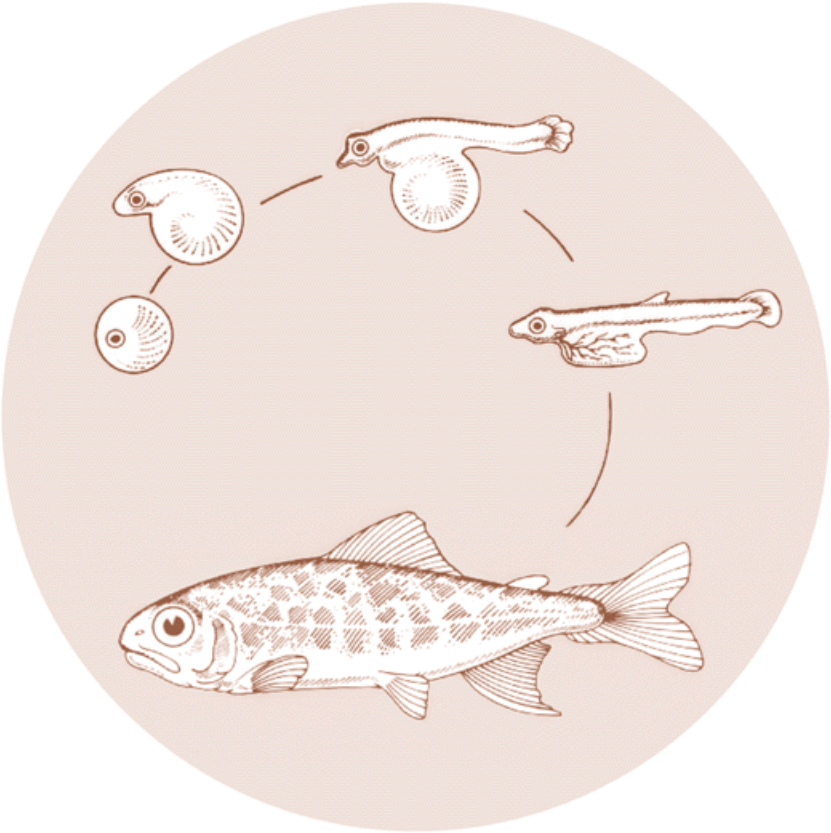
May 1994

ANNUAL CODED WIRE TAG PROGRAM MISSING PRODUCTION GROUPS

Annual Report 1993



DOE/BP-01931-1

This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views of this report are the author's and do not necessarily represent the views of BPA.

This document should be cited as follows:

Donna Allard - U.S. Fish and Wildlife Service, Annual Coded Wire Tag Program Missing Production Groups Annual Report 1993, Report to Bonneville Power Administration, Contract No. 1989BP01931, Project No. 198906500, 50 electronic pages (BPA Report DOE/BP-01931-1)

This report and other BPA Fish and Wildlife Publications are available on the Internet at:

http://www.efw.bpa.gov/cgi-bin/efw/FW/publications.cgi

For other information on electronic documents or other printed media, contact or write to:

Bonneville Power Administration
Environment, Fish and Wildlife Division
P.O. Box 3621
905 N.E. 11th Avenue
Portland, OR 97208-3621

Please include title, author, and DOE/BP number in the request.

ANNUAL CODED WIRE TAG PROGRAM
MISSING PRODUCTION GROUPS

ANNUAL REPORT 1993

Prepared by:

Donna Allard - Fishery Biologist
U.S. Fish and Wildlife Service
Vancouver, Washington

Prepared for:

U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife
P.O. Box 3621
Portland, OR 97283-3621

Project Number 89-065
Contract Number DE-AI79-89BP01931

MAY 1994

INTRODUCTION

In 1989, the U.S. Fish and Wildlife Service (USFWS) recieved funding from the Bonneville Power Administration (BPA) to begin a program of coded-wire tagging missing production groups of anadromous fish. The purpose of the program is to mark a representative group of fish from each production release.

The three objectives of the program are:

1. To estimate the survival of each release group,

2. To estimate the contribution of each release group to ocean and inriver fisheries, and

3. To estimate the straying rate of hatchery fish.

This information will be used to evaluate hatchery practices and individual broodstocks. It will also enable salmon harvest managers to develop a scenario to harvest excess hatchery fish while protecting the threatened or endangered stocks.

In order to meet these objectives, a minimum of one marked group of fish for' each production release is necessary for evaluation. The level of marking varies according to the hatchery's location, species of fish, and age at release. In general, 50,000 fish are marked with a coded wire tag (CWT) to represent each production release group at hatcheries in the Bonneville pool area and downriver and 120,000 to 200,000 fish are marked for groups at hatcheries in the Mid-Columbia Area and Idaho.

All fish released from the various facilities. along with mark/unmarked release ratios are reported to the Pacific States Marine Fisheries Commission (PSMFC). All fish recovered in the various fisheries or at the hatchery are sampled to recover coded-wire tags. This information is then reported to the PSMFC along with sampling rates. Contribution, to various fisheries and survival of the release groups can then be estimated from this information.

RESULTS

Under the 1993 contract with BPA, the USFWS, Lower Columbia River Fishery Resource Office marked a total of 1,094,512 salmon and steelhead. This total represents 40 different tag groups (Table 1).

HATCHERY	SPBCIBS	BROODYEAR	DATE	GROUPS	NUMBER
Willard NFH	Coho Salmon	91	January 1993	2	50,384
Entiat NFH	Spring- Chinook "O-Age Release"	92	March I993	4	200,046
Entiat NFH	Spring Chinook	92	April 1993	2	120,000
Little White Salmon NFH	Spring Chinook "O-Age Release"	92	April. 1993	2	100,400
Little White Salmon NFH	Spring Chinook	92	April 1993	1	50,137
Winthrop NFH	Spring Chinook-	92	May 1993	4	200,956
Little White Salmon NFH	Upriver Bright Fall Chinook	92	June 1993	1	50,008
Carson NFH	Spring Chinook	92	June 1993	12	161,476
Eagle Creek NFH	Coho Salmon	92	October 1993	'4	50,382
Eagle Creek NFH	Winter Steelhead	93	-October 1993	6	60,310
Eagle Creek NFH	Coho Salmon	92	October 1993	2	50,413

Table 1. Fish Marked in CY 93 under Missing Production *Groups*

DISCUSSION

The percent recovery (by state) for the last five completed broodyears is presented in Appendix A for each federal hatchery. The broods included are as follows: chinook 1983 to 1987; coho 1985 to 1989; and steelhead 1984 to 1988. This information is completely absent or incomplete for many USFWS hatcheries due to lack of marked groups 'of fish. Appendix B contains reference documents for these same broodyears. These documents were developed using'the Columbia River Information System (CRiS) database and Tag Summary 1 reports (TSI) downloaded from the Pacific State Marine Fisheries Commission (PSMFC) .

Abernathy Salmon Culture Technology Center

Abernathy Salmon Culture Technology Center (SCTC) is located 14 miles west of Longview, Washington, on Abernathy Creek, approximately three miles upstream from its confluence with the Columbia River. The center was constructed in 1959. At present, lower river tule fall chinook are the only species reared on a production basis at Abernathy.

There were no releases of marked fish for broodyears 1983 to 1987 from Abernathy. Marking fish with coded wire tags was resumed for BY 1989 under the missing production group program. It-has continued each year under other programs.

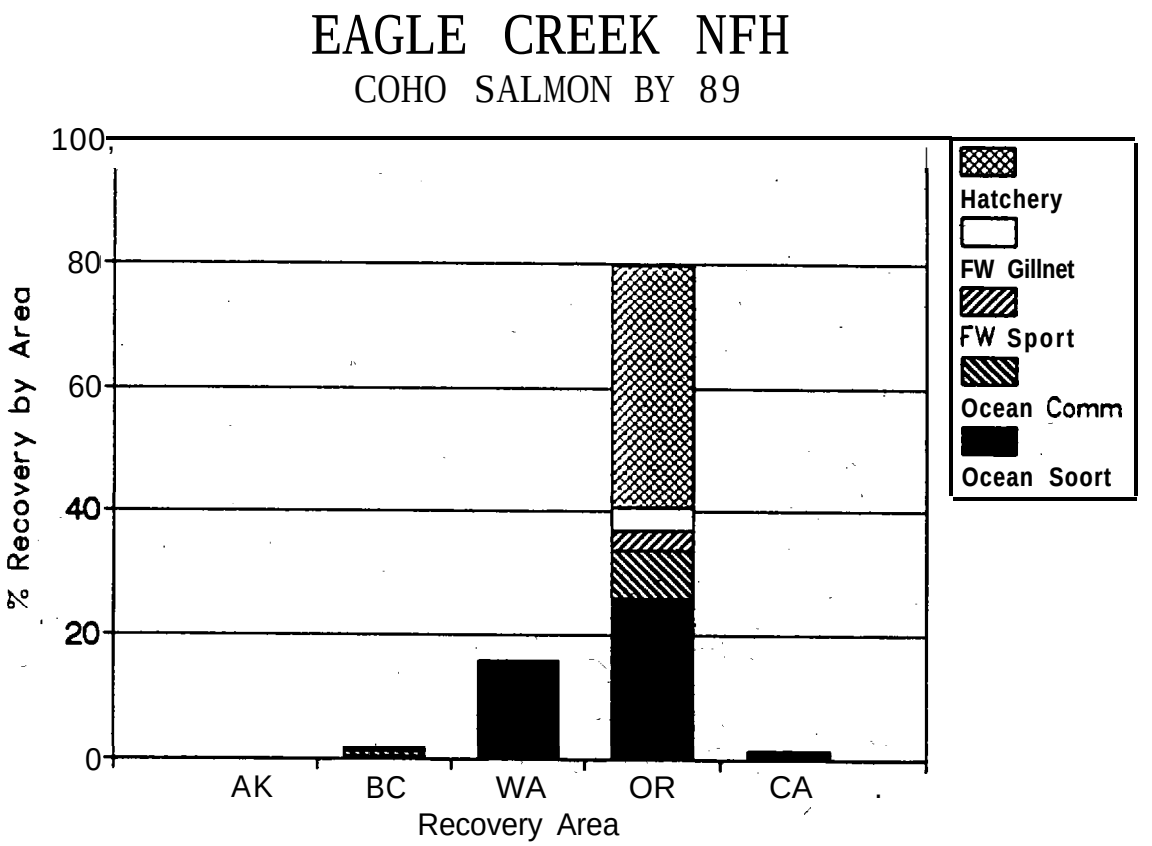
Eagle Creek National Fish Hatchery

-Eagle- Creek National Fish Hatchery (NFH) is located about seven miles from Estacada, Oregon on Eagle Creek, approximately eight. miles above its confluence with the Clackamas River. The hatchery was constructed in 1956 under the Columbia River Fishery Development Program (CRFDP) . Even though Eagle Creek NFH has raised fall and spring chinook in past years, production is now limited to coho and winter steelhead.

The I989 brood coho survived at a rate of 0.91 percent. This compares with 4.1 percent survival of broodyear 88 coho. The coho were caught primarily off the Oregon coast in the sport and commercial fisheries (Figure 1).

Carson National Fish Hatchery

Carson NFH is located 13 miles northwest. of Carson, Washington at the confluence of the Wind River and Tyee Springs. Carson NFH began operation in 1938 by rearing and releasing fall chinook salmon and trout.. In 1956, the hatchery was remodeled under the Mitchell Act in an attempt to establish a spring chinook run in the Wind River. Current production involves adult collection, egg incubation and rearing of spring chinook salmon.



	OCEAN		FRESH WATER		
	SPORT	COMM	SPORT	GILLNET	HATCHERY
AK	0.0	0.0	0.0	0.0	0.0
BC	0.6	1.6	0.0	0.0	0.0
WA	15.8	0.0	0.0	0.0	0.0
OR	26.0	7.8	3.3	3.9	39.3
CA	1.6	0.0	0.0	0.0	0.0

PERCENT SURVIVAL - 0.9
PERCENT CONTRIBUTION - 0.6

Figure 1. Contribution and survival for Eagle Creek National Fish Hatchery, coho broodyear 89.

