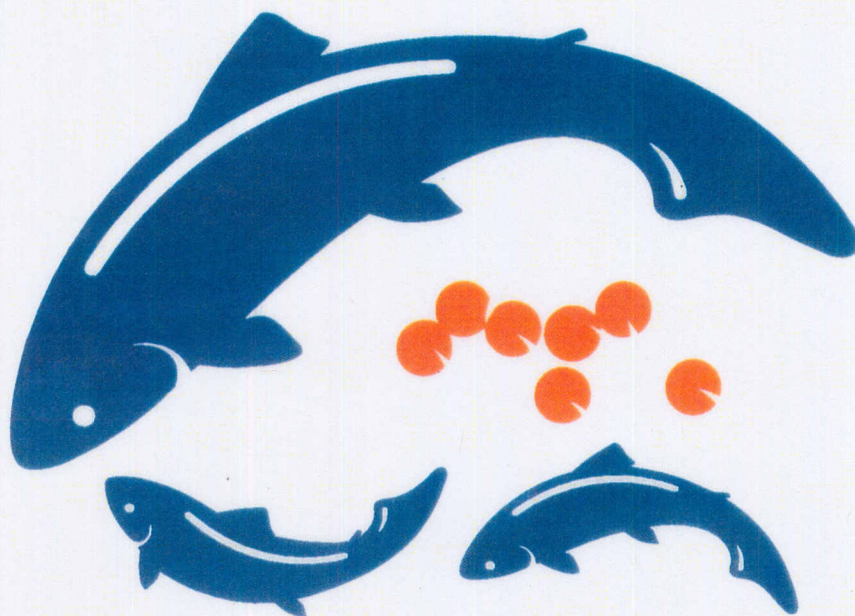
LOWER SNAKE RIVER

COMPENSATION PLAN PROGRAM

ANNUAL REPORT FOR FISCAL YEAR 1996

Boise, Idaho

October 1, 1995 - September 30, 1996



LOWER SNAKE RIVER COMPENSATION PLAN *Hatchery Program*



TABLE OF CONTENTS

	PAGE
I. INTRODUCTION	1
II. PROGRAM HIGHLIGHTS FOR FY1996	2
III. STATION AND COOPERATOR OPERATIONS	3
Clearwater Anadromous FH - Idaho	4
Magic Valley FH - Idaho	5
McCall FH - Idaho	5
Sawtooth FH - Idaho	6
Irrigon/Wallowa FH - Oregon	7
Lookingglass FH - Oregon	8
Lyons Ferry/Tucannon FH - Washington	9
Pittsburg Landing Acclimation Facility - Idaho	11
Dworshak NFH Expansion	11
Hagerman NFH	12
IV. LSRCP OFFICE OPERATIONS	12
V. EVALUATION STUDIES	12
Idaho Department of Fish and Game	13
Oregon Department of Fish and Wildlife	15
Washington Department of Fish and Wildlife Salmon Study	16
Washington Department of Fish and Wildlife Trout Study	18
Nez Perce Tribe	18
Confederated Tribes of the Umatilla Indian Reservation	19
VI. FWS COOPERATIVE PROGRAMS	20
VII. OTHER COOPERATIVE PROGRAMS	20
VIII. CORPS CONSTRUCTION ACTIVITIES	21
IX. STAFFING	21
X. FUTURE OUTLOOK	22
XI. MEETING ATTENDED IN FY1996	24
XII. TRAINING	28
XIII. AVAILABLE REPORTS	29

LIST OF TABLES AND FIGURES

	PAGE
TABLE 1 LOWER SNAKE RIVER COMPENSATION PLAN ACTIVITIES FOR 1996	53
TABLE 2 PERTINENT DATA FOR LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN FISH HATCHERY FACILITIES	54
TABLE 3 HATCHERY OR TRAP RACK RETURNS TO LSRCP HATCHERIES OPERATING IN 1996	55
FIGURE 1	56

I. INTRODUCTION

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

The LSRCP was authorized by the Water Resources Development Act of 1976 (90 Stat. 2917) to replace fish and wildlife losses caused by the construction and operation of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Lock and Dam projects on the lower 150 miles of the Snake River in Washington and Idaho. The plan described fish hatchery developments as well as improvements to the dams and powerplants to improve smolt passage.

Construction responsibility for the LSRCP was assigned to the Walla District, U.S. Army Corps of Engineers (Corps), while responsibility for fish hatchery O&M funding was to be accomplished by "one of the Federal fisheries agencies." The question of O&M funding was settled in 1977 with the signing of an interagency agreement by the Corps, National Marine Fisheries Service (NMFS), and FWS; it stated that the FWS would budget for and administer O&M funds for LSRCP fish hatchery programs (responsibility for administration and O&M for fish passage and wildlife programs remains with the Corps).

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

The Corps' estimated cost for construction of the authorized LSRCP off-project fisheries facilities (hatcheries and related satellite facilities) is \$177 million; the FWS costs for annual O&M now exceeds \$12 million. All anadromous fisheries compensation and most resident fisheries compensation are allocated to project power costs and are reimbursed to the U.S. Treasury with interest by the Bonneville Power Administration (BPA) from power revenues.

The LSRCP legislation authorized what was believed to be sufficient anadromous fish hatcheries and associated trapping and holding facilities to produce enough smolts to return 18,300 fall chinook adults, 58,700 spring and summer chinook adults, and 55,100 steelhead adults back to the project area, and sufficient resident fish hatcheries and stream enhancement projects to produce 93,000 pounds of trout annually to replace lost resident sport fisheries in Washington and

Idaho. The program required expansion or construction of 12 hatcheries and 11 satellite facilities in Idaho, Oregon, and Washington. Idaho Department of Fish and Game (IDFG) operates four hatcheries, Oregon Department of Fish and Wildlife (ODFW) operates three hatcheries, Washington Department of Fish and Wildlife (WDFW), formerly Washington Department of Wildlife and Washington Department of Fisheries, operates three hatcheries, and FWS two hatcheries. The Pittsburg Landing Acclimation Facility, authorized by a Congressional add-on to the Corps program, was completed by them in 1996 and is operated by the Nez Perce Tribe (NPT).

II. PROGRAM HIGHLIGHTS FOR FY1996

LSRCP facilities continue to produce and release large numbers of salmon, steelhead and resident trout as part of their mitigation responsibility. In FY1996, 9,551,915 salmon, steelhead and rainbow trout weighing 1,531,866 pounds were released from LSRCP facilities. The numbers and pounds of fish produced were lower than FY1995 and release sites and sizes were adjusted to reduce impacts on listed species.

The 1995-96 steelhead run above Lower Granite Dam of 79,321 fish compared to previous years totals of 47,147, 97,000, 113,000, and 59,604. The run was comprised mostly of hatchery releases in 1993 and 1994. Returns of both salmon and steelhead were low coastwide, and like many programs, the LSRCP portion is close to the adult steelhead mitigation goal of 55,100 steelhead adults back to the project area. In 1996 approximately 6,757,088 steelhead fingerlings and smolts (1,305,607 lbs) were released from LSRCP hatcheries compared to a release of approximately 6 million from these facilities in 1995. Magic Valley Fish Hatchery (FH) alone released 1,868,085 steelhead smolts this year weighing 402,976 pounds.

Considerable LSRCP staff time in FY1996 was spent on Endangered Species Act (ESA) consultations and modifications of biological assessments of hatchery production and release actions on listed Snake River spring/summer and fall chinook. Fish hatchery production was and will continue to be adjusted where appropriate to meet ESA requirements.

The LSRCP staff and cooperators entered into the second year of captive broodstock programs in Oregon and Idaho. The programs are measures initiated by the LSRCP program conserve listed salmon stocks. The LSRCP Office chairs and, with its cooperators, developed the Conservation Program Oversight Team (CONSPOT), a multi agency workgroup to provide planning, direction, and coordination for the captive broodstock programs. The LSRCP Office participated with the "local" ODFW and IDFG integrated technical teams (IT's) to develop their respective captive broodstock programs and Section 10 permits. The CONSPOT and the IT's met several times during FY1996 to address captive broodstock issues. The LSRCP also held a Captive Broodstock Workshop in Walla Walla, Washington during FY1996 to address issues resulting from development of the two LSRCP programs. NMFS participates on the CONSPOT and portions of the captive broodstocks from each state program were moved to the Manchester salt water facility in Washington (operated by the NMFS) for rearing to maturation.

The LSRCP Office participated in the regional development of the scientific panel to address issues regarding the use of Rapid River stock spring chinook salmon in the Grande Ronde River basin. The scientific panel produced a draft report with their analysis and recommendations late in FY1996. The LSRCP Office also initiated meetings to discuss the August 6, 1996 Proposed Steelhead Listing and identify conferencing requirements for all LSRCP actions in the future.

Members of the LSRCP staff continued to actively participated in the region's ecosystem reorganization process as either leaders or members of several of the reorganization work teams. We hope our efforts will result in a well coordinated Columbia River ecosystem team approach to resource management.

In early 1996, high spring run off caused extensive damage at two LSRCP hatcheries and three satellite facilities in Washington and Oregon. On April 26, 1996, the U.S. Department of Interior's FY1996 Omnibus Bill was signed into law allocating \$504,288 of Emergency Storm Damage Supplemental Appropriations for flood damage repairs for the LSRCP. The LSRCP spent \$484,917 for repair work in FY1996. ODFW spent \$22,000 to repair the access road, hatchery water intake, and to stabilize stream banks at Lookingglass FH. WDFW spent \$462,917 1) to repair the Tucannon FH water intake, access bridge and roadway, weir, and adult fish trap; 2) to repair the Cottonwood Pond groin, stream banks and pond intakes and clean debris; 3) to repair the Dayton pond dike and outlet and remove debris; and 4) to repair the Curl Lake intake and remove debris and stabilize the water intake.

The LSRCP Office finalized the preparation of full color brochures for Clearwater and Lookingglass FH's, with the Corps printing of 50,000 copies of each brochure in FY1996. These brochures completed the preparation of brochures for all LSRCP facilities.

III. STATION AND COOPERATOR OPERATIONS

The Boise LSRCP Office negotiated cooperative agreements with and administered funds to three state agencies, two Indian tribes and the FWS for operation and maintenance of fish hatcheries and to conduct hatchery monitoring and evaluation studies and fish health programs. A total of \$8,796,739 was obligated to WDFW, ODFW, and IDFG or transferred to Dworshak NFH, Hagerman NFH, and Dworshak Fish Health Center (DFHC) for operation and maintenance and fish health monitoring of 12 hatcheries and 11 associated satellite facilities. An additional \$2,682,395 was obligated to the same three state cooperators, Nez Perce and Umatilla tribes, Idaho Fisheries Resource Office (IFRO), and the Columbia River Coordinators Office for hatchery monitoring and evaluation studies and Section 7 consultation work. A total of 9,551,915 salmon, steelhead and rainbow trout weighing 1,531,866 pounds were stocked from LSRCP facilities in FY1996. Funding of cooperator disease monitoring programs at LSRCP facilities continued in FY1996. LSRCP pathologists met with the evaluation biologists during their annual meeting to discuss the status of their efforts.

Below are brief summaries of hatchery and evaluation activities in FY1996. Tables 1 and 2 provide further data on fish stocked, production targets, construction costs, and hatchery/trap returns.

Clearwater Anadromous Fish Hatchery - Idaho

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

The Clearwater FH is located on land (17.5 acres) purchased by the Corps in 1989. Construction of Clearwater FH began in August 1989 and was completed by the end of 1991. The water supply line was tested in November 1991, and steelhead eggs from Dworshak NFH and rainbow trout for resident fisheries program were supplied to Clearwater in 1992 for the first rearing cycle.

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

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

Red River trapped 62 spring chinook this year (9 jacks and 53 adults), compared to the 4 adults collected last year. Seventeen were released to spawn naturally. Ten females were spawned resulting in 40,495 green eggs. Crooked River was operational for the seventh year of trapping; a total of 299 spring chinook (93 jacks, 206 adults) were trapped and 63 were released to spawn naturally. This compares to a Crooked River return of only 6 jacks trapped in 1995. A total of 73 females were spawned producing 274,332 green eggs. Only 3 male steelhead were trapped at the Crooked River trap this year with two released above the weir. The Powell trap, on the Lochsa River, trapped a total of 186 chinook (45 jacks and 141 adults) with 17 released to spawn naturally. This compares to only 14 fish trapped at Powell in 1995. Sixty-six females were spawned resulting in 275,883 green eggs.

Clearwater FH spawned 12 females (BY91-92) from the Selway River spring chinook captive broodstock program resulting in 15,970 green eggs. The Clearwater FH is currently holding approximately 25,200 BY1995 spring chinook fingerlings and 683,258 BY96 steelhead fingerlings

for production and release from the hatchery and satellite facilities in 1997. In addition approximately 466,480 BY1996 spring chinook eggs are on hand for release in 1998.

A total of 293,804 BY1994 chinook smolts weighing 16,546 pounds were released from the satellite facilities and supplementation sites in April 1996. Approximately 37,071 BY1994 spring chinook smolts were released from the Crooked River pond, 232,731 were released from Powell, and 24,002 were released from Red River. A total of 188,209 BY1994 N.F. Clearwater and Selway strain steelhead smolts (two year rearing program) weighing 28,902 pounds were released directly into Crooked R., Red R., and Clear Ck. and 603,118 BY1995 North Fork Clearwater strain steelhead smolts weighing 77,716 pounds were released into five additional Clearwater basin sites in 1996. In addition 48,730 BY1996 N.F. Clearwater strain steelhead fingerlings (886 lbs) were released into the S.F. Red River for supplementation studies.

Magic Valley Fish Hatchery - Idaho

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

The hatchery was constructed on a commercial hatchery site that was purchased by the Corps in March 1981. Steelhead have been produced for the Magic Valley program since 1982. Until 1985, fish were produced onsite in a commercial facility; however, with the start of construction, fish production was transferred to unused raceways at Hagerman NFH (approximately 255,000 steelhead smolts were reared at Hagerman in 1986 for the Magic Valley program). Sawtooth FH and the East Fork Salmon River satellite serve as the juvenile release and adult trapping sites for the hatchery program.

Magic Valley FH completed its ninth rearing season this year, and released 1,868,085 BY1995 Dworshak, E.F. Salmon R., Pahsimeroi strain steelhead smolts in April 1996, weighing 402,976 pounds. The releases were distributed between the East Fork of the Salmon R., Slate Creek, Hazard Creek, and the Salmon River. Magic Valley currently has 1,664,746 BY1996 steelhead fingerlings on hand for release in 1997.

McCall Fish Hatchery - Idaho

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

The hatchery achieved considerable success with its summer chinook program from 1986 through 1993 with 2,690, 2,705, 2,393, 939, 969, 1,212, 2848, and 2,703 fish trapped respectively. Typical of the lower chinook runs throughout the basin, McCall's returns decreased in 1994 and 1995 to only 517 (447 adults, 70 jacks) and 408 fish (307 adults and 101 jacks). In 1996, 1,199 summer chinook (461 adults and 738 jacks) were trapped at the S. F. Salmon weir. A total of 111 females were spawned producing 486,644 green eggs. Because of listed stock considerations, 175 adults were released to spawn naturally in 1996. Due to the high jack count in 1996 a larger adult return is expected next year.

