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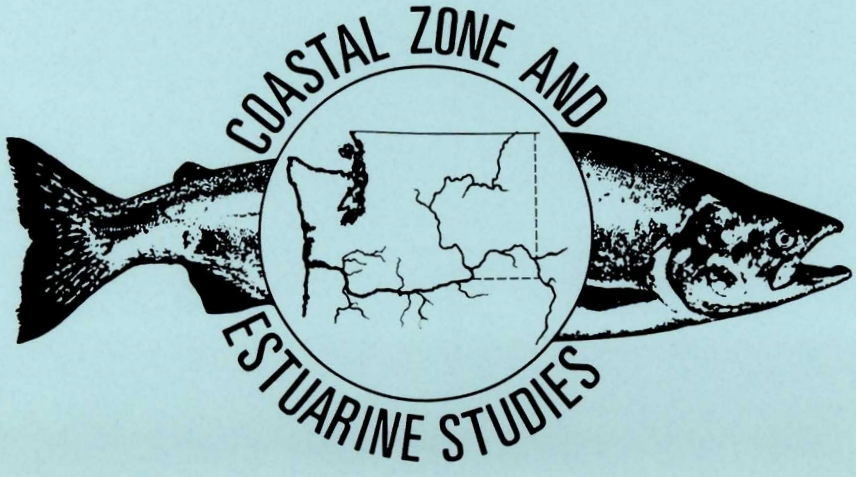

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TRANSPORTATION STUDIES, LOWER GRANITE AND MCNARY DAMS

Introduction

Spring/summer chinook salmon smolts were marked in 1983, 1984, and 1985 with coded wire tags (CWT) and freeze brands to index the relative success of the barge transportation program conducted annually by the U.S. Army Corps of Engineers (COE). No paired control groups were marked. Similar studies with steelhead smolts were conducted in 1984 and 1985. The 1985 smolt marking operations were conducted by the Fish Passage Center (formerly the Water Budget Center) and, therefore, were not included in any of the NMFS annual reports. Final returns for the 1983 and 1984 study years were reported in Harmon et al. (1989); final returns for the 1985 study year were reported in Matthews et al. (1990). By 1985, preliminary adult returns from these marking efforts indicated that survival of marked/transported smolts improved considerably compared to returns from the 1976-80 study years (Park et al. 1986). We believe a combination of factors including, but not limited to, major improvements in the transport collection facilities, improved fish quality, and greatly improved fish handling/marking techniques were responsible for the observed increase in smolt to adult survival of marked/transported fish.

In 1986, a new 3-year smolt marking study (including control releases) was initiated on spring/summer chinook salmon and steelhead at Lower Granite Dam and spring/summer and fall chinook salmon at McNary Dam. The primary goal of the study was to re-evaluate transportation of smolts around dams utilizing state-of-the-art collection/transport and handling/marking techniques. At

McNary Dam, we marked test and control groups of both races of salmon for three consecutive years (1986-1988); this concluded the marking at McNary Dam.

At Lower Granite Dam, we marked transport and control groups of both species in 1986. However, drought conditions in 1987, 1988, and 1990 interrupted the marking schedule. In 1987, we marked only barge transport index groups; no marking occurred in 1988. The study continued at Lower Granite Dam in spring 1989, completing the second year of complete marking for the 3-year study. In 1990, we again marked only a barge transport index group of spring chinook salmon due to persistent drought conditions in the Snake River drainage.

Methods

Smolts in test (transport) or control (in-river passage) were marked with CWTs and freeze brands during each year when flows were sufficient to allow evaluation. Controls were released below Little Goose or McNary Dams, as appropriate. Evaluation was based on comparative recovery rates of adults and associated transport/control ratios (T/C) from these marking efforts (see Matthews et al. 1987 for details on juvenile marking procedures). Beginning at Lower Granite Dam in 1989, the study design was adjusted to test a T/C of 1.5 with a coefficient of variation of 10.0% for spring/summer chinook salmon and 7.5% for steelhead. However, as mentioned previously, we marked only a barge transport index group at Lower Granite Dam in spring 1990.

Marking, Delayed Mortality, and CWT Retention (Lower Granite Dam)

Throughout the spring of 1990, we marked naturally migrating spring/summer chinook salmon smolts only during the morning hours to accommodate the daily barging schedules. All fish were marked from the fish facility sample tank with pre-anesthesia techniques (Matthews et al. 1986) and within guidelines established by the Fish Transportation Oversight Team. Fish were marked with adipose fin clips, freeze brands, and CWTs.

Marking began on 13 April and continued through 8 June. A total of 44,708 fish were marked in release lots of approximately 7,000 fish each. Appendix Table 1 provides marking details for each release lot of fish. Too few fish were available to complete marking of the last release lot (only 2,708 fish were marked). After marking, fish were transported by barge and released near Beacon Rock below Bonneville Dam.

To measure short-term effects of our handling/marking procedures and CWT retention, we held samples of approximately 50 fish for 48 hours throughout the season. These tests were conducted nearly every other day throughout the season.

Recovery of Adults and Data Analysis

Adults are recovered in each of 3 years following marking as juveniles. Traps in fish ladders at Lower Granite and Priest Rapids Dams (for McNary Dam releases) were the primary recovery sites for spring/summer chinook salmon and steelhead. Ocean and river commercial fisheries were primary recovery sites for fall chinook salmon marked at McNary Dam. If recoveries were sufficient, trapping efficiencies were estimated for individual release lots by

comparing the number of marked fish identified at a fish ladder trap to the total marks returning to hatcheries and, when available, tributary sports fisheries and natal spawning areas.

When adult returns were complete for a marking year, T/Cs were calculated. The T/C estimates were transformed by the natural logarithm since such ratios can be assumed to follow a log-normal distribution. Using the transformed T/C estimates and their associated empirical variance, 95% confidence intervals (CI) were calculated. These intervals were then back-transformed to obtain intervals on the original scale. Comparisons among years were made with analysis of variance in studies conducted identically for 3 years.

Adult returns for the 1986 study are now complete for both spring/summer chinook salmon and steelhead marked at Lower Granite Dam. For marking at McNary Dam in 1986, adult returns of spring/summer chinook salmon are complete, but incomplete for fall chinook salmon.

Results and Discussion

Delayed Mortality and CWT Retention

Post-marking delayed mortality and CWT retention for spring/summer chinook salmon marked at Lower Granite Dam are detailed in Appendix Table 2. We sampled a total of 555 fish which included fish from each release lot. Overall, delayed mortality and tag loss were 1.3 and 0.2%, respectively.

Adult Recoveries for Lower Granite Dam Studies

Spring/summer chinook salmon --A total of 74 transports and 47 controls from 1986 smolt releases were recovered at Lower Granite Dam (0.16 and 0.10% of smolt releases, respectively) (Table 1 and Appendix Tables 3.0-4.9). The calculated T/C is 1.6 with a 95% CI of (1.01, 2.47). The 95% CI is relatively broad because returns of both transports and controls were low.

The magnitude of the T/C estimate depends primarily on the survival rates of in-river control fish during passage through the hydropower complex. Better in-river migration conditions (high flows and spill) should result in higher survivals of in-river fish and a lower T/C estimate. Conversely, poorer in-river migration conditions (low flows and no spill) should result in lower survivals of in-river fish and a higher T/C estimate. Since in-river migration conditions in 1986 were reasonably good, the T/C estimate was low. Flows in the Snake River at Ice Harbor Dam averaged 98, 112, and 158 kcfs during April, May, and the first half of June, respectively. At both Lower Monumental and Ice Harbor Dams, spill occurred daily throughout this period, averaging 41% of the flow (range 26 to 47%). Similarly, flows in the Columbia River at McNary Dam averaged 256, 258, and 320 kcfs over the same period. At this dam, spill occurred nearly every day averaging 23% (range 14 to 35%) of the flow throughout the period. At John Day, The Dalles, and Bonneville Dams, daily spill averaged 28 (range 25 to 38%), 29 (range 14 to 43%), and 44% (range 41 to 46%) of the flow, respectively. Since the in-river study fish passed through only six hydropower projects under good conditions, and considering the low

Table 1.--Summary of recovered adult spring/summer chinook salmon marked as juveniles at Lower Granite Dam in 1986 and 1989 (recoveries through July 1990). Recoveries for 1986 are complete; 1989 recoveries are incomplete. Numbers in parentheses represent adults that were jaw-tagged at the dam and subsequently recovered upstream.

Group	Number released	Ocean-age	Observed adult returns: Ocean fishery	Bonneville Dam	River fishery	Indian fishery	L. Granite Dam N	L. Granite Dam %	Hatchery	Stream surveys	Total N	Total %
1986 Transport	45,004	1	1	0	0	0	7 (1)	0.01	1	0	8	0.02
		2	5	7 (3)	1	6	41 (6)	0.09	23	1	75	0.17
		3	0	6	2	4	26 (2)	0.06	4	0	40	0.09
		Total	6	13 (3)	3	10	74 (9)	0.16	28	1	123	0.28
1986 Control	45,035	1	0	0	0	0	2	0.00	2	0	4	0.01
		2	0	1	0	0	27 (3)	0.06	18	1	44	0.10
		3	0	2	0	0	18 (2)	0.04	7	0	25	0.06
		Total	0	3	0	0	47 (5)	0.10	27	1	73	0.17
1989 Transport	75,295	1	0	0	0	0	2	0.00	0	0	2	0.00
1989 Control	107,176	1	0	1	0	0	1	0.00	0	0	2	0.00

numbers of returning adults of both test groups, we submit that the measured T/C range for 1986 is a reasonable estimate for that year. In any case, we conclude that spring/summer chinook salmon smolts transported from Lower Granite Dam and released below Bonneville Dam in 1986 returned to the dam as adults in greater numbers than did smolts released below Little Goose Dam during the same year.

Adult returns from the 1987 barge transport index groups to various recovery sites are low (Table 2 and Appendix Tables 5.0-5.11); 91 fish or 0.18% of the release to Lower Granite Dam and 120 fish or 0.25% of the release to all recovery sites combined. One- and 2-ocean recoveries are complete; 3-ocean recoveries are incomplete.

During spring 1989, we marked approximately 107,000 spring/summer chinook salmon for release as controls below Little Goose Dam and approximately 75,000 for barge transport (Matthews et al. 1990). Jack (1-ocean) returns to Lower Granite Dam from these releases totaled only 3 fish; 2 transports and 1 control (Table 1 and Appendix Tables 6.0-7.0). We expected 5 to 7 times more jack returns from both release groups. However, the total spring/summer chinook salmon jack count past Lower Granite Dam was a record low of only 357 fish--about 5 to 7 times lower than expected. These data imply that early ocean survival of the 1989 outmigration, whether marked or unmarked, transported or not transported, was unusually poor.

During spring 1990, an unusually high occurrence of teeth marks resulting from attacks by marine mammals (probably harbor seals) was documented on spring/summer chinook salmon at the Lower Granite Dam

Table 2.--Preliminary summary of recovered adult spring/summer chinook salmon marked as juveniles at Lower Granite Dam in 1987 (recoveries through July 1990). Numbers in parentheses represent adults that were jaw-tagged at the dam and subsequently recovered upstream.

Group	Number released	Ocean-age	Observed adult returns: Ocean fishery	Bonneville Dam	River fishery	Indian fishery	Lower Granite Dam N	Lower Granite Dam %	Hatcheries	Total N	Total %
1987											
Transport	50,207	1	2	0	1	0	12 (1)	0.02	0	14	0.03
		2	0	11 (5)	1	2	66 (19)	0.13	37	93	0.19
		3	0	1 (1)	0	0	13	0.03	0	13	0.03
		Total	2	12 (6)	2	2	91 (20)	0.18	37	120	0.25

adult collection facility. These marks were generally located on one or both sides of the lower abdomen. The severity of the marks or "bites" ranged from simple scale loss to large, open flesh wounds. Open wounds occurred on 41% of the fish with marks and ranged from small punctures to long, deep gashes.

We began documenting bite incidence on 9 May, after the run was about one-third past the dam, and continued through 16 June. Prior to 9 May, the estimated incidence was approximately 40-50%. From 9 May to 16 July, weekly incidence ranged from 10.5-29.4% with an average of 19.2% (Table 3).

We do not know where the attacks took place or how many fish were killed outright or fatally injured and dropped out of the population prior to arrival at Lower Granite Dam. However, continuation of this activity could further jeopardize this seriously depressed salmon population.

Steelhead --Adult returns are complete from steelhead that were marked as smolts in spring 1986 (Table 4 and Appendix Tables 8.0 through 9.7). Recoveries combined to all evaluation points total 355 for transports (1.16% of releases) and 184 for controls (0.58% of releases). The T/C was 2.0 with a 95% CI of (1.43, 2.66) for adults recovered at Lower Granite Dam.

Returns of 1- and 2-ocean age adult steelhead from smolts marked at Lower Granite Dam for barge index purposes in 1987 are complete (Table 5 and Appendix Tables 10.0-10.7). One-ocean adults migrated upstream during drought conditions with the accompanying high water-temperatures and low water-flows in summer/fall 1988 (Matthews et al. 1990). We feel these adverse conditions

Table 3.--Weekly incidence (9 May to 16 June) of marine mammal bites on adult spring/summer chinook salmon at Lower Granite Dam.

Date	Sample size	Incidence (%)
9-12 May	200	10.5
13-19 May	443	15.1
20-26 May	284	25.0
27 May-2 June	76	19.7
3-9 June	49	18.4
10-16 June	119	29.4
17-23 June	248	23.8
24-30 June	144	19.4
1-7 July	123	16.3
8-14 July	39	17.9
15-16 July	5	20.0
Total	1,730	Average 19.2

Table 4.--Summary of recovered adult steelhead marked as juveniles at Lower Granite Dam in 1986 (recoveries through July 1990). Numbers in parentheses represent fish that were jaw-tagged at the dam and subsequently recovered upstream.

Group	Number released	Ocean-age	Observed adult returns: Bonneville Dam	River fishery	Indian fishery	Lower Granite Dam N		Lower Granite Dam %	Hatcheries	Total N	Total %
Transport	30,659	1	10	4	1	87	(6)	0.28	3	99	0.32
		2	4	36	0	241	(63)	0.79	28	246	0.80
		3	0	2	2	9	(5)	0.03	2	10	0.03
		Total	14	42	3	337	(74)	1.10	33	355	1.16
Control	31,414	1	2	1	0	60	(5)	0.19	6	64	0.20
		2	3	21	0	110	(31)	0.35	10	113	0.36
		3	0	3	0	7	(4)	0.02	1	7	0.02
		Total	5	25	0	177	(40)	0.56	17	184	0.58

Table 5.--Preliminary summary of recovered adult steelhead marked as juveniles at Lower Granite Dam in 1987 and transported to below Bonneville Dam by barge (recoveries through July 1990). Numbers in parentheses represent fish that were jaw-tagged at Lower Granite Dam and subsequently recovered upstream.