Broodyears 1983 to 1985 spring chinook from Carson were marked with a coded wire tag for a density study. The average survival of these broods' is 0.22 percent. These fish were recovered mainly in the freshwater sport fishery.

Little White Salmon National Fish Hatchery

Little White Salmon NFH is located on the Little White Salmon River, twelve (12) miles east of Stevenson, Washington. The hatchery was originally built in 1898 and was remodeled and expanded in 1958. Now operating as part of the CRFDP, hatchery production consists of rearing upriver bright fall chinook and spring chinook salmon.

Both O-age and yearling spring chinook are released from the hatchery. Broodyears 1983 and 1984 were coded wire tagged. Average survival for O-age release fish was 0.11 as compared with a average survival of 0.39 percent for the yearling release. Marking of spring chinook was resumed for broodyear 1988 under the Missing Group Program.

Broodyears 1983 through 1985 upriver brights were marked for both a yearling release and fingerling release. Average percent survival for the fingerling release was 1.1 as compared to the survival of 0.36 for the yearling release. The extended rearing period for upriver brights is no longer in effect.

Willard National Fish Hatchery

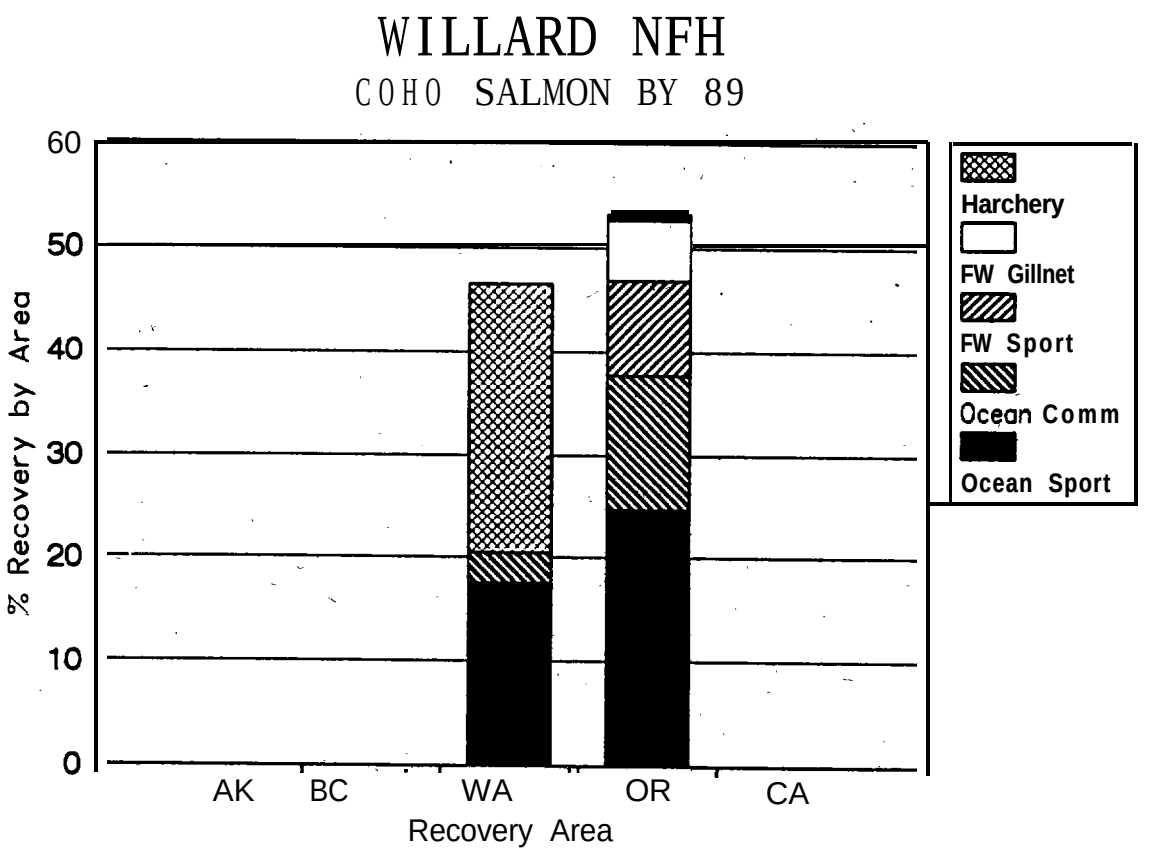
Willard NFH is situated four miles upstream of Little White Salmon NFH on the' Little White Salmon River. Willard NFH was constructed in 1952 under authorization of- the Mitchell Act and was originally planned as a fall chinook hatchery. The hatchery was switched to a spring chinook and coho facility because of cold water temperatures. Since the mid-1960s, -the hatchery has been used entirely for coho- production, All adult coho are trapped and spawned at Little White Salmon NFH.

Broodyear 89 coho survived at a rate of 0.32 percent. They contributed mainly in ocean sport fisheries of Oregon and Washington (Figure 2).

Spring Creek National Fish Hatchery

Spring Creek NFH is located on the Columbia River at Underwood, Washington; about 30 miles upstream of Bonneville Dam. The hatchery was constructed in 1900 and began operations a year later. Spring Creek NFH was remodeled in 1955 under the Mitchell Act and currently produces tule fall chinook.

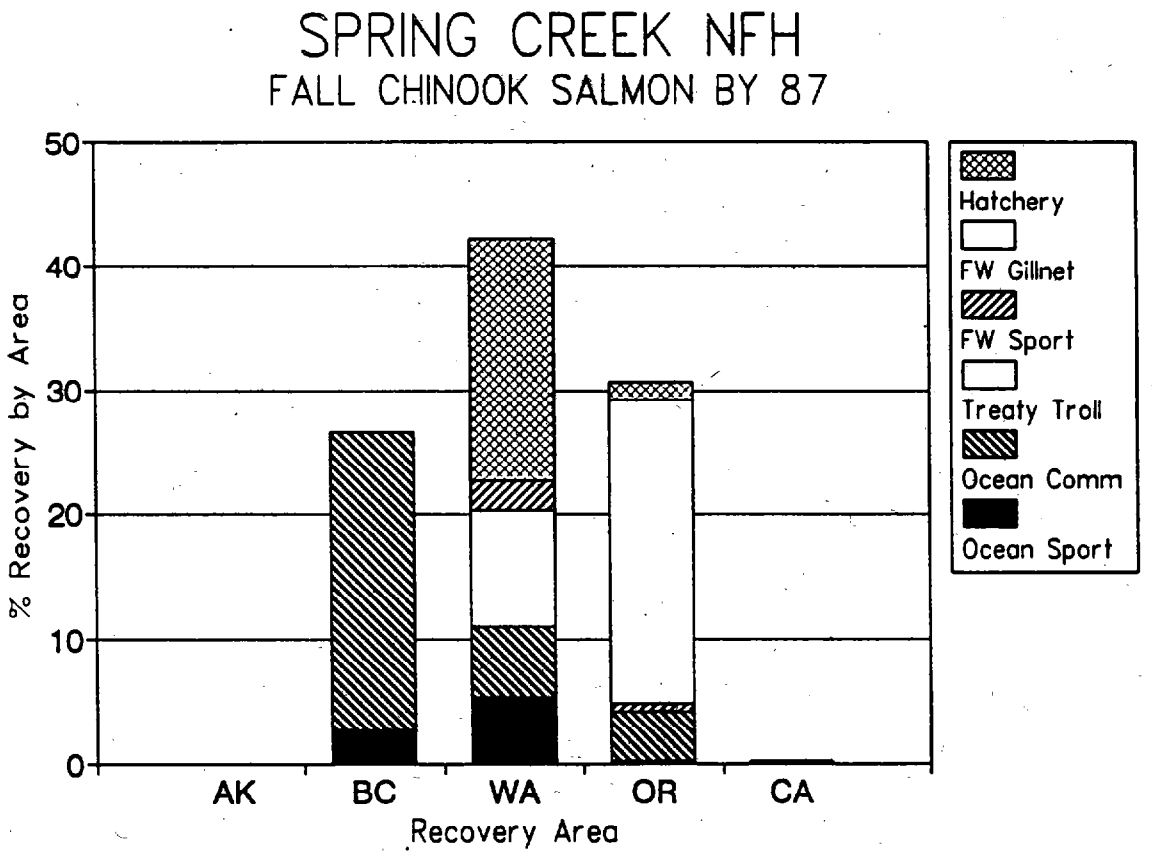
Broodyear 87 fall chinook were recovered primarily in commercial fisheries off the coasts of Canada and Washington as well as in the Columbia River gill net fishery (Figure 3). The survival of the 1987 broodyear was 0.3 percent compared with the latest five year average of 0.2 percent.



	OCEAN		FRESH WATER		
	SPORT	COMM	SPORT	GILLNET	HATCHERY
Ax	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	. 0.0	0.0
WA	17.5	3 . 3	0.0	0.0	26.0
OR	24.7	13.0	9.1	, 5.8	0.7
CA	0.0	0.0	0.0	0 . 0	-0.0

PERCENT SURVIVAL - 0.3
PERCENT CONTRIBUTION - 0 . 2

Figure 2. Contribution and survival for Willard National Fish Hatchery, coho broodyear 89.



	OCEAN			FRESH WATER		
	SPORT	NON-TR COMM	TREATY TROLL	SPORT	GILLNET	HATCHERY
AK	0.0	0.0	0.0	0.0	0.0	0.0
BC	2.7	24.0	0.0	0.0	0.0	0.0
WA	5.4	5.8	9.3	2.4	0.0	19.5
OR	0.2	4.0	0.0	0.7	24.4	1.5
CA	0.0	0.2	0.0	0.0	0.0	0.0

PERCENT SURVIVAL - 0.3
PERCENT CONTRIBUTION - 0.2

Figure 3. Contribution and survival for Spring Creek National Fish Hatchery, fall chinook salmon broodyear 87.

Warm Springs National Fish Hatchery

Warm Springs NFH is located on the Warm Springs River, approximately 14 miles north of Warm Springs, Oregon. The hatchery was authorized in 1966 and began operations in 1978. The Confederated Tribes of the Warm Springs Indian Reservation of Oregon entered into an agreement with the USFWS to increase tribal fishing opportunities. Operations at the hatchery presently consist of adult collection, egg incubation and rearing of spring chinook salmon.

The 1987 brood of spring chinook is the first group of fish coded wire tagged since the late 70's. Since then, every fish released from the hatchery is marked. The 87 brood spring chinook had a 0.14 percent survival and contributed mainly to the freshwater sport fishery on the Deschutes River (Figure 4).

For specific information concerning ongoing studies at Warm Springs NFH refer to "Warm Springs National Fish Hatchery Evaluation and Anadromous Fish Study on the Warm Springs Indian Reservation of Oregon" progress reports.

Leavenworth National Fish Hatchery

Leavenworth NFH is located about 40 miles northeast of Leavenworth, Washington along Icicle Creek, a tributary to the Wenatchee River. The hatchery was originally authorized in 1937 by the Grand Coulee Fish Maintenance Project and was re-authorized in 1938 by the Mitchell Act. The facility began operations in 1942 and is currently used for the production of summer steelhead and spring chinook salmon.

None of the summer steelhead at Leavenworth are marked with a coded wire tag. The 87 brood of spring chinook salmon released as yearlings had a total survival of 0.26 percent and were recovered mainly in the freshwater sport fishery by WDF and treaty ceremonial fishery (Figure 5). The 87 brood spring chinook released as fingerlings survived at a rate of only 0.003 percent.