The McCall FH staff released 585,654 BY1994 summer chinook salmon smolts weighing 32,773 pounds in the South Fork Salmon River in April 1996. This is slightly above one half the hatchery's release target of 1,000,000 smolts. The fish were in good health throughout the rearing cycle and mortalities were low. McCall currently has 175,322 (reserve) and 63,357 (supplementation) BY1995 summer chinook fingerlings on hand for release in 1997 and 436,509 BY1996 eggs on hand for release in 1998.

Sawtooth Fish Hatchery - Idaho

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

A total of 553 steelhead returned to the Sawtooth trap in 1996 compared to 532 and 338 in 1995 and 1994. Returns for the years 1988 through 1993 were 994, 974, 1,056, 261, 156 and 1,598 respectively. The East Fork satellite facility trapped only 54 steelhead, compared to 38 in 1995, 73 in 1994, 176 in 1993, 156 in 1992, 119 in 1991, and 454 in 1990. Steelhead trapping was initiated at Slate Ck. in 1996 with 38 steelhead trapped. A total of 226, 20, and 15 females were spawned from Sawtooth, East F. Salmon, and Slate Ck. respectively resulting in 1,091,543 green eggs from Sawtooth and a combined 161,632 green eggs from the E.F. Salmon and Slate Ck. sites. Sawtooth FH shipped a total of 849,800 BY1996 Sawtooth and 463,700 BY1996 Pahsimeroi steelhead eggs to Hagerman NFH and 882,000 BY1996 Pahsimeroi and 82,800 BY1996 Sawtooth steelhead eggs to Magic Valley FH for rearing and release in 1997.

Spring chinook trapping at Sawtooth FH began in June and ended in September with a total of 156 chinook trapped this year compared to 37 in 1995, 96 in 1994 and 587 in 1993. Ten spring chinook were trapped at the East Fork site this year compared to 0 in 1995, 15 in 1994, 90 in 1993, 65 in 1992, and 62 in 1991. Numbers of chinook trapped continue to remain low at the facilities and were typical of the low numbers that returned basin wide in recent years. As part of ESA Section 10 conditions for operation, the hatchery staff released 94 chinook above the Sawtooth weir (compared to 20 in 1995) and all 10 collected at the E.F. Salmon weir. Ten

females were spawned from Sawtooth FH returns resulting in 52,332 green eggs. A total of 25,006 BY1994 chinook smolts (1,256 lbs) were released in March 1996 into the Salmon River at the hatchery weir. Sawtooth currently has a total of 4,803 BY1995 chinook (375 lbs) on hand for release in 1997 and 45,717 BY1996 chinook eggs on hand for release in 1998.

This year marked the 2nd year of a captive rearing program for the Lemhi R., East Fork Salmon R., and West Fork of the Yankee Fork Salmon R. The strategy of the program is to prevent cohort collapse of the specific target populations by providing 20 pairs of captively reared adult spawners back to the natural environment on an annual basis. A total of 140 wild spring chinook parr were collected from the Lemhi R. in the fall of 1996 (compared to 575 collected in the fall from the three tributaries in 1995 and 30 the following spring 1996). No parr were collected in the fall of 1996 in the W.F. Yankee Fork and E.F. Salmon R. due to the lack of juvenile fish in those tributaries (only one redd found between both tributaries). A screw trap will be operated in the E.F. Salmon R. and is being considered in the W.F. Yankee Fork Salmon R. to collect spring migrants for the program. All BY1995 fish collected in the fall of 1996 are currently being reared at Sawtooth FH until they are transferred to Eagle FH in the spring 1997.

One half of the BY1994 fish were transferred to the Manchester facility (salt water) in Washington and the other half are being held at Eagle FH for rearing to maturation. The progeny of these broodstock will be raised at Eagle FH for subsequent release as mature adults back into their rivers of origin.

In addition to the LSRCP program, the State cooperates with the Shoshone-Bannock Tribe, BPA, NMFS, and other agencies in a FWS-approved sockeye salmon restoration project at Sawtooth FH. The project is funded by BPA and is an effort to recover the endangered sockeye run. In 1995 a catchable trout holding and distribution program was instituted to stock local waters; that project was funded entirely by IDFG.

Irrigon/Wallowa Hatcheries - Oregon

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

An expansion of ODFW's Wallowa State Hatchery was completed in May 1985; it serves as a final rearing, acclimation, and release site for about 600,000 steelhead smolts from Irrigon FH and has facilities for steelhead trapping and spawning. In 1996 a total of 998 steelhead returned to the Wallowa FH compared to 318 in 1995, 599 in 1994, 1,353 in 1993, 2,644 in 1992 and 576 in 1991. Fifty three steelhead were released to spawn naturally. A total of 592 females were spawned from Wallowa and Big Canyon steelhead returns resulting in 2,781,565 green eggs. No steelhead were transferred from the Cottonwood trap (WDFW) in 1996.

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 their Tucannon River spring chinook program. The remaining 7,000 pounds of rainbow trout production stipulated in the compensation plan (the total requirement is 93,000 pounds) is to come from stream enhancement structures funded by the Corps. These structures were constructed by WDW in the early 1980's.

The hatcheries along with the Phase I (steelhead) satellite facilities at Cottonwood Creek, Dayton Pond, and Curl Lake were completed from 1983 to 1986. The two fall chinook adult holding ponds at Lyons Ferry FH were found to be unmanageable and were rehabilitated by the Corps in 1993. Each pond were divided into two units by construction of a dividing wall down the center, providing much more versatility for handling and sorting adults. Additional office space at the Lyons Ferry steelhead facility was constructed in 1992 by adding 400 square feet onto the administration building. This work was done by the WDFW personnel. The road to the Marmes pump site, which was originally constructed with large cobbles was smoothed and graded by hatchery personnel.

Spring chinook returns to the Tucannon trap and weir totaled 135 up from 40 in 1995 and 73 in 1994, and down from 448 in 1993. Forty-four adults and 6 jacks were released above the weir to spawn naturally. Seventy-three adults and 7 jacks were spawned producing 129,500 green eggs. There are currently about 62,218 BY1995 Tucannon River chinook (1,353 lbs) on hand for release in 1997.

This year adult fall chinook were trapped at the Lyons Ferry FH and at Lower Granite and transported to Lyons Ferry FH for holding and spawning. A total of 2,256 fall chinook voluntarily entered the hatchery in 1996 compared to 956 in 1995, 972 in 1994 and 1,332 in 1993. An additional 703 were captured at Lower Granite Dam compared to 327 in 1995. A total of 998,200 green eggs were collected in FY1995, only from known Lyons Ferry fall chinook. A considerable effort was necessary during spawning to ensure that only Snake River fall chinook adults were used for broodstock. All coded wire tags were read before spawning to ensure that the Snake River genetic stock is maintained. Strays from programs outside the basin were inadvertently used prior to 1990. The new concerted effort to spawn only Snake River stocks with each other is of particular importance because the fall chinook are listed as endangered under the ESA. All eggs from strays identified at spawning (404,800 eyed eggs) were shipped out of basin to another WDFW facility. Lyons Ferry currently has 785,142 BY1995 fall chinook (19,150 lbs) on hand for release in 1997.

Because of the potential for large numbers of stray steelhead that return to the Lyons Ferry ladder in the fall (when it remains open for fall chinook returns) all trapped steelhead are checked for Lyons Ferry brands. In FY1996, 5,920 steelhead returned to the hatchery compared to 4,009 in 1995. A total of 1,614,636 green eggs were taken from the 330 females spawned. Four thousand seven hundred twenty-five steelhead were released to spawn naturally. Approximately 818,304 BY1996 Lyons Ferry stock steelhead (37,196 lbs) remain on hand for release in 1997. In addition a total of 430 Wallowa stock steelhead were trapped at the Cottonwood Creek satellite facility

compared to 460 in 1995. One hundred twenty five females were spawned for the WDFW program, resulting in 601,979 green eggs. About 334,979 fingerlings (5,678 lbs) are on hand for rearing and release in 1997.

Releases from Lyons Ferry FH were below the goals for fall/spring chinook and steelhead. The fall chinook release totaled 114,299 BY1994 smolts weighing 11,108 pounds at Pittsburg Landing and 404,270 BY1994 smolts (38,502 lbs) at Lyons Ferry FH. In addition a total of 112,038 BY 1995 fingerlings (487 lbs) were released into the Snake and Clearwater rivers. A total of 130,069 BY1994 spring chinook weighing 7,841 pounds were released into the Tucannon River as smolts.

A total of 875,449 steelhead smolts weighing 183,118 lbs were released from Lyons Ferry FH, hauled to the three satellite ponds, or trucked directly to streams. Lyons Ferry and Tucannon FH's combined, reared and released 428,525 catchable (8 to 9 inch) and sub-legal rainbow trout for Washington lakes and streams and the Idaho Program weighing 79,270 pounds.

Pittsburg Landing

As noted above the Pittsburg Landing fall chinook acclimation and release facility was completed by the Corps of Engineers in late 1995 and is operated by the NPT in cooperation with WDFW. The facility receives fall chinook from Lyons Ferry FH for acclimation in 16 round tanks in February or March and releases them in April as yearlings. This year 114,299 BY1994 smolts weighing about 11,108 pounds were released.

Dworshak National Fish Hatchery Expansion - Idaho

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

Spring chinook runs in the Clearwater River in 1996 totaled 1,165 fish returning to the Dworshak/Kooskia Complex, compared to 61 adults and 104 jacks in 1995 and 305 adults in 1994. A total of 384 females were spawned producing 1,326,386 green eggs. The Dworshak Program currently has approximately 53,000 BY1995 Dworshak and 16,120 BY1995 Kooskia spring chinook fingerlings on hand for releases in 1997.

In April 1995, Dworshak/Kooskia NFH personnel released 102,903 BY1994 spring chinook smolts weighing 9,285 pounds into the North Fork Clearwater River and 333,794 BY1994 spring chinook smolts weighing 16,782 pounds into Clear Ck. directly from Kooskia NFH.

Hagerman National Fish Hatchery - Idaho

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

Hagerman NFH received a total of 1,565,565 BY1995 steelhead "A" eggs composed of Sawtooth, Pahsimeroi, and Oxbow stocks this year. No Dworshak or East Fork "B" eggs were received. Overall survival from egg to smolt was 95%.

A surplus of 161,890 Oxbow stock steelhead (15,230 lbs) were stocked in Lucky Peak, Salmon Falls Creek, and Oakley reservoirs in November, 1995 and April, 1996. In April 1996 Hagerman NFH released 1,329,226 BY1994 steelhead smolts weighing 255,750 pounds into various streams in the Salmon River basin and to acclimation ponds at Sawtooth and Pahsimeroi FH's. Fish health for the entire history of steelhead production for BY1994 was excellent. Hagerman currently has 838,509 BY1996 Sawtooth/Pahsimeroi stock (28,521 lbs) and 436,690 Pahsimeroi stock (14,178 lbs) on hand.

IV. LSRCP OFFICE OPERATIONS

A total of \$12,827,917 was obligated for LSRCP programs in FY1996 (\$790,500 from carryover funds). This total included \$2,682,395 for cooperator monitoring and evaluation studies and ESA requirements, \$318,012 for Boise LSRCP Office management and coordination, \$545,854 for the Regional Office and FWS administrative costs, \$8,796,739 for hatchery operations and maintenance and pathology, and \$484,917 for flood damage (the latter were not LSRCP appropriations). Eight cooperative agreements were signed for FY1995 to distribute \$10,544,084 in evaluation and operation and maintenance funding to non-federal entities. Two of these agreements, ODFW O&M and WDFW O&M, included the monies to repair facilities for damages caused by high spring run off.

V. EVALUATION STUDIES

In 1996 all five operating agencies and two Indian Tribes had fully operational evaluation studies underway. By the end of the fiscal year, a total of \$2,220,811 had been obligated for studies being carried out by the IDFG, ODFW, WDFW, FWS Idaho Fishery Resource Office (IFRO), and the Nez Perce (NPT) and Confederated Umatilla Tribes (CTUIR). Below is an overview of the FY1996 evaluation program followed by a synopsis of state and tribal evaluation programs. The IFRO evaluation program is discussed in the next section, **FWS Cooperative Programs**.

Results of LSRCP-funded evaluation studies are available in our cooperator's annual reports; a listing of reports is found in Section XIII of this document.

The Evaluation Study Committee (ESC) is an eight-member workgroup consisting of the LSRCP Office evaluation studies coordinator and a single representative from each cooperating agency and tribe: IDFG, ODFW, WDFW, FWS, NPT, CTUIR, and Shoshone-Bannock Tribes (SBT). Each year since 1985 the group has met for an annual program review and issue discussion meeting; in addition, several partial committee meetings are held each year to discuss specific topics, such as ESA and review of study proposals. The annual meetings often include additional staff members from each agency/tribe and occasionally visiting experts.

The FY1996 ESC meeting was held in November 1995 in Clarkston, Washington, and was attended by a number of representatives from other agencies with management and funding responsibilities in the Snake River basin. Although this annual meeting's purpose was primarily to update all members on ongoing and proposed LSRCP-funded studies, a couple of panels were also conducted to discuss current issues.

Because the LSRCP Office received a Biological Opinion for 1995-1999 LSRCP Operations last year, the LSRCP ESA coordinator, Joe Krakker, and the agency/tribal evaluation biologists dedicated significantly less time to ESA Section 7 consultation efforts in 1996. However, a considerable amount of time was still required to modify the Opinion and Section 10 Scientific/Enhancement Permits for changed or new proposed actions.

Two multi-agency efforts were initiated this year to form a Conservation Program Oversight Team (the CONSPOT) to guide the LSRCP listed stocks captive propagation efforts and development of joint NPT, WDFW, and FWS (Idaho Fishery Resource Office) study plan to monitor fall chinook releases above Lower Granite Dam. These efforts will be described in more detail below.

IDFG's Evaluation Program

IDFG conducted their investigations under a single study in 1996, the **LSRCP Fish Hatchery Evaluations-Idaho**, which combines three projects--*Hatchery Evaluations*, *Hatchery-Wild Composition of the Idaho Steelhead Harvest*, and *Coded-Wire Tag Analyses*. Idaho's projects are being conducted to 1) ensure that accurate and adequate monitoring of hatchery practices occurs so the most cost effective mode of operation for each hatchery is implemented, and 2) assess the LSRCP contribution to fisheries and escapement. Specifically, the *Hatchery Evaluations* studies include monitoring and evaluation of hatchery rearing; size, time, and location of releases; and adult returns. These types of studies are long-term because constant monitoring is required to identify problems before they result in catastrophic fish losses and to determine which hatchery rearing and release practices will result in the best adult returns. In 1996, the monitoring and evaluation of the captive rearing program was added to the *Hatchery Evaluation* project.

Several evaluation studies initiated in previous years to address specific hatchery problems and needs were continued in 1996. Production groups of salmon from all LSRCP programs were PIT-tagged to determine migration timing and interrogation rates at Snake and Columbia River dams. IDFG collected scales from known chinook hatchery adults (i.e. those tagged as juveniles) and wild fish and used scale patterns to identify hatchery fish for broodstock and other management purposes. Production and test groups are marked (CWT'ed and fin clipped) and returns are used to assess survival rates (by sex and age). Survival determinations of high, medium, and low density chinook rearing conditions continued as adult returns are analyzed from 1991 and 1992 releases. To assess effects of handling and CWTing, BY1988 through BY1990 summer chinook in one pond at McCall FH were marked with TM-100 for comparison to ad-clipped/CWT'ed fish in the adjacent pond. The study continued this year as 5-year-old adults returned and bone samples were taken and analyzed for a T-100 mark.