Number released	Ocean-age	Observed adult returns: Bonneville Dam	River fishery	Indian fishery	Lower Granite Dam N	Lower Granite Dam %	Hatcheries	Total N	Total %
27,544	1	10	22	0	103 (25)	0.37	6	116	0.42
	2	3	96	3	390 (143)	1.42	54	403	1.46
	Total	13	118	3	493 (168)	1.79	60	519	1.88

contributed to 1-ocean recoveries of less than one-half of those expected; only 0.37% of releases returned to Lower Granite Dam. With normal migrating conditions in summer/fall 1989, we recovered 1.42% of the release as 2-ocean adults at the dam. Matthews et al. (1990) predicted a return of 2-ocean adults in excess of 1.0%, if river conditions were suitable in summer/fall 1989. Preliminary returns to the dam total 493 fish (1.79% of release) while total recoveries to all sample sites combined are 519 fish (1.88% of release).

Adult Recoveries for McNary Dam Studies

Spring chinook salmon --Table 6 summarizes and Appendix Tables 11.0-16.10 detail adult recoveries of spring chinook salmon from transport and control releases from McNary Dam from 1986 to 1988. Since few spring chinook salmon are recovered in ocean fisheries we rely on returns to the Columbia River for evaluation of this study. We do not have a single sample point to intercept all study fish for analysis on the river; adult collectors at Bonneville and Priest Rapids Dams sample only a portion of the adult run. These partial samples result in low recoveries to any single sample site and may preclude statistical analysis of some study groups.

Recovery of adults from 1986 releases are complete and poor to all recovery sites. A total of 10 transports and 14 controls returned to all recovery sites combined. These low returns did not provide sufficient data for statistical analysis. It should be noted that the fingerling facility was not equipped to accommodate pre-anesthesia handling/marking procedures until spring 1987.

Table 6.--Preliminary summary of recovered adult spring/summer chinook salmon marked as juveniles at McNary Dam from 1986 to 1988 (recoveries through July 1990). Numbers in parentheses represent fish that were jaw-tagged at the dam and subsequently recovered upstream.

Group	Number released	Ocean-age	Observed adult return: Ocean fishery	Bonneville Dam	River fishery	Indian fishery	L. Granite Dam	Priest R.	Dam	Hatch-eries	Stream surveys	Total N	Total %
1986													
Transport	49,274	1	0	0	0	0	0	1		1	0	2	0.00
		2	0	2	0	0	1	2	(1)	2	0	6	0.01
		3	0	1	0	0	0	0		1	0	2	0.00
		Total	0	3	0	0	1	3	(1)	4	0	10	0.01
1986													
Control	50,273	1	0	0	1	0	0	1	(1)	0	0	1	0.00
		2	1	0	0	0	2	3		5	0	11	0.02
		3	0	0	0	0	1	0		1	0	2	0.00
		Total	1	0	1	0	3	4	(1)	6	0	14	0.02
1987													
Transport	38,487	1	1	1	5	0	0	0		1	0	8	0.02
		2	0	11	(6)	2	3	5	(1)	17	(4)	9	2	38	0.10
		3	0	2		2	0	2		3		0	0	9	0.02
		Total	1	14	(6)	9	3	7	(1)	20	(4)	10	2	55	0.14
1987													
Control	57,902	1	0	1		1	0	0		0		0	0	2	0.00
		2	1	17	(5)	2	7	6	(1)	11	(1)	14	1	52	0.10
		3	0	1		0	0	0		2	(2)	0	0	1	0.01
		Total	1	19	(5)	3	7	6	(1)	13	(3)	14	1	55	0.11
1988													
Transport	50,028	1	0	2		0	0	3		0		1	0	6	0.01
		2	0	17		1	0	5		9	(1)	0	0	31	0.06
		Total	0	19		1	0	8		9	(1)	1	0	37	0.07
1988													
Control	75,036	1	0	1		0	0	1		1		1	0	4	0.01
		2	0	22	(1)	1	0	7		14	(1)	0	0	42	0.06
		Total	0	23	(1)	1	0	8		15	(1)	1	0	46	0.07

Recoveries from 1987 McNary smolt releases are nearly complete. Returns, although still low, had improved when compared to 1986 recoveries. To date we have collected 55 transports (0.14% of release) and 55 controls (0.11% of release) from all recovery areas combined. These numbers indicated a possible benefit from transportation (T/C of 1.3). Next year, when returns are complete, we will apply statistical treatment to 1987 recoveries.

Adult recoveries from the 1988 study year are preliminary; however, totals of 37 transports and 46 controls indicated equal recovery rates of 0.07% for both groups to date.

Fall chinook salmon --Since a large number of tag recoveries from fall chinook salmon marked as juveniles at McNary Dam between 1986 and 1988 are from the ocean fisheries, the timeliness of reporting these returns from other agencies depends upon the number of tags they must process. Therefore, reporting may be delayed a year or longer (Matthews et al. 1990).

Ocean recoveries, especially from the southeast Alaska troll fishery where the majority of the harvest takes place, are down from previous study years. In the past, the state of Alaska sampled throughout the year, but in recent years, sampling has been restricted to short segments throughout the year, with most recoveries coming during the first 2 weeks in July. Although sampling intensity is high during these 2 weeks, high concentrations of our tagged fish may not be in the area at this particular time. Consequently, ocean recoveries have been lower than expected.

Recoveries from 1986 McNary releases are preliminary, since 3- and 4-ocean returns are incomplete. Returns to date from all sampling sites combined show approximately twice as many transport returns (158 or 0.14% of release) as control returns (78 or 0.07% of release) (Table 7 and Appendix Tables 17.0-21.0). Likewise, ocean recoveries from this study group show twice as many transport recoveries (72) as control recoveries (36). We recovered 52 CWTs from 3-ocean age fish in the Indian river gill-net fishery during fall 1989. Due to a minimum mesh-size gill-net restriction of 7-1/4 inches to protect upriver steelhead runs, we expect most recoveries will be large fish (3- and 4-ocean) in the future.

Preliminary 1- and 2-ocean returns from transport and control releases in 1987 to all recovery sites combined indicate a possible benefit from transportation; 65 recoveries or 0.10% of release from transported fish and 20 recoveries or 0.03% of release from control fish. Only two fish (both transports) have been recovered from 1988 releases.

PILOT STUDY OF THE FEASIBILITY OF USING PIT TAGS TO EVALUATE TRANSPORTATION OF WILD SPRING CHINOOK SALMON

Introduction

The NMFS and COE initiated a pilot study in the summer of 1988 to examine the feasibility of using PIT tags for evaluating transportation of spring chinook salmon smolts (Matthews et al. 1990). Although the initial study focused on wild fish, hatchery-reared fish were included. During the first year, we 1) developed effective and efficient techniques for collecting and PIT tagging

Table 7.--Preliminary summary of recovered adult fall chinook salmon marked as juveniles at McNary Dam from 1986 to 1988 (recoveries through July 1990).

Group	Number released	Ocean-age	Observed adult returns: Ocean fishery	Bonneville Dam	River fishery	Indian fishery	Priest R. Dam	Hatch-eries	Stream surveys	Total N	Total %
1986 Transport	114,653	1	2	0	6	0	8	0	0	16	0.01
		2	28	4	2	0	0	9	0	43	0.04
		3	42	0	17	36	0	0	4	99	0.09
		Total	72	4	25	36	8	9	4	158	0.14
1986 Control	115,991	1	1	0	1	0	3	0	1	6	0.01
		2	11	4	0	0	8	0	0	23	0.02
		3	24	0	9	16	0	0	0	49	0.04
		Total	36	4	10	16	11	0	1	78	0.07
1987 Transport	68,376	1	8	24	1	0	0	6	0	39	0.06
		2	12	0	5	7	0	0	2	26	0.04
		Total	20	24	6	7	0	6	2	65	0.10
1987 Control	68,291	1	4	8	1	0	4	0	0	17	0.03
		2	2	0	0	1	0	0	0	3	0.00
		Total	6	8	1	1	4	0	0	20	0.03
1988 Transport	60,013	1	1	0	1	0	0	0	0	2	0.00
1988 Control	60,010	1	0	0	0	0	0	0	0	0	0.00

large numbers of wild parr in their natal streams, with exceptionally low associated mortality; 2) realized much lower than expected recovery rates for all PIT-tagged fish the following spring at the three collector dams; and 3) determined that the outmigration timing of wild chinook salmon smolts through Lower Granite Dam differed from that of their hatchery-reared counterparts.

In the summer of 1989, we continued the pilot study for a second year. This second study included streams in the Middle Fork of the Salmon River drainage--a primary production area for wild spring/summer chinook salmon in Idaho. At the request of the Idaho Department of Fish and Game (IDFG), no fish were tagged in this drainage in 1988. Consequently in 1989, we repeated PIT tagging parr in only four streams that were also included in the previous study year.

Methods

Wild Fish

During August and September 1989, we collected and PIT tagged wild spring chinook salmon parr in Sulphur Creek, Elk Creek, Marsh Creek, Bear Valley Creek, and Big Creek in the Middle Fork of the Salmon River drainage; Valley Creek and Alturas Lake Creek in the upper Salmon River drainage; and the Lostine River in Oregon (Fig. 1). Wild summer chinook salmon parr were PIT tagged in the Secesh River in the South Fork of the Salmon River drainage and the Imnaha River in Oregon.

We collected and PIT tagged fish from various reaches of each stream. Collecting and PIT-tagging procedures were described by Matthews et al. (1990).

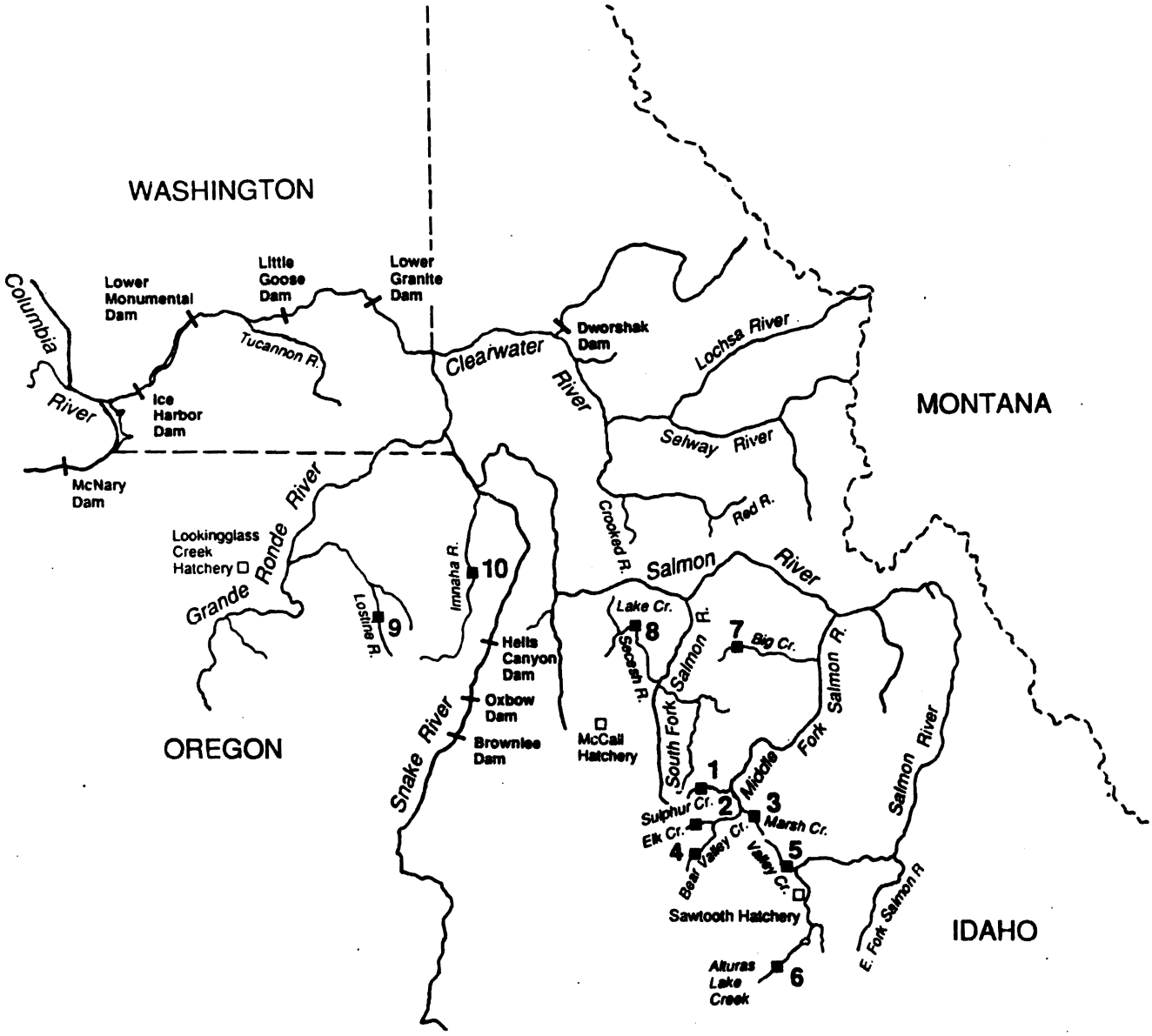

Figure 1.--Study area where wild spring/summer chinook salmon were PIT tagged; numbers indicate the sequence of tagging.

Hatchery-reared Fish

We used hatchery-reared fish from Dworshak and Sawtooth Hatcheries to provide comparative outmigration timing information. These fish were part of a pilot study conducted by the U.S. Fish and Wildlife Service (USFWS) using PIT tags to examine the effects of bacterial kidney disease (BKD) on transported spring chinook salmon (Appendix Tables 34-36). Other tagging, release, and recovery information will be reported by the USFWS.

Monitoring PIT Tags at Dams

During spring 1990, PIT-tagged spring/summer chinook salmon were monitored as they passed through PIT-tag detectors in the smolt collection facilities of Lower Granite and Little Goose Dams on the Snake River and McNary Dam on the Columbia River (Fig. 1). These dams also serve as the collection points for the smolt transportation program. Details of the monitoring phase of the study remained the same as reported by Matthews et al. (1990).

Results

Collection and Tagging

During 22 working days in August and September 1989, we collected 18,672 wild spring/summer chinook salmon parr in Idaho and Oregon (Table 8 and Appendix Table 22). Of these, 16,567 were PIT tagged and released back into the streams. No fish smaller than 50 mm were tagged. The numbers tagged and released per stream ranged from 16 in Elk Creek to 2,509 in Sulphur Creek. We PIT tagged and released less than 2,000 fish in 5 of the 10 streams.