Entiat National Fish Hatchery

Entiat NFH is located on the Entiat River, east of Entiat, Washington. Construction began in 1940 under authorization of the Mitchell Act and operations began a year later. Present production at the hatchery consists of adult collection, egg incubation, and rearing of spring chinook salmon.

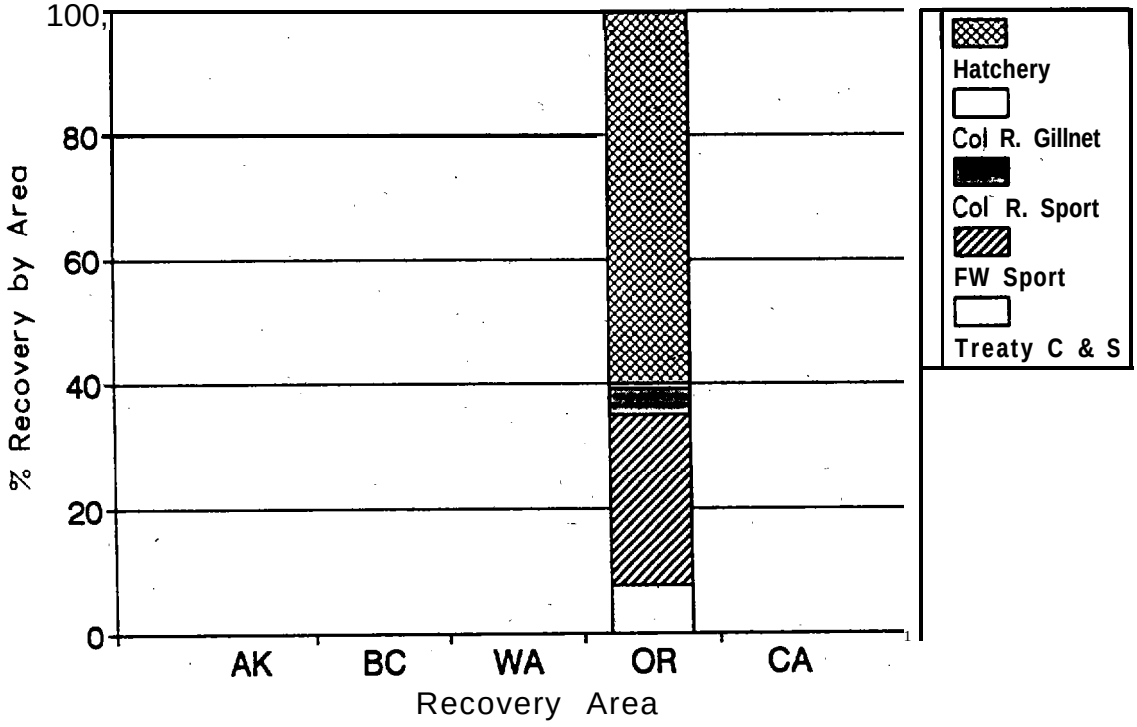
No groups of fish released at Entiat were marked for evaluation. Beginning with brood 1988, the spring chinook at Entiat are coded wire tagged under the missing group program.

Winthrop National Fish Hatchery

Winthrop NFH is situated along the Methow River, near the town of Winthrop, Washington. The facility began operations in 1942 by trapping adult sockeye, chinook, and steelhead at Rock Island Dam and transporting them to the

WARM SPRINGS NFH

SPRING CHINOOK BY 87



FRESH WATER

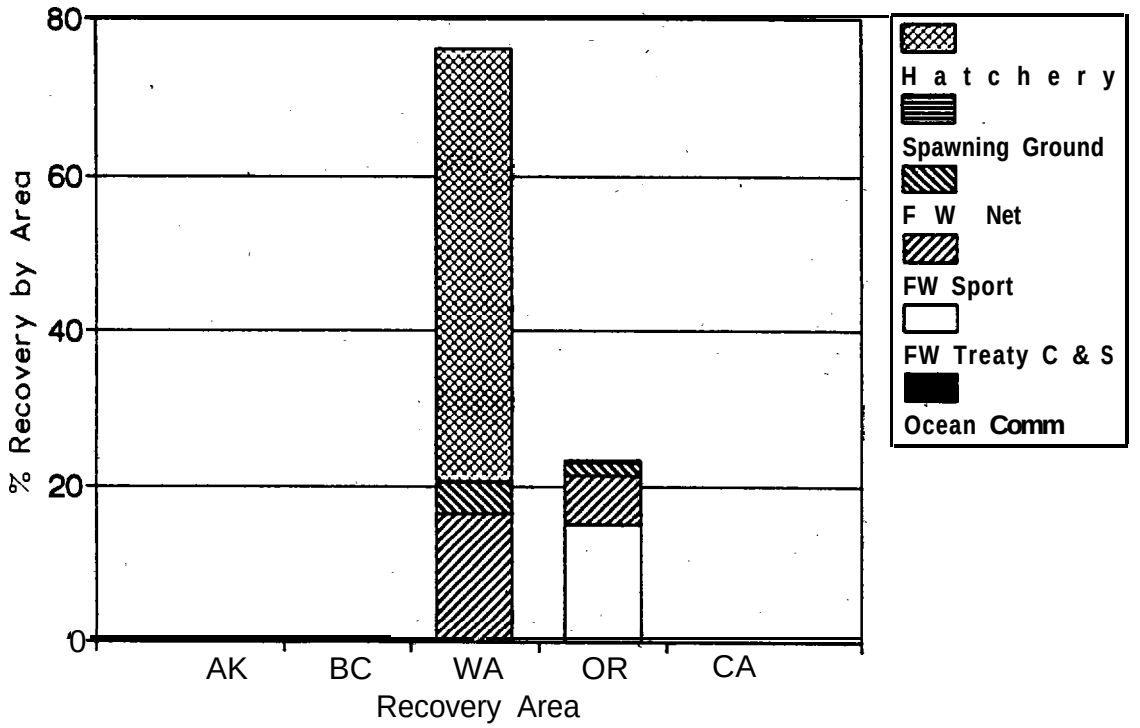
	TREATY C & S	Fw SPORT	COL R. SPORT	COL R. GILLNET	HATCHERY
AK	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	0.0	0.0
WA	0 . 0	0.0	0.0	0.0	0.0
OR	7.8	27.4	4.2.	0.8	59.8
CA	0.0	0.0	0.0	0.0	0.0

PERCENT SURVIVAL - 0.14
PERCENT CONTRIBUTION' - 0.06

Figure 4. Contribution and survival of Warm Springs National Fish Hatchery, spring chinook broodyear 87.

LEAVENWORTH NFH

SPRING CHINOOK SALMON BY 87



	OCEAN COMM	FW TREATY C & S	Fw SPORT	Fw NET	SPAWNING GROUNDS	HATCHERE!
AK	0.0	0.0	0.0	0.0	0.0	0.0
BC	0.5	0.0	0.0	0.0	0.0	0.0
WA	0.0	0.0	16.4	4.2	0.2	55.5
OR	0.0	15.0	6.3	1.9	0.0	0.0
CA	0.0	0.0	0.0	0.0	0.0	0.0

PERCENT SURVIVAL - 0.26
PERCENT CONTRIBUTION - 0.11

Figure 5. Contribution and survival of Leavenworth National Fish Hatchery, spring chinook broodyear 87.

hatchery. By 1951, the hatchery was rearing sockeye, chinook, steelhead, kokanee, coho and resident trout. Winthrop NFH produces only spring chinook salmon at the present time.

Beginning with brood 1989, the spring chinook at Winthrop were marked with coded wire tags under the missing group program.

Dworshak National Fish Hatchery

Dworshak NFH is located at the confluence of the North Fork Clearwater River and the main stem Clearwater River about three miles west of Orofino, Idaho. Dworshak NFH first began operations in 1969 rearing summer steelhead and resident trout. The facility was expanded in 1982 under the Lower Snake River Compensation Program (LSRCP) to rear spring chinook salmon. The hatchery is now used to produce spring chinook and summer steelhead.

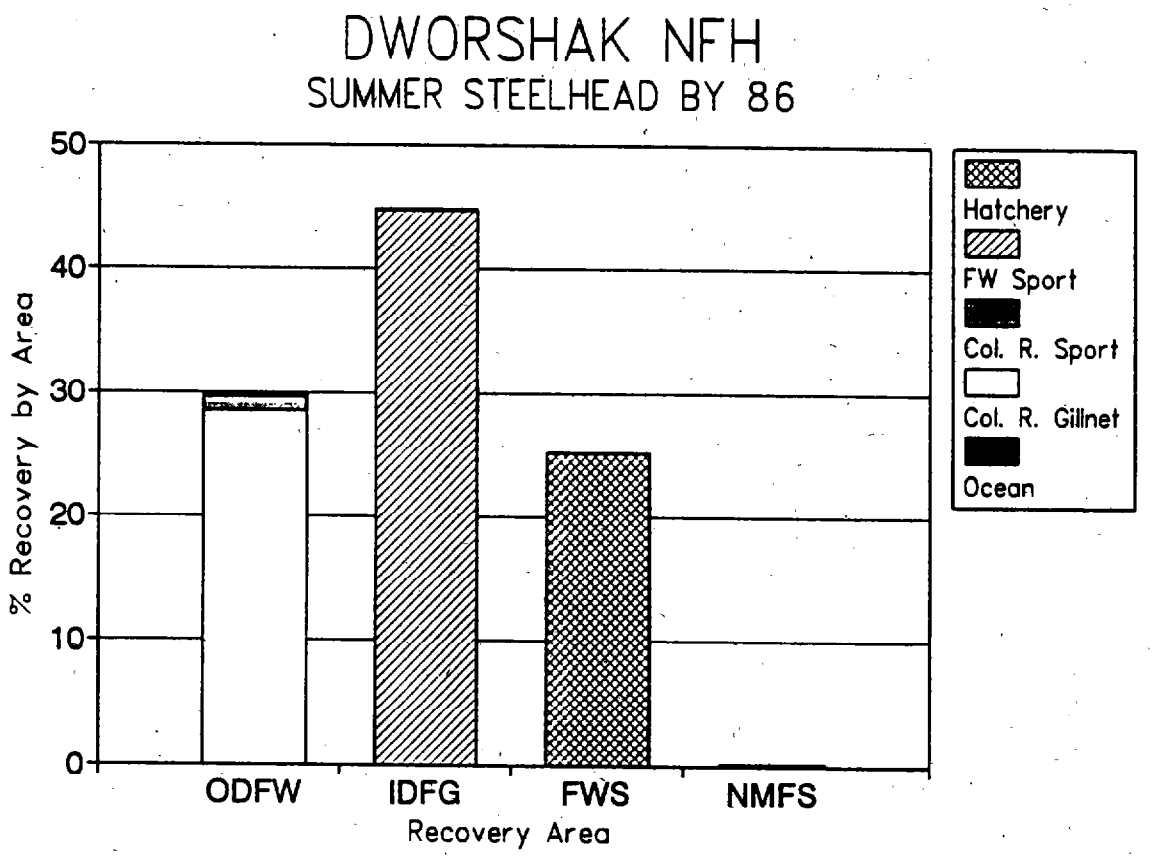
No marked groups of spring chinook were released at the hatchery for broods 1983 to 1987. Brood 1986 summer steelhead released at the hatchery were marked with coded wire tags for evaluation. The steelhead has an overall survival of 1.9 percent and contributed mainly to the freshwater sport fishery in Idaho (Figure 6). Many of these steelhead were also recovered in the Columbia River gillnet fishery.

Kooskia National Fish Hatchery

Kooskia NFH is situated along Clear Creek, just upstream of the confluence, with the Middle Fork Clear-water River. It is located appoximatsly 75 miles southeast of Lewiston, Idaho. The hatchery was authorized in 1961 and is currently used for adult collection and rearing of spring chinook salmon.

No marked groups of fish were released at Kooskia until brood 1988 were marked with coded wire tags under the missing group program. Fish marking at Kooskia NFH has continued each year under other programs.