IDFG evaluations and hatchery personnel continued natural rearing experimentation of chinook at Sawtooth and Clearwater FH's initiated in 1993. They will rely on CWT's and PIT's of BY1992 through BY1994 releases to assess effects of various raceway alterations and other rearing conditions on juvenile and adult survival. IDFG completed a time of release study of South Fork Salmon River summer chinook salmon to help identify the optimum time of release into the South Fork. IDFG began preparation of a report evaluating the efficacy of outplanting adult summer chinook to historic spawning grounds in the South Fork's Stolle Meadows area.

A steelhead size-at-release experiment (Salmon River releases from Hagerman NFH) designed to identify the optimum size with the greatest survival and lowest residualism was completed with adult returns in 1995 and data are being analyzed. Steelhead acclimation studies continued as adults returned from acclimated (21 days) and control groups reared at Hagerman NFH and released at Sawtooth FH. All fish were CWT and PIT tagged to determine juvenile interrogation and adult survival rates. A volitional release study was designed (to reduce residualism in the river) and a pilot study used PIT-tagged fish was completed. A 2-year rearing cycle pilot project at Sawtooth FH and rearing methods study at Hagerman are being monitored with FH personnel.

In late 1984 Idaho began an angler survey to assess the LSRCP contribution to Idaho's steelhead fishery, estimate the total escapement of LSRCP fish, recover information on marked fish, and obtain data for managing the fishery while protecting wild stocks. In 1996 pre- and in-season run projections were provided. This survey is also the major means of recovering adult steelhead tagged as fingerlings under other evaluation studies. These efforts were funded through 1996 and will be continued annually (at some level) until compensation goals have been met, and periodically thereafter.

The process of reading tags and analyzing marks was first funded in 1992 as part of the evaluation study, whereas actual marking costs remain a part of each hatchery's budget. In 1996 several hundred tags (many recovered under the Harvest Study described above) from several state and tribal LSRCP programs were removed from fish and decoded at IDFG's Lewiston lab.

As in 1995, IDFG and Shoshone-Bannock Tribal evaluation personnel collaborated to collect juvenile spring chinook salmon from three Idaho streams to continue a captive propagation effort to conserve those threatened populations. They were able to capture fish in only one stream due to the poor adult return in 1995. Detailed planning was initiated by the CONSPOT (which includes IDFG's evaluation biologists) to help define the long range captive program goals and identify all future activities, facility needs, and funding requirements. IDFG also took the lead in developing the Idaho Integrated Team (IDIT), which is made up of biologists, fish culturists, and pathologists of IDFG, FWS, and the NPT and Shoshone-Bannock tribes and will guide the local captive rearing program.

ODFW's Evaluation Study Program

ODFW conducts nearly all of their evaluations under one study, **An Evaluation of the LSRCP Program in Oregon**. A second minor study involves helping develop a Snake River chinook life-cycle simulation model for recovery and rebuilding. The latter study was initiated in 1992 and was continued in 1996.

The ODFW evaluation program encompasses monitoring and evaluating hatchery practices; implementing size, time, and location of release studies; marking activities (CWTing, branding); assisting with disease monitoring efforts; determining the LSRCP contribution to Oregon's steelhead fishery (while recovering tagged fish); determining the effects on natural spawning populations; determining the success of maintaining the genetic integrity of native wild stocks potentially effected by the LSRCP program (through spawning ground carcass recovery); and, added in 1996, detailed monitoring and evaluating the ongoing captive broodstock program in Oregon. In addition to being the evaluation studies coordinator, the principal LSRCP investigator in Oregon also coordinates broodstock selection, egg-taking programs, and outplanting of juveniles with ODFW's regional personnel. The following paragraphs describe specific studies that go beyond the ongoing juvenile rearing, adult return, spawning ground monitoring efforts, and ESA monitoring and reporting duties.

ODFW conducted a sixth year of acclimated versus direct stream releases of steelhead at Little Sheep and Big Canyon Creeks with releases from BY1995. Similar studies at Wallowa FH were completed with the release of smolts in 1991. The migration of BY1995 juveniles was monitored in 1996, and adult return data were compiled and assessed. The last returns resulting from size at release studies at Wallowa FH were in 1994 and the results of that study are in the final stages of report preparation.

ODFW began pilot studies in FY1996 with BY1995 fish to compare smolt-to-adult survival and juvenile outmigration performance of summer steelhead smolts released volitionally with standard releases. These effort is an offshoot of ODFW's 1991 through 1995 studies to monitor the characteristics and interaction of residual steelhead on listed natural chinook in several N.E. Oregon streams, determine strategies to reduce the number of residual steelhead, and develop a strategy to implement new steelhead management plans. Field studies associated with this pilot project will continue with ODFW's effort to characterize yearly variation in the relative

abundance of juvenile residual steelhead in index areas and to describe the characteristics of steelhead which residualize. Detailed studies will continue with the 1997 to 2001 broods at Wallowa FH and the Big Canyon facility.

Chinook acclimation versus direct stream release studies, initiated at Imnaha facility with BY1990 progeny releases, continued with releases of BY1993 juveniles in 1995. Data from adult returns of BY1990 releases were collected and are being analyzed. Lack of sufficient fish prevent this study from continuing at this time. Spring chinook size at release (25 vs 15 fpp) experiments initiated with BY1988 Imnaha fish and, with the exception of BY1993 releases, were continued with releases of BY1994 smolts in 1996. The last size at release experiments from Lookingglass FH (Rapid R. stock) occurred in 1992; Imnaha studies are planned through BY1996. Outmigration timing and survival and adult return rates of past releases are currently being compiled and evaluated for both Imnaha and Rapid River stocks.

ODFW began a pilot study in 1995 to determine the influence of exercise on the physiology, outmigration performance, and survival to adult for Rapid River fish reared at Lookingglass FH. This effort continued in 1996 and is planned to be completed with BY1998 fish.

Although a density experiment using Rapid River stock chinook reared at 50 percent of normal densities was not continued with releases in 1995 or 1996, collection of adults released as juveniles in 1993 and 1994 continued at Lookingglass FH. A study was initiated in 1995 using BY1994 Imnaha stock at Lookingglass FH to compare rearing densities from 1/4 to 1/8 of normal. This effort will continue with BY1996 fish.

Studies of acclimated versus direct stream released fish were curtailed with BY's 1994 and 1995 (Imnaha stock) due to low returns. The low returns in 1996 will also prevent further studies. Adult returns from BY's 1992 and 1993 are being monitored.

In 1990 a study was initiated to develop a discriminate function model based on scale growth patterns to allow identification of hatchery and wild-origin adult salmon at Lower Granite Dam and points above (e.g. hatchery racks, spawning grounds). This effort was continued in FY1996.

ODFW, CTUIR, and NPT personnel continued their collaborative effort to collect juvenile spring chinook salmon from three Oregon streams and maintain the captive propagation program initiated in 1995. As noted above, ODFW evaluation personnel joined other LSRCP cooperators in 1996 to form the CONSPOT for dealing with LSRCP-funded captive propagation efforts and formed a local integrated team (the ORIT) to serve the coordination needs for the effort in Oregon. ODFW evaluation personnel are taking the lead on monitoring and evaluating the Oregon captive populations and will continue this effort in 1997.

WDFW's Salmon Evaluation Study Program

WDFW's 1994 evaluation studies combine fall and spring chinook efforts under one multiple-objective study including 1) monitoring and evaluation of hatchery practices, juvenile

outputs, adult returns (including homing studies), and contribution to fisheries; 2) time, size, and location of release (including acclimation) studies; and 3) evaluation of effects of hatchery releases on naturally producing chinook stocks (including parr density monitoring and spawning ground counts). Because the hatchery stocks are comprised entirely of endemic fall and spring chinook stocks, special attention is being paid to quantifying and monitoring genetic variables in each population. The following paragraphs summarize some of WDFW's efforts in 1996 beyond their ongoing fish culture monitoring programs and ESA monitoring and reporting duties.

WDFW evaluation and hatchery staffs continued efforts to ensure that fall chinook broodstocks retained at Lyons Ferry FH contain no non-endemic fish by identifying the origin of fall chinook broodstock captured at Lower Granite Dam and returning to the hatchery ladder. All Lyons Ferry FH fall chinook releases are being marked so Lyons Ferry origin adults can be identified in future returns.

WDFW continued their ongoing efforts to determine smolt outmigration timing and relative survival from Lyons Ferry (fall chinook) and Tucannon (spring chinook) FH's. Their fall chinook efforts were expanded with year to include monitoring and evaluating outplants from the Pittsburg Landing facility. The evaluation of this and other planned release sites is a joint WDFW/FWS/NPT effort and will continue for two more years at Pittsburg Landing and include two new sites in 1997 and 1998, Big Canyon (on the Clearwater) and a second Snake River site.

A study was initiated in 1993 to evaluate the effectiveness of outplanting spring chinook adults and presmolts to increase spawner density in the upper Tucannon River. Direct stream fingerling releases were evaluated in the fall of 1994. In 1996 all adults were collected at the Tucannon River weir and retained for hatchery spawning and rearing; therefore, no adults were outplanted above the weir. In the spring 1996, yearling juveniles were released from portable acclimation ponds and as direct stream releases over Tucannon FH and from the Tucannon FH ponds using a volitional release strategy. Juvenile migration success and adult survival of all release strategies will be compared.

As noted above, all Tucannon River spring chinook returning to the weir were collected and spawned in the hatchery; their eggs were used to conduct a controlled mating study. WDFW is attempting to determine if there are measurable genetic or survival differences between progeny of hatchery x hatchery and natural x natural single pair matings. As in previous years, these crosses will be compared through the hatchery rearing period and uniquely marked to determine adult return rates. Adults from previous releases were collected and analyzed in 1996.

Other studies initiated in previous years and continued in 1996 included documenting juvenile rearing and releases (including, determining the extent and cause of prespawning mortalities of adult spring chinook), estimating production and migration timing of naturally-produced Tucannon R. spring chinook (some problems occurred due to the flood), collecting spring and fall chinook stock profile data (meristic, morphometric, electrophoretic monitoring), and evaluating success of cryopreserving spring and fall chinook milt. WDFW evaluation personnel are assisting

with developing the design for a new weir to replace the Tucannon weir blown out by the February 1996.

WDFW's Trout Evaluation Study Program

WDFW's trout evaluation program, **Lyons Ferry FH Evaluation Study - Steelhead**, is a long term program that 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 (about 95 percent of the total). The hatchery evaluations and related field studies at Lyons Ferry and Tucannon FH's have been underway since 1983, when the steelhead and trout production programs were initiated. Where flood damages did not curtail them, the 1996 objectives continued the directions initiated in 1990 regarding developing new broodstocks, improving hatchery management practices, and modifying juvenile steelhead release strategies.

In an effort to directly reduce residualism in the Tucannon River and downstream, WDFW prevent further emigration from Curl Lake during the volitional release when 80% of the fish remaining in the pond are males and a high percent are precocious. This approach has been used and monitored since 1993 and was continued in 1996 in spite of flood-related difficulties. This year is the last year of a three-year test using full pond loading.

As noted above, development of endemic wild broodstocks is a recent goal of the program which should help reduce residualism and improve homing to the rivers of release. WDFW captured wild broodstock on the Tucannon River in 1992 and 1993 for rearing, release, and comparison to existing hatchery broods during migration (with PIT tags) and at adult return. No adults were collected in 1994 or 1995 when efforts to trap adults in Cummings Creek (a Tucannon River tributary) failed due to high flows. Although a similar program was delayed for Touchet River in 1992, the logistics of trapping and handling fish were tested there in 1993, 1994 and again in 1995. In 1996 flood problems eliminated any attempts.

Other studies initiated in previous years and continued in 1996 estimating percent residualism of hatchery steelhead in the Tucannon River; estimating adult returns to fisheries, Lower Granite Dam, Lyons Ferry FH, and tributary spawning areas; and estimating juvenile population densities in index streams effected by LSRCP programs. Efforts that were curtailed in 1996 due to flood-related problems included enumerating naturally- and hatchery-produced steelhead adults at the Tucannon weir and collecting baseline stock profile data on southeast Washington wild steelhead populations.

Nez Perce Tribe

The Nez Perce Tribe (NPT) initiated their **Nez Perce Tribe LSRCP Evaluation Study** in 1986 and continued it in 1996 to develop tribal stocking and outplanting priorities; monitor tribal harvest; evaluate effects of hatchery plants on native production; assist IDFG, ODFW, and FWS in their evaluation studies; and, beginning in 1996, evaluate tribal acclimation programs. The NPT's major initiative in 1991 was to develop a long-term plan for monitoring natural production

in the Imnaha River. The plan was closely coordinated with ODFW and the CTUIR, completed in late FY1991, initially funded for field studies in 1992, and funded for continuing studies in 1996. NPT evaluation personnel joined the LSRCP Office and other LSRCP cooperators in 1996 to form the CONSPOT for dealing with LSRCP-funded captive propagation efforts and, with the state co-managers, formed local integrated teams (the IDIT and ORIT) to serve the coordination needs for the specific captive programs in Idaho and Oregon.

As in recent years, the Tribe's major field activities in 1996 involved the long term Imnaha River study. NPT continues to use two rotary screw traps in the Imnaha River to capture and PIT tag juvenile chinook. The Imnaha River study objectives in 1996 were to 1) determine the outmigration timing of natural and LSRCP FH-produced chinook salmon, river conditions in the Imnaha River during migration, and post-release survival of LSRCP FH-produced chinook salmon in the Imnaha River and Snake River to Lower Granite Dam; and 2) determine and compare timing, travel time, and recapture rates of natural and LSRCP FH-produced chinook salmon and steelhead trout smolts from the Imnaha River to Lower Granite Dam.

Because the NPT now operates the Pittsburg Landing facility, their efforts now include solving fish culture problems, as well as monitoring and evaluating the implementation and success of that overall program.

Other studies initiated in previous years and continued in 1995 included coordinating planning, evaluation studies, and management recommendations; monitoring tribal chinook harvest of LSRCP stocks; conducting chinook salmon spawning ground surveys in selected streams; collecting and preserving male chinook gametes in Snake River tributaries using cryopreservation techniques; and monitoring the abundance of juvenile chinook and steelhead in stocked and unstocked streams in Idaho and Oregon.

Confederated Tribes of the Umatilla Indian Reservation

The Confederated Tribes of the Umatilla Indian Reservations (CTUIR) became cooperators in the LSRCP Program for the first time in FY1987. The CTUIR biologist assigned to the LSRCP program continues to be supervised by the LSRCP ODFW research coordinator because of the close coordination required for their joint studies in Oregon. In 1991 CTUIR initiated a program to evaluate the success of reestablishing a naturally reproducing population of spring chinook in Lookingglass Creek. A study plan was drafted in FY1992 and continued to undergo review and revision in 1993. The field program was initiated in 1992 with the release of Lookingglass FH/Rapid River stock above the weir and the monitoring of their movements and spawning effort.