Table 8.--Summary of the numbers collected, numbers PIT tagged and released, and average lengths and weights of wild spring/summer chinook salmon in 1989.

Tagging location	Number collected	Number PIT tagged and released	Average fork length of tagged fish (mm)	Average weight of tagged fish (g)
		Idaho		
Sulphur Creek	2,599	2,509	70	3.8
Elk Creek	16	16	73	4.2
Marsh Creek	2,810	2,496	67	3.6
Bear Valley Creek	1,610	1,557	68	4.2
Valley Creek	3,342	2,498	66	3.7
Alturas Lake Creek	1,107	1,036	77	5.7
Big Creek	2,456	2,026	65	3.7
Secesh River	2,542	2,359	66	3.1
Totals or averages	16,482	14,497	68	3.7
		Oregon		
Lostine River	84	84	70	4.8
Imnaha River	2,106	1,986	73	3.8
Totals or averages	2,190	2,070	73	3.8

The fork length of wild fish from Idaho streams ranged from 48 to 112 mm with an average of 68 mm (Table 8). The weight ranged from 1.0 to 16.6 g with an average of 3.7 g. In the two Oregon streams, the fish were larger with an average fork length of 73 mm (range 55-108 mm) and an average weight of 3.8 g (range 1.2-11.1 g).

Mortality and tag loss (Table 9 and Appendix Table 23) were lower than for our first PIT tagging effort in summer 1988. The overall collection mortality was 0.1 and 0.0% for Idaho and Oregon streams, respectively. The collection mortality using the seining technique was 0.1% for Idaho. However, in the two Idaho streams where we used a combination of seining and electro-shocking collection techniques, the collecting mortality was 0.3%. The tagging mortality was 0.3 and 1.1% for Idaho and Oregon streams. Of the 1,486 fish held for 24-hour delayed mortality and tag loss check (no fish were held from Oregon streams), we experienced 2.4% mortality and 0.1% tag loss. The overall observed mortality was 0.6 and 1.0% for Idaho and Oregon streams, respectively.

Detection of Test Fish at Dams

As during the previous year, the detection totals and percentages were based on first-time detections of PIT-tagged fish at the three collector dams.

A total of 5,661 PIT tags were detected at the three collector dams combined during spring 1990 (Appendix Tables 24-36). Of these, 1,517 originated from wild releases with the remainder from the hatchery releases. Of the total wild fish detected, 64.9, 24.0, and 11.1% were recorded for the first time at Lower Granite, Little Goose, and McNary Dams, respectively.

Table 9.--Mortality and tag loss for wild spring/summer chinook salmon collected and PIT tagged in Idaho and Oregon in summer 1989.

Stream	Mortality (%)				24-hour tag loss (%)
	Collection	Tagging	24-hour	Overall observed	
			Idaho		
Elk Creek	0.0	0.0	---	0.0	---
Bear Valley Creek	0.1	0.1	0.0	0.2	0.0
Sulphur Creek	0.2	0.3	0.9	0.6	0.0
Marsh Creek	0.1	0.2	5.6	0.8	0.0
Valley Creek	0.1	0.4	2.4	0.6	0.0
Alturas Lake Creek	0.3	0.8	---	1.0	---
Big Creek	0.4	0.3	0.9	0.7	0.5
Secesh River	0.0	0.3	5.1	0.6	0.0
Average	0.1	0.3	2.4	0.6	0.1
			Oregon		
Lostine River	0.0	0.0	---	0.0	---
Imnaha River	0.0	1.1	---	1.1	---
Average	0.0	1.1	---	1.0	---

The detection rates of wild fish at the dams varied by stream of origin (Fig. 2). The overall detection at the three collector dams combined was 9.2%, while the detection at Lower Granite Dam was 5.9%. The low detection rate of fish from Alturas Lake Creek may have been related to their very poor condition during tagging. Frayed caudal fins, soft bodies, and poor coloration typified these fish. Also, swollen abdomens, typical of advanced BKD infections, were common (necropsy of a few of these fish confirmed internal lesions typical of advanced BKD infections). We note that the IDFG planted 57,000 spring chinook salmon parr from Sawtooth Hatchery into this small stream in June 1989, roughly 2 months prior to our collection and PIT-tagging effort in the stream. Since only one redd was counted in the stream in 1988 (White and Cochnauer 1989), we suspect that nearly all of the fish we PIT tagged originated from the hatchery release.

During the PIT-tag detection/diversion tests conducted by NMFS at Lower Granite Dam in spring 1990 (see following section), we recovered, weighed, and measured several PIT-tagged wild fish from various streams (Table 10). This provided insight into the length and weight gains for these wild fish from time of tagging in late summer until recovery the following spring. Overall, the fish gained an average of 36.7 mm (range 13 to 56 mm) in length, and an average of 8.3 g (range 1.1 to 15.4 g)in weight. Of the wild fish that were diverted during these tests, 83 were subsequently released into the dam's tailrace to continue their downstream migration. Of these, 23 were later detected at Little Goose Dam, and 9 were later detected at McNary Dam.

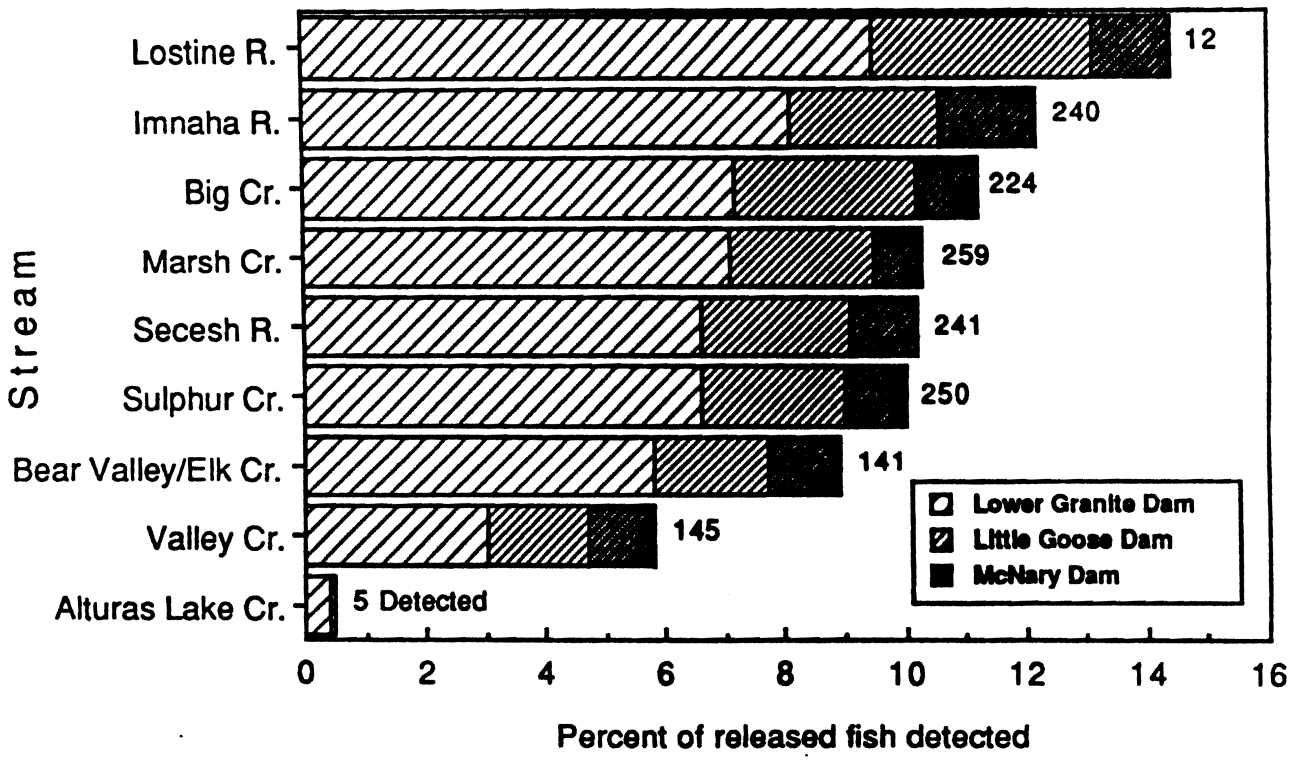

Figure 2.--Percent of PIT-tagged wild spring/summer chinook salmon detected at Lower Granite, Little Goose, and McNary Dams in spring 1990. The Secesh and Imnaha Rivers are considered summer chinook salmon streams.

Table 10.--Increases in length (mm) and weight (g) for wild spring/summer chinook salmon from time of tagging in summer 1989 to time of recovery at Lower Granite Dam in spring 1990. Tagged fish were recovered during PIT-tag detection/diversion tests.

Stream	Length increase			Weight increase		
	N	$\bar{x}$	Range	N	$\bar{x}$	Range
Bear Valley Creek	3	46.0	41.0-49.0	3	9.2	7.1-11.0
Sulphur Creek	16	29.9	17.0-43.0	15	6.7	1.1-10.7
Marsh Creek	16	33.9	16.0-49.0	11	6.9	2.6-11.8
Valley Creek	6	41.5	29.0-56.0	1	7.7	--
Big Creek	7	34.3	13.0-51.0	7	6.6	2.0-10.1
Secesh River	18	36.2	26.0-46.0	8	8.3	5.3-11.4
Lostine River	1	34.0	--	--	--	--
Imnaha River	16	44.4	36.0-53.0	14	11.6	7.7-15.4

Outmigration Timing at Lower Granite Dam

Timing of outmigrations for individual and combined streams and hatchery populations was calculated from 1 April to 20 July by the method described by Matthews et al. (1990).

Spring chinook salmon --For wild fish, outmigration timing to Lower Granite Dam varied among individual streams; four of the five streams exhibited a strong early peak prior to 1 May and a smaller peak near the end of May (Fig. 3). The timing of hatchery-reared spring chinook salmon at Lower Granite Dam was much more compressed than for their wild counterparts (Fig. 3).

To illustrate the overall difference in timing between wild and hatchery fish, we combined the recoveries of all wild and all hatchery fish into their respective groups (Fig 4). The combined wild fish outmigration at Lower Granite Dam was characterized by two equal peaks on 23 April and 31 May. The 50th percentile passed the dam on 7 May, and the 90th percentile passed on 5 June. These dates are respectively 16 and 10 days earlier than in 1989 (Matthews et al. 1990). The combined hatchery outmigration peaked on 22 April, with the 50th and 90th percentiles passing the dam on 23 April and 10 May, respectively. This timing was similar to the previous year with peak passage on the same day and the 50th and 90th percentile passage times only 1 and 6 days later. However, Sawtooth and Lookingglass Hatcheries were used to represent hatchery timing the previous year. In that year, fish from the latter hatchery were the earliest to arrive at Lower Granite Dam. The use of Dworshak Hatchery instead of Lookingglass Creek Hatchery this year could account for the slightly later shift in timing of hatchery fish.

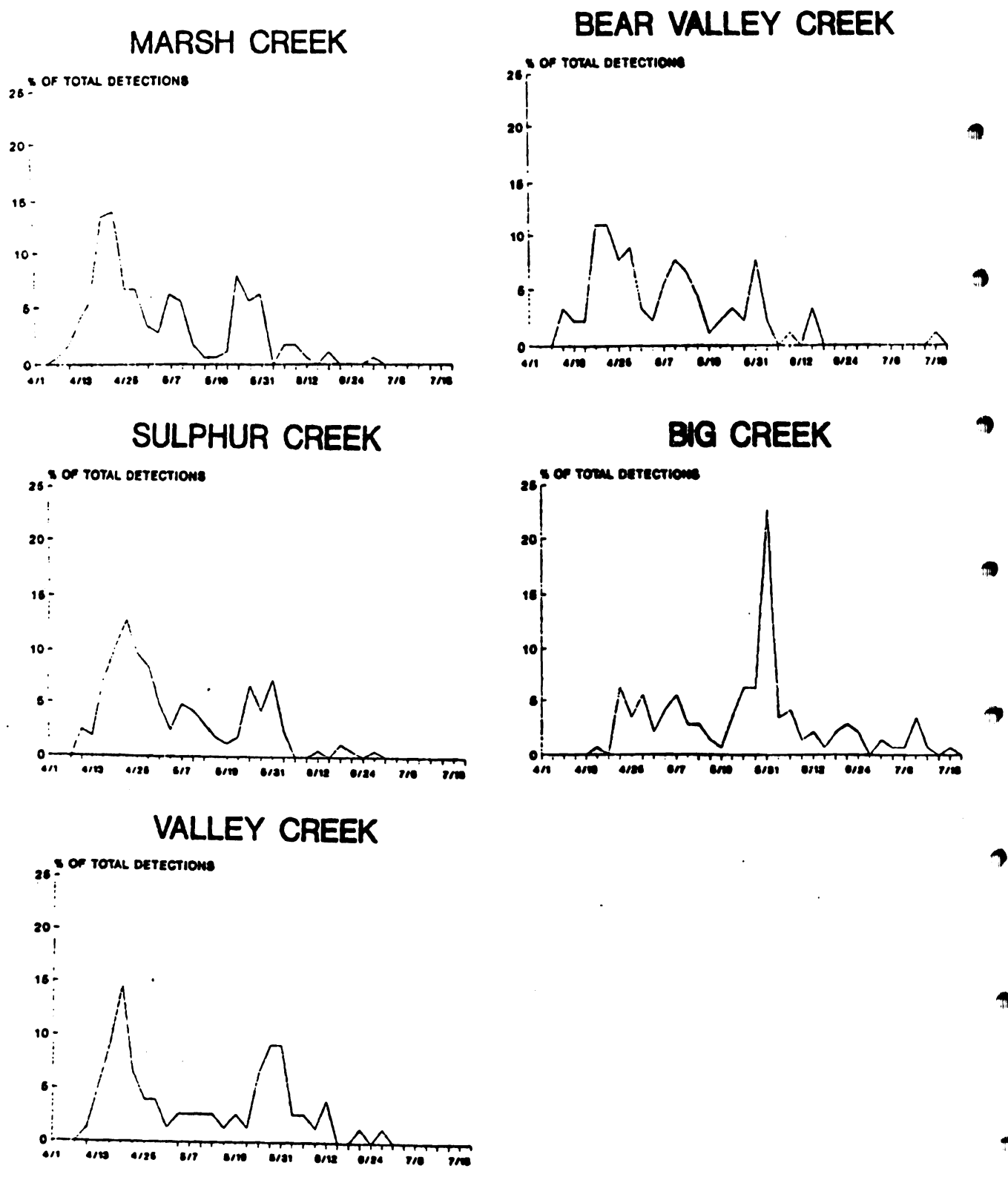

Figure 3.--The outmigration timing of spring chinook salmon smolts at Lower Granite Dam in 1990 by individual streams and hatcheries.