For further information regarding the various programs at Dworshak and Kooskia NFHs, refer to "A Review of Coded-Wire Tagged Fish Released from Dworshak, Kooskia, and Hagerman National Fish Hatcheries".



	COLUMBIA R.			FRESH WATER	
	OCEAN	GILLNET	SPORT	SPORT	HATCHERY
ODFW	0.0	28.5	1.2	0.2	0.1
IDFG	0.0	0.0	0.0	44.8	0.0
FWS	0.0	0.0	0.0	0.0	25.1
NMFS	0.1	0.0	0.0	0.0	0.0

PERCENT SURVIVAL - 1.9
PERCENT CONTRIBUTION - 1.4

Figure 6. Contribution and survival of Dworshak National Fish Hatchery, summer steelhead broodyear 86.

APPENDIX A

Appendix Table 1. Average Percent Reccoveries for the last 5 Conpleted Brood Years
Coho Salmon Brood years 1985 to 1989

Eagle Creek NFH

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
88	48,314	1,012,793	4.20	0.0	2.1	21.5	26.4	10.9	21.1	18.0
a9	55,593	1,199,000	0.92	0.0	2.2	15.8	33.8	1.6	7.2	39.3
		AVERAGE	2.56	0.0	2.2	18.7	30.1	6.3	14.2	26.7

Willard NFH

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Cot. R.	Esc.
88	45,240	2,898, 140	1.67	0.0	3.0	17.0	25.8	lo.7	18.0	25.5
a9	47,743	2,573,323	0.32	0.0	0.0	20.8	37.7	0.0	14.9	26.6
		AVERAGE	1.00	0.0'	1.5	18.9	31.8	5.4	16.5	26.1

Appendix Table 2. Averege Percent Recoveries for the last 5 Completed Brood Years
Fall Chinook Brood years 1983 to 1987

Spring Creek NFH Tule FCS

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
a3	93,348	11,040,980	0.15	0.0	25.2	7.7	1.4	0.0	52.4	13.3
84	259,933	13,905,417	0.05	0.0	20.3	29.7	4.2	0.0	27.1	18.6
85	566,555	10,594,893	0.13	0.0	29.2	la.5	6.0	1.2	37.7	7.5
86	574,908	10,640,406	0.42	0.0	17.9	19.7	9.1	0.0	35 .a	17.5
87	553,561	8,850,757	0.30	0.0	26.7	20.6	4.2	0.2	27.3	21.0
		AVERAGE	0.21	0.0	23.9	19.2	5.0	0.3	36.1	15.6

Little White Salmon NFH Upriver Bright FCS (fingerling release)

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
a3	94,847	929,771	0.97	10.0	26.5	2.8	1.9	0.0	46.7	12.0
a4	186,061	l,045,722	1.97	8.7	26.5	2.8	1.9	0.1	40.3	19.7
85	195,310	1,169,825	0.41	13.9	17.4	2.1	0.6	0.0	39.1	26.1
		AVERAGE	1.12	10.9	23.5	2.6	is	0.0	42.0	19.5

Little White Salmon NFH Upriver Bright FCS (extended reering)

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Cal. R.	Esc.
a3	91,549	95,364	0.69	4.4	39.7	7.0	3.7	0.0	34.0	10.7
a4	75,389	85,830	0.03	14.a	14.8	0.0	0.0	0.0	51.9,	18.5
as	83,132	93,734	0.44	7.4	26.9	7.7	0.2	0.0	36.0	21.8
		AVERAGE	0.39	9.0	27.1	4.9	1.3	0.0	40.6	17.0

Appendix Table 3. Average Percent Recoveries for the Last 5 Completed Broad years Spring Chinook Brood years 1983 to 1987

Little White Salmon NFH Spring Chinook (0 age release)

				Percent Recovery by Area						
				Ocean					Freshuater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
83	97,594	573,621	0.04	0.0	0.0	0.0	0.0	0.0	18.9	81.1
84	49,535	665,939	0.17	0.0	0.0	0.0	0.0	0.0	23.5	76.5
		AVERAGE	0.11	0.0	0.0	0.0	0.0	0.0	21.2	78.8

Little White Salmon NFH Spring Chinook (yearling release)

				Percent 'Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
83	47,849	1,354,959	0.70	0.0	0.0	0.0	0.0	0.0	39.1	60.9
84	48,373	412,212	0.08	0.0	0.0	0.0	0.0	0.0	29.0	71.0
		AVERAGE	0.39	0.0	0.0	0.0	0.0	0.0	34.1	66.0

Carson NFH Spring Chinook Salmon

				Percmt Recovery by Area						
				Ocean					Freshwater	
BY	lagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
83	326,282	2,390,971	0.41	0.0	0.2	0.0	0.0	0.0	30.6	69.1
84	389,854	2.392.468	0.03	0.0	0.0	0.0	0.0	0.0'	29.5	70.5
85	442,289	2,339,164	0.21	0.3	0.3	0.2	0.0	0.0	39.0	60.1
		AVERAGE	0.22	0.1	0.2	0.1	0.0	0.0	33.0	66.6

Warm Springs NFH Spring Chinook Salmon

				Percent, Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	EC	WA	OR	CA	Col. R.	Esc.
87	514,633	661,019	0.14	6.0	0.0	0.0	0.0	0 0	40.2	59.7

Appendix Table 3. (cont.)

Leavenworth NFH Spring Chinook (0 age release)

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
87	236,200	939,426	0.003	0.0	0.0	0.0	0.0	0.0	42.9	57.1

Leavenworth NFH Spring Chinook (yearling release)

				Percent Recovery by Area						
				Ocean					Freshwater	
BY	Tagged	Total Release	Percent Survival	AK	BC	WA	OR	CA	Col. R.	Esc.
86	323,740	2,207,294	0.12	0.0	0.0	0.0	0.0	0.0	53.5	46.5
87	318,765	2,239,677	0.26	0.0	0.5	0.0	0.0	0.0	43.7	55.7
		AVERAGE	0.19	0.0	0.3	0.0	0.0	0.0	48.6	51.1

Appendix Table 4. Average Percent Recoveries for the Last 5 Completed Broodyears.
Steelhead Trout Brood years 1984 to 1988

Dworshak NFH Summer Steelhead

				Percent Recovery by Area					
				Ocean	Columbia River		Freshwater		
BY	Taggad	Total Release	Percent Survival	NMFS	Gillnet	Sport	OR	ID	Esc.
86	78,175	1,206,581	1.90	0.1	28.5	1.2	0.2	44.8	25.2

APPENDIX B

05/01/90 88 EC COS 14.2 24,144 07-43-05 yearlingEC yearling
04/27/90 88 EC COS 12.2 yearlingEC yearling
24,170 07-43-06 yearlingSa yearling
total-tagged fish 48,314
total released 1,012,793 yearling
expansion factor 20.96

total OBSD 658 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	-Total
Columbia River Gillnet	ODFW	5,073	4	238	0	0	0	242
Estuary Sport	ODFW	3,270	0	156	0	0	0	156
Freshwater Sport	WDF	252	0	12	0	0	0	12
Hatchery	FWS	7,589	96	266	0	0	0	362
Hatchery	ODFW	21	0	1	0	0	0	1
Mixed Net and Seine	CDFO	84	0	4	0	0	0	4
Ocean Sport	CDFG	2,306	0	110	0	0	0	110
Ocean Sport	ODFW	5,932	3	280	0	0	0	283
Ocean Sport	WDF	147	0	7	0	0	0	7
Ocean Troll (Non-treaty)	CDFG	2,264	0	108	0	0	0	108
Ocean Troll- (Non-treaty)	CDFO	797	0	38	0	0	0	38
Ocean Troll (Non-treaty)	ODFW	5,157	0	246	0	0	0	246
Ocean Troll (Non-treaty)	WDF	650	0	31	0	0	0	31
Sport (Charter)	WDF	1,195	2	55	0	0	0	57
Sport (Jetty)	WDF	482	0	23	0	0	0	23
Sport (Private)	WDF	6,498	0	310	0	0	0	310
Test Fishery Net	ODFW	293	0	14	0	0	0	14
Treaty Troll	WDF	63	0	3	0	0	0	3
Totals		42,073	105	1,902	0	0	0	2,007

88 EC COS

		% of total	% of release
Ocean contribution	25,575	61	2.5252
Escapement to Columbia River	16,498	39	1.6290
Total Survival	42,073		4.1542
Escapement to NFH	7,589	18	0.7493
Columbia River contribution	8,909	21	0.8796

03/29/91 89	EC COS	20.8	0	07-55-52	yearling	yearling
04/23/91 89	EC COS	14.5	27,225	07-55-52	yearling	yearling
05/16/91 89	EC COS	9.8	0	07-55-52	yearling	yearling
03/29/91 89	EC COS	20.8	0	07-55-53	yearling	yearling
04/25/91 89	EC COS	14.9	28,368	07-55-53	yearling	yearling
05/16/91 89	EC COS	9.8	0	07-55-53	yearling	yearling
total tagged fish			55,593			
total released			1,199,000	yearling		
expansion factor			21.57			

total OBSD 2 0 1 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	410	0	19	0	0	0	19
Estuary Sport	ODFW	367	0	17	0	0	0	17
Hatchery	FWS	4,335	19	182	0	0	0	201
Ocean Sport	CDFO	65	0	3	0	0	0	3
Ocean Sport	ODFW	2,868	0	133	0	0	0	133
Ocean Troll (Non-treaty)	CDFG	173	0	8	0	0	0	8
Ocean Troll (Non-treaty)	CDFO	173	0	8	0	0	0	8
Ocean Troll (Non-treaty)	ODFW	863	0	40	0	0	0	40
Sport (Charter)	WDF	216	0	10	0	0	0	10
Sport (Private)	WDF	1,531	0	71	0	0	0	71
Test Fishery Net	ODFW	22	0	1	0	0	0	1
Totals		11,023	19	492	0	0	0	511

89 EC COS		% of total	% of release
Ocean contribution	5,889	53	0.4912
Escapement to Columbia River	5,134	47	0.4282
Total Survival	11,023		0.9193
Escapement to NFH	4,335	39	0.3616
Columbia River contribution	799	7	0.0666

04/11/85	83	Ca 'SCS	17.2	17,384	05-11-53	20K	600GPM	yearling
04/15/85	83	Ca SCS	16.9	14,053	05-11-54	20K	600GPM	yearling
04/15/85	83	Ca SCS	18.5	14,175	05-11-55	20K	400GPM	yearling
04/15/85	83	Ca SCS	19.1	16,377	05-11-56	20K	400GPM	yearling
04/15/85	83	Ca SCS	16.9	11,618	05-11-57	20K	200GPM	yearling
04/15/85	83	Ca SCS	17.1	12,411	05-11-58	20K	200GPM	yearling
04/15/85	83	Ca SCS	17.3	25,701	05-11-59	40K	400GPM	yearling
04/15/85	83	Ca SCS	16.4	19,737	05-11-60	40K	400GPM	yearling
04/15/85	83	Ca SCS	17.4	23,967	05-11-61	40K	600GPM	yearling
04/15/85	83	Ca SCS	17.9	25,254	05-11-62	40K	600GPM	yearling
04/15/85	83	Ca SCS	16.2	13,013	05-11-63	60K	200GPM	yearling
04/15/85	83	Ca SCS	17.4	15,011	05-12-16	60K	200GPM	yearling
04/15/85	83	Ca SCS	17.2	20,988	05-12-17	60K	400GPM	yearling
04/15/85	83	Ca SCS	17.0	21,416	05-12-18	60K	400GPM	yearling
04/15/85	83	Ca SCS	17.4	20,732	05-12-19	60K	600GPM	yearling
04/15/85	83	Ca SCS	16.4	19,437	05-12-20	60K	600GPM	yearling
04/15/85	83	Ca SCS	17.9	18,706	05-12-21	40K	200GPM	yearling
04/15/85	83	Ca SCS	16.1	16,302	05-12-22	40K	200GPM	yearling

total tagged fish 326,282
total released 2,390,971 yearling
expansion factor 7.33

total OBSD 1,097 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	667	0	0	0	89	2	91
Columbia River Sport	ODFW	95	0	0	0	13	0	13
Freshwater Sport	WDF	1,510	0	4	124	78	0	206
Hatchery	FWS	6,654	0	10	535	361	2	908
Ocean Troll (Non-treaty)	CDFO	22	0	0	3.	0	0	3
Spawning Ground	WDF	176	0	0	16	8	0	24
Test Fishery Net	ODFW	59	0	0	5	3	0	8
Treaty Ceremonial	ODFW	696	0	0	40	55	0	95
Totals		9,879	0	14	723	607	4	1,340