Funding was provided in 1996 to assess: 1) reproductive success of adults released to spawn naturally in Lookingglass Creek, 2) survival rates from green egg to juvenile migrant from Lookingglass Creek, 3) survival of BY94 migrants from Lookingglass Creek to recapture at the Snake River dams, 4) juvenile to adult survival from natural Lookingglass migrants, 5) long term performance of Rapid River stock for reintroduction, and 6) ecological interactions between naturally-produced chinook and their environment. Due to disease concerns at Lookingglass FH

(which relies on Lookingglass Creek for its water supply), only 25 pairs of adults were released above the Lookingglass weir in 1996. In addition, however, about 35,000 Lookingglass-reared juveniles were released above the weir. The tribes monitored and evaluated these releases and helped remove the spawned-out adults to reduce disease concerns.

VI. FWS COOPERATIVE PROGRAMS

The LSRCP program funded a variety of studies with other FWS stations. Most can be categorized as evaluation studies and were funded to investigate and solve specific hatchery production problems or assist with ESA-related activities.

The IFRO was funded by the LSRCP program in FY1996 to conduct hatchery monitoring and evaluation studies at Dworshak and Hagerman NFH's. IFRO's on-hatchery program is similar to those conducted by the state agencies and tribes is closely coordinated with IDFG and the NPT. Their study, **Evaluation and Technical Coordination for FWS LSRCP Hatchery Programs**, is a long-term effort designed to: 1) define and solve cultural and management problems affecting LSRCP success (adult returns), 2) provide intra- and interagency coordination, 3) determine fishery contribution and escapements of Dworshak and Hagerman NFH's LSRCP programs, and 4) aid the NFH's with the development and maintenance of a database system for hatchery management. The IFRO's LSRCP-funded studies are summarized in their annual report.

LSRCP funds were provided to the Dworshak Fish Health Center for diagnostic activities at Dworshak and Hagerman NFH's and for health monitoring coordination between State and Federally-operated LSRCP hatcheries. Additional monies were obligated in 1996 so the Center could assist the WDFW and NPT with their health monitoring at Lyons Ferry FH and Pittsburg Landing. FY1996 monies were also obligated to FWS's Office of the Columbia River Coordinator for their assistance to the LSRCP office on regional issues.

VII. OTHER COOPERATIVE PROGRAMS

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

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

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

VIII. CORPS CONSTRUCTION ACTIVITIES

The U.S. Army Corps of Engineers (COE), Walla Walla District completed most cleanup items in the remaining facilities to be transferred in FY1996. Preacquisition contaminants surveys were completed at Lookingglass, Lyons Ferry, Tucannon and Magic Valley Fish Hatcheries and several acclimated satellite facilities this year. No contaminant problems were noted, but the Service is reluctant to accept transfer of these facilities because of our underground storage tanks campaign. The Service is working with the COE in an attempt to reach a mutually acceptable arrangement to correct deficiencies before accepting transfer of any facilities that are currently or will be and of compliance in the near future. Requests for transfer for several facilities remain in the secretary's office until these deficiencies are rectify. Under ground storage tanks (UST's) that the Service is requiring all facilities to replace is currently being negotiated with the COE before transfer of facilities is accepted.

The COE received a \$5.0 million add on to the LSRCP construction program to build the fall chinook acclimation facilities for Nez Perce Tribal programs. One temporary acclimation facility consisting of 16 20-foot circular tanks and associated plumbing was put into operation on U.S. Forest Service land at Pittsburg Landing on the Snake River approximately 40 miles below Hells Canyon Dam. A second site will be proceeding operation in early 1997 at Big Canyon Creek for the Clearwater River near the town of Peck, and a third site should be in operation in the Snake River below the Grande Ronde River by 1998. In addition the Service, the CTUIR and ODFW have been working with COE in an attempt to obtain pathogen-free water through ozonation or underground water sources at Lookingglass FH. To date the estimates for ozonation have been extremely high and alternatives are being explored. Once all additional construction has been completed the COE will be required to transfer these facilities to the FWS, LSRCP program. The COE installed an oxygen supplementation system at Irrigon FH to offset the lack of sufficient water from its Raney well. The well was designed to produce 25,000 GPM and is only producing 20,000 GPM.

IX. STAFFING

A total of 4.0 permanent full time (FTE) staff years are now being utilized for operation of the LSRCP Office. One FTE, the Cooperative Agreement Assistant position was vacated during the year and will be filled in FY1997. The LSRCP has been utilizing the services of an employee from the Snake River Basin Field Office which is co-located on a temporary basis until we can fill the vacancy.

LSRCP Boise Office employees as of September 30, 1996

Edouard J. Crateau, LSRCP Coordinator, GM-13

Daniel M. Herrig, Evaluation Study Coordinator, GS-12

Joseph J. Krakker, Fishery Biologist, GS-11

Tammy A. Froscher, Secretary, GS-6

X. FUTURE OUTLOOK

Although still a relatively new program in the Columbia River basin, the Lower Snake River Compensation Plan Program is now fully underway. The Corps has in most cases done an excellent job in constructing and equipping LSRCP hatcheries and satellites facilities and, where problems have been experienced, the Corps has been willing to make the necessary repairs and changes in an attempt to help them reach their full capability. With the exception of the new facilities, the Corps advertised clean-up contracts on 11 facilities in FY1991, 1992, 1993, and 1994 and most major changes and repairs were completed in 1995.

Steelhead returns in 1995 and 1996 were low coastwide but close to meeting our goals for the LSRCP mitigation program. Getting steelhead to return back at the right time and to the right place still remains as a problem in some areas. The proposed listing of Snake River steelhead will require conferencing in FY1997 on all LSRCP funded actions until a final determination has been made for the species. How current and future LSRCP steelhead programs are affected will be determined during the conferencing period and during consultations if Snake River steelhead are listed.

As evidenced by the listing of naturally-produced fall and spring/summer chinook, we are still experiencing difficulties in achieving programmed rates of return for hatchery chinook salmon. Changes are being made in rearing and release strategies which we hope will improve this situation, and research is underway to solve outmigration and disease problems that we hope will further improve our performance. Most LSRCP chinook facilities are now operating and are likely to continue operating under Section 10 enhancement and/or research permits under the ESA. These efforts to save listed stocks will also help to increase hatchery adult return rates.

Two years ago the LSRCP embarked on captive rearing/broodstock programs in Oregon and Idaho as gene conservation measures to assist in recovery when mainstem passage problems are sited and to use as future broodstock sources for mitigation. The ODFW program was designed as a full term captive broodstock program to release smolts back into their streams of origin; whereas the IDFG program was designed as a captive rearing program to release mature adults back into their streams of origin for natural spawning. In 1995, ODFW collected listed BY1994 spring chinook juveniles from the Lostine R., Catherine Ck., and upper Grande Ronde R. and in 1996 from the Lostine R. and Catherine Ck. Only two juveniles were captured in the upper Grande Ronde R. in 1996 due to low natural escapement. Efforts will be made later to capture emigrating BY 1995 juveniles in the upper Grande Ronde R. in the spring 1997. IDFG collected listed BY1994 juvenile spring chinook in 1995 and 1996 in the Lemhi R., E.F. Salmon R., and W. F. Yankee Fork and BY1995 juveniles in 1996 in the Lemhi R. No BY1995 juveniles were collected in the W.F. Yankee Fork Salmon R. and E.F. Salmon R. in 1996 due to low natural escapement. Efforts will be made in the spring 1997 to collect BY1995 juveniles in both of the above tributaries. The ODFW program initially rears captured juveniles at Lookingglass FH prior to splitting brood year groups between Bonneville FH (freshwater) and the NMFS's Manchester facility (salt water) for rearing to final maturation. IDFG initially rears captured juveniles at

Sawtooth FH prior to splitting brood years between Eagle FH (freshwater) and Manchester (saltwater) for rearing to maturation. The LSRCP Office will continue to chair and participate in the CONSPOT and technical teams to address ongoing captive broodstock issues and other ESA issues as needed. The LSRCP will continue efforts to maintain nonlisted chinook salmon programs under Section 7 of the ESA for future mitigation options (Rapid River stock at Lookingglass FH in Oregon). We will also continue effort to assist in the conservation and future recovery of listed populations where those hatchery populations represent an important component of the Evolutionary Significant Unit of the listed populations (e.g., Pittsburg Landing and Big Canyon acclimation sites on the Snake and Clearwater rivers for Lyons Ferry fall chinook).

Hatchery monitoring and evaluation programs are being improved, redesigned, and refined each year to assist hatcheries in providing the best rate of return of released hatchery smolts. We substantially increased funding for this phase of the LSRCP program in BY1993 and continued funding will be needed for an adequate hatchery evaluation program which ensures protection and enhancement of naturally reproducing populations.

As noted above, the LSRCP is a relatively new program with the average age of hatcheries at only 11 to 12 years and satellite facilities about 10 years. This translates to about two full chinook life cycles and a little over two for steelhead. We are optimistic about the future of the LSRCP Program and the general trends indicate that, with normal precipitation, snow packs, etc., increases in the return rates of steelhead which may exceed model predictions. The chinook salmon return rates and adult returns to the basin are currently much below the level anticipated and used to design the LSRCP facilities. Improved adult chinook return rates are expected with changes in production release strategies, increased disease treatment and prevention, and improvements in smolt emigration. Captive broodstock efforts, if successful, will develop critical culture expertise needed in the immediate future for conservation of listed Snake River species. If regional managers can implement measures that significantly increase the productivity of listed populations, then these efforts may be used in the future to assist in recovery and also as a brood source for LSRCP mitigation programs.

During FY1997 the LSRCP Office and its cooperators will conduct a LSRCP program review. The program review will be an analysis of what the LSRCP program has achieved through FY1996. The review will be used as a basis for determining how successful we have been in meeting LSRCP goals in the past and what steps we can initiate in the future to meet our mitigation, ESA, and Tribal Trust responsibilities.

XI. MEETINGS ATTENDED IN FY1996

- 10/11-13/95 Captive Broodstock Workshop, Newport, OR, Ed, Dan Joe
- 10/18/95 CRITFC Supplementation Program meeting, Ed
- 10/20/95 Evaluation Studies Coordination Meeting with CTUIR, La Grande, OR, Dan
- 10/24/95 Conservation Program Oversight Team (CONSPOT) conference call, Ed, Dan, Joe
- 10/25-26/95 NMFS, COE, NBS, ODFW, WDFW, GPC, CRITFC, IDFG, Section 10 Permit Review, Portland, OR, Joe
- 11/6/95 CONSPOT organization meeting, Boise, ID, Ed, Dan, Joe
- 11/14/95 IDFG, NPT, Selway Captive Broodstock Progress and Future Plans, Clearwater FH, Orofino, ID, Ed
- 11/15/95 Dworshak Coordinator Meeting, Dworshak FH, Orofino, ID, Ed
- 11/20/95 Kit Freudenberg, Ed Bowles, Tom Rogers, discuss Idaho Fish and Wildlife Foundation use of \$150,000 for salmon education related to LSRCP, LSRCP Office, Boise, ID, Ed
- 11/21/95 ODFW, WDFW, IDFG, and Tribes: CPOT meeting to form expert and integrated teams for captive brood program, LSRCP Office, Ed, Dan, Joe
- 11/29-12/1/95 Evaluation Studies Coordinators Meeting, Ongoing and future studies, Clarkston, WA, Dan, Joe, Ed
- 12/4/95 Oregon Integrated Team (ORIT) organization meeting to develop conservation plans for the three captive (BY1994) populations in Oregon, LaGrande, OR, Joe
- 12/6-12/95 Northwest Fish Culture conference, Fife, WA, Ed
- 12/5/95 IDFG, Sho-Ban Tribe, NPT, Idaho Integrated Team Meeting, Boise, ID, Dan
- 12/7/95 Sho-Ban Tribe, Stream side Incubation Technology workshop, Ft. Hall, ID, Dan
- 12/8/95 CONSPOT conference call, status of integrated teams, Ed, Dan, Joe
- 12/11/95 CBFWA, Dave Riley, Brian Kuehner, Kathy Clemens, Bill Miller, Ben Richardson, Hatchery EIS review and our comments, Portland, OR, Ed

12/18/95 IDIT meeting, captive rearing planning, LSRCP Office, Dan

12/20/95 Oregon Integrated Team, Captive rearing planning, Enterprise, OR, Joe

1/20/96 ODFW, Biological assessment for special use permit for Imnaha satellite facility/captive broodstock program at Lookingglass FH, Lookingglass FH, Joe

1/4/96 CONSPOT meeting, LSRCP Office, Boise, Ed, Dan, Joe

1/9/96 COE, CTUIR, ODFW, NPT, Discuss improvement (ozonation) of Lookingglass water supply, Walla Walla, WA, Ed

1/10-11/96 ODFW Research review workshop, LaGrande, OR, Dan

1/10/96 COE, NPT, WDFW, logistics of Pittsburg Landing fall chinook acclimation, Lyons Ferry FH, Ed

1/12/96 NPT, IFRO, WDFW, Pittsburg Landing evaluation studies, Lapwai, ID, Dan

1/16/96 Oregon Integrated Team, Captive broodstock plan development, Enterprise, OR, Joe

1/17-18/96 Idaho Integrated Team meeting, Boise, ID, Dan

1/24/96 COE, NPT, BPA, WDFW, fall chinook acclimation facilities, Ed

1/25-26/96 Captive broodstock workshop, Walla Walla, WA, Ed, Dan, Joe

2/2/96 CONSPOT Meeting, LSRCP, Boise, Joe, Ed, Dan

2/6/96 OIT meeting, Development of captive broodstock programs in Oregon, Enterprise, OR, Joe

2/8/96 IDIT meeting, LSRCP, Boise, Dan

2/9/96 COE, CTUIR, NPT, ODFW, Lookingglass water supply, Walla Walla, WA, Ed

2/10/96 COE, NPT, WDFW, Pittsburg landing logistics of fish transfer, transport, agency responsibility, Lyons Ferry FH, Ed

2/12/96 COE, ODFW, NPT, CTUIR, Hatfield \$5.0 million add-on, spring chinook acclimation site location and construction, Walla Walla, WA, Ed

2/13/96 CONSPOT conference call, Ed, Dan, Joe

2/21/96 IDIT meeting, LSRCP, Boise, Dan

2/21/96 IDFG, IAA, Tribes, FWS, Hagerman Coordination Meeting, Hagerman, ID, Ed

2/22/96 Conference call, IDFG, NMFS (Manchester), LSRCP, Ed, Dan, Joe

2/27/96 Oregon Integrated Team, Oregon captive broodstock plan development, LaGrande, OR, Joe

2/28/96 LSRCP funding-FWS, Washington, D.C., Ed

2/29/96 CINE Awards, Washington, D.C., Ed

2/29-3/2/96 Idaho Chapter AFS, Idaho Chapter AFS Annual Meeting, Coeur d'Alene, ID, Joe, Dan

3/5/96 Idaho Integrated captive broodstock meeting, Boise, Ed, Dan, Joe

3/7/96 CONSPOT conference call, Ed, Joe, Dan

3/14/96 Jerry Bower/Bob Austin, LSRCP/BPA coordination for CONSPOT, Boise, ID, Ed, Dan, Joe

3/15/96 COE, NPT, CTUIR, WDFW, fall chinook acclimation sites, Walla Walla, WA, Ed

3/20/96 FWS, Diggs, LSRCP Program, Ed

3/21/96 FWS, IDFG, NPT, Dworshak coordination meeting, Ashahka, Ed

3/28-29/96 Artificial propagation workshop, Bodega Bay, CA, Ed, Joe

4/11/96 Oregon Integrated Team, Development of Oregon captive broodstock programs, Enterprise, OR, Joe