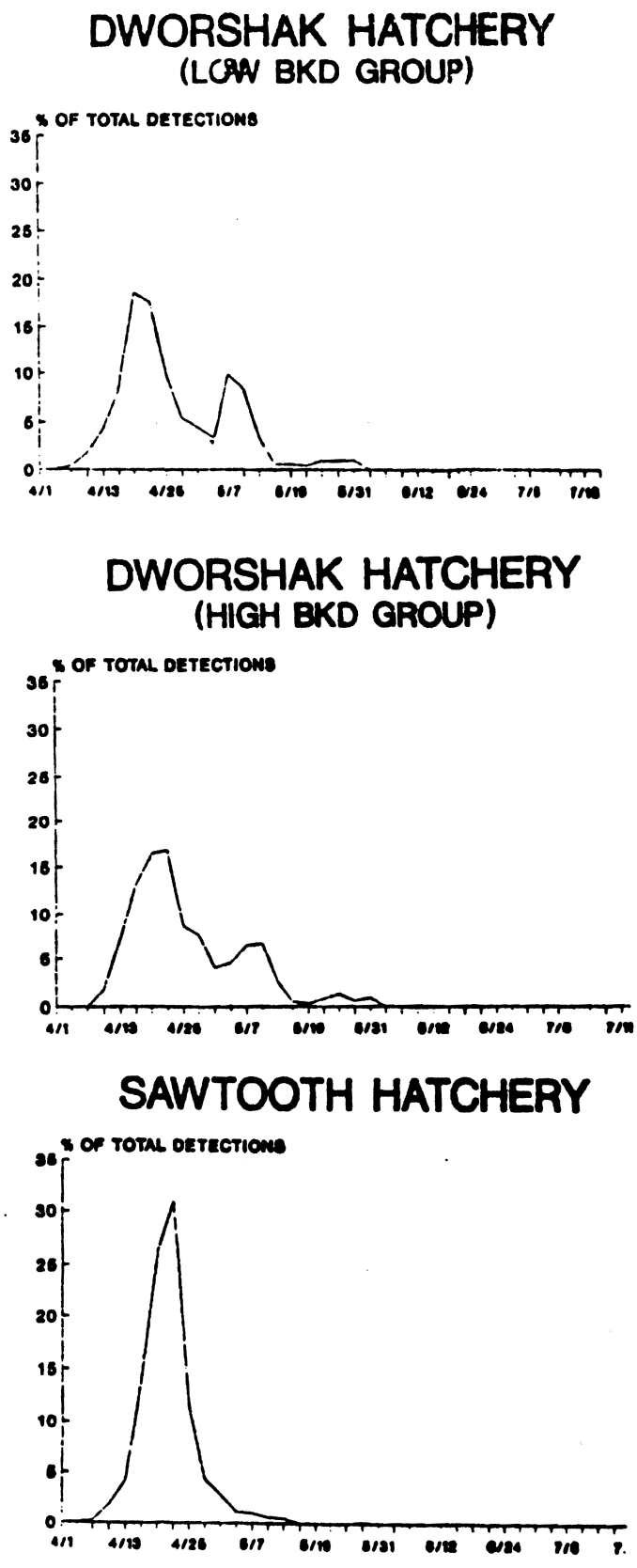

Figure 3.--Continued.

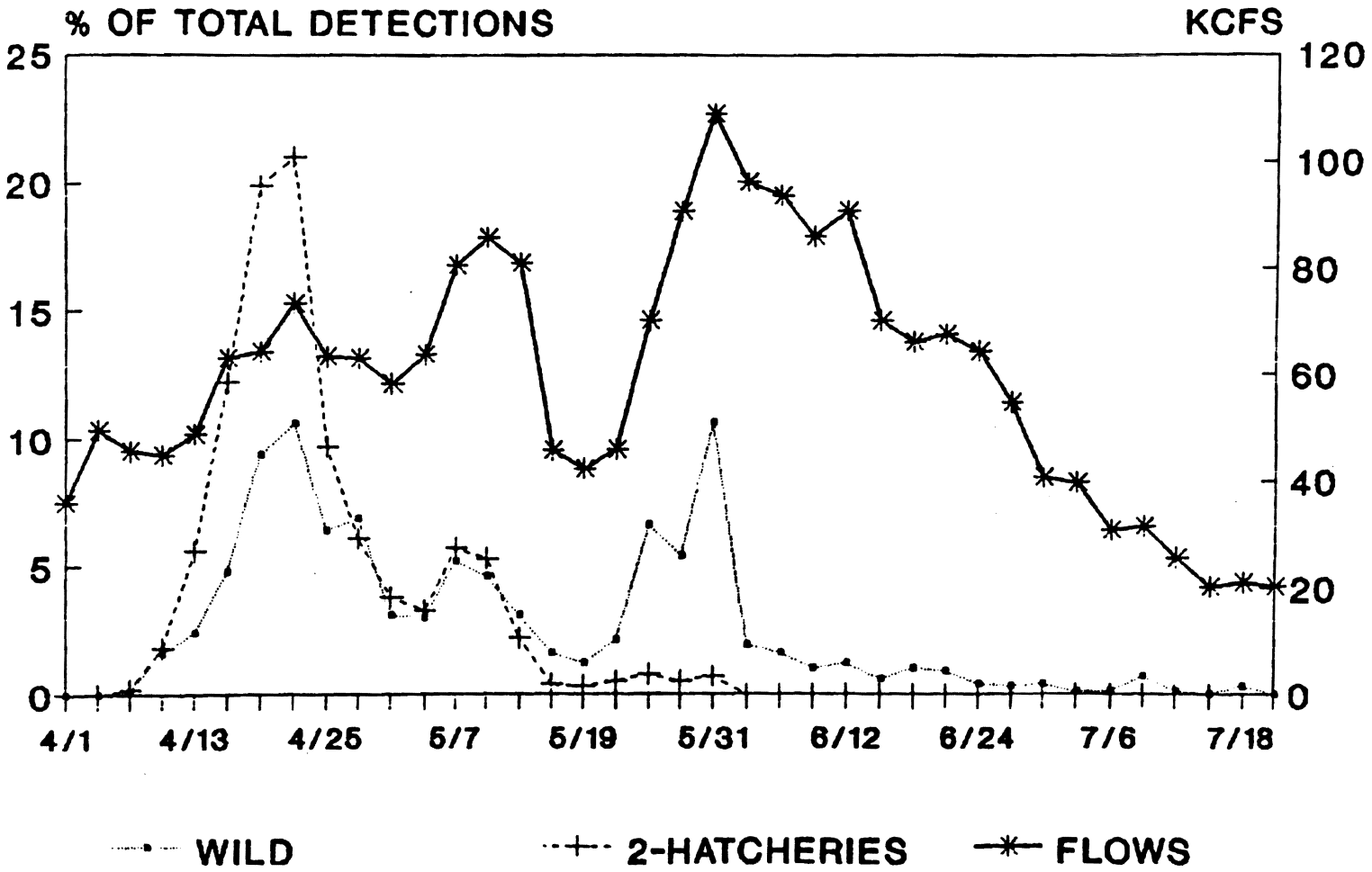

Figure 4.--The outmigration timing of wild and hatchery-reared spring chinook salmon at Lower Granite Dam in 1990. Data represent recoveries from all wild streams combined and Dworshak and Sawtooth Hatcheries combined.

In general, high detection rates of spring chinook salmon smolts at Lower Granite Dam were associated with higher river discharge (Fig. 4). An early peak in river flow occurred on 23 April, concurrent with the major peak of hatchery and wild fish. This period of flow appeared to move most of the hatchery-reared fish past the dam. Flows peaked twice later, on 11 and 31 May. The last and highest peak in flow coincided with the second peak of wild fish at the dam. However, this later peak of wild fish could have been related simply to the arrival of different groups of fish at the dam.

Wild summer chinook salmon --The outmigration timing of wild summer chinook salmon smolts from two wild streams (no hatchery-reared summer chinook salmon were PIT tagged for the 1990 outmigration) was earlier than either wild or hatchery-reared spring chinook salmon (Fig. 5). Although both streams showed similar early peaks, other aspects of migrational timing from these streams were quite different. The 50th and 90th percentile passage dates for fish tagged in the Imnaha River in Oregon were 18 April and 9 May, respectively, which was 12 and 2 days earlier than the previous year (Matthews et al. 1990). Fish tagged in the Secesh River in Idaho (a tributary of the South Fork of the Salmon River) exhibited a considerably more protracted outmigration. In contrast to wild and hatchery-reared spring chinook salmon, higher detections of wild summer chinook salmon did not coincide with higher flows (Fig. 6). In fact, a large portion of these fish passed Lower Granite Dam in early April, under relatively low flows of 40-60 kcfs.

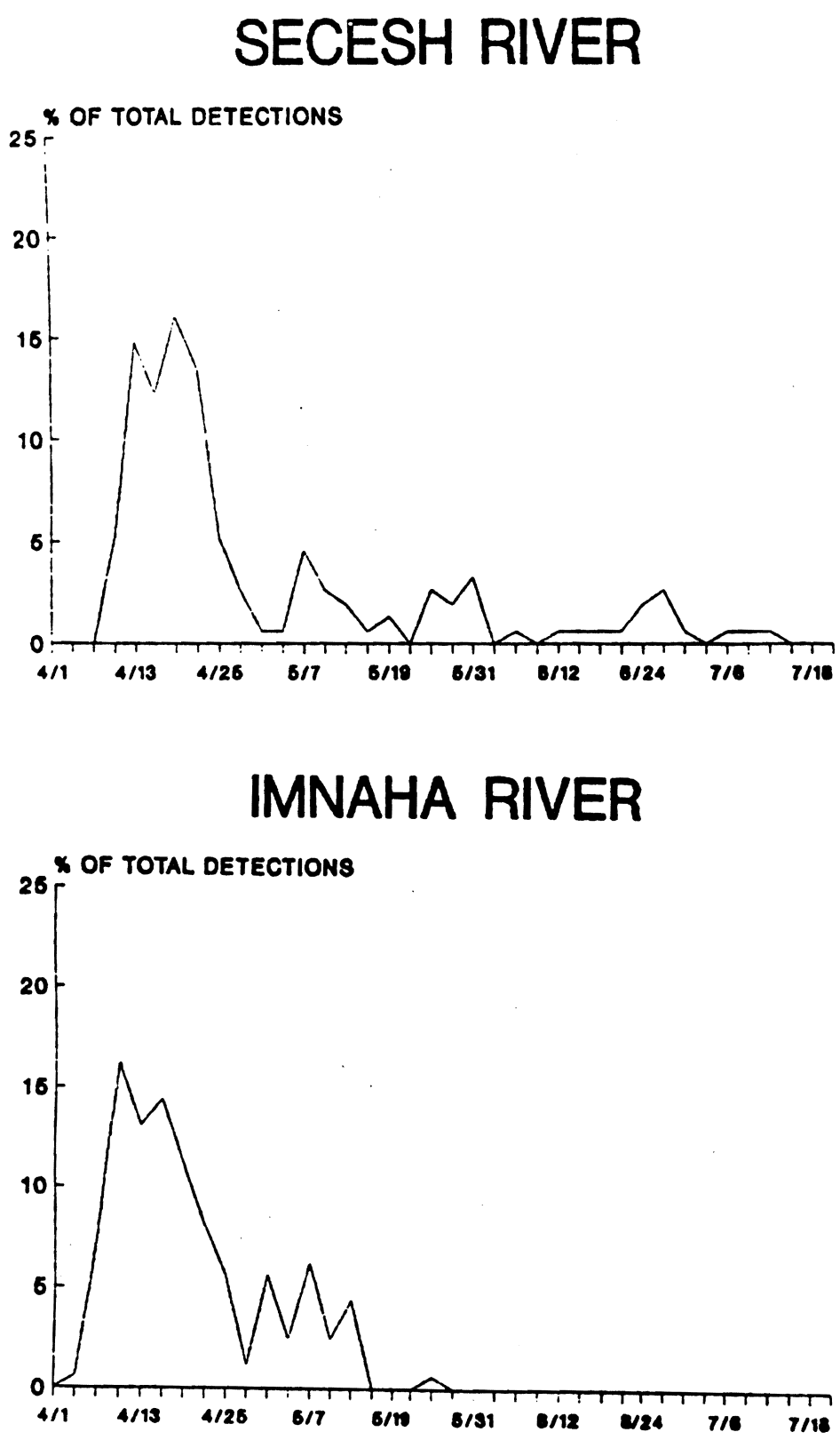

Figure 5.--The outmigration timing of summer chinook salmon smolts at Lower Granite Dam in 1990 by individual streams.