83 Ca SCS

		% of total	% of release
Ocean contribution	22	0	0.0009
Escapement to Columbia River	9,857	100	0.4123
Total Survival	9,879		0.4132
Escapement to NFH	6,654	67	0.2783
Columbia River contribution	3,203	32	0.1340

04/15/86	84	Ca	SCS	19.2	17,009	05-16-08	20K	600GPM yearling
04/15/86	84	Ca	SCS	19.5	18,438	05-16-09	20K	600GPM yearling
04/15/86	84	Ca	SCS'	19.6	18,259	05-16-10	20K	400GPM yearling
04/15/86	84	Ca	SCS	20.2	16,270	05-16-11	20K	4 00GPM yearling
04/15/86	84	Ca	SCS	19.1	15,804	05-16-12	20K	200GPM yearling
04/15/86	84	Ca	SCS	19.6	16,398	05-16-13	20K	200GPM yearling
04/15/86	84	Ca	SCS	20.0	26,403	05-16-14	40K	600GPM yearling
04/15/86	84	Ca	SCS	20.0	25,233	05-16-15	40K	600GPM yearling
04/15/86	84	Ca	SCS	19.5	22,900	05-16-16	60K	ZOOGPM yearling
04/15/86	84	Ca	SCS	19.2	22,602	05-16-17	60K	200GPM yearling
04/15/86	84	Ca	SCS	19.5	20,288	05-16-18	60K	400GPM yearling
04/15/86	84	Ca	SCS	19.6	21,631	05-16-19	60K	400GPM yearling
04/15/86	84	Ca	SCS	19.6	23,190	05-16-20	40K	200GPM yearling
04/15/86	84	Ca	SCS	19.7	24,804	05-16-21	40K	200GPM yearling
04/15/86	84	Ca	SCS	20.0	24,627	05-16-22	60K	600GPM yearling
04/15/86	84	Ca	SCS	'18.7	23,715	05-16-23	60K	600GPM yearling
04/15/86	84	Ca	SCS	19.4	26,417	05-16-24	40K	40 OGPM yearling
04/15/86	84	Ca	SCS	19.2	25,866	05-16-25	40K	400GPM yearling'

total tagged fish 389,854
total released 2,392,468 yearling
expansion factor 6.14

total OBSD 95 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	25	0	0	0	4	0	4
Freshwater Sport	WDF	184	0	0	14	16	0	30
Hatchery	FWS	466	0	2	50	24	0	76
Spawning Ground	WDF	49	0	0	8	0	0	8
Test Fishery Net	ODFW	6	0	0	1	0	0	1
Totals		730	0	2	73	44	0	119

84 Ca SCS

		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	730	-100	0.0305
Total Survival	730		0.0305
Escapement to NFH	466	64	-0.0195
Columbia River contribution	264	36	0.0110

04/15/87	85	Ca	SCS	18.5	26,345	05-18-13	60K 200GPM yearling
04/15/87	85	Ca	SCS	18.6	28,158	05-18-14	60K ZOOGPM yearling
04/15/87	85	Ca	SCS	17.4	27,250	05-18-15	60K 400GPM yearling
04/15/87	85	Ca	SCS	18.8	26,194	05-18-16	60K 400GPM yearling
04/15/87	85	Ca	SCS	18.1	26,971	05-18-17	60K 600GPM yearling
04/15/87	85	Ca	SCS	$7.8	28,368	05-18-18	60K 600GPM yearling
04/15/87	85	Ca	SCS	18.1	26,996	05-18-19	40K 400GPM yearling
04/15/87	85	Ca	SCS	18.1	28,812	05-18-20	40K 400GPM yearling
04/15/87	85	Ca	SCS	17.8	27,051	05-18-21	40K 600GPM yearling
04/15/87	85	Ca	SCS	18.0	28,450	05-18-22	40K 600GPM yearling
04/15/87	85	Ca	SCS	17.7 .	27,878	05-18-23	40K 200GPM yearling
04/15/87	85	Ca	SCS	18.3	29,035	05-18-24	40K ZOOGPM yearling
04/15/87	85	Ca	SCS	17.8	16,691	05-18-25	20K 600GPM yearling
04/15/87	85	Ca	SCS	17.6	19,070	05-18-26	20K 600GPM yearling
04/15/87	85	Ca	SCS	17.4	18,842	05-18-27	20K 400GPM yearling
04/15/87	85	Ca	SCS	17.2	18,557	05-18-28	20K 400GPM yearling
04/15/87	85	Ca	SCS	17.7	18,931	05-18-29	20K ZOOGPM yearling
04/15/87	85	Ca	SCS	17.9	18,690.	05-18-30	20K 200GPM yearling

total tagged fish 442,289
total released 2,339,164 yearling
expansion factor 5.29

total OBSD 744 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODF'W	79	0	0	0	15	0	15
Columbia River Gillnet	WDF	16	0	0	3	0	0	3
Columbia River Sport	ODF'W	79	0	0	1	14	0	15
Freshwater Sport	WDF	1,423	0	- 2	200	67	0	269
Hatchery	FWS	2,941	0	12	376	168	0	556
Ocean Troll (Non-treaty)	ADFG	16	0	0	3	0	0	3
Ocean Troll (Non-treaty)	CDFO	16	0	0	0	3	0	3
Spawning Ground.	WDF	5	0	0	1	0	0	1
Test Fishery Net	ODFW	42	0	0	5	3	0	8
Treaty Ceremonial.	ODFW	270	0	0	32	19	0	51
Treaty Troll	WDF	11	0	0	2	0	0	2
Totals		4,898	0	14	623	289	0	926

85 Ca SCS

		% of total	% of release
Ocean contribution	43	1	0.0018
Escapement to Columbia River	4,855	99	0.2076
Total Survival	4,898		0.2094
Escapement to NFH	2,941	60	0.1257
Columbia River contribution	1,914	39	0.0818

06/20/85 84 LW SCS 43.3 24,619 05-14-35 0 Age fingerling
total tagged fish 24,916 Age fingerling
49,535
total released 665,939 fingerling
expansion factor 13.44

total OBSD 72 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	40	0	0	3	0	0	3
Freshwater Sport	WDF	215	0	0	16	0	0	16
Hatchery	FWS	874	1	12	52	0	0	65
Test Fishery Net	ODFW	13	0	0	0	1	0	1
Totals		1,142	1	12	71	1	0	85

84 LW SCS		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	1,142	100	0.1715
Total Survival	1,142		0.1715
Escapement to NFH	874	77	0.1312
Columbia River contribution	268	23	0.0402

05/07/84	83	LW	scs	65.2	49,799	05-14-58	0	Age	fingerling	
06/22/84	83	LW	SCS	38.7	47,795	05-14-59	0	Age	fingerling	
total tagged fish					97,594					
total released					573,621	fingerling				
expansion factor					5.88					

total OBSD 39 RdocHard.prg

== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	18	0	0	3	0	0	3
Freshwater Sport	WDF	24	0	0	4	0	0	4
Hatchery	FWS	206	0	10	25	0	0	35
Test Fishery Net	ODFW	6	0	1	0	0	0	1
T o t a l s		254	0	11	32	0	0	43

83 LW SCS		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	254	100	0.0443
Total Survival	254		0.0443
Escapement to NFH	206	81	0.0359
-Columbia River contribution	48	19	0.0084

Broodyear 83

04/17/85 83 LW scs	10.4	47,849	05-14-60	yearling	yearling	
total tagged fish		47,849				
total released		1,354,959	yearling			
expansion factor		28.32				

total OBSD 158 RdocHard.prg

== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	340	0	0	0	12	0	12
Freshwater Sport	WDF	2,180	0	0	48	29	0	77
Hatchery	FWS	5,748	0	13	142	48	0	203
Test Fishery Net	ODFW	85	0	0	3	0	0	3
Treaty Ceremonial	ODFW	1,076	0	0	29	9	0	38
Totals		9,429	0	13	222	98	0	333

83 LW SCS		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	9,429	100	0.6959
Total Survival	9,429		0.6959
Escapement to NFH	5,748	61	0.4242
Columbia River contribution	3,681	39	0.2717

04/14/86	84 LW SCS	11.3	24,368	05-14-39	yearling	yearling
04/14/86	84 LW SCS	11.3	24,005	05-14-40	yearling	yearling
total tagged fish			48,373			
total released			412,212	yearling		
expansion factor			8.52			

total OBSD 31 RdocHard.prg

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
			== PSC expanded numbers ==					
Freshwater Sport	WDF	68	0	0	6	2	0	8
Hatchery	FWS	230	0	2	21	4	0	27
Treaty Ceremonial	ODFW	26	0	0	3	0	0	3
Totals		324	0	2	30	6	0	38

84 LW SCS'		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	324	100	0.0786
Total Survival	324		0.0786
Escapement to NFH	230	71	0.0558
Columbia River contribution	94	29	0.0228

06/13/84 83	SC URB	140.0	0	05-13-37	LWS	fingerling	
07/09/84 83	LW URB	101.5	94,847	05-13-37	0 Age	fingerling	
total tagged fish			94,847				
total released			929,771	fingerling			
expansion factor			9.80				

total OBSD 337 RdocHard.prg

== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	4,186	13	53	256	100	5	42.7
Commercial Seine	ADFG	10	1	0	0	0	0	1
Estuary Sport	ODFW	39	0	4	0	0	0	4
Fish Trap (Freshwater).	ODFW	10	0	0	1.	0	0	1
Hatchery	FWS'	1,069	26	11	51	21	0	109
Hatchery	ODFW	10	0	1	0	0	0	1
Mixed Net and Seine	CDFO	431	26	9	9	0	0	44
Mixed Net and Seine	WDF	39	0	4	0	0	0	4
Ocean Sport	ADFG	20	0	1	0	1	0	2.
Ocean Sport	CDFO	157	0	8	8	0	-0	16
Ocean Troll (Non-treaty)	ADFG	872	0	7	62	20	0.	89
Ocean Troll (Non-treaty)	CDFO	1,814	0	59	89	3.7	0	185
Ocean Troll (Non-treaty)	ODFW	176	0	4	11	3	0	18
Ocean Troll (Non-treaty)	WDF	20	0	0	2	0	0	2
Sport (Private)	WDF	196	0'	3	17	0	0	20
Test Fishery Net	ODFW	10	0	0	0	1	0	1
Totals		9,059	66	164	506	183	5	924

83 LW URB		% of total	% of release
Ocean contribution	3,735	41	0.4017
Escapement to Columbia River	5,324	59	0 . 5 7 2 6
Total Survival	9,059		0.9743
Escapement to NFH	1,069	12	0.1150
Columbia River contribution	4,255	47	0.4576