4/11/96 COE, WDFW, NPT, fall chinook acclimation sites, Clarkston, WA, Ed

4/16/96 COE, NPT, CTUIR, ODFW, Hatfield \$5.0 million add-on to LSRCP Compensation program, Ed

4/17/96 Tribes, COE, ODFW, Spring chinook acclimation sites meeting, Walla Walla, WA, Ed

4/23/96 WDFW, Review of flood damage at Hatchery, Tucannon FH, Ed

4/25/96 BPA, Funding of supplemental/acclimation and captive rearing projects, Portland, OR, Ed, Dan

4/25/96 Mike Spear, Bill Shake, Dave Patte, Denny Lassuy, Dan Diggs, Rapid River stock, LSRCP funding, Portland, OR, Ed, Dan

4/30/96 CONSPOT conference call, Ed, Dan, Joe

5/8-9/96 Eastern Oregon College Biology class seminar with college students, LaGrande, OR, Dan

5/28/96 NMFS, Rapid River Lookingglass Section 7 consultation meeting, Portland, OR, Ed, Dan, Joe

5/30/96 NPT, COE, WDFW, Big Canyon fall chinook acclimation site construction, Ed

06/11/96 FWS, IFRO Office, Dworshak NFH, Mid-Columbia FRO, Lee Hilwig, Production and fisheries coordination, Walla Walla, WA, Ed

6/19-21/96 ODFW, CTUIR, NPT, Section 7 meeting in LaGrande, OR, flood damage in Oregon/Washington, Ed, Dan, Joe

6/20/96 WDFW, Lyons Ferry FH, FY1996-97 budget discussions, Ed

06/24-25/96 FWS, IRM Training, Portland, OR, Ed

06/26/96 COE, NMFS, BPA, Spring and fall chinook acclimation facilities and Lookingglass water treatment, Portland, OR, Ed

07/11/96 COE, NPT, WDFW, Acclimation facilities for fall chinook, Clarkston and two sites on Snake River, Ed

7/15-17/96 West Division AFS meeting, Eugene, OR, Dan

7/24-25/96 Public hearing on Oregon Captive broodstock permit, LaGrande, OR, Ed, Joe

08/7/96 Idaho Aquaculture Association, U of Idaho, State Representatives, local citizens, opening of Hagerman Fish Culture Experiment Station, meet new U of I president Hoover, meet new lab director Ron Harty, meet with Dave Bruhn, Executive Secretary of IAA, meet with Brian Kenworthy, Hagerman NFH, Hagerman, ID, Ed

08/5-9/96 WDFW, field work electrofishing, snorkeling, radio tracking, Dayton, WA, Joe

08/12/96 CTUIR, NMFS, ODFW, CRITFC, develop questions for scientific panel on Grande Ronde basin issues, Portland, OR, Joe

8/12/96 COE, CTUIR, NPT, ODFW, Ozone system design review for Lookingglass FH, Ed

8/19-20/96 DNFH, DFHC, Proposed steelhead listing meeting at Dworshak IFRO, Ahsahka, Ed, Dan, Joe

8/27-28/96 Oregon spawning ground counts, Dan

9/6/96 IDFG evaluation studies coordination meeting, Dan

9/10-12/96 Oregon spawning ground counts, Joe

XII. Training

Dan Herrig
Paradox 5.0 12/13/95
Negotiation Strategies and Techniques 4/17-18/96

Joseph Krakker
Paradox 5.0 12/13/95

Tammy Froscher
Paradox 5.0 12/13/95
Federal Financial System 4/2-4/96
WordPerfect 6.1 for Windows 4/16/96
Administrative Training 7/23-25/96

Ginny Neunaber
Federal Financial System 12/12-14/95

XIII. AVAILABLE REPORTS

U.S. Fish and Wildlife Service Operation & Maintenance

- Bigelow, J., J. Streufert. 1992. Rearing Unit Effect on Spring Chinook Salmon Performance. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 5 pp.
- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1980 (80165). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1981 (81127). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1982 (82265). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1983 (83160). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1984 (84122). Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T. C. and R. R. Ringe. 1985. Fall Chinook Trapping at Ice Harbor Dam in 1985. Idaho Cooperative Fishery Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1987. Fall Chinook Trapping at Ice Harbor Dam in 1986. Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1987. Fall Chinook Trapping at Ice Harbor Dam in 1987. Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bjornn, T.C. and R. Ringe. 1989. Fall Chinook Trapping at Ice Harbor Dam in 1988. Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow, Idaho. 6 pp.
- Bruhn, D. 1983. Annual Report, FY1983, Hagerman National Fish Hatchery. U. S. Fish and Wildlife Service, Hagerman, Idaho. 8 pp.
- Bruhn, D. 1985. Annual Report, FY1984, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 2 pp.
- Bruhn, D. 1986. Annual Report, FY1985, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 6 pp.

- Bruhn, D. 1987. Annual Report, FY1986, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho.
- Bruhn, D. 1988. Annual Report, FY1987, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 13 pp.
- Bruhn, D. 1988. Annual Report, FY1988, Hagerman National Fish Hatchery. U.S. Fish Wildlife Service, Hagerman, Idaho. 18 pp.
- Bruhn, D. 1989. Annual Report, FY1989, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 19 pp.
- Bruhn, D. 1990. Annual Report, FY1990, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 18 pp.
- Bruhn, D. 1991. Annual Report, FY1991, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 20 pp.
- Bruhn, D. 1992. Annual Report, FY1992, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 20 pp.
- Clemens, K. 1995. Annual Report, FY1995, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 63 pp.
- Hesson, C.P., J. C. Lientz, G. Pratschner, and R. B. Roseburg. 1986. ELISA/FAT Comparisons for Bacterial Kidney Disease (BKD). U.S. Fish and Wildlife Service, Dworshak National Fish Hatchery, Ahsahka, Idaho. 12 pp.
- Kenworthy, B. 1993. Annual Report, FY1993, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 18 pp.
- Kenworthy, B. 1994. Annual Report, FY1994, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 31 pp.
- Kenworthy, B. 1995. Annual Report, FY1995, Hagerman National Fish Hatchery. U.S. Fish and Wildlife Service, Hagerman, Idaho. 44 pp.
- Lientz, J. 1988. Annual Report, FY1987, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 30 pp.
- Lientz, J., C. Hesson, and E. Steiner. 1988. Annual Report FY1988, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 10 pp.

- Lientz, J. 1989. Annual Report FY1989, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 53 pp.
- Lientz, J. 1990. Annual Report, FY1990, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 65 pp.
- Lientz, J. 1991. Annual Report, FY1991, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 41 pp.
- Lientz, J. 1992. Annual Report, FY1992, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 54 pp.
- Lientz, J. 1993. Annual Report, FY1993, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 53 pp.
- Lientz, J. 1994. Annual Report, FY1994, Dworshak Fish Health Center. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 56 pp.
- Olson, W. 1982. Annual Report, FY1981, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 47 pp.
- Olson, W. 1983. Annual Report, FY1982, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 47 pp.
- Olson, W. 1984. Annual Report, FY1983, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 50 pp.
- Olson, W. 1985. Annual Report, FY1984, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 50 pp.
- Olson, W. 1986. Annual Report, FY1985, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 51 pp.
- Olson, W. 1987. Annual Report, FY1986, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 45 pp.
- Olson, W. 1988. Annual Report, FY1987, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 63 pp.
- Olson, W. 1988. Annual Report, FY1988, Dworshak National Fish Hatchery. U.S. FISH and Wildlife Service, Ahsahka, Idaho. 65 pp.

- Olson, W. 1990. Annual Report FY1989, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 66 pp.
- Olson, W. 1990. Annual Report FY1990, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 67 pp.
- Olson, W. 1991. Annual Report FY1991, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 41 pp.
- Olson, W. 1992. Annual Report FY1992, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 84 pp.
- Olson, W. 1993. Annual Report FY1993, Dworshak National Fish Hatchery. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 94 pp.

U.S. Fish and Wildlife Service Evaluation Studies

- Bjornn, T.C., C.M. Moffitt, J.D. Varley, D. Diggs, R. Austin, J. McClain, and J. Lientz. 1984. Annual Progress Report, Bacterial Kidney Disease in Chinook Salmon as Related to Hatchery Practices and Methods, 1982-1983 (0009-1514). U.S. Fish and Wildlife Service, Boise, Idaho. 68 pp
- Burge, Howard. 1995. Annual Report FY1995, Idaho Fishery Resource Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 69 pp.
- Jones, R.N. 1994. An Evaluation of Rearing Density in Relation to Rearing Performance, Post-Release Performance and Adult Returns of Spring Chinook Salmon at Dworshak NFH, Idaho, 1993 Progress Report. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 30 pp.
- Jones, R.N. and D. Burum. 1994. Dworshak-Kooskia NFH Complex Spring Chinook Salmon Evaluation Program, FY1993 Annual Report - June 1992 to May 1993. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 23 pp.
- Jones, R.N. and W. Miller. 1996. An Evaluation of Rearing Density in Relation to Post-Release Smolt Survival and Adult Returns of Spring Chinook Salmon at Dworshak National Fish Hatchery in Idaho, Final Report. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 37 pp.
- Ketola, G. 1985. Study of the Etiology of Early Mortality in Spring Chinook Salmon (0009-1500). Tunnison Lab. Fish Nutrition. U.S. Fish and Wildlife Service, Cortland, New York. 50 pp.

- Miller, W. 1989. Annual Report, FY1988, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 30 pp.
- Miller, W. 1989. Annual Report, FY1989, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 37 pp.
- Miller, W. 1990. Annual Report, FY1990, Idaho Fishery Resource Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 35 pp.
- Miller, W. 1992. Annual Report, FY1991, Idaho Fishery Resources Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 21 pp.
- Miller, W. 1993. Annual Report, FY1992, Idaho Fishery Resources Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 43 pp.
- Miller, W. 1994. Annual Report, FY1993, Idaho Fishery Resources Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 42 pp.
- Miller, W.H. and D. Diggs. 1985. Annual Report, FY1984, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 4 pp.
- Miller, W.H. and D. Diggs. 1985. Annual Report, FY1985, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho. 6 pp.
- Miller, W.H. and D. Diggs. 1986. A Review of Coded-Wire Tagged Fish Released From Dworshak, Kooskia, and Hagerman NFH's, Idaho, 1976-1986. U.S. Fish and Wildlife Service, Dworshak Fisheries Assistance Office, Ahsahka, Idaho. 101 pp.
- Miller, W.H. and S.M. Noble. 1985. IHN-Water Supply Study, Dworshak National Fish Hatchery, 1985. U.S. Fish and Wildlife Service, Fisheries Assistance Office, Ahsahka, Idaho. 20 pp.
- Miller, W., Coley, T., and R. Roseberg. 1988. Annual Report, FY1987, Dworshak Fisheries Assistance Office. U.S. Fish and Wildlife Service, Ahsahka, Idaho 32 pp.
- Moffitt, C.M. and T.C. Bjornn. 1989. Protection of Chinook Salmon Smolts with Oral Doses of Erythromycin Against Acute Challenges of *Renibacterium Salmoninarum*; J. Aquatic Animal Health. 1:227-232.
- Moffitt, C.M. and J.A. Schreck. 1988. Accumulation and depletion of orally administered erythromycin thiocyanate in tissues of chinook salmon. Transactions of the American Fisheries Society. 117:394-400.

Sankovich, P. and T.C. Bjornn. 1992. Distribution and Spawning Behavior of Hatchery and Natural Adult Chinook Salmon Released Upstream of Weirs in Two Idaho Rivers. U.S. Fish and Wildlife Service, Idaho Coop. Fish. and Wildl. Res. Unit, Moscow, Idaho. 32 pp.

Schreck, J.A. and L.M. Moffitt. 1987. Palatability of Feed Containing Different Concentrations of Erythromycin Thiocyanate to Chinook Salmon. The Progressive Fish Culturist. Vol. 49 (4), October 1987. pp. 241-247

Smith, C. E. and M. E. Mueller. 1984. The Effects of Diet and Vitamin Supplementation on the Occurrence of Spring Thinning in Summer Chinook Salmon. U.S. Fish and Wildlife Service, Bozeman, Montana. 13 pp.

Idaho Department of Fish and Game Operations & Maintenance

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

Ainsworth, B. 1989. Magic Valley Steelhead Hatchery, Annual Report, FY1989. Idaho Dept. of Fish and Game, Filer, Idaho. 8 pp.

Ainsworth, B. 1990. Magic Valley Steelhead Hatchery, Annual Report, FY1990. Idaho Dept. of Fish and Game, Filer, Idaho. 5 pp.

Ainsworth, B. 1991. Magic Valley Steelhead Hatchery, Annual Report, FY1991. Idaho Dept. of Fish and Game, Filer, Idaho. 4 pp.

Ainsworth, B. 1992. Magic Valley Steelhead Hatchery, Annual Report, FY1992. Idaho Dept. of Fish and Game, Filer, Idaho. 5 pp.

Ainsworth, B. 1992. Magic Valley Hatchery, 1990 Brood Year Report. Idaho Dept. of Fish and Game, Filer, Idaho. 11 pp.

Ainsworth, B. 1992. Magic Valley Hatchery, 1991 Brood Year Report. Idaho Dept. of Fish and Game, Filer, Idaho. 17 pp.

Ainsworth, B. 1993. Magic Valley Steelhead Hatchery, Annual Report, FY1993. Idaho Dept. of Fish and Game, Filer, Idaho. 3 pp.

Ainsworth, B. 1994. Magic Valley Steelhead Hatchery, Annual Report, FY1994. Idaho Dept. of Fish and Game, Filer, Idaho. 3 pp.

- Alsager, R. 1989. Sawtooth Fish Hatchery, Annual Report, FY1989. Idaho Dept. of Fish and Game, Stanley, Idaho. 8 pp.
- Alsager, R. 1989. Sawtooth Fish Hatchery, East Fork Satellite, 1989 Spring Chinook Salmon Run Report. Idaho Dept. of Fish and Game, Stanley, Idaho. 10 pp.
- Alsager, R. 1990. Sawtooth Fish Hatchery, Annual Report, FY1990. Idaho Dept. of Fish and Game, Stanley, Idaho. 8 pp.
- Alsager, R. 1990. Sawtooth Fish Hatchery and East Fork Satellite, 1990 Steelhead Run Report. Idaho Dept. of Fish and Game, Stanley, Idaho. 17 pp.
- Alsager, R. 1990. Sawtooth Fish Hatchery and East Fork Satellite, 1990 Spring Chinook Salmon Run Report. Idaho Dept. of Fish and Game, Stanley, Idaho. 17 pp.
- Alsager, R. 1991. Sawtooth Fish Hatchery, Annual Report, FY1991. Idaho Dept. of Fish and Game, Stanley, Idaho. 11 pp.
- Alsager, R. 1991. Sawtooth Fish Hatchery and East Fork Satellite, 1991 Spring Chinook Salmon Run Report. Idaho Dept. of Fish and Game, Stanley, Idaho. 17 pp.
- Alsager, R. 1991. Sawtooth Fish Hatchery and East Fork Satellite, 1991 Steelhead Run Report. Idaho Dept. Of Fish and Game, Stanley, Idaho. 17 pp.
- Alsager, R. 1993. Sawtooth Fish Hatchery and East Fork Satellite, 1989 Spring Chinook Salmon Brood Year, 1990 Steelhead Brood Year. Idaho Dept. of Fish and Game, Stanley, Idaho. 33 pp.
- Bourbon, K. and J. Rankin, 1992. Protection of Wild Adult Steelhead in Idaho by Adipose Fin Extraction of Hatchery Stock, Annual Report, Brood Year 1991. Idaho Dept. of Fish and Game, Boise, Idaho. 10 pp.
- Chapman, J. and P. Coonts, and S. Wingert. 1992. Sawtooth Fish Hatchery, Annual Report, FY1992. Idaho Dept. of Fish and Game. Stanley, Idaho. 8 pp.
- Chapman, J. and P. Coonts. 1993. Sawtooth Fish Hatchery, 1990 Chinook Brood Year Report, 1991 Steelhead Brood Year Report. Idaho Dept. of Fish and Game. Stanley, Idaho. 41 pp.
- Coonts, P. 1992. Sawtooth Fish Hatchery and East Fork Satellite, 1992 Spring Chinook Run Report. Idaho Dept. of Fish and Game. Stanley, Idaho. 13 pp.
- Frew, T. 1985. Annual Report, FY1995, McCall Hatchery, 1 Oct. 1984 - 30 Sept. 1985, (85022). Idaho Dept. of Fish and Game, McCall, Idaho. 4 pp.