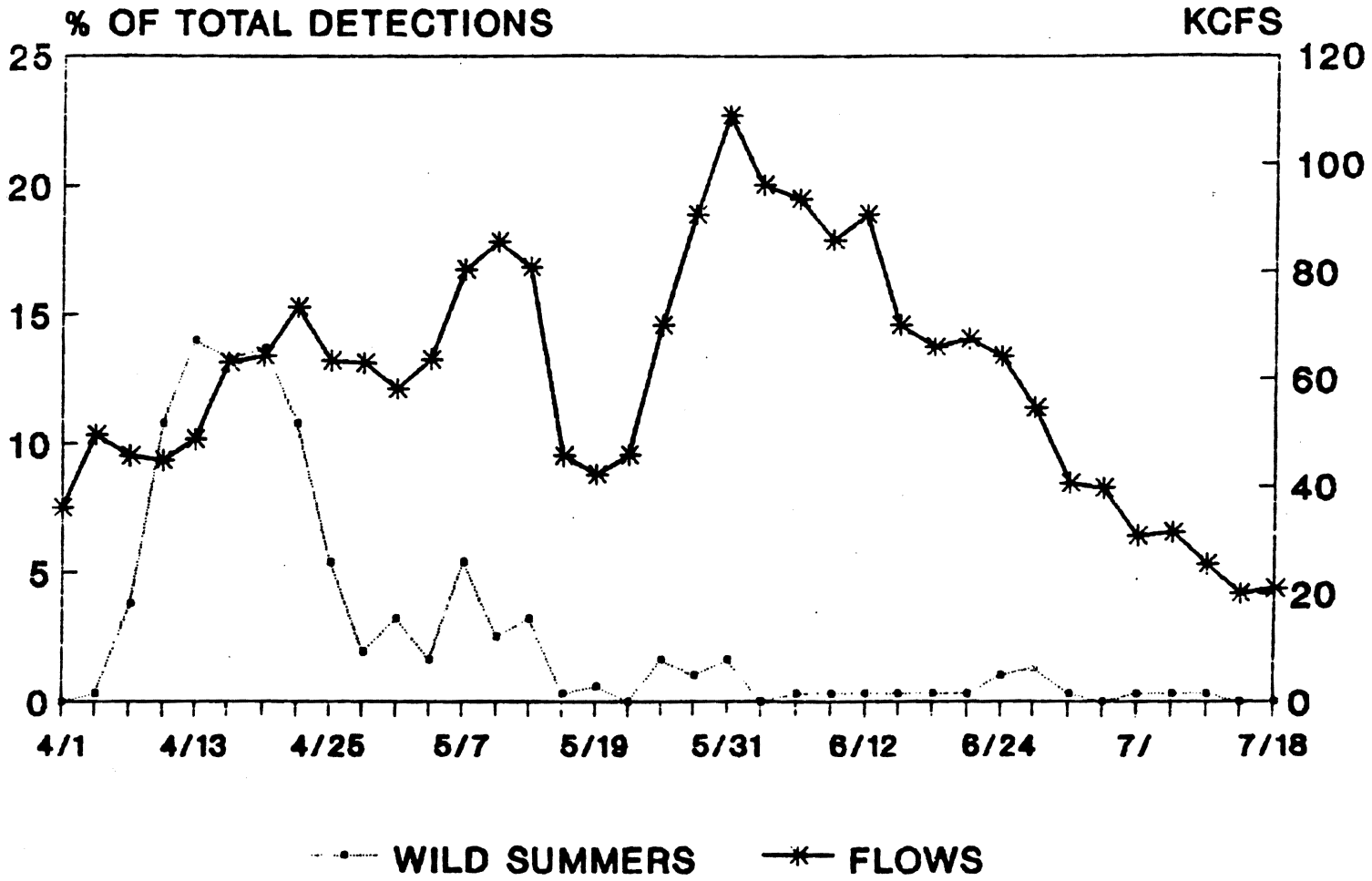

Figure 6.--The outmigration timing of wild summer chinook salmon at Lower Granite Dam in 1990. Data represent recoveries from both wild streams combined.

Discussion

The collection and tagging methods that we developed for use in wild streams in 1988 continued to be highly effective in 1989. The experience gained in 1988 enabled us to reduce by one-half in 1989 the already low collection and tagging mortality. With the present equipment, an additional crew, and adequate fish available, we believe it would be possible to capture and PIT tag up to 80,000 wild fish during August-September for a full-scale transportation study. However, due to the severely depressed adult runs of wild spring and summer chinook salmon returning to Idaho and Oregon, a full-scale study will not be feasible in the foreseeable future.

Although recovery rates of wild smolts were higher at the collector dams in 1990 than in 1989, they were still approximately 2 to 3 times lower than we had anticipated. This may be partly because we overestimated over-winter survival for most years. Matthews et al. (1990) reported that environmental conditions were extremely severe during the winter of 1988-89, which could have adversely affected over-winter survival during the first study year. In the second study year, the winter conditions appeared to be less severe and we realized a 31% increase in recovery of wild fish at Lower Granite Dam, with an overall increase of 21% among the three collector dams combined. However, for the four streams included in both study years, recovery rates in 1990 were lower for two of the streams, and only slightly higher for the other two. This suggests that over-winter survival may be higher for fish inhabiting streams in the Middle Fork of the Salmon River than in the other streams, regardless of environmental conditions.

The consistency in the proportions of individual populations recovered among the three collector dams in 1989 (Matthews et al. 1990) continued in 1990. There was, however, a slight shift in overall recovery proportions among the dams in 1990; 5% more wild fish were detected at Lower Granite Dam, 5% fewer fish were detected at Little Goose Dam, and the percent detected remained the same at McNary Dam.

As during the previous year, the outmigration timing varied among the individual wild spring/summer chinook salmon smolt populations at Lower Granite Dam. In addition, individual and collective timing differed from that observed during the previous year. Collectively, wild summer chinook salmon were present in abundance at the dam earlier in 1990 than in 1989 even though river discharge was considerably lower in early April 1990. These populations peaked in mid-April 1990 with 50% passing the dam before the initial peaks of either wild or hatchery spring chinook salmon. In both years, the collective outmigration of wild spring chinook salmon smolts was protracted, encompassing nearly the entire spring and early summer migration period. Also in both years, the collective outmigration was characterized by two distinct peaks. Both peaks were earlier in 1990 than in 1989, with the second peak coinciding with maximum spring river flows at the end of May.

A combination of key environmental factors may have influenced the overall difference in the timing of wild smolt populations observed between the 2 years at Lower Granite Dam. In general, a cold, late winter and early spring with close to average river flows prevailed in 1989. In contrast, in 1990, the late winter and early

spring were very mild. This combination may have contributed to the earlier timing of the wild smolt populations in 1990, even though river flows were considerably lower than during the previous year. Raymond (1979) cited water temperature as one of the most important factors triggering downstream movement of chinook salmon smolts in spring. It should be repeated that the overall timing of wild smolt populations in 1990 was heavily influenced by detections of PIT-tagged fish originating in the Middle Fork of the Salmon River drainage, whereas this drainage was not included in the 1989 study year. However, for individual wild populations that were included in both study years, the smolt migrations were also considerably earlier in 1990 than in 1989. Finally, the outmigration timing of hatchery-reared spring chinook salmon smolts was basically the same for both years, suggesting that external environmental forces have much less influence on the migrational timing of these fish.

The collective results from both pilot studies should be viewed in perspective, for now at least, since only a few stocks of wild fish were included in both study years. To precisely characterize and fully understand the factors that influence the migrational dynamics of wild fish, we must study the same stocks repetitively, over times that encompass different environmental conditions.

ASSESSMENT OF A PIT-TAG DETECTION/DIVERSION SYSTEM AT LOWER GRANITE DAM

Introduction

The use of PIT tags to conduct a full-scale transportation study requires a method of automatically detecting and recording a portion of tagged fish collected at dams and diverting them back to the river to serve as experimental controls. Moreover, other studies may have similar requirements in the future. The technology and equipment required to efficiently detect and record PIT-tagged fish within these systems has been developed and is in use (Prentice et al. 1990). However, the ability is lacking to efficiently divert PIT-tagged fish back to the river or elsewhere as they are detected and recorded.

To be efficient and effective, a system to accomplish this task must be capable of operating in fractions of a second in water velocities ranging from 6 to 9 fps without adversely impacting fish. With these goals in mind, NMFS built and tested several prototype systems in spring and summer 1988 at its Pasco, Washington field station. One of the systems, which incorporated a sliding gate in the bottom of a flume, showed great potential and was chosen for installation and field testing at Lower Granite Dam in spring 1989.

The initial field trials were hampered by some rather severe design, mechanical, and procedural flaws that limited testing and resulted in the system not functioning as originally envisioned (Matthews et al. 1990). In addition, we found that the hourly fish counts derived from the facility sample often underestimated the actual number of fish exiting the fish and debris separator. Since

the rates of fish movement in our tests were derived from this source by necessity, they were also often low estimates. Even so, the numbers of untagged fish diverted per diversion cycle were about double the expected or theoretical best values over the limited range of fish abundance levels tested. Descaling/injury and mortality rates were also somewhat higher than expected. Finally, the efficiency of the system as a function of the numbers of untagged fish diverted per diversion cycle appeared to be inversely related to the abundance of steelhead smolts in the system. Considering the extent of the problems encountered during the initial field tests, the results demonstrated that, with some procedural and design adjustments, the basic system has great potential for efficiently diverting PIT-tagged fish within the smolt collection systems at dams.

To correct the problems encountered during the initial assessment of the PIT-tag detection/diversion system in spring 1989, Matthews et al. (1990) recommended the following design and procedural adjustments: 1) use a single slide-gate, positioned as near as possible to the exit orifice of the fish and debris separator, to function as both the PIT-tag diverter and facility sampler, 2) increase the downward slope of the flumes to increase and maintain water velocities, 3) install a staff gauge in the fish and debris separator to allow operators to maintain more constant water levels, and 4) increase the periodicity of the hourly facility samples and treat the fish and debris separator the same regardless of the status of the facility sample (in particular, pertains to removal of steelhead kelts).

The recommendations were incorporated into the system for field testing in spring 1990. The primary objectives of the field tests in 1990 were to determine the following under actual conditions: 1) numbers of untagged fish diverted during each PIT-tag diversion cycle at different levels of fish abundance, and 2) descaling/injury and mortality rates for diverted fish.

Methods

The new configuration for the dual-flume PIT-tag detection/diversion system at Lower Granite Dam is illustrated in Figure 7. Each flume was equipped with a single, bottom-mounted sliding gate panel (slide-gate) located close to the exit of the fish and debris separator and serving the dual purpose of a PIT-tag diverter and facility sampler. An additional, larger sliding gate was installed in a common flume connecting the slide-gates with the facility sample tank. The PIT-tag head box (container for collecting diverted PIT-tagged fish) was located directly underneath the larger slide-gate in the common flume. When the system was in the facility sample mode, the large slide-gate was closed, allowing sampled fish to enter the facility sample tank. Conversely, when the system was in the PIT-tag diversion mode, the large slide-gate was open, allowing diverted fish to enter the PIT-tag head box directly below. The remainder of the system was the same as described by Matthews et al. (1990) with the exceptions that the downward slope of the entire flume system was increased and the flume sections between the slide-gates and the curve were shortened.

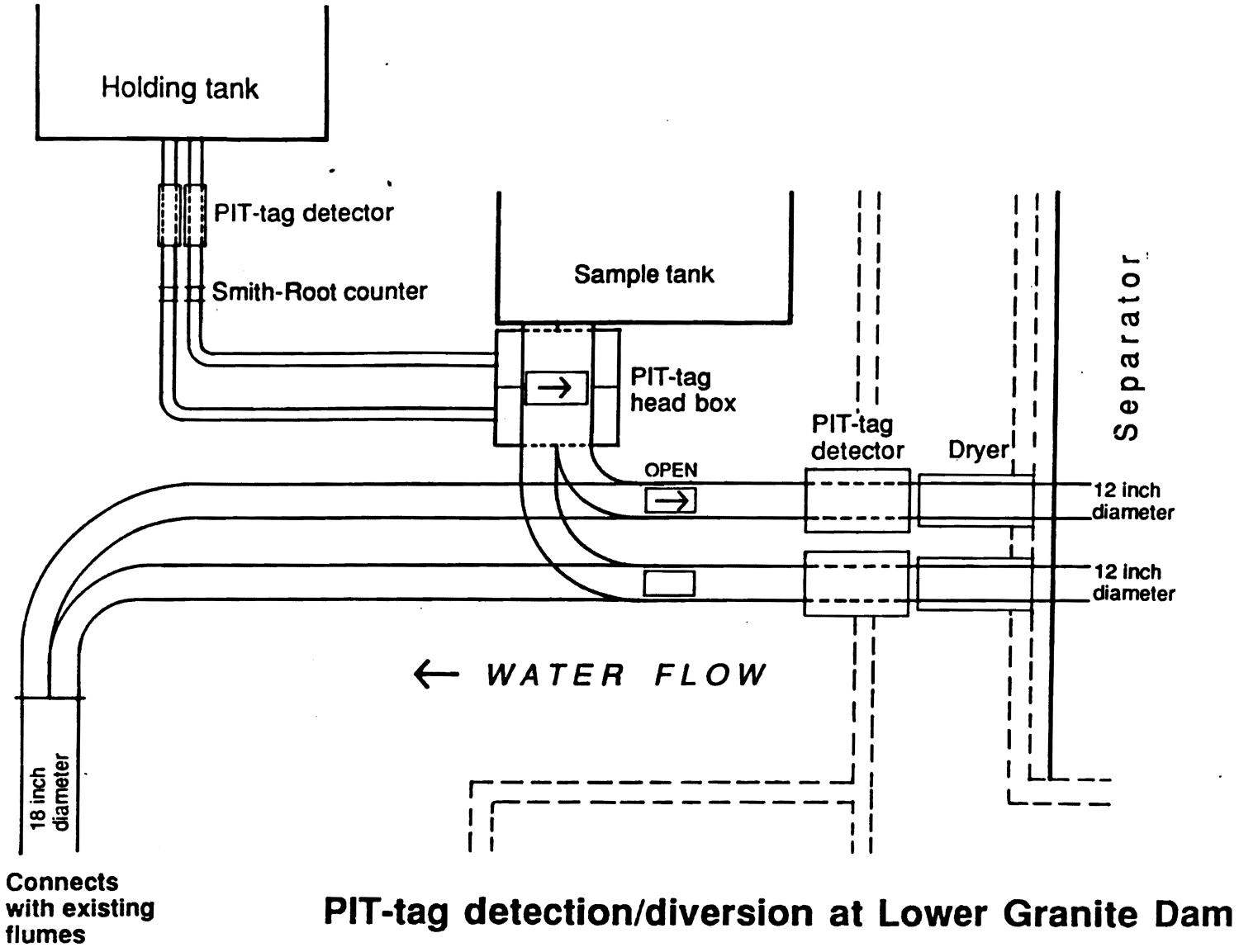

Figure 7.--Schematic of the dual-flume PIT-tag detection/diversion system tested at Lower Granite Dam in spring 1990.

For this study, the efficiency of the PIT-tag detection/diversion system was defined as the ratio of untagged fish diverted per PIT-tag diversion cycle. This efficiency is primarily a function of the number of fish exiting the fish and debris separator in any given hour and the amount of time the slide-gates remain open to divert a PIT-tagged fish, which is dictated by the water velocity. Matthews et al. (1990) described a method for calculating the theoretical (expected) or best efficiencies possible for any set of water velocity and gate opening parameters. The calculations assume that fish exit the fish and debris separator randomly and do not react in a behavioral sense to conditions in the flumes. These theoretical values are not obtainable under actual field conditions because the above assumptions are violated. However, they do provide useful baselines for comparisons of actual results.

The actual efficiency of the system was determined by conducting a series of hourly tests at different rates of fish movement. Many tests were conducted during evening and early morning hours when fish abundance was increasing to maximum levels. The rate of fish movement for each test was not known in advance, but was derived from the facility sample after a test was completed. Likewise, the number of PIT-tag diversion cycles per test was not known in advance, but was dependent upon the abundance of PIT-tagged fish exiting the fish and debris separator during any given test. Water velocities in the flumes were measured just prior to starting an hourly test and only varied between 7.1 and 7.4 fps for the entire season. This allowed us to set the time the slide-gates

remained open during each PIT-tag diversion cycle at 0.6 seconds for nearly all tests. At the end of each hourly test, fish were removed from the collection tank with a sanctuary dip net and anesthetized. Anesthetized fish were scanned for PIT tags, counted, identified to species, weighed, measured, and observed for descaling/injury. After data collection, fish were allowed to recover from the anesthetic and returned to the flume system for inclusion in the transport barges. At the request of the fisheries agencies and tribes, some PIT-tagged fish were returned to the river to continue their downstream migration through the hydroelectric complex.