06/20/85	84	LW URB	87.0	22,393	05-12-50	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	23,100	05-12-51	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	20,075	05-12-52	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	21,158	05-12-53	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	25,467	05-12-54	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	25,505	05-12-55	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	21,864	05-12-56	0	Age &pen fingerling
06/20/85	84	LW URB	87.0	26,499	05-12-57	0	Age &pen fingerling

total tagged fish 186,061
total released 1,045,722 fingerling
expansion factor 5.62

total OBSD 1,361 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	8,009	10	225	817	345	28	1,425
Columbia River Sport	ODFW	56	0	10	0	0	0	10
Commercial Seine	ADFG	51	0	0	8	1	0	9
Estuary Sport	ODFW	90	0	12	1	3	0	16
Estuary Sport	WDF	107	6	5	0	8	0	19
Freshwater Sport	ODFW	11	0	0	0	2	0	2
Freshwater Sport	WDF	17	0	0	0	3	0	3
Hatchery	FWS	2,175	5	60	183,	119	20	387
Hatchery	ODFW	34	1	0	2	3	0	6
Hatchery	WDF	11	0	1	0	1	0	2
Mixed Net and Seine	CDFO	348	20	17	10	15	0	62
Mixed Net and Seine	WDF	11	0	2	0	0	0	2
Multiple Gear	ADFG	6	0	1	0	0	0	1
Ocean Sport	ADFG	6	0	0	1	0	0	1
Ocean Sport	CDFO	157	0	16	4	8	0	28
Ocean Sport	ODFW	67	0	9	0	3	0	12
Ocean Sport	WDF	6	0	0	0	1	0	1
Ocean Troll (Non-treaty)	ADFG	1,737	1	59	138	108	3	309
Ocean Troll (Non-treaty)	CDFG	17	0	3	0	0	0	3
'Ocean Troll (Non-treaty)	CDFO	4,940	1	341	399	124	14	879
Ocean Troll (Non-treaty)	ODFW	320	0	22	11	24	0	57
Ocean Troll (Non-treaty)	WDF	259	0	12	34	0	0	46
Spawning Ground	WDF	1,827	0	48	190	81	6	325
Sport (Charter)	WDF	90	0	14	2	0	0	16
Sport (Private)	WDF	141	3	14	0	8	0	25
Treaty Troll	'WDF	79	0	10	4	0	0	14
Totals		20,572	47	881	1,804	857	71	3,660

8 4 L W U R B		% of total	% of release
Ocean contribution'	8,235	40	0.7875
Escapement to Columbia River	12,337	60	1.1798
Total Survival	20,572		1.9673
Escapement. to NFH	2,175	11	0.2080
Columbia River contribution	10,162	49	0.9718

06/18/86	85	LW URB	106.8	49,573	05-18-08	0	Age	fingerling
06/18/86	85	LW URB	106.8	48,147	05-18-09	0	Age	fingerling
06/18/86	85	LW URB	106.8	48,147	05-18-10	0	Age	fingerling
							Age	fingerling

total tagged fish 195,310
total released 1,169,825 fingerling
expansion factor 5.99

total OBSD 346 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6	s Total
Columbia River Gillnet	ODFW	1,761	0	46	108	133	7	294
Estuary Sport	WDF	18	0	0	3	0	0	3
Freshwater Sport	WDF	90	0	4	0	11	0	15
Hatchery	FWS	785	0	13	35	79	4	131
Hatchery	ODFW	18	1	0	0	2	0	3
Mixed Net and Seine	CDFO	42	5	0	2	0	0	7
Multiple Gear	ADFG	6	0	0	0	'1	0	1
Ocean Sport	ADFG	6	0	0	0	1	0	1
Ocean Sport	ODFW	30	0	0	0	5	0	5
Ocean Troll (Non-treaty)	ADFG	647	0	5	30	61	12	108
Ocean Troll (Non-treaty)	CDFO	791	0	26	48	52	6	132
Ocean Troll (Non-treaty)	WDF	66	0	0	2	9	0	-11
Spawning Ground	WDF	479'	8	0	23	49	0	80
Sport (Private)	WDF	24	0	0	4	0	0	4
Test Fishery Troll	ADFG	6	0	0	1	0	0	1
Treaty Troll	WDF	12	0	2	0	0	0	2
Totals		4,781	14	96	256	403	29	798

85 LW URB		% of total	% of release
Ocean contribution	1,624	3 4	0.1388
Escapement to Columbia River	3,151	66	0.2694
Total Survival	4,781		0.4087
Escapement to NFH	785	16	0.0651
Columbia River contribution	2,366	49.	0.2023

Check for No Water-in Rdoc.dbf. modi comm Rdoc.exp

06/13/84	83	SC URB	124.0	0	05-15-27	transfer	fingerling
03/14/85	83	LW URB	17.3	0	05-15-27	exrearing	yearling
04/02/85	83	LW URB	16.0	91,549	05-15-27	exrearing	yearling
total'tagged fish				91,549			
total released				95,364	yearling		
expansion factor				1.04			

total OBSD 2 1 7 RdocHard.prg

== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	217	0	9	130	67	2	208
Commercial Seine	ADFG	1	0	1	0	0	0	1
Estuary Sport	ODFW	6	0	0	6	0	0	6
Hatchery	FWS	69	7	8	36	14	1	66
Hatchery	ODFW	1	0	0	0	1	0	1
Mixed Net and Seine	CDFO	20	0	16	3	0	0	19
Ocean Sport	ADFG	1	0	0	1	0	0	1
Ocean Sport	CDFO	13	0	4	4	4	0	12
Ocean Sport	ODFW	4	0	0	4	0	0	4
Ocean Sport	WDF	1	0	0	0	1	0	1
Ocean Troll (Non-treaty)	ADFG	30	1	0	20	5	3	29
Ocean Troll (Non-treaty)	CDFO	227	0	3	193	22	0	218
Ocean Troll (Non-treaty)	ODFW	20	0	0	19	0	0	19
Ocean Troll (Non-treaty)	WDF	22	0	0	10	11	0	21
Sport (Charter)	WDF	13	0	0	9	3	0	12
Sport (Private)	WDF	4	0	0	4	0	0	4
Treaty Troll	WDF	6	0	0	6	0	0	6
Totals		655	8	41	445	128	6	628

83 LW URB

		% of total	% of release
Ocean contribution	362	55	0.3796
Escapement to Columbia River	293	45	0.3072
Total Survival	655		0.6868
Escapement to NFH	69	11	0.0724
Columbia River contribution	224	34	0.2349

04/14/86	84	LW URB	17.6	18,941	05-14-41	exrearing yearling
04/14/86	84	LW URB	17.6	19,217	05-14-42	exrearing 'yearling
04/14/86	84	LW URB	17.6	17,860	05-14-43	exrearing yearling
04/14/86	84	LW URB	17.6	19,367	05-14-44	exrearing yearling

total tagged fish 75,385
total released 85,830 yearling
expansion factor 1.14

total OBSD 11. RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW.	14	0	0	0	8	4	12
Commercial Seine	ADFG	2	0	2	0	0	0	2
Hatchery	FWS	5	0	1	1	2	0	4
Mixed Net and Seine	CDFO	2	0	2	0	0	0	2
Ocean Troll (Non-treaty)	ADFG.	2	0	0	2	0	0	2
Ocean Troll (Non-treaty)	CDFO	2	0	0	2	0	0	2
Totals		27	0	5	5	10	4	24

84 LW URB

		% of total	%o release
Ocean contribution	8	30	0.0093
Escapement to Columbia River	19	70	0.0221
Total Survival	27		0.0315
Escapement to NFH	5	19	0.0058
Columbia River contribution	14	52	0.0163

04/15/87	85	LW URB	16.6	41,299	05-18-11	exrearing yearling
04/15/87	85	LW URB	16.6	41,833	05-18-12	exrearing yearling
total tagged fish				83,132		
total released				93,734	yearling	
expansion factor				1.13		

total OBSD 164 RdocHard.prg

== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	129	0	13	64	27	10	114
Columbia River Sport	ODFW	1 7	0	0	0	15	0	15
Estuary Sport	ODFW	3	0	0	3	0	0	3
Hatchery	FWS	91	0	8	29	32	12	81
Mixed Net and Seine	CDFO	12	0	3	5	3	0	11
Multiple Gear	ADFG	2	0	0	1	1	0	2
Ocean Sport	ADFG	1	0	0	1	0	0	1
Ocean Troll (Non-treaty)	ADFG	28	0	0	7	18	0	25
Ocean Troll (Non-treaty)	CDFO	100	0	0	46	40	3	89
Ocean Troll (Non-treaty)	ODFW	1	0	0	1	0	0	1
Ocean Troll (Non-treaty)	WDF	16	0	0	0	14	0	14
Sport (Charter)	WDF	7	0	2	2	2	0	6
Sport (Private)	WDF	9	0	0	5	3	0	8
Test Fishery Net	ODFW	1	0	0	1	0	0	1
Totals		417	0	26	165	155	25	371

85 LW URB		% of total-	% of release
Ocean contribution	176	42	0.1878
Escapement to Columbia River	241	58	0.2571
Total Survival	417		0.4449
Escapement to NFH	9 1	22	0.0971
Columbia River contribution	150	36	0.1600

'Broodyear 88 Willard NFH C o h o Reference Document 02/14

04/18/90 88 Wi COS 14.5 22,524 05-22-26 yearling yearling
yearling yearling

total tagged fish 45,240
total released 2,898,140 yearling
expansion factor 64.06

total OBSD 369 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	5,509	0	86	0	0	0	86
Estuary Sport	ODFW	3,203	0	50	0	0	0	50
Hatchery	FWS	11,723	51	132	0	0	0	183
Hatchery	ODFW	641	0	10	0	0	0	10
Ocean Sport	CDFG	2,819	0	44	0	0	0	44
Ocean Sport	ODFW	5,958	0	93	0	0	0	93
Ocean Troll (Non-treaty)	CDFG	2,370	0	37	0	0	0	37
Ocean Troll (Non-treaty)	CDFO	1,473	0	23	0	0	0	23
Ocean Troll (Non-treaty)	ODFW	6,534	0	102	0	0	0	102
Ocean Troll (Non-treaty)	WDF	577	0	9	0	0	0	9
Sport (Charter)	W D F	1,666	0	26	0	0	0	26
Sport (Private)-	WDF	6,022	0	94	0	0	0	94
Totals		48,495	51	706	0	0	0	757

8 8 W i C O S

		% of total	% of release
Ocean contribution	27,419	57	0.9461
Escapement to Columbia River	21,076	43	0.7272
Total Survival	48,495		1.6733
Escapement to NFH	11,723	24	0.4045
Columbia River contribution	9,353	19	0.3227

04/15/91 89 Wi COS	14.6	23,930	05-25-32	yearling	yearling
04/15/91 89 Wi COS	14.6	23,813	05-25-33	yearling	yearling
total tagged fish		47,743			
total released		2,573,323	yearling		
expansion factor		53.90			

total OBSD 7 9 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	485	0	9	0	0	0	9
Estuary Sport	ODFW	755	0	14	0	0	0	14
Hatchery	FWS	2,156	1	39	0	0	0	-40
Hatchery	ODFW	54	0	1	0	0	0	1
Ocean Sport	ODFW	2,048	0	38	0	0	0	38
Ocean Troll (Non-treaty)	ODFW	1,078	0	20	0	0	0	20
Ocean Troll (Non-treaty)	WDF	108	0	2	0	0	0	2
Sport (Charter,)	WDF	485	0	9	0	0	0	9
Sport (Private)	WDF	970	0	18	0	0	0	18
Treaty Troll	WDF	162	0	3	0	0	0	3
Totals		8,301	1	153	0	0	0	154

89 Wi COS		% of total	% of release
Ocean contribution	4,851	58	0.1885
Escapement to Columbia River	3,450	42	0.1341
Total Survival	8,301		0.3226
Escapement to NFH	2,156	26	0.0838
Columbia River contribution	1,294	16	0.0503