- Frew, T. 1986. Annual Report, McCall Summer Chinook Salmon Hatchery, 1984 Brood Year. Idaho Dept. of Fish and Game, McCall, Idaho. 26 pp.
- Frew, T. 1988. Annual Report, McCall Summer Chinook Salmon Hatchery, Brood 1985 Production Report. Idaho Dept. of Fish and Game, McCall, Idaho. 20 pp.
- Hauck, A. and D. Munson. 1992. Assessment of Effect of Endemic and Introduced Fish Pathogens on Chinook and Sockeye in Idaho. Idaho Dept. Of Fish and Game, Eagle, Idaho. 80 pp.
- Hutchinson, W. G. 1983. Annual Report, FY1993, McCall Hatchery, 1 Oct. 1982 - 30 Sept. 1983, (80002). Idaho Dept. Fish and Game, McCall, Idaho. 3 pp.
- Hutchinson, W. G. 1984. Annual Report, FY1994, McCall Summer Chinook Salmon Hatchery, 1 Oct. 1983 - 30 Sept. 1984, (80002). Idaho Dept. Fish and Game, McCall, Idaho. 6 pp.
- Hutchinson, W. G. 1985. Annual Report FY1981, McCall Summer Chinook Hatchery, 1 Oct. 1980 - 30 Sept. 1981 (80002). Idaho Dept. Fish and Game, McCall, Idaho. 28 pp.
- Hutchinson, W. G. 1985. Annual Report, FY1982, McCall Summer Chinook Hatchery, 1 Oct. 1981 - 30 Sept. 1982 (80002). Idaho Dept. Fish and Game, McCall, Idaho. 30 pp.
- Kiefer, S.W. 1994. Endangered Species Act Coordination Annual Report, Oct. 11 1992 - Sept. 30, 1993 (93500). Idaho Dept. Fish and Game, Boise, Idaho. 22 pp.
- Kiefer, S.W. 1994. Endangered Species Act Coordination Annual Report, FY1994, Oct. 1, 1993 - Sept. 30, 1994 (91504). Idaho Dept. Fish and Game, Boise, Idaho. 14 pp.
- McGehee, J. 1989. Clearwater Fish Hatchery, Annual Report, FY1989. Idaho Dept. of Fish and Game, Kamiah, Idaho. 4 pp.
- McGehee, J. 1990. Clearwater Fish Hatchery, Annual Report, FY1990. Idaho Dept. of Fish and Game, Kamiah, Idaho. 11 pp.
- McGehee, J. 1991. Clearwater Fish Hatchery, Annual Report, FY1991. Idaho Dept. of Fish and Game, Kamiah, Idaho. 4 pp.
- McGehee, J. 1992. Clearwater Fish Hatchery, Annual Report, FY1992. Idaho Dept. of Fish and Game, Ahsahka, Idaho. 5 pp.
- McGehee, J. 1993. Clearwater Fish Hatchery, Annual Report, FY1993. Idaho Dept. of Fish and Game, Ahsahka, Idaho. 16 pp.

- McGehee, J. 1994. Clearwater Fish Hatchery, Annual Report, FY1994. Idaho Dept. of Fish and Game, Ahsahka, Idaho. 15 pp.
- McGehee, J. 1995. Clearwater Fish Hatchery, Annual Report, FY1995. Idaho Dept. of Fish and Game, Ahsahka, Idaho. 14 pp.
- McPherson, D. 1989. McCall Summer Chinook Hatchery Annual Report, FY1989. Idaho Dept. of Fish and Game, McCall, Idaho. 6 pp.
- McPherson, D. 1990. McCall Summer Chinook Hatchery, Annual Report, FY1990. Idaho Dept. of Fish and Game, McCall, Idaho. 4 pp.
- McPherson, D. and D. Munson. 1993. McCall Summer Chinook Salmon Hatchery, 1990 Brood Year Report. Idaho Dept. of Fish and Game, McCall, Idaho. 21 pp.
- McPherson, D. 1991. McCall Summer Chinook Hatchery, Annual Report, FY1991. Idaho Dept. of Fish and Game, McCall, Idaho. 4 pp.
- McPherson, D. 1992. McCall Summer Chinook Hatchery, Annual Report, FY1992. Idaho Dept. of Fish and Game, McCall, Idaho. 5 pp.
- McPherson, D. 1993. McCall Summer Chinook Hatchery, Annual Report, FY1993. Idaho Dept. of Fish and Game, McCall, Idaho. 14 pp.
- McPherson, D. 1995. McCall Summer Chinook Hatchery, Annual Report, FY1995. Idaho Dept. of Fish and Game, McCall, Idaho. 5 pp.
- Moore, B. 1983. Annual Report, FY1982, Sawtooth Salmon Trap. Idaho Dept. Fish and Game, Stanley, Idaho. 5 pp.
- Moore, B. 1995. Magic Valley Steelhead Fish Hatchery, Annual Report FY1995. Idaho Dept. of Fish and Game, Filer, Idaho. 4 pp.
- Rogers, T. L. 1984. Annual Report, FY1983 Sawtooth Hatchery, 1 Oct. 1982 - 30 Sept. 1983 (83103). Idaho Dept. Fish and Game, Boise, Idaho. 10 pp.
- Rogers, T. L. 1985. Annual Report, FY1984, Sawtooth Hatchery, 1 Oct. 1983 - 30 Sept. 1984 (83103). Idaho Dept. Fish and Game, Boise, Idaho. 20 pp.
- Rogers, T. L. 1986. Sawtooth Fish Hatchery and East Fork Satellite, 1984 Chinook Salmon Brood Year Report and 1985 Steelhead Brood Year Report. Idaho Dept. Fish and Game, Stanley, Idaho. 22 pp.

- Rogers, T. 1988. Sawtooth Fish Hatchery and East Fork Satellite, 1985 Spring Chinook Salmon and 1986 Steelhead Brood Year Reports. Idaho Dept. of Fish and Game, Stanley, Idaho. 26 pp.
- Snider, B., 1993. Sawtooth Fish Hatchery Annual Report, FY1993. Idaho Dept. of Fish and Game, Stanley, Idaho. 18 pp.
- Snider, B., 1995. Sawtooth Fish Hatchery Annual Report, FY1995. Idaho Dept. of Fish and Game, Stanley, Idaho. 6 pp.
- Vaughn, R. L. 1984. Annual Report, FY1983, Magic Valley Steelhead Hatchery. Idaho Dept. Fish and Game, Filer, Idaho. 5 pp.
- Vaughn, R. L. 1985. Annual Report, FY1984, Magic Valley Steelhead Hatchery, 1 Oct. 1983 - 30 Sept. 1984 (84044). Idaho Dept. Fish and Game, Boise, Idaho. 6 pp.
- Vaughn, R. L. 1986. Annual Report, FY1985, Magic Valley Steelhead Hatchery. Idaho Dept. Fish and Game, Filer, Idaho. 4 pp.
- Wimer, L. 1985. Annual Report, FY1980, McCall Summer Chinook Salmon Hatchery, 1 Oct. 1979 - 30 Sept. 1980 (80002). Idaho Dept. Fish and Game, McCall, Idaho. 25 pp.

Idaho Department of Fish and Game Evaluation Studies

- Ball, K. 1986. Evaluation of Hatchery - Wild Steelhead Harvest for September 1, 1984 through November 30, 1984 (84133). Idaho Dept. Fish and Game, Salmon, Idaho. 38 pp.
- Ball, K. 1986. Evaluation of the Hatchery - Wild Composition of Idaho Salmon and Steelhead Harvest for December 1, 1984 to October 1, 1985 (85067). Idaho Dept. Fish and Game, Salmon, Idaho. 62 pp.
- Ball, K. 1988. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest for October 1, 1985 to December 31, 1986 (86505). Idaho Dept. of Fish and Game, Salmon, Idaho. 99 pp.
- Ball, K. 1989. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest for October 1, 1986 to December 31, 1987 (87501). Idaho Dept. of Fish and Game, Salmon, Idaho. 84 pp.

- Ball, K. 1990. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1987 to December 31, 1988 (88501). Idaho Dept. of Fish and Game, Salmon, Idaho. 75 pp.
- Ball, K. 1991. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, Oct. 1, 1988 to Dec. 31, 1989 (89501). Idaho Dept. of Fish and Game, Salmon, ID. 73 pp.
- Ball, K. 1992. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1989 to December 31, 1990 (89501). Idaho Dept. of Fish and Game, Salmon, Idaho. 112 pp.
- Ball, K. 1992. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1990 - December 31, 1991 (89501). Idaho Dept. of Fish and Game, Salmon, Idaho. 78 pp.
- Ball, K. 1994. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1991 to December 31, 1992. Idaho Dept. of Fish and Game, Salmon, Idaho. 119 pp.
- Ball, K. 1996. Evaluation of the Hatchery-Wild Composition of Idaho Salmon and Steelhead Harvest, October 1, 1993 - December 31, 1994. Idaho Dept. of Fish and Game, Salmon, Idaho. 69 pp.
- Cannamela, D., S. Elam, and T. Cochnauer. 1991. Fish Hatchery Evaluations-Idaho, October 1988 through September 1989 (89501). Idaho Dept. of Fish and Game, Boise, Idaho. 64 pp.
- Cannamela, D. 1991. Fish Hatchery Evaluations - Idaho, October 1, 1989 through September 30, 1990 (90502). Idaho Dept. of Fish and Game, Boise, Idaho. (Draft).
- Cannamela, D. 1992. Potential Impacts of Releases of Hatchery Steelhead Trout Smolts on Wild and Natural Juvenile Chinook and Sockeye Salmon - A White Paper. Idaho Dept. of Fish and Game. Boise, Idaho. 23 pp.
- Cannamela, D. 1992. Fish Hatchery Evaluations - Idaho, October 1, 1989 to September 30, 1990. Idaho Dept. of Fish and Game, Boise, Idaho. 89 pp.
- Cannamela, D. 1993. Fish Hatchery Evaluations - Idaho, October 1, 1990 to September 30, 1991. Idaho Dept. of Fish and Game, Boise, Idaho. 105 pp.
- Cannamela, D. 1993. Hatchery Steelhead Smolt Predation of Wild and Natural Juvenile Chinook Salmon Fry in the Upper Salmon River, Idaho. Idaho Dept. of Fish and Game, Boise, Idaho. 36 pp.

- Hill, R. 1990. Irrigon Fish Hatchery, Annual Report, FY1990. Oregon Dept. of Fish and Wildlife, Irrigon, Oregon. 9 pp.
- Hill, R. 1991. Irrigon Fish Hatchery, Annual Report, FY1991. Oregon Dept. of Fish and Wildlife, Irrigon, Oregon. 11 pp.
- Leppink, J. 1994. Annual Status Reports, October 1992 to September 1993, Lookingglass, Irrigon, and Wallowa FH's. Oregon Dept. of Fish and Wildlife, Portland, Oregon. 27 pp.
- Lichatowich, T. 1989. FY1989 Report of Operations for Irrigon, Wallowa, and Lookingglass Fish Hatcheries. Oregon Dept. of Fish and Wildlife, Portland, Oregon. 8 pp.
- Lusted, S., 1992. Lookingglass Fish Hatchery, Annual Report, FY1991. Oregon Dept. of Fish and Wildlife. Elgin, Oregon. 10 pp.
- Stratton, M. 1984. Annual Report, FY1983, Lookingglass Hatchery, 1 Oct. 1982 - 30 Sept. 1983 (83062). Oregon Dept. Fish and Game, Portland, Oregon. 1 page

Oregon Department of Fish and Wildlife Evaluation Studies

- Carmichael, R. and R. T. Messmer. 1986. Evaluation of Lower Snake River Compensation Plan Facilities in Oregon - FY1984 (84118, 84119, 84120). Oregon Dept. Fish and Wildlife, Portland, Oregon. 31 pp.
- Carmichael, R. W. and E. J. Wagner. 1984. Evaluation of Lower Snake River Compensation Plan Facilities in Oregon - FY1983 (83269). Oregon Dept. Fish and Wildlife, Portland, Oregon. 4 pp.
- Carmichael, R., R. Messmer, and B.A. Miller. 1989. Annual Progress Report, Evaluation of LSRCF Facilities in Oregon, April 1, 1986 through June 30, 1987 (86520). Oregon Dept. of Fish and Wildlife, Portland, Oregon. 48 pp.
- Carmichael, R.W., M.W. Flesher, and R.T. Messmer. 1989. Annual Progress Report, Summer Steelhead Creel Surveys in the Grande Ronde, Wallowa, and Imnaha Rivers for the 1988-1989 Run Year (88518). Oregon Dept. of Fish and Wildlife, Portland, Oregon. 11 pp.
- Carmichael, R.W., R.T. Messmer, and B.A. Miller. 1990. Annual Progress Report, Evaluation of LSRCF Facilities in Oregon, July 1, 1987 to June 30, 1988 (87513). Oregon Dept. of Fish and Wildlife, Portland, Oregon. 42 pp.