Results and Discussion

During the season, we conducted 113 successful hourly tests of the efficiency of the PIT-tag detection/diversion system (Table 11 and Appendix Tables 37-40). A few additional tests were conducted, but were aborted for various reasons. The highest hourly facility count tested was 28,982 fish. Theoretically, the efficiency of the system decreases linearly and gradually as fish abundance increases. Therefore, we bracketed and averaged the results of individual tests within 5,000-fish increments of abundance. As predicted by the theoretical calculations, the efficiency of the system decreased as fish abundance increased in the hourly tests. The average number of untagged fish per diversion increased from 0.56 ± 0.09 when the hourly facility count was less than or equal to 5,000-fish to 3.60 ± 0.56 when the hourly facility count was between 25,001 and 30,000 fish. Overall, these values represent a considerable improvement (about 50%) over those reported by Matthews et al. (1990) for the

Table 11.--The average number ± SE of untagged fish diverted per PIT-tag diversion cycle at different levels of fish abundance at Lower Granite Dam in 1990.

Hourly fish facility count	Number of tests	Number of untagged fish diverted per cycle	Theoretical value
0-5,000	31	0.56 ± 0.09	0.26
5,001-10,000	48	1.04 ± 0.11	0.68
10,001-15,000	19	1.60 ± 0.15	1.13
15,001-20,000	8	2.48 ± 0.51	1.58
20,001-25,000	2	3.71 ± 0.89	2.04
25,001-30,000	2	3.60 ± 0.56	2.65
Totals or averages	113	1.20 ± 0.09	0.75

first year of testing of the system. While these levels may be acceptable, we believe they can be further improved.

During the initial tests in 1989, Matthews et al. (1990) reported an apparent reduction in relative efficiency as the percentage of steelhead in the system increased. This relationship was again apparent this year (Fig. 8). The efficiency of the system increased linearly, as predicted, until steelhead comprised greater than 50% of the fish diverted. Although increased numbers of steelhead were also associated with increased numbers of total fish in the system, we believe the swimming behavior of the larger, more powerful steelhead caused them to be diverted out of proportion to their actual abundance in the flumes. The aluminum flumes gather and reflect light even at night when the facility lights are on. As steelhead exit the dark inside the separator, they are instantly exposed to much brighter ambient light. Many respond in the area near the PIT-tag diversion system by attempting to swim back into the separator, thus increasing their chances of being diverted during a cycle. The smaller chinook salmon are incapable of swimming against the flow and are rapidly swept past the system. Since fish lose orientation and move with the current much more readily when denied light (Hoar 1951), we believe the tendency for steelhead to swim aggressively in the area of the PIT-tag diversion system can be reduced considerably, if not eliminated, by painting the insides of the flumes black and installing covers over the flumes in the area of the diversion system.

Generally, descaling/injury and mortality rates for diverted fish were substantially lower than reported by Matthews et al.

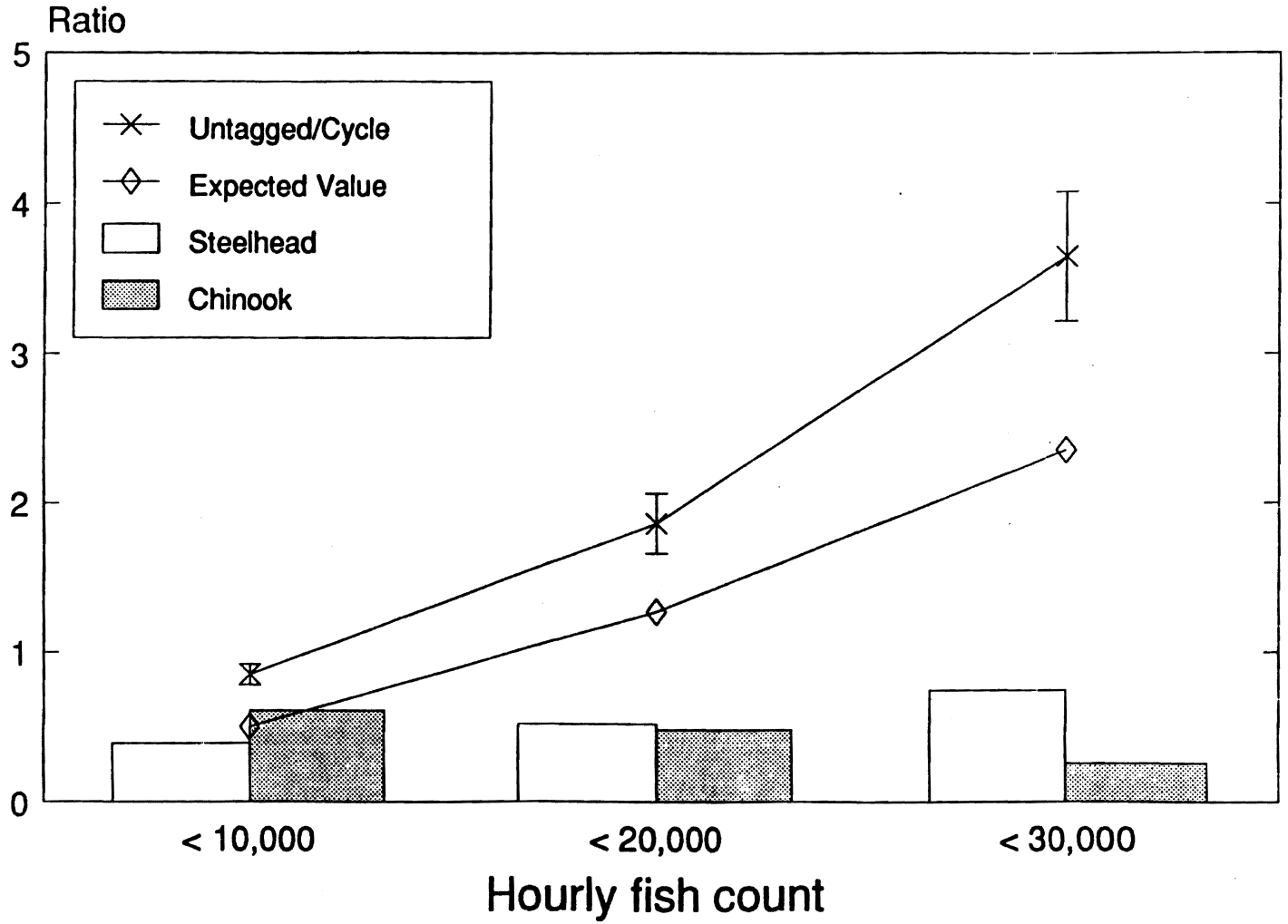

Figure 8.--The relationship between the expected and actual ratios of untagged fish to tagged fish diverted per diversion cycle when the percentage of steelhead is less than, equal to, or greater than 50% of the sample. Vertical lines indicate S.E.

(1990) for the first year of testing. Descaling/injury averaged 1.7 and 0.5% for spring chinook salmon and steelhead, respectively; mortality averaged 0.1 and 0.6% for both species, respectively. The descaling/injury rates were 4-5 times lower than the rates reported for the first year of testing. The mortality rate for spring chinook salmon was nearly identical to the rate measured during the previous year, whereas the mortality rate for steelhead was 5 times lower than reported during the previous year.

As during the previous year, all mortalities were caused by the slide-gate. While mortality rates for both species were very low, we believe the somewhat higher rates for steelhead can be reduced further. To accomplish this, we recommend installing a "buffer" in the operational system of the slide-gate. The buffer would stop the slide-gate prior to complete closure, then close it slowly for the final few inches. This would allow the few steelhead that are pinched by the slide-gate to clear the opening before closure is completed.

Results from the second year of testing of the PIT-tag detection/diversion system were very encouraging. Substantial improvements were seen in all factors measured, indicating our recommended modifications following initial testing in spring 1989 (Matthews et al. 1990) led to the desired results. With a few more minor modifications, we believe the system has great potential for efficiently diverting PIT-tagged fish for future studies.

SUMMARY

1. Due to low flows projected for the Snake River, we marked only a barge transport index group of 44,708 spring chinook salmon smolts at Lower Granite Dam in 1990. Marking for the T/C evaluation at McNary Dam was compleed in 1988.
2. Post-marking delayed mortality was low, averaging 1.3% for spring chinook salmon smolts marked at Lower Granite Dam.
3. Returns of adult spring chinook salmon marked as smolts for transportation research at Lower Granite Dam in 1986 are complete. At the dam, we observed 0.16% of the barge transport group and 0.10% of the in-river control group. The T/C was 1.6 with a 95% CI of (1.01, 2.47).
4. Returns of adult steelhead marked as smolts for transportation research at Lower Granite Dam in 1986 are also complete. In total, we recovered 1.16% of the barge transport group and 0.58% of the in-river control group. The T/C was 2.0 with a 95% CI of (1.43, 2.66) for recoveries at Lower Granite Dam.
5. Returns of adult spring chinook salmon marked as smolts for transportation research at McNary Dam in 1986 are complete, but insufficient for statistical analysis. Adult returns for the 1987 and 1988 study years are incomplete, but improved over returns for the 1986 study year.
6. Adult recoveries of fall chinook salmon marked for transportation research at McNary Dam from 1986 through 1988 are preliminary. To date, T/Cs range between 2.0 and 3.0.
7. The second year of a pilot study to examine the feasibility of using PIT tags to evaluate transportation of wild spring/summer

chinook salmon smolts was completed. We PIT tagged 16,567 wild spring/summer chinook salmon parr in Idaho and Oregon combined in August and September 1989.

8. As during the previous year, mortality and tag loss associated with the PIT-tag study were exceptionally low.

9. Detections of PIT-tagged wild spring/summer chinook salmon smolts were higher in spring 1990 than during the previous year, but still lower than expected.

10. The overall outmigration timing of wild spring chinook salmon smolts through Lower Granite Dam in 1990 was again later and more protracted than for their hatchery-reared counterparts. However, the overall timing for wild fish was earlier than during 1989.

11. The outmigration timing of wild summer chinook salmon smolts through Lower Granite Dam in 1990 was earlier than for either hatchery-reared or wild spring chinook salmon smolts and was also earlier than during 1989.

12. Peak outmigration periods for both hatchery-reared and wild spring chinook salmon smolts were coincidental with peak periods of flow; however, peak outmigration periods for wild summer chinook salmon smolts were not.

13. Results of the second year of testing the PIT-tag detection/diversion system at Lower Granite Dam were very encouraging. Substantial improvements were observed for all factors measured. With a few minor modifications, we believe the system has great potential for diverting PIT-tagged fish for future studies.

RECOMMENDATIONS

1. Based upon results of the 1986 study, together with previous results, we now recommend transporting spring chinook salmon smolts from the Snake River collector dams under all flow conditions.
2. Studies of the outmigration timing of wild spring/summer chinook salmon smolts should continue, even if they are not associated with transportation research.
3. With respect to the PIT-tag detection/diversion system, we recommend painting the insides of the flumes black and installing covers in the area of the system. Further, a buffer, designed to stop the slide-gate just before complete closure, should be incorporated into the system.

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APPENDIX

Data Tables

Appendix Table 1.--Summary of spring/summer chinook salmon juveniles marked for barge transport indexing at Lower Granite Dam in 1990, including dates, brands, wire-tag codes, and numbers marked.

Replicate number	Marking period	Brand position,[a] symbol, and orientation [b]	Wire-tag code	Number released
1	13-18 Apr	RAL-1	23-24-29	7,000
2	17-21 Apr	RAL-4	23-24-30	7,000
3	21-25 Apr	RAL-2	23-24-31	7,000
4	25 Apr-2 May	RAV-1	23-24-32	7,000
5	2-14 May	RAV-2	23-24-33	7,000
6	14-29 May	RAV-3	23-24-34	7,000[c]
7	29 May-8 June	RAV-4	23-24-35	2,708[c]
			Total	44,708

[a] RA indicates right anterior portion of fish.
[b] Orientation refers to rotation of brand around its centerpoint.
[c] Fifty-seven fish from replicate 6 and 282 fish from replicate 7 released 2 miles below McNary Dam because of the John Day Dam fire.

Appendix Table 2.--Mortality and tag loss from tagged spring/summer chinook salmon that were held 24 hours at Lower Granite Dam in 1990.