04/16/84	83 SC FCS	68.0	46,449	05-11-51	Salt Contr fingerling
04/16/84	83 SC FCS	69.0	46,899	05-11-52	Salt Contr fingerling
total tagged fish			93,348		
total released			11,040,980	fingerling	
expansion factor			118.28		

total OBSD 54 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s.	4s	5s	6s	Total
Columbia River Gillnet	ODFW	8,871	9	62	4	0	0	75
Fish Trap (Freshwater)	FWS	1,064	0	9	0	0	0	9
Hatchery	FWS	1,064	3	5	1	0	0	9
Hatchery	ODFW	118	0	1	0	0	0	1
Mixed Net and Seine	CDFO	355	3	0	0	0	0	3
Mixed Net and Seine	WDF	355	0	3	0	0	0	3
Ocean Sport	CDFO	473	0	4	0	0	0	4
Ocean Troll (Non-treaty)	CDFO	3,438	0	29	0	0	0	29
Ocean Troll (Non-treaty)	ODFW	237	0	2	0.	0	0	2
Ocean Troll (Non-treaty)	WDF	355	o-	3	0	0	0	3
Sport (Charter)	WDF	237	2	0	0	0	0	2
Sport (Private)	WDF	355	0	-3	0	0	0	3
Totals		16,914	17	121	5	0	0	143

83 SC FCS

		% of total	% of release
Ocean contribution	5,797	3 4	0.0525
Escapement to Columbia River,	11,117	6 6	0.1007
Total Survival	16,914		0.1532
Escapement to NFH	1,064	6	0.0096
Columbia River contribution	10,053	59	0.0911

02/25/85	84	SC FCS	167.0	47,462	05-15-34	Feb25	fingerling
02/25/85	84	SC FCS	167.0	53,653	05-15-35	Feb25	fingerling
02/28/85	84	SC FCS	147.3	41,826	05-15-36	Feb28	fingerling
02/28/85	84	SC FCS	147.0	42,107	05-15-37	Feb28	fingerling
02/28/85	84	SC FCS	145.0	37,373	05-15-38	Feb28	fingerling
02/28/85	84	SC FCS	145.0	36,912	05-15-39	Feb28	fingerling

total tagged fish 259,933
total released 13,905,417 fingerling
expansion factor, 53.50

total OBSD 51 RdocHard.prg

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
			== PSC expanded numbers ==					
Columbia River Gillnet	ODFW	1,712	7	17	8	0	0	32
Fish Trap (Freshwater)	FWS	214	0	4	0	0	0	4
Hatchery	FWS	481	1	4	4	0	0	9
Hatchery	ODFW	481	1	8	0	0	0	9
Mixed Net and Seine	CDFO	428	8	0	0	0	0	8
Mixed Net and Seine	WDF	267	0	5	0	0	0	5
Ocean Sport	ODFW	107	2	0	0	0	0	2
Ocean Troll (Non-treaty)	CDFO	856	0	10	6	0	0	16
Ocean Troll (Non-treaty)	ODFW	160	0	3	0	0	0	3
Ocean Troll (Non-treaty)	WDF	535	0	10	0	0	0	10
Sport (Charter)	WDF	107	0	2	0	0	0	2
Sport (Private)	WDF	749	0	14	0	0	0	14
Treaty Troll	WDF	214	0	1	3	0	0	4
Totals		6,311	19	78	21	0	0	118

8 4 S C F C S		% of total	%-of release
Ocean contribution	3,423	54	0.0246
Escapement to Columbia River	2,888	46	0.0208
Total Survival	6,311		0.0454
Escapement to NFH	481	8	0.0035
Columbia River contribution	2,407	38	0.0173

03/06/86	85	SC FCS	123.8	91,229	B5-01-09	March	fingerling
04/08/86	85	SC FCS	69.0	93,292	B5-01-10	April,	fingerling
05/15/86	85	SC FCS	38.5	96,854.	B5-01-11	,May	fingerling
03/06/86	85	SC FCS	123.8	44,147	B5-01-12	March	fingerling
03/06/86	85	SC FCS	123.8	51,218	B5-01-13	March	fingerling
04/08/86	85	SC FCS	69.0	43,406	B5-01-14	April	fingerling
04/08/86	85	SC FCS	69.0	51,921	B5-01-15	April	fingerling
05/15/86	85	SC FCS	38.5	41,980	B5-02-08	May	fingerling
05/15/86	85	SC FCS	38.5	52,508	B5-02-09	May	fingerling

total tagged fish 566,555
total released 10,594,893 fingerling
expansion factor 18.70

total OBSD 240 RdocHard.prg
== PSC expanded numbers ==

Where Recovered		expanded	2s	3s	4s	5s	-6s	Total
Columbia River Gillnet	ODFW	4,563	4	131	96	13	0	244
Estuary Sport	ODFW	75	3	1	0	0	0	4
Estuary Sport	WDF	430	5	9	0	9	0	23
Hatchery	FWS	785	4	29	8	1	0	42
Hatchery	ODFW	206	0	8	3	0	0	11
Mixed Net and' Seine	CDFO	56	0	0	0	3	0	3
Mixed Net and Seine	WDF	449	24	0	0	0	0	24
Ocean Sport	CDFG	168	0	9	0	0	0	9
Ocean Sport	CDFO	168	0	-5	4	0	0	9
Ocean Sport	ODFW	37	2	0	0	0	0	2
Ocean Troll (Non-treaty)	CDFO	3,703	0	167	23	4	4	198
Ocean Troll (Non-treaty)	ODFW	767	0	37	4	0	0	41
Ocean Troll (Non-treaty)	WDF	9 5 4	0	36	15	0	0	51
Sport (Charter)	WDF	187	0	10	0	0	0	10
Sport (Private)	WDF	187	0	6	4	0	0	10
Test Fishery Net	ODFW	19	0	0	1	0	0	1
Treaty Troll	WDF	711	4	30	4	0	0	38
Totals		13,465	46	478	162	30	4	720

85 SC FCS

		% of total	% of release
Ocean contribution	7,307	55	0.0697
Escapement to Columbia River	6,078	45	0.0574
Total Survival	13,465		0.1271
Escapement to NFH	785	6	0.0074
Columbia 'River contribution	5,293	39	0.0500

03/19/87	86	SC FCS	85.9	48,712	05-18-55	March	fingerling
03/19/87	86	SC FCS	80.4	48,882	05-18-56	March	fingerling
03/19/87	86	SC FCS	82.4	49,259	05-18-57	March	fingerling
03/19/87	86	SC FCS	82.7	49,437	05-18-58	March	fingerling
04/16/87	86	SC FCS	63.6	48,971	05-18-59	April	fingerling
04/16/87	86	SC FCS	60.2	48,387	05-18-60	April	fingerling
04/16/87	86	SC FCS	59.8	47,756	05-18-61	April	fingerling
04/16/87	86.	SC FCS	61.8	48,073	05-18-62	April	fingerling
05/21/87	86	SC FCS	42.1	46,113	05-18-63	May	fingerling
05/21/87	86	SC FCS	37.5	45,408	05-19-05	May	fingerling
05/21/87	86	SC FCS	35.3	47,213	05-19-06	May	fingerling
05/21/87	86	SC FCS	36.3	46,697	05-19-09	May	fingerling
total tagged fish				574,908			
total released				10,640,406	fingerling		
expansion factor				18.51			

total OBSD 912 RdocHard.prg

== PSC expanded numbers'==

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	14,529	50	552	183	0	0	7 8 5
Columbia River Sport	ODFW	185	0	10	0	0	0	10
Estuary Sport	ODFW	333	2	16	0	0	0	18
Estuary Sport	WDF	833	14	31	0'	0	0	45
Hatchery	FWS	5,812	28	145	140	1	0	314
Hatchery	ODFW	722	3	23	'13	0	0	39
Mixed Net and Seine	CDFO	352	is	0	0	0	0.	19
Mixed Net and Seine	WDF	2 9 6	14	2	0	0	0	16
Ocean Sport	CDFO	592	6	8	18	0	0	32
Ocean Sport	ODFW	574	-2	26	3	0	0	31
Ocean Sport	WDF	19	0	1	0	0	0	1
Ocean Troll (Non-treaty)	CDFO	7,015	0	298	81	0	0	379
Ocean Troll (Non-treaty)	ODFW	3,480	1	180	7	0	0	188
Ocean Troll (Non-treaty)	WDF	4,534	0	226	19	0	0	245
Spawning Ground	WDF	1,259	0	68	0	0	0	-68
Sport (Charter)	WDF	685	3	18	16	0	0	37
Sport (Private)	WDF	1,314	13	50	4	4	0	71
Test Fishery Net	ODFW	93	0	3	1	1	0	5
Treaty Troll	WDF	1,943	26	74	3	2	0	105
Totals		44,570	181	1,731	488	a	0	2,408

86 SC FCS		% of total	% of release
Ocean contribution	20,804	47	0.1955
Escapement to Columbia River	23,766	'53	0.2234
Total Survival	44,570		0.4189
Escapement to NFH	5,812	13	0.0546
Columbia River contribution	17,954	40	0.1687

04/07/88	87	SC FCS	65.3	23,960	05-14-45	AprilAbeSC	fingerling
04/07/88	87	SC FCS	60.9	24,695	05-14-49	AprilAbeSC	fingerling
05/18/88	87	SC FCS	37.3	24,930	05-14-50	MayAbexSC	fingerling
05/18/88	87	SC FCS	37.3	25,226	05-14-51	MayAbexSC	fingerling
05/18/88	87	SC FCS	33.2	25,655	05-16-59	MayBWxSC	fingerling
05/18/88	87	SC FCS	33.2	24,716	05-16-60	MayBWxSC	fingerling,
04/07/88	87	SC FCS	67.9	23,946,	05-16-61	AprilBHxSC	fingerling
05/18/88	87	SC FCS	42.0	24,120	05-16-62	MayBHxSC	fingerling
05/18/88	87	SC FCS	36.7	50,786	05-19-10	MayBTxSC	fingerling
05/18/88	87	SC FCS	36.7	50,564	05-19-12	MayBTxSC	fingerling
05/18/88	87	SC FCS	34.4	50,445	05-19-13	MaySC	fingerling
05/18/88	87	SC FCS	34.4	50,956	05-19-14	MaySC	fingerling
04/07/88	87	SC FCS	67.9	50,332	05-19-23	AprilBHxSC	fingerling
04/07/88	87	SC FCS	67.9	51,757	05-19-24	AprilBHxSC	fingerling
04/07/88	87	SC FCS	67.9	51,473	05-19-25	AprilBHxSC	fingerling

total tagged fish 553,561
total released 8,850,757 fingerling
expansion factor 15.99

total OBSD 791 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	6,523	49	203	156	0	0	408
Estuary Sport	ODFW	144	0	6	3	0	0	9
Estuary Sport	WDF	656	6	35	0	0	0	41
Hatchery	FWS	5,244	19	208	100	1	0	328
Hatchery	ODFW	416	3	15	8	0	0	26
Mixed Net and Seine	CDFO	272	'15	2	0	0	0	17
Mixed Net and Seine	WDF	64	2	2	0	0	0	4
Ocean Sport	CDFO	719	16	23	6	0	0	45
Ocean Sport	ODFW	48	0	3	0	0	0	3
Ocean Sport	WDF	32	0	1	1	0	0	2
Ocean Troll (Non-treaty)	CDFG	48	0	3	0	0	0	3
Ocean Troll (Non-treaty)	CDFO	6,188	0	333	54	0	0	387
Ocean Troll (Non-treaty)	ODFW	1,087	0	68	0	0	0	68
Ocean Troll (Non-treaty)	WDF	1,519,	0	91	4	0	0	9 5
Sport (Charter)	WDF	. 368	3	17	3	0	0	23
Sport (Private)	WDF	1,039	17	44	4	0	0	65
Test Fishery Net	ODFW	16	0	1	0	0	0	1
Treaty- Troll	WDF	2,510	62	90	5	0	0	157
Totals		26,893	192	1,145	344	1	0	1,682