- Carmichael, R., B. Miller, and R. Messmer. 1986. Annual Progress Report, Evaluation of Lower Snake River Compensation Plan Facilities in Oregon, April 1, 1985 through March 31, 1986 (85069, 85070, 85071). Oregon Dept. of Fish and Wildlife, Portland, Oregon. 45 pp.
- Carmichael, R., B. Miller, and R. Messmer. 1989. Summer Steelhead Creel Surveys in the Grande Ronde, Wallowa, and Imnaha Rivers for the 1987- 88 Run Year (87513). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 21 pp.
- Carmichael, R., B. Miller, and R. Messmer. 1989. Migrational Patterns of Wallowa Stock Summer Steelhead Adults in the Grande Ronde and Snake Rivers during the 1987-88 Run Year (87513). Oregon Dept. of Fish and Wildlife, LaGrande, OR. 15 pp.
- Flesher, M., M. Buckman, R. Carmichael, R. Messmer, and T. Whitesel. 1994. Annual Progress Report, Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1991-92 Run Year (91535). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 22 pp.
- Flesher, M., M. Buckman, R. Carmichael, R. Messmer and T. Whitesel. 1994. Summer Steelhead Creel Surveys on the Grande Ronde, Walla and Imnaha Rivers for the 1992-93 Run Year. (92541/93538). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 30 pp.
- Flesher, M., M. Buckman, R. Carmichael, R. Messmer and T. Whitesel. 1995. Annual Progress Report, Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1993-94 Run Year. (93538). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 32 pp.
- Jonasson, B., R. Carmichael and T. Whitesel. 1995. Annual Progress Report, Residual Hatchery Steelhead: Characteristics and Potential Interactions with Spring Chinook Salmon in Northeast Oregon(93538). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 39 pp.
- Jonasson, B., R. Carmichael and T. Whitesel. 1996. Annual Progress Report, Residual Hatchery Steelhead: Characteristics and Potential Interactions with Spring Chinook Salmon in Northeast Oregon(94543). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 45 pp.
- Messmer, R., R.W. Carmichael, and M. Flesher. 1991. Annual Progress Report, Evaluation of LSRCP Facilities in Oregon, July 1, 1989 to June 30, 1990 (89527). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 54 pp.
- Messmer, R., R. Carmichael, M. Flesher, and T. Whitesel. 1992. Annual Progress Report, Evaluation of LSRCP Facilities in Oregon, July 1, 1990 to December 31, 1991 (89527). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 90 pp.

Messmer, R., R. Carmichael, M. Flesher and T. Whitesel. 1994. Annual Progress Report, Evaluation of Lower Snake River Compensation Plan Facilities in Oregon, January 1, 1992 - December 31, 1992 (92541). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 68 pp.

Messmer, R., R. Carmichael, M. Flesher and T. Whitesel. 1994. Annual Progress Report, Evaluation of Lower Snake River Compensation Plan Facilities in Oregon, January 1, 1993 - December 31, 1993 (93538). Oregon Dept. of Fish and Wildlife, LaGrande, Oregon. 76 pp.

Royce, R. and R. Carmichael. 1986. Grande Ronde River Spring Chinook Production Plan -- WORKING DRAFT. Oregon Dept. Fish and Wildlife, Portland, Oregon. 35 pp.

Royce, R. and R. Carmichael. 1986. Imnaha River Spring Chinook Production Plan -- WORKING DRAFT. Oregon Dept. Fish and Wildlife, Portland, Oregon. 28 pp.

Washington Department of Fish and Wildlife
Salmon Fish Hatcheries
Operations and Maintenance

Allan, R. and K. Hopper. 1994. Lyons Ferry Salmon Fish Hatchery Operation and Maintenance Annual Report, FY1993, October 1992 to September 1993. Washington Dept. of Fisheries, Olympia, Washington. 14 pp.

Atkins, L. 1987. Annual Report FY1987, Lyons Ferry Salmon Hatchery (86502 - FY 1987). Washington Dept. of Fisheries, Olympia, Washington. 7 pp.

Ringe, R. and R. Bugert. 1989. Fall Chinook Salmon Trapping at Ice Harbor Dam in 1989 (89525). Washington Dept. of Fisheries, Dayton, Washington. 7 pp.

Ross, Carl. 1985. Annual Report Lyons Ferry Salmon Hatchery, FY1984. Washington Dept. of Fisheries, Olympia, Washington. 4 pp.

Ross, C. 1986. Lyons Ferry Hatchery FY1985 Annual Report. Washington Dept. of Fisheries, Olympia, Washington. 11 pp.

Ross, C. 1986. Operations Reports, Lyons Ferry Salmon Hatchery. August 1, 1985 through July 31, 1986. Washington Dept. of Fisheries, Olympia, Washington. 20 pp.

Ross, C. and K. Hopper. 1989. Lyons Ferry Salmon Hatchery, Annual Report, FY1989. Washington Dept. of Fisheries, Olympia, Washington. 14 pp.

Ross, C. and K. Hopper. 1990. Lyons Ferry Salmon Hatchery, Annual Report FY1990. Washington Dept. of Fisheries, Starbuck, Washington. 15 pp.

Ross, C. and K. Hopper. 1992. Lyons Ferry Salmon Hatchery, Annual Report FY1991. Washington Dept. of Fisheries, Starbuck, Washington. 14 pp.

Washington Department of Fish and Wildlife Salmon Evaluation Studies

Bugert, R., C. Busack, G. Mendel, K. Petersen, D. Marbach, L. Ross, and J. Dedloff. 1992. Lyons Ferry Fall Chinook Salmon Hatchery Program, 1990 Evaluation Report (90524). Washington Dept. of Fisheries, Olympia, WA. 118 pp.

Bugert, R., C. Busack, G. Mendel, L. Ross, K. Petersen, D. Marbach, and J. Dedloff. 1991. Tucannon River Spring Chinook Supplementation Studies, FY1990 Annual Report (90524). Washington Dept. of Fisheries, Olympia, WA. 81 pp.

Bugert, R. and B. Hopley. 1991. Fall Chinook Salmon Trapping on the Snake River in 1990 (90524). Washington Dept. of Fisheries, Olympia, WA. 21 pp.

Bugert, R., P. LaRiviere, D. Marbach, S. Martin, L. Ross, and D. Geist. 1990. Lower Snake River Compensation Plan Salmon Hatchery Evaluation Program, Annual Report FY1989 (89525). Washington Dept. of Fisheries, Olympia, Washington. 145 pp.

Bugert, R., P. Seidel, P. LaRiviere, D. Marbach, S. Martin, and L. Ross. 1989. Lower Snake River Compensation Plan, Lyons Ferry Evaluation Program, 1988 Annual Report (88519). Washington Dept. of Fisheries, Olympia, Washington. 84 pp.

Bugert R., K. Peterson, G. Mendel, L. Ross, D. Milks, J. Dedloff, and M. Alenandersdottir. 1992. LSRCP Tucannon River Spring Chinook Salmon Hatchery Evaluation Program, 1991 Annual Report (91534). Washington Dept. of Fisheries, Olympia, Washington. 91 pp.

Bumgarner, J., G. Mendel, L. Ross, D. Milks, and J. Dedloff. 1994. Tucannon River, Spring Chinook Salmon Hatchery Evaluation Program, 1993 Annual Report. Washington Dept. of Fish and Wildlife, Olympia, Washington. 69 pp.

Bumgarner, J., G. Mendel, D. Milks, L. Ross and J. Dedloff. 1995. Tucannon River Spring Chinook Salmon Hatchery Evaluation Program, 1994 Annual Report (94544). Washington Dept. of Fish and Wildlife, Olympia, Washington. 32 pp.

Bumgarner, J., G. Mendel, D. Milks, L. Ross and J. Dedloff. 1996. Tucannon River Spring Chinook Hatchery Evaluation, 1995 Annual Report (95572). Washington Dept. of Fish and Wildlife, Olympia, Washington. 41 pp.

- Foster, R. W. 1981. Snake River Fall Chinook Egg Bank Program, 1 Oct. 1980 - 30 Sept. 1981 (81002). Washington Dept. of Fisheries, Olympia, Washington. 3 pp.
- Hopley, B. 1984. Completion Report Snake River Fall Chinook Egg Bank Program, 1 Oct. 1982 - 30 Sept. 1982 (82027). Washington Dept. of Fisheries, Olympia, Washington. 5 pp.
- Hopley, B. 1984. Completion Report Snake River Fall Chinook Egg Bank Program, 1 Oct. 1982 - 30 Sept. 1983 (82027). Washington Dept. of Fisheries, Olympia, Washington. 5 pp.
- Hopley, B. 1984. Closing Report, Snake River Fall Chinook Egg Bank Program, 1 Oct. 1983 - 30 Sept. 1984 (82027). Washington Dept. of Fisheries, Olympia, Washington. 6 pp.
- Mendel, G., J. Bumgarner, D. Milks, L. Ross, J. Dedloff and R. Bugert. 1994. Lower Snake River Compensation Plan Lyons Ferry Hatchery Evaluation Program, Fall Chinook Salmon 1993 Annual Report, (93539), AFF-1/LSR-94-14. Washington Dept. of Fish and Wildlife, Olympia, Washington. 59 pp.
- Mendel, G., J. Bumgarner, D. Milks, L. Ross and J. Dedloff. 1995. Lyons Ferry Hatchery Evaluation, Fall Chinook Salmon 1994 Annual Report, (93539). Washington Dept. of Fish and Wildlife, Olympia, Washington. 46 pp.
- Mendel, G., J. Bumgarner, D. Milks, L. Ross and J. Dedloff. 1996. Lyons Ferry Hatchery Evaluation, Fall Chinook Salmon 1995 Annual report, (93539). Washington Dept. of Fish and Wildlife, Olympia, Washington. 59 pp.
- Mendel, G., J. Bumgarner, K. Peterson, R. Bugert, L. Ross, D. Milks, J. Dedloff, J. Shaklee, and C. Knutson. 1993. Tucannon River Spring Chinook Salmon Hatchery Evaluation Program, 1992 Annual Report. Washington Dept. of Fisheries, Olympia, Washington. 128 pp.
- Mendel, G., J. Dedloff, L. Ross, R. Bugert, and K. Petersen. 1992. Fall Chinook Salmon Trapping on the Snake River in 1991 (91502). Washington Dept. of Fisheries, Olympia, Washington. 22 pp.
- Mendel, G., D. Milks, R. Bugert, and K. Petersen. 1992. Upstream Passage and Spawning of Fall Chinook in the Snake River, 1991 (91502). Washington Dept. of Fisheries, Olympia, Washington. 45 pp.
- Mendel, G., K. Peterson, R. Bugert, D. Milks, L. Ross, J. Dedloff and L. LaVoy. 1992. Lyons Ferry Fall Chinook Salmon Hatchery Program, 1991 Evaluation Report. Washington Dept. of Fisheries, Olympia, Washington. 42 pp.

- Mendel, G., K. Peterson, R. Bugert, D. Milks, L. Ross, J. Dedloff and J. Bumgarner. 1994. Lyons Ferry Hatchery Evaluation Program, Fall Chinook Salmon, 1992 Annual Report. Washington Dept. of Fish and Wildlife, Olympia, Washington. 52 pp.
- Mendel, G., J. Bumgarner, D. Milks, L. Ross, J. Dedloff and R. Bugert. 1994. Lyons Ferry Hatchery Evaluation Program, Fall Chinook Salmon 1993 Annual Report (93539). Washington Department of Fish and Wildlife, Olympia, Washington, 59 pp.
- Seidel, P. 1984. Lower Snake River Compensation Hatchery Evaluation Study (82064). Washington Dept. of Fisheries, Olympia, Washington. 23 pp.
- Seidel, P. and B. Bugert. 1985. Lower Snake River Compensation Plan, Hatchery Evaluation Study (84097). Washington Dept. of Fisheries, Olympia, Washington. 22 pp.
- Seidel, P., R. Bugert, R. S. Kirby, and L. Ross. 1986. LSRCP Lyons Ferry Evaluation Project, 1985 Annual Report (85072). Washington Dept. of Fisheries, Olympia, Washington. 54 pp.
- Seidel, P. and R. Bugert. 1987. LSRCP Lyons Ferry Salmon Evaluation Program, 1986 Annual Report (86521). Washington Dept. of Fisheries, Olympia, Washington. 51 pp.
- Seidel, P., R. Bugert, P. LaRiviere, D. Marback, S. Martin, and L. Ross. 1988. Lyons Ferry Salmon Evaluation Program, 1987 Annual Report (87512). Washington Dept. of Fisheries, Olympia, Washington. 106 pp.

Washington Department of Fish and Wildlife
Trout/Steelhead FH
Operation and Maintenance

- Fischer-Benzon, H. von. 1984. Lyons Ferry Operating Statistics, 1 Oct. 1982 - 30 Sept. 1983 (83061). Washington Dept. of Wildlife, Olympia, Washington. 2 pp.
- Fischer-Benzon, H. von and W.N. Hubbard. 1985. Tucannon Hatchery Operating Statistics, 1 Oct. 1983 - 30 Sept. 1984 (83061). Washington Dept. of Wildlife, Olympia, Washington. 3 pp.
- Fischer-Benzon, H. V. and W. N. Hubbard, 1986. Lyons Ferry - Tucannon FH's Operating Statistics for October 1, 1984 to October 1, 1985. Washington Dept. of Wildlife, Olympia, Washington, 5 pp.
- Harty, H.R. and W.N. Hubbard. 1989. Annual Report - Lyons Ferry and Tucannon Trout Hatcheries, October 1, 1987 to September 30, 1988. Washington Dept. of Wildlife, Olympia, Washington. 12 pp.

- Schuck, M. L. and G. W. Mendel. 1986. Assessment of Production from Lyons Ferry/Tucannon Complex, and Estimates of Return of Marked Fish to LSRCP Streams in Washington. Lyons Ferry Evaluation Study, Part II (84096). Washington Dept. of Wildlife, Dayton, Washington. 54 pp.
- Schuck, M. L. and G.W. Mendel. 1987. Lyons Ferry Evaluation Study, Part II 1985-86 Annual Report (85073). Washington Dept. of Wildlife, Olympia, Washington. 110 pp.
- Schuck, M.L., G.W. Mendel, and S.A. Nostrant. 1988. Lyons Ferry Evaluation Study, Part II: 1986-87 Annual Report (86522). Washington Dept. of Wildlife, Olympia, Washington. 127 pp.
- Schuck, M., G. Mendel, and S. Nostrant. 1989. Lyons Ferry Evaluation Study, 1987-88 Annual Report (87514). Washington Dept. of Wildlife, Dayton, Washington. 66 pp.
- Schuck, M., A. Viola and M. Keller. 1993. Lyons Ferry Evaluation Study, 1991-92 Annual Report (91537). Washington Dept. Fish and Wildlife, Olympia, Washington. 56 pp.
- Schuck, M., A. Viola and M. Keller. 1994. Lyons Ferry Evaluation Study, 1992-93 Annual Report (92543). Washington Dept. Fish and Wildlife, Olympia, Washington. 65 pp.
- Schuck, M, A. Viola and M. Keller. 1996. Lyons Ferry Trout Evaluation Study, 1993-94 Annual Report (93540). Washington Dept. Fish and Wildlife, Olympia, Washington. 65 pp.
- Schuck, M., A. Viola and M. Keller. 1996. Lyons Ferry Trout Evaluation Study, 1994-95 Annual Report (94545). Washington Dept. Fish and Wildlife, Olympia, Washington. 72 pp.
- Schuck, M., A. Viola, and S. Nostrant. 1990. Lyons Ferry Evaluation Study, 1988-89 Annual Report (88502). Washington Dept. of Wildlife, Dayton, Washington. 67 pp.
- Schuck, M., A. Viola, and S. Nostrant. 1991. Lyons Ferry Evaluation Study, 1989-90 Annual Report (89526). Washington Dept. of Wildlife, Dayton, Washington. 82 pp.
- Schuck, M., A. Viola, S. Nostrant, and M. Keller. 1993. Lyons Ferry Evaluation Study, 1990-91 Annual Report (90525). Washington Dept. of Wildlife. Olympia, Washington. 63 pp.
- Viola, A., M. Schuck, and S. Nostrant. 1991. An Evaluation of Instream Habitat Alterations in Southeast Washington, 1983-1989 (89526). Washington Dept. of Wildlife. Dayton, WA. 69 pp.
- Viola, A. and M. Schuck. 1991. Estimates of Residualism in Southeast Washington. Washington Dept. of Wildlife, Dayton, Washington. 16 pp.