Date	Wire-tag code	Number held	Mortality	Lost tags
17 Apr	23-24-29	50	1	0
19 Apr	23-24-30	50	0	1
21 Apr	23-24-30	50	0	0
24 Apr	23-24-31	50	0	0
27 Apr	23-24-32	50	1	0
29 Apr	23-24-32	50	1	0
03 May	23-24-33	50	0	0
09 May	23-24-33	52	2	0
15 May	23-24-34	50	1	0
22 May	23-24-34	50	0	0
31 May	23-24-35	53	1	0
	Total	555	7	1
	% Mortality and tag loss		1.3	0.2

Appendix Table 3.0.--Summary of all recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614A 8614B 8614C 8614D 8614E 8614F 8614G 8614H 8614I

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

SPRING CHINOOK

Brands Used: LAP 1 LAP 2 LAP 3 LAP 4 LAW 1 LAW 2 LAW 3 LAW 4 LAL 1
Wire Codes Used: 231902 231903 231904 231905 231906 231907 231908 231909 231863

NUMBER RELEASED: 45035

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	2	0	3	0.007
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	27	18	0	47	0.104
PRIEST RAPIDS TRAP	0	0	0	1	0	1	0.002
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	2	2	0	4	0.009
RAPID RIVER H.	0	2	6	0	0	8	0.018
	0	0	2	0	0	2	0.004
HATCHERIES (GENERAL)	0	0	8	5	0	13	0.029
STREAM SURVEY	0	0	1	0	0	1	0.002
TOTALS	0	4	47	28	0	79	0.175
PERCENT OF RECOVERY %	0.0	5.1	59.5	35.4	0.0		

Appendix Table 3.1.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 9 to 11 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614A

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE
SPRING CHINOOK

Brands Used: LAP 1
Wire Codes Used: 231902

NUMBER RELEASED: 5000

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	1	2	2	0	5	0.100
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
RAPID RIVER H.		0	1	0	0	0	1	0.020
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	2	2	2	0	6	0.120
PERCENT OF RECOVERY	%	0.0	33.3	33.3	33.3	0.0		

Appendix Table 3.2.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 11 to 15 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86145

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

SPRING CHINOOK

Brands Used: LAP 2
Wire Codes Used: 231903

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	3	1	0	5	0.100
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
HATCHERIES (GENERAL)	0	0	0	2	0	2	0.040
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	3	3	0	7	0.140
PERCENT OF RECOVERY %	0.0	14.3	42.9	42.9	0.0		

Appendix Table 3.3.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 15 to 17 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614C

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE
SPRING CHINOOK

Brands Used: LAP 3
Wire Codes Used: 231904

NUMBER RELEASED: 5164

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	0	2	0.039
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	1	1	0	2	0.039
PERCENT OF RECOVERY	%	0.0	0.0	50.0	50.0	0.0		

Appendix Table 3.4.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 17 to 21 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614D

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE SPRING CHINOOK

Brands Used: L&P 4
Wire Codes Used: 231905

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	1	0	2	0.040
PRIEST RAPIDS TRAP	0	0	0	1	0	1	0.020
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	2	2	0	4	0.080
PERCENT OF RECOVERY %	0.0	0.0	50.0	50.0	0.0		

Appendix Table 3.5.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 21 to 23 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86143

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE
SPRING CHINOOK

Brands Used: LAW 1
Wire Codes Used: 231906

NUMBER RELEASED: 5000

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	7	3	0	10	0.200
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
DWORSHAK H.		0	0	1	2	0	3	0.060
RAPID RIVER H.		0	0	2	0	0	2	0.040
HATCHERIES (GENERAL)		0	0	2	0	0	2	0.040
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	12	5	0	17	0.340
PERCENT OF RECOVERY	%	0.0	0.0	70.6	29.4	0.0		

Appendix Table 3.6.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 23 to 27 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614F

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

SPRING CHINOOK

Brands Used: LAW 2
Wire Codes Used: 231907

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	1	0	3	0.060
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.	0	0	1	0	0	1	0.020
HATCHERIES (GENERAL)	0	0	2	0	0	2	0.040
STREAM SURVEY	0	0	1	0	0	1	0.020
TOTALS	0	0	6	1	0	7	0.140
PERCENT OF RECOVERY %	0.0	0.0	85.7	14.3	0.0		

Appendix Table 3.7.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 29 April to 3 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8614G

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE
SPRING CHINOOK

Brands Used: LAW 3
Wire Codes Used: 231908

NUMBER RELEASED: 500[illegible]

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	1	0	2	0.040
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	6	2	0	8	0.160
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	1	0	0	1	0.020
RAPID RIVER H.	0	1	2	0	0	3	0.060
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	10	3	0	14	0.280
PERCENT OF RECOVERY %	0.0	7.1	71.4	21.4	0.0		

Appendix Table 3.8.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 3 to 15 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86145

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

SPRING CHINOOK

Brands Used: LAW 4
Wire Codes Used: 231909

NUMBER RELEASED: 4938

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	3	1	0	4	0.080
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
HATCHERIES (GENERAL)		0	0	2	0	0	2	0.040
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	5	1	0	6	0.120
PERCENT OF RECOVERY	%	0.0	0.0	83.3	16.7	0.0		

Appendix Table 3.9.--Recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam from 15 to 31 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86141

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE
SPRING CHINOOK

Brands Used: LAL 1
Wire Codes Used: 231863

NUMBER RELEASED: 4933

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	1	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	6	0	8	0.162
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	2	0	0	2	0.041
HATCHERIES (GENERAL)	0	0	2	3	0	5	0.101
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	6	10	0	16	0.324
PERCENT OF RECOVERY %	0.0	0.0	37.5	62.5	0.0		

Appendix Table 4.0.--Summary of all recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite to below Bonneville Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612A 8612B 8612C 8612D 8612E 8612F 8612G 8612H 8612I

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 1 RAL 2 RAL 3 RAL 4 RAV 1 RAV 2 RAV 3 RAV 4 RAP 1
Wire Codes Used: 231910 231911 231912 231913 231914 231915 231916 231917 231918

NUMBER RELEASED: 45004

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	7	6	0	13	0.029
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	7	41	26	0	74	0.164
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	1	5	0	0	6	0.013
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.002
CLEARWATER R.	0	0	0	1	0	1	0.002
RIVER COMMERCIAL							
COL. R. TEST FSHRY (ORE)	0	0	0	1	0	1	0.002
INDIAN FISHERY							
INDIAN FISHERY	0	0	2	2	0	4	0.009
INDIAN CEREMONIAL	0	0	4	2	0	6	0.013
HATCHERIES							
DWORSHAK H.	0	0	1	1	0	2	0.004
RAPID RIVER H.	0	1	15	2	0	18	0.040
	0	0	4	0	0	4	0.009
HATCHERIES (GENERAL)	0	0	3	1	0	4	0.009
STREAM SURVEY	0	0	1	0	0	1	0.002
OTHER	0	0	1	1	0	2	0.004
TOTALS	0	9	85	43	0	137	0.304
PERCENT OF RECOVERY %	0.0	6.6	62.0	31.4	0.0		

Appendix Table 4.1.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 10 to 12 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612A

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAL 1
Wire Codes Used: 231910

NUMBER RELEASED: 500

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	1	1	0	4	0.080
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	2	0	0	2	0.040
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
OTHER	0	0	0	1	0	1	0.020
TOTALS	0	2	4	2	0	8	0.160
PERCENT OF RECOVERY %	0.0	25.0	50.0	25.0	0.0		

Appendix Table 4.2.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 12 to 16 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612B

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 2
Wire Codes Used: 231911

NUMBER RELEASED: 5091

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	2	0	0	2	0.040
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	5	2	0	8	0.160
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.020
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL	0	0	2	0	0	2	0.040
HATCHERIES							
RAPID RIVER H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	11	2	0	14	0.280
PERCENT OF RECOVERY - %	0.0	7.1	78.6	14.3	0.0		

Appendix Table 4.3.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam on 16 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612C

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 3
Wire Codes Used: 231912

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	2	1	0	3	0.060
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	3	2	2	0	6	0.120
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN FISHERY	0	0	0	1	0	1	0.020
HATCHERIES							
DWORSHAK H.	0	0	1	0	0	1	0.020
RAPID RIVER H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	1	0	0	1	0.020
TOTALS	0	2	8	4	0	14	0.280
PERCENT OF RECOVERY %	0.0	14.3	57.1	28.6	0.0		

Appendix Table 4.4.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 18 to 20 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612D

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 4
Wire Codes Used: 231913

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	4	0	5	0.100
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	0	1	0	1	0.020
RAPID RIVER H.	0	0	2	0	0	2	0.040
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	3	5	0	8	0.160
PERCENT OF RECOVERY %	0.0	0.0	37.5	62.5	0.0		

Appendix Table 4.5.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below bonneville Dam from 20 to 22 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612E

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAV 1
Wire Codes Used: 231914

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	3	2	0	5	0.100
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	8	3	0	13	0.260
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN FISHERY	0	0	1	1	0	2	0.040
HATCHERIES							
RAPID RIVER H.	0	1	3	1	0	5	0.100
HATCHERIES (GENERAL)	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
OTHER	0	0	1	0	0	1	0.020
TOTALS	0	3	18	7	0	28	0.560
PERCENT OF RECOVERY %	0.0	10.7	64.3	25.0	0.0		

Appendix Table 4.6.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 24 to 28 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612F

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 2
Wire Codes Used: 231915

NUMBER RELEASED: 5000

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	2	0	2	0.040
MCNARY TRAP		0	0	0	3	0	3	0.060
LOWER GRANITE TRAP		0	0	8	6	0	14	0.280
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
RAPID RIVER H.		0	0	3	1	0	4	0.080
		0	0	2	0	0	2	0.040
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	13	9	0	22	0.440
PERCENT OF RECOVERY	%	0.0	0.0	59.1	40.9	0.0		

Appendix Table 4.7.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 28 April to 2 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612G

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 3
Wire Codes Used: 231916

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	1	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	5	3	0	8	0.160
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
CLEARWATER R.	0	0	0	1	0	1	0.020
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL	0	0	1	0	0	1	0.020
HATCHERIES							
RAPID RIVER H.	0	0	3	0	0	3	0.060
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	10	5	0	15	0.300
PERCENT OF RECOVERY %	0.0	0.0	66.7	33.3	0.0		

Appendix Table 4.8.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 5 to 14 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8612H

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 4
Wire Codes Used: 231917

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	3	1	0	4	0.080
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN FISHERY	0	0	1	0	0	1	0.020
HATCHERIES							
RAPID RIVER H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	5	1	0	6	0.120
PERCENT OF RECOVERY %	0.0	0.0	83.3	16.7	0.0		

Appendix Table 4.9.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 14 May to 3 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86121

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAP 1
Wire Codes Used: 231918

NUMBER RELEASED: 5003

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	8	4	0	12	0.240
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	1	0	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COL. R. TEST FSHRY (ORE)	0	0	0	1	0	1	0.020
INDIAN FISHERY							
INDIAN CEREMONIAL	0	0	1	2	0	3	0.060
HATCHERIES							
	0	0	2	0	0	2	0.040
HATCHERIES (GENERAL)	0	0	2	1	0	3	0.060
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	13	8	0	22	0.440
PERCENT OF RECOVERY %	0.0	4.5	59.1	36.4	0.0		

Appendix Table 5.0.--Summary of all recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706A 8706B 8706C 8706D 8706E 8706F 8706G 8706H 8706I 8706J 8706K

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RA2 1 RA2 2 RA2 3 RA2 4 RA9 3 RA9 4 RASU1 RASU3 RASU2 RA9 1 RA9 2
Wire Codes Used: 231943 231944 231945 231946 232018 232019 232022 232029 232026 231947 231948

NUMBER RELEASED: 50207

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	11	1	12	0.024
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	12	66	13	91	0.181
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	2	0	0	2	0.004
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	1	0	0	1	0.002
RIVER COMMERCIAL						
COL. R. TEST FSHRY (ORE)	0	0	1	0	1	0.002
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	2	0	2	0.004
HATCHERIES						
DWORSHAK H.	0	0	21	0	21	0.042
RAPID RIVER H.	0	0	10	0	10	0.020
KOOSKIA H.	0	0	1	0	1	0.002
	0	0	2	0	2	0.004
HATCHERIES (GENERAL)	0	0	3	0	3	0.006
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	15	117	14	146	0.291
PERCENT OF RECOVERY %	0.0	10.3	80.1	9.6		

Appendix Table 5.1.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 10 to 16 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706A

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA2 1
Wire Codes Used: 231943

NUMBER RELEASED: 4226

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	2	0	2	0.047
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	4	1	5	0.118
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	1	0	0	1	0.024
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COL. R. TEST FSHRY (ORE)	0	0	1	0	1	0.024
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	5	0	5	0.118
HATCHERIES (GENERAL)	0	0	1	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	13	1	15	0.355
PERCENT OF RECOVERY %	0.0	6.7	86.7	6.7		

Appendix Table 5.2.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 16 to 18 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706B

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA2 2
Wire Codes Used: 231944

NUMBER RELEASED: 5136

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	2	6	0	8	0.156
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.		0	0	5	0	5	0.097
		0	0	1	0	1	0.019
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	2	12	0	14	0.273
PERCENT OF RECOVERY	%	0.0	14.3	85.7	0.0		

Appendix Table 5.3.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 18 to 20 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706C

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RA2 3
Wire Codes Used: 231945

NUMBER RELEASED: 4636

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	1	1	2	0.043
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	15	1	18	0.388
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	1	0	0	1	0.022
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	6	0	6	0.129
RAPID RIVER H.	0	0	3	0	3	0.065
KOOSKIA H.	0	0	1	0	1	0.022
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	3	26	2	31	0.669
PERCENT OF RECOVERY %	0.0	9.7	83.9	6.5		

Appendix Table 5.4.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 20 to 22 April 1987.

Master File Date : 13 July 1990
RELEASE GROUPS INCLUDED: 8706D

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA2 4
Wire Codes Used: 231946

NUMBER RELEASED: 4929

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	1	[illegible]	1	0.020
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	8	5	14	0.284
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	1	0	1	0.020
RAPID RIVER H.	0	0	1	0	1	0.020
HATCHERIES (GENERAL)	0	0	1	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	12	5	18	0.365
PERCENT OF RECOVERY %	0.0	5.6	66.7	27.8		

Appendix Table 5.5.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 24 to 26 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 87065

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: FA9 3
Wire Codes Used: 232018

NUMBER RELEASED: 4446

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	2	0	2	0.045
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.		0	0	1	0	1	0.022
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	0	3	0	3	0.067
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0		

Appendix Table 5.6.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 26 to 28 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706F

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RA9 4
Wire Codes Used: 232019

NUMBER RELEASED: 4843

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	0	1	0.021
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.		0	0	1	0	1	0.021
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	0	2	0	2	0.041
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0		

Appendix Table 5.7.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 30 April to 1 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 87066

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RASO1
Wire Codes Used: 232022

NUMBER RELEASED: 4815

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	1	3	0	4	0.083
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.		0	0	1	0	1	0.021
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	1	4	0	5	0.104
PERCENT OF RECOVERY	%	0.0	20.0	80.0	0.0		

Appendix Table 5.8.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 1 to 4 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706H

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RASO3
Wire Codes Used: 232029

NUMBER RELEASED: 5059

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	1	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	3	6	1	10	0.198
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	1	0	0	1	0.020
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	4	7	1	12	0.237
PERCENT OF RECOVERY %	0.0	33.3	58.3	8.3		

Appendix Table 5.9.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 4 to 12 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 87081

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RASQ2
Wire Codes Used: 232023

NUMBER RELEASED: 2681

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	6	0	6	0.224
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	7	2	9	0.336
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	1	0	1	0.037
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	14	2	16	0.597
PERCENT OF RECOVERY %	0.0	0.0	87.5	12.5		

Appendix Table 5.10.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 12 to 13 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706J

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RA9 1
Wire Codes Used: 231947

NUMBER RELEASED: 5070

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	3	9	2	14	0.276
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.		0	0	3	0	3	0.059
RAPID RIVER H.		0	0	2	0	2	0.039
		0	0	1	0	1	0.020
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	3	15	2	20	0.394
PERCENT OF RECOVERY	%	0.0	15.0	75.0	10.0		

Appendix Table 5.11.--Recoveries of adult spring chinook salmon transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 15 to 27 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8706K

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA9 2
Wire Codes Used: 231948

NUMBER RELEASED: 4366

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	5	1	6	0.137
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL		0	0	1	0	1	0.023
HATCHERIES							
RAPID RIVER H.		0	0	2	0	2	0.046
HATCHERIES (GENERAL)		0	0	1	0	1	0.023
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	0	9	1	10	0.229
PERCENT OF RECOVERY	%	0.0	0.0	90.0	10.0		

Appendix Table 6.0.--Summary of all recoveries of adult spring chinook salmon released as juveniles below Little Goose Dam in 1989.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8907A 8907B 8907C 8907D 8907E 8907F 8907G 8907H 8907I 8907J 8907K 8907L

1989 L.GRANITE TRANS CONTROL BELOW L.GOOSE

SPRING CHINOOK

Brands Used:	LA2 1	LA2 2	LA2 3	LA2 4	LART1	LART2	LART3	LART4	LA3 1	LA3 2	LA3 3	LA3 4
Wire Codes Used:	[illegible]	232258	232349	232350	232351	232352	232411	232412	232413	232414	232415	232416

NUMBER RELEASED: 107176

RECOVERY AREA		YEAR OF RETURN 1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP		0	1	1	0.001
MCNARY TRAP		0	0	0	0.000
LOWER GRANITE TRAP		0	1	1	0.001
PRIEST RAPIDS TRAP		0	0	0	0.000
OCEAN FISHERIES		0	0	0	0.000
RIVER SPORT		0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0.000
INDIAN FISHERY		0	0	0	0.000
HATCHERIES		0	0	0	0.000
STREAM SURVEY		0	0	0	0.000
TOTALS		0	2	2	0.002
PERCENT OF RECOVERY	%	0.0	100.0		

Appendix Table 7.0.--Summary of all recoveries of adult spring chinook salmon transported as juveniles from Lower Granite Dam to below Bonneville Dam in 1989.