8 7 S C FCS		% of total	% of release
Ocean contribution	13,894	52	0.1570
Escapement to Columbia River	12,999	48	0.1469
Total Survival	26,893		0.3038
Escapement to NFH	5,244	19	0.0592
Columbia River contribution	7,755	29	0.0876

09/30/88	87	WS	SCS	10.9	10,682	05-16-07	KDmoistF	fall rel
09/30/88	87	WS	SCS	10.9	0	05-16-07	KDmoistFV	fall rel
04/05/89	87	WS	SCS	15.4	13,757	05-16-07	KDmoistS	yearling
04/05/89	87	WS	SCS	15.4	0	05-16-07	KDmoistSV	yearling
09/30/88	87	WS	SCS	11.4	12,071	05-16-58	KDmoistF	fall rel
09/30/88	87	WS	SCS	11.4	0	05-16-58	KDmoistFV	fall rel
04/05/89	87	WS	SCS	15.4	11,285	05-16-58	KDmoistS	yearling
04/05/89	87	WS	SCS	15.4	0	05-16-58	KDmoistSV	yearling
05/06/88	87	WS	SCS	66.0	5,319	05-16-63	KDdryA	fingerling
05/06/88	87	WS	SCS	66.0	0	05-16-63	KDdryA	fingerling
09/30/88	87	WS	SCS	9.0	6,898	05-16-63	KDdryF	fall rel
09/30/88	87	WS	SCS	9.0	0	05-16-63	KDdryFV	fall rel
04/05/89	87	WS	SCS	15.0	0	05-16-63	KDdrySV	yearling
04/05/89	87	WS	SCS	15.0	11,479	05-16-63	KDdryS	yearling
09/30/88	87	WS	SCS	10.5	19,213	05-20-05	OWDenstyLF	fall rel
04/05/89	87	WS	SCS	15.6	27,808	05-20-05	OWDenstyLS	yearling
09/30/88	87	WS	SCS	10.6	19,906	05-20-06	OWDenstyHF	fall rel
04/05/89	87	WS	SCS	15.2	25,009	05-20-06	OWDenstyHS	yearling
09/30/88	87	WS	SCS	11.4	15,709	05-20-07	OWDenstyLF	fall rel
04/05/89	87	WS	SCS	13.6	33,229	05-20-07	OWDenstyLS	yearling
09/30/88	87	WS	SCS	10.2	14,638	05-20-08	OWDenstyHF	fall rel
04/05/89	87	WS	SCS	15.2	30,743	05-20-08	OWDenstyHS	yearling
04/05/89	87	WS	SCS	8.5	16,631	05-20-09	HoldoverLa	yearling
04/05/89	87	WS	SCS	15.0	30,086	05-20-09	HoldoverSm	yearling
05/06/88	87	WS	SCS	66.0	37,036	05-20-10	PRODA	fingerling
09/30/88	87	WS	SCS	10.6	4,994	05-20-10	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	5,968	05-20-10	ProdS	yearling
09/30/88	87	WS	SCS	10.6	16,988	05-20-11	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	20,300	05-20-11	ProdS	yearling
09/30/88	87	WS	SCS	10.6	13,642	05-20-12	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	35,150	05-20-12	ProdS	yearling
04/05/89	87	WS	SCS	8.8	18,978	05-20-14	HoldoverLa	yearling
04/05/89	87	WS	SCS	17.0	27,703	05-20-14	HoldoverSm	yearling
09/30/88	87	WS	SCS	11.6	0	05-20-22	KDdryFV	fall rel
09/30/88	87	WS	SCS	11.6	10,808	05-20-22	KDdryF	fall rel
04/05/89	87	WS	SCS	15.8	12,067	05-20-22	KDdryS	yearling
04/05/89	87	WS	SCS	15.8	0	05-20-22	KDdrySV	yearling
09/30/88	87	WS	SCS	10.6	803	14-07-09	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	2,068	14-07-09	ProdS	yearling
09/30/88	87	WS	SCS	10.6	805	14-08-09	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	2,075	14-08-09	ProdS	yearling
09/30/88	87	WS	SCS	10.6	219	14-09-09	ProdF	fall rel
04/05/89	87	WS	SCS	14.4	566	14-09-09	ProdS	yearling

total tagged fish	514,633	
total released	661,019	yearling
expansion factor	1.28	

total OBSD 550 RdocHard.prg

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
			== PSC expanded numbers ==					
Columbia River Gillnet	ODFW	5	0	0	4	0	0	4
Columbia River Sport	ODFW	39	0	0	25	5	0	30
Fish Trap (Freshwater)	ODFW	1	0	0	0	1	0	1
Freshwater Sport	ODFW	253	0	21	164	12	0	197
Hatchery	FWS	552	1	21	374	34	0	430
Test Fishery Net	ODFW	3	0	0	2	0	0	2
Treaty Ceremonial	ODFW	32	0	2	11	12	0	25
Treaty Subsistence	ODFW	40	0	4	25	2	0	31
Totals		925	1	48	605	66	0	720

87 WS SCS

		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	925	100	0.1399
Total Survival	925		0.1399
Escapement to NFH	552	60	0.0835
Columbia River contribution	373	40	0.0564

04/22/88	87	Le SCS	52.8	32,478	23-23-22	acc April.	fingerling
04/22/88	87	Le SCS	52.8	32,695	23-23-23	acc April	fingerling
04/22/88	87	Le SCS	52.8	32,822	23-23-24	acc April	fingerling
04/22/88	87	Le SCS	52.8	24,344	23-23-25	acc April	fingerling
05/16/88	87	Le SCS	44.5	28,353	23-23-26	acc May	fingerling.
05/16/88	87	Le SCS	44.5	27,671	23-23-27	acc May	fingerling
05/16/88	87	Le SCS	44.5	28,634	23-23-28	acc May	fingerling
05/16/88	87	Le SCS	44.5	29,203	23-23-29	acc May	fingerling
total tagged fish				236,200			
total released				939,426	fingerling		
expansion factor				3.98			

total OBSD 5 RdocHard.prg

Where Recovered		expanded	2s	3s	4s	5s	6s	Total
			== PSC expanded numbers ==					
Freshwater Sport	FWS	12	0	3	4	0	0	3
Hatchery		16	0	0	0	0	0	4
Totals		28	0	3	4	0	0	7

87 Le SCS

		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	28	100	0.0030
Total Survival	28		0.0030
Escapement to NFH	16	57	0.0017
Columbia River contribution	12	43	0.0013

04/20/88	86	Le SCS	16.0	46,458	05-17-06	yearling yearling
04/20/88	86	Le SCS	16.0	46,719	05-17-07	yearling 'yearling
04/20/88	86	Le SCS	16.0	44,688	05-17-08	yearling yearling
04/20/88	86	Le SCS	16.0	48,630	05-17-09	yearling yearling,
04/20/88	86	Le SCS	16.0	33,919	23-23-18	yearling23 yearling
04/20/88	86	Le SCS	16.0	34,462	23-23-19	yearling23 yearling
04/20/88	86	Le SCS	16.0	34,652	23-23-20	yearling23 yearling .
04/20/88	86	Le SCS	16.0	34,212	23-23-21	yearling23 yearling

total tagged fish 323,740
total released 2,207,294 yearling
expansion factor 6.82

total OBSD 283 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	14	0	0	0	2	0	2
Columbia River Sport	ODF'W	89	0	0	13	0	0	13
Freshwater Net	WDF	95	0	0	0	14	0	14
Freshwater Sport	WDF	757	0	2	85	24	0	111
Hatchery	FWS	1,207	0	1	110	66	0	177
Test Fishery Net	ODFW	27	0	0	4	0	0	4
Treaty Ceremonial	ODF'W	409	0.	0	'33	27	0	60
Totals		2,598	0	3	245	133	·0	381

86 Le SCS		% of total	% of release
Ocean contribution	0	0	0.0000
Escapement to Columbia River	2,598	ioo	0.1177
Total Survival	2,598		0.1177
Escapement to NFH	1,207	46	0.0547
Columbia River contribution	1,391	54	0.0630

04/19/89 87	Le SCS	20.6	47,364	05-19-51	yearling	yearling
04/19/89 87	Le SCS	20.6	47,437	05-19-53	yearling	yearling
04/19/89 87	Le scs	20.6	48,854	05-19-54	yearling	yearling
04/19/89 87	Le SCS	20.6	46,646	05-19-57	yearling	yearling
05/03/89 87	Le SCS	18.5	32,313	23-23-62	yearling23	yearling
05/03/89 87	Le SCS	18.5	31,960	23-23-63	yearling23	yearling
05/03/89 87	Le SCS	18.5	31,407	23-24-01	yearling23	yearling
05/03/89 87	Le SCS	18.5	32,784	23-24-02	yearling23	yearling
total tagged fish			318,765			
total released			2,239,677	yearling		
expansion factor			7.03			

total OBSD 6 0 7 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	105	0	0	0	15	0	15
Columbia River Sport	ODFW	365	0	0	35	17	0	52
Freshwater Net	WDF	246	0	0	35	0	0	35
Freshwater Sport	WDF	956	0	0	136	0	0	136
Hatchery	FWS	3,225	0	4	178	277	0	459
Hatchery	WDF	7	1	0	0	0	0	1
Ocean Troll (Non-treaty)	CDFO	28	0	0	4	0	0	4
Spawning Ground	WDF	14	0.	0	2	0	0	2
Test Fishery Net	ODFW	7	0	0	1	0	0	1
Treaty Ceremonial	ODFW	871	0	0	74	50	0	124
Totals		5,824	1	4	465	359	0	829

87 Le SCS		% of total	% of release
Ocean contribution	28	0	0.0013
Escapement to Columbia River	5,796	100	0.2588
Total Survival	5,824		0.2600
Escapement to NFH	3,225	55	0.1440
Columbia River contribution	2,571	44	0.1148

04/20/87	86 Dw SST	0.0	19,675	05-18-36	yearling
04/22/87	86 Dw SST	0.0	18,825	10-29-31	yearling
04/22/87	86 Dw SST	0.0	20,625	10-29-32	yearling
04/23/87	86. Dw SST	0.0	19,050	10-29-33	yearling
total tagged fish			78,175		
total released			1,206,581	yearling	
expansion factor			15.43		

total OBSD 615 RdocHard.prg

Where Recovered		expanded	== PSC expanded numbers == 2s	3s	4s	5s	6s	Total
Columbia River Gillnet	ODFW	6,590	0	348	79	0	0	427
Columbia River Sport	ODFW	278	0	8	10	0	0	18
Fish Trap (Freshwater)	ODFW	1 5	0	0	1	0	0	1
Foreign Research Vessels	NMFS	31	1	1	0	0	0	2
Freshwater Sport	IDFG	10,356	0	392	279	0	0	671
Freshwater Sport	ODFW	46	0	3	0	0	0	3
Hatchery	FWS	5,788	0	12	340	23	0	375
Totals		23,104	1	764	709	23	0	1,497

86 Dw SST

		% of total	% of release
Oceancontribution	31	0	0.0026
Escapement to Columbia River	23,073	100	1.9123
Total Survival	23,104		1.9148
Escapement to NFH	5,788	25	0.4797
Columbia River contribution	17,285	75	1.4326

References

US Fish and Wildlife Service. 1992. Internal Report. "A review of Coded Wire Tagged Fish Released from Dworshak, Kooskia, and Hagerman National Fish Hatcheries, 1976-1990."

US Fish and Wildlife Service. 1992. Progress Report. "Warm Springs National Fish hatchery Evaluation and Anadromous Fish Study on the Warm Springs Indian Reservation of Oregon, 1975-1989." Lower Columbia River Fisheries Resource Office, Vancouver, Washington.

US Fish and Wildlife Service. 1992. Progress Report. "Warm Springs . National Fish hatchery Evaluation and Anadromous Fish Study on the Warm Springs Indian Reservation of Oregon, 1990-1991." Lower Columbia River Fisheries Resource Office, Vancouver, Washington.