Nez Perce Tribal Evaluation Studies

- Ashe, B., A. Miller, P. Kucera and M. Blenden. 1995. Spring Outmigration of Wild and Hatchery Chinook Salmon and Steelhead Trout Smolts From the Imnaha River, Mar. 1 - Jun. 15, 1994. NPT Dept. of Fish. Resource Mgmt., Lapwai, Idaho. 76 pp.
- Cowley, P. K., B. Hill, and D. B. Johnson. 1987. A Method for Evaluating the Progress of the LSRCP in Meeting It's Goals - Revised (86510). Nez Perce Tribe, Lapwai, Idaho. 49 pp.
- Kucera, P. A. 1987. Nez Perce Tribal Review of the Salmon River, Lower Snake River Compensation Plan Working Paper (87502). Nez Perce Tribe, Lapwai, Idaho. 75 pp.
- Kucera, P. 1989. Nez Perce Tribal Review of the Imnaha River, Lower Snake River Compensation Plan Working Paper (87502). Dept. of Fisheries Management, Nez Perce Tribe, Lapwai, Idaho. 49 pp.
- Kucera, P., M. Banach and M. Blenden. 1991. Nez Perce Tribe LSRCP Evaluation Studies, Annual Project Report - 1989. Dept. of Fisheries Management, Nez Perce Tribe, Lapwai, Idaho. 57 pp.
- Kucera, P., M. Banach, and M. Blenden. 1992. Nez Perce Tribe LSRCP Evaluation Studies, Annual Project Report 1990. NPT Dept. of Fish. Resource Mgmt., Lapwai, Idaho. 120 pp.
- Kucera, P., M. Blenden and M. Banach. 1994. Nez Perce Tribe LSRCP Evaluation Studies Annual Project Report, 1991. NPT Dept. of Fish. Resource Mgmt., Lapwai, Idaho. 92 pp.
- Mauney, J. 1989. A Survey of the Nez Perce Subsistence Fishery for Chinook Salmon, North Fork Clearwater River, Idaho, 1988. Department of Fisheries Management, Nez Perce Tribe, Lapwai, Idaho. 49 pp.
- Murphy, P.K. and D.B. Johnson. 1990. Nez Perce Tribal Review of the Clearwater River Lower Snake River Compensation Plan Working Paper. Department of Fisheries Management, Nez Perce Tribe, Lapwai, Idaho. 105 pp.

Confederated Tribes of the Umatilla Indian Reservation Evaluation Studies

- Lofy, P. 1991. Annual Progress Report. LSRCP CTUIR Evaluation Studies for 1989-1990. CTUIR Proj. No. 63. Fish. Off., Dept. Nat. Res., CTUIR, Pendleton, OR 97801. 18 pp.

- Lofy, P. and M. McLean. 1994. Annual Progress Report. LSRCP CTUIR Evaluation Studies for 1991 (91533). Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon. 34 pp. (draft)
- Lofy, P. and M. McLean. 1995. Lower Snake River Compensation Plan 1994 Annual Report, (94517). Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon. 57 pp.
- Lofy, P. and M. McLean. 1995. Lower Snake River Compensation Plan 1992 Annual Report (92502), AFF1/LSR95-02. Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon. 98 pp.
- McLean, M. and P. Lofy. 1995. Lower Snake River Compensation Plan 1993 Annual Report (93515). Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon. 60 pp.
- McLean, M. and P. Lofy. 1996. Lower Snake River Compensation Plan 1996 Annual Report (95525). Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon. 109 pp.

TABLE 1. LOWER SNAKE RIVER COMPENSATION PLAN ACTIVITIES FOR FY 1996

INSTALLATION/PROGRAM	SPECIES	TYPE	FISH RELEASED	
			NUMBERS	POUNDS
STATE OF IDAHO				
McCALL FH and SOUTH FORK SATELLITE	SUCS	SMOLTS	585,654	32,773
SAWTOOTH FH and EAST FORK SATELLITE	SPCS	SMOLTS	25,006	1,256
	STT	SMOLTS	22,507	3,041
MAGIC VALLEY FH	STT	SMOLTS	1,868,085	402,976
CLEARWATER FH and SATELLITE FACILITIES	SPCS	SMOLTS	293,804	16,546
	STT	FINGERLING	48,730	886
	STT	SMOLTS	791,327	106,618
ESA CONSERVATION PROGRAM				
FISH MARKING				
IDFG EVALUATIONS				
IDFG ESA COORDINATOR				
EAGLE LAB				
STATE OF OREGON				
LOOKINGGLASS FH and IMNAHA SATELLITE	SPCS	FINGERLING	30,880	205
	SPCS	SMOLTS	139,112	6,956
	SPCS	SMOLTS	91,240	4,943
IRRIGON/WALLOWA FH and LITTLE SHEEP/BIG CANYON	STT	SMOLTS	1,664,523	338,228
ESA CONSERVATION PROGRAM				
BONNEVILLE ESA PROGRAM				
FLOOD DAMAGE				
ODFW EVALUATIONS				
ODFW PATHOLOGY LAB				
STATE OF WASHINGTON				
LYONS FERRY FH	SPCS	SMOLTS	130,069	7,841
	FCS	FINGERLING	112,038	487
	FCS	SMOLTS	521,802	49,915
	STT	SMOLTS	875,449	183,118
	RBT	FINGERLING	159,798	3,652
	RBT	CATCHABLE	149,277	41,567
TUCANNON FH	RBT	CATCHABLE	119,450	34,051
ESA CONSERVATION PROGRAM				
FLOOD DAMAGE				
WDFW EVALUATIONS				
TRIBAL PROGRAMS				
CTUIR EVALUATIONS				
NEZ PERCE EVALUATIONS				
NPT PITTSBURG O&M (FISH REARED AT LYONS FERRY)				
FISH AND WILDLIFE SERVICE				
HAGERMAN NFH	STT	SMOLTS	1,486,467	270,740
DWORSHAK NFH	SPCS	SMOLTS	436,697	26,067
DWORSHAK FHC				
COLUMBIA RIVER COORD.				
IDAHO FRO EVALUATIONS				
REGIONAL OFFICE	FCS	FINGERLING	112,038	487
FWS GEN. ADMINIST. COSTS	FCS	SMOLTS	521,802	49,915
LSRCP MANAGEMENT/COORD.	SUCS	SMOLTS	585,654	32,773
	SPCS	FINGERLING	30,880	205
TOTAL OBLIGATED	SPCS	SMOLTS	1,115,928	63,609
	STT	FINGERLING	48,730	886
	STT	SMOLTS	6,708,358	1,304,721
	RBT	FINGERLING	159,798	3,652
	RBT	CATCHABLE	268,727	75,618
	TOTALS		9,551,915	1,531,866

RBT=RAINBOW TROUT, FCS=FALL CHINOOK, SPCS=SPRING CHINOOK, SUCS=SUMMER CHINOOK, STT=STEELHEAD

c:\office\qpw\98reltab.wb2

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

Hatchery (Operator) ^a	Fish Type	Pound	Total Cost (\$1,000)	Satellite Facilities	Date of Completion
Lookingglass (ODFW)	Spring Chinook	69,600	\$ 8,993	Big Canyon Ck. Imnaha	Nov. 82
			\$ 2,763		Apr. 87
			\$ 1,525		Jul. 89
Irrigon/Wallowa (ODFW)	Steelhead	279,600	\$15,646	(Wallowa) ^b Little Sheep Ck (Big Canyon Ck)	Oct. 85
			\$ 3,230		May 85
			\$ 2,545		Aug. 87
Lyons Ferry:			\$31,831 ^c		
Phase I (WDW)	Steelhead	116,400		Cottonwood Dayton Pond	Nov. 83
	Trout	45,000	\$ 801		Feb. 85
Phase II (WDF)	Trout	41,000	\$ 1,182	Tucannon FH Curl Lake	Oct. 86
			\$ 4,235		Nov. 84
	Fall Chinook	101,800	\$ 230	Feb. 85	
	Spring Chinook	8,800		Nov. 84	
Sawtooth (IDFG)	Spring Chinook	149,000	\$13,543	E.Fk. Salmon R.	Jan. 85
			\$ 2,067		Nov. 83
Dworshak (FWS)	Spring Chinook	70,000	\$ 2,234		Nov. 82
Clearwater (IDFG)	Steelhead	350,000	\$37,128	Red River Crooked River Powell	Dec. 91
	Spring Chinook	91,300	\$ 1,651		Nov. 86
Magic Valley (IDFG)	Steelhead	291,500	\$ 2,054	(Sawtooth) (East Fork)	May 90
			\$ 2,320		Aug. 89
			\$19,520		Aug. 87
Hagerman (FWS)	Steelhead	340,000	\$ 9,801	(Sawtooth) (East Fork)	Apr. 84
McCall (IDFG)	Summer Chinook	61,300	\$ 5,741	S.Fk. Salmon R.	Sep. 81
			\$ 1,149		Jul. 80
Eagle Lab (IDFG)	Disease Diagnostic		\$ 1,300		Apr. 89

^a ODFW - Oregon Department of Fish and Wildlife
WDFW - Washington Department of Wildlife
WDFW - 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 3. Hatchery or trap rack returns to LSRCP hatcheries operating in 1995 and 1996.

Species/Hatchery	Hatchery/Trap Adults	Returns Jacks
Summer Chinook		
McCall FH/South Fork	461	738
Spring Chinook		
Clearwater FH1	400	147
Sawtooth FH	129	27
East Fork Trap	7	3
Lookingglass FH2	832	46
Imnaha Trap	185	59
Big Canyon Trap	0	0
Dworshak NFH3	61	104
Tucannon FH5	135	
Fall Chinook		
Lyons Ferry FH4,	1,172	1,752
Steelhead Trout		
Irrigon FH:		
Wallowa FH	988	
Little Sheep Trap	489	
Big Canyon Trap	527	
Lyons Ferry FH	5,920	
Cottonwood Creek Trap, WA	430	
Hagerman NFH/Magic Valley FH6	645	
Crooked River Trap, ID	3	

¹ Returns to Powell, Red River and Crooked River traps only.

² Includes those trapped at Lower Granite Dam and at the Lookingglass FH trap.

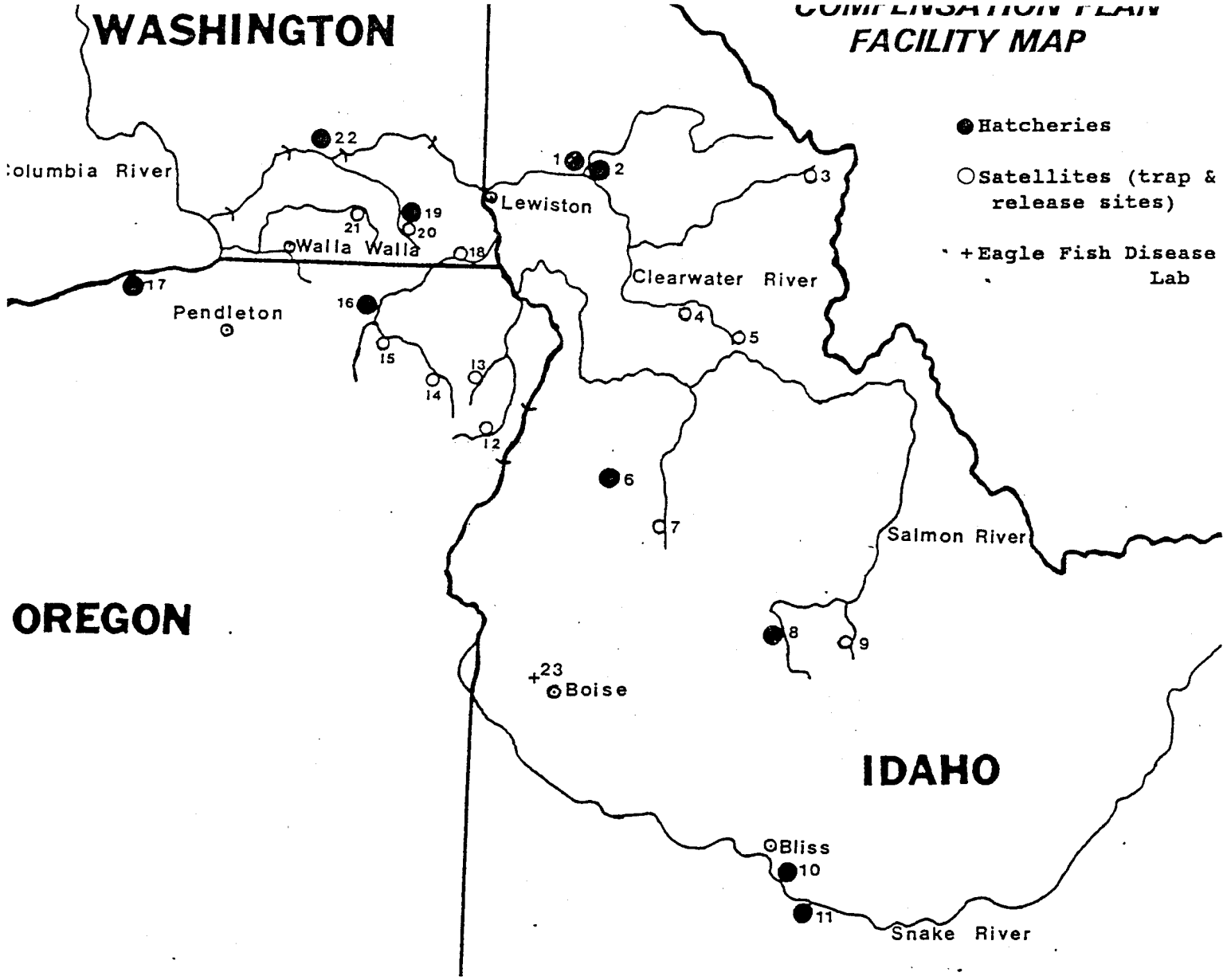
³ Dworshak and Kooskia returns.

⁴ Includes ladder returns plus Lower Granite trapping (including strays).

⁵ Shown is total returns (adults and jacks).

⁶ Includes returns to East Fork, Slate Ck., and Sawtooth FH racks.

**COMPENSATION PLAN
FACILITY MAP**



Operating Agencies

Idaho Department of Fish and Game

- 1. Clearwater Fish Hatchery
- 3. Powell Satellite Facility
- 4. Crooked River Satellite Facility
- 5. Red River Satellite Facility
- 6. McCall Fish Hatchery
- 7. South Fork Satellite Facility
- 8. Sawtooth Fish Hatchery
- 9. East Fork Satellite Facility
- 11. Magic Valley Fish Hatchery
- 23. Eagle Fish Disease Lab

U.S. Fish and Wildlife Service

- 2. Dworshak NFH Expansion
- 10. Hagerman NFH

Oregon Department of Fish and Wildlife

- 12. Imnaha Satellite Facility
- 13. Sheep Creek Satellite Facility
- 14. Wallowa Fish Hatchery
- 15. Big Canyon Satellite Facility
- 16. Lookingglass Fish Hatchery
- 17. Irrigon Fish Hatchery

Washington Department of Fish and Wildlife

- 18. Cottonwood Creek Satellite Facility
- 19. Tucannon Fish Hatchery
- 20. Curl Lake Satellite Facility
- 21. Dayton Pond Satellite Facility
- 22. Lyons Ferry Fish Hatchery