Master File Date : 16 July 1990
RELEASE GROUPS INCLUDED: 8908A 8908B 8908C 8908D 8908E 8908F 8908G 8908H 8908I 8908J 8908K 8908L

1989 L.GRANITE TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAF 1 RAF 2 RAF 3 RAF 4 RA9 1 RA9 2 RA9 3 RA9 4 RASU1 RASU2 RASU3 RASU4
Wire Codes Used: 232252 232259 232262 232309 232310 232311 232312 232313 232340 232354 232251 232251

NUMBER RELEASED: 75295

RECOVERY AREA	YEAR OF RETURN 1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS				
BONNEVILLE TRAP	0	0	0	0.000
MCNARY TRAP	0	0	0	0.000
LOWER GRANITE TRAP	0	2	2	0.003
PRIEST RAPIDS TRAP	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0.000
RIVER SPORT	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0.000
INDIAN FISHERY	0	0	0	0.000
HATCHERIES	0	0	0	0.000
STREAM SURVEY	0	0	0	0.000
TOTALS	0	2	2	0.003
PERCENT OF RECOVERY %	0.0	100.0		

Appendix Table 8.0.--Summary of all recoveries of adult steelhead released as juveniles below Little Goose Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611A 8611B 8611C 8611D 8611E 8611F 8611G 8611H

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAP 1 LAP 2 LAP 3 LAP 4 LAW 1 LAW 2 LAW 3 LAW 4
Wire Codes Used: 231902 231903 231904 231915 231905 231906 231907 231908

NUMBER RELEASED: 31414

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	2	3	0	0	5	0.016
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	60	110	7	0	177	0.563
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	1	6	0	0	7	0.022
CLEARWATER R.	0	0	15	3	0	18	0.057
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	10	1	0	11	0.035
PAHSIMEROI H.	0	3	0	0	0	3	0.010
	0	3	0	0	0	3	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	69	144	11	0	224	0.713
PERCENT OF RECOVERY %	0.0	30.8	64.3	4.9	0.0		

Appendix Table 8.1.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 15 to 27 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611A

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAP 1
Wire Codes Used: 231962

NUMBER RELEASED: 4319

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.023
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	25	16	0	0	41	0.949
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	1	0	0	0	1	0.023
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
PAHSIMEROI H.	0	2	0	0	0	2	0.046
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	28	17	0	0	45	1.042
PERCENT OF RECOVERY %	0.0	62.2	37.8	0.0	0.0		

Appendix Table 8.2.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 29 April to 1 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611B

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAP 2
Wire Codes Used: 231903

NUMBER RELEASED: 4176

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	9	10	1	0	20	0.479
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.024
CLEARWATER R.	0	0	1	0	0	1	0.024
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	1	1	0	2	0.048
PAHSIMEROI H.	0	1	0	0	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	10	13	2	0	25	0.599
PERCENT OF RECOVERY %	0.0	40.0	52.0	8.0	0.0		

Appendix Table 8.3.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 1 to 8 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611C

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAP 3
Wire Codes Used: 231904

NUMBER RELEASED: 4966

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	15	1	0	18	0.362
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.020
CLEARWATER R.	0	0	4	0	0	4	0.081
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	2	0	0	2	0.040
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	2	23	1	0	26	0.524
PERCENT OF RECOVERY - %	0.0	7.7	88.5	3.8	0.0		

Appendix Table 8.4.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 8 to 13 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611D

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAP 4
Wire Codes Used: 231915

NUMBER RELEASED: 4150

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	2	0	0	0	2	0.048
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	7	15	2	0	24	0.578
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	2	0	0	2	0.048
CLEARWATER R.	0	0	4	2	0	6	0.145
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	4	0	0	4	0.096
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	9	25	4	0	38	0.916
PERCENT OF RECOVERY - %	0.0	23.7	65.8	10.5	0.0		

Appendix Table 8.5.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 13 to 17 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611E

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAW 1
Wire Codes Used: 231905

NUMBER RELEASED: 4249

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	6	25	0	0	31	0.730
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	2	0	0	2	0.047
CLEARWATER R.	0	0	2	0	0	2	0.047
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	2	0	0	2	0.047
	0	3	0	0	0	3	0.071
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	9	31	0	0	40	0.941
PERCENT OF RECOVERY %	0.0	22.5	77.5	0.0	0.0		

Appendix Table 8.6.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 17 to 22 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611F

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAW 2
Wire Codes Used: 231906

NUMBER RELEASED: 4250

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	8	15	1	0	24	0.565
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
CLEARWATER R.	0	0	3	1	0	4	0.094
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	1	0	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	8	19	2	0	29	0.682
PERCENT OF RECOVERY %	0.0	27.6	65.5	6.9	0.0		

Appendix Table 8.7.--Recoveries of adult steelhead released as juveniles below Little Goose Dam from 22 to 27 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611G

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAW 3
Wire Codes Used: 231907

NUMBER RELEASED: 4250

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	12	2	0	15	0.353
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
CLEARWATER R.	0	0	1	0	0	1	0.024
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	13	2	0	16	0.376
PERCENT OF RECOVERY %	0.0	6.3	81.3	12.5	0.0		

Appendix Table 8.8.--Recoveries of adult steelhead released as juveniles below Little Goose Dam on 27 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8611H

1986 L.GRANITE TRANS CONTROL BELOW L.GOOSE

STEELHEAD

Brands Used: LAW 4
Wire Codes Used: 231906

NUMBER RELEASED: 1054

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	1	0	0	1	0.095
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	2	2	0	0	4	0.380
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	2	3	0	0	5	0.474
PERCENT OF RECOVERY	%	0.0	40.0	60.0	0.0	0.0		

Appendix Table 9.0.--Summary of all recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613A 8613B 8613C 8613D 8613E 8613F 8613G

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAL 1 RAL 2 RAL 3 RAL 4 RAV 1 RAV 2 RAV 3
Wire Codes Used: 231910 231911 231912 231913 231914 231916 231917

NUMBER RELEASED: 30659

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	10	4	0	0	14	0.046
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	87	241	9	0	337	1.099
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	3	9	1	0	13	0.042
CLEARWATER R.	0	1	27	1	0	29	0.095
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
CLEARWATER INDIAN	0	1	0	2	0	3	0.010
HATCHERIES							
DWORSHAK H.	0	0	26	2	0	28	0.091
PAHSIMEROI H.	0	3	2	0	0	5	0.016
STREAM SURVEY	0	0	0	0	0	0	0.000
OTHER	0	0	0	2	0	2	0.007
TOTALS	0	105	309	17	0	431	1.406
PERCENT OF RECOVERY %	0.0	24.4	71.7	3.9	0.0		

Appendix Table 9.1.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 16 to 28 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613A

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAL 1
Wire Codes Used: 231910

NUMBER RELEASED: 4904

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	1	1	0	0	2	0.041
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	33	51	2	0	86	1.754
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.020
CLEARWATER R.	0	0	3	0	0	3	0.061
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
CLEARWATER INDIAN	0	1	0	0	0	1	0.020
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
OTHER	0	0	0	1	0	1	0.020
TOTALS	0	35	56	3	0	94	1.917
PERCENT OF RECOVERY %	0.0	37.2	59.6	3.2	0.0		

Appendix Table 9.2.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 28 to 30 April 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613B

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAL 2
Wire Codes Used: 231911

NUMBER RELEASED: 4250

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.024
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	5	12	1	0	18	0.424
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.024
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	1	0	0	1	0.024
PAHSIMEROI H.	0	1	0	0	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	6	15	1	0	22	0.518
PERCENT OF RECOVERY - %	0.0	27.3	68.2	4.5	0.0		

Appendix Table 9.3.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 2 to 9 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613C

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAL 3
Wire Codes Used: 231912

NUMBER RELEASED: 4247

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	3	0	0	0	3	0.071
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	13	19	1	0	33	0.777
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	1	0	0	1	0.024
CLEARWATER R.	0	0	1	1	0	2	0.047
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
CLEARWATER INDIAN	0	0	0	1	0	1	0.024
HATCHERIES							
DWORSHAK H.	0	0	5	0	0	5	0.118
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	16	26	3	0	45	1.060
PERCENT OF RECOVERY %	0.0	35.6	57.8	6.7	0.0		

Appendix Table 9.4.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 9 to 14 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613D

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAL 4
Wire Codes Used: 231913

NUMBER RELEASED: 4250

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	2	0	0	0	2	0.047
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	7	41	1	0	49	1.153
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
CLEARWATER R.	0	0	9	0	0	9	0.212
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
CLEARWATER INDIAN	0	0	0	1	0	1	0.024
HATCHERIES							
DWORSHAK H.	0	0	8	1	0	9	0.212
PAHSIMEROI H.	0	2	0	0	0	2	0.047
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	11	58	3	0	72	1.694
PERCENT OF RECOVERY %	0.0	15.3	80.6	4.2	0.0		

Appendix Table 9.5.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 14 to 19 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613E

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAV 1
Wire Codes Used: 231914

NUMBER RELEASED: 4244

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	3	0	0	0	3	0.071
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	10	46	2	0	58	1.367
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	1	0	0	0	1	0.024
CLEARWATER R.	0	1	5	0	0	6	0.141
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	11	1	0	12	0.283
PAHSIMEROI H.	0	0	1	0	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	15	63	3	0	81	1.909
PERCENT OF RECOVERY %	0.0	18.5	77.8	3.7	0.0		

Appendix Table 9.6.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 19 to 23 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613F

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAV 2
Wire Codes Used: 231916

NUMBER RELEASED: 4514

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	2	0	0	2	0.044
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	14	52	0	0	66	1.462
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	1	4	0	0	5	0.111
CLEARWATER R.	0	0	6	0	0	6	0.133
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	1	0	0	1	0.022
PAHSIMEROI H.	0	0	1	0	0	1	0.022
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	15	66	0	0	81	1.794
PERCENT OF RECOVERY %	0.0	18.5	81.5	0.0	0.0		

Appendix Table 9.7.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 23 May to 3 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8613G

1986 L.GRANITE TRANS BARGE BELOW BONNEVILLE

STEELHEAD

Brands Used: RAV 3
Wire Codes Used: 231917

NUMBER RELEASED: 4250

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	1	0	0	0	1	0.024
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	5	20	2	0	27	0.635
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	1	2	1	0	4	0.094
CLEARWATER R.	0	0	3	0	0	3	0.071
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
OTHER	0	0	0	1	0	1	0.024
TOTALS	0	7	25	4	0	36	0.847
PERCENT OF RECOVERY %	0.0	19.4	69.4	11.1	0.0		

Appendix Table 10.0.--Summary of all recoveries of adult steelhead transported as juveniles from Lower Granite Dam to below Bonneville Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707A 8707B 8707C 8707D 8707E 8707F 8707G

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

STEELHEAD

Brands Used: RA2 1 RA2 2 RA2 3 RA2 4 RASU1 RASU2 RASU3
Wire Codes Used: 231943 231944 231945 231946 231947 231948 232030

NUMBER RELEASED: 27544

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	10	3	0	13	0.047
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	103	390	0	493	1.790
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	1	0	1	0.004
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	17	40	0	57	0.207
CLEARWATER R.	0	5	56	0	61	0.221
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.004
CLEARWATER INDIAN	0	0	2	0	2	0.007
HATCHERIES						
DWORSHAK H.	0	2	52	0	54	0.196
PAHSIMEROI H.	0	3	2	0	5	0.018
HATCHERIES (GENERAL)	0	1	0	0	1	0.004
STREAM SURVEY	0	0	0	0	0	0.000
OTHER	0	0	1	0	1	0.004
TOTALS	0	141	548	0	689	2.501
PERCENT OF RECOVERY %	0.0	20.5	79.5	0.0		

Appendix Table 10.1.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 16 to 30 April 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707A

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE
STEELHEAD

Brands Used: RA2 1
Wire Codes Used: 231943

NUMBER RELEASED: 3869

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.026
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	15	97	0	112	2.895
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	1	0	1	0.026
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	3	10	0	13	0.336
CLEARWATER R.	0	1	19	0	20	0.517
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
CLEARWATER INDIAN	0	0	2	0	2	0.052
HATCHERIES						
DWORSHAK H.	0	1	13	0	14	0.362
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	21	142	0	163	4.213
PERCENT OF RECOVERY %	0.0	12.9	87.1	0.0		

Appendix Table 10.2.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 30 April to 2 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707B

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE STEELHEAD

Brands Used: RA2 2
Wire Codes Used: 231944

NUMBER RELEASED: 3829

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	2	0	0	2	0.052
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0.000
CLEARWATER R.	0	0	1	0	1	0.026
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	1	23	0	24	0.627
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	3	24	0	27	0.705
PERCENT OF RECOVERY %	0.0	11.1	88.9	0.0		

Appendix Table 10.3.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 2 to 7 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707C

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

STEELHEAD

Brands Used: RA2 3
Wire Codes Used: 231945

NUMBER RELEASED: 4168

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	1	0	1	0.024
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	21	68	0	89	2.135
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	3	12	0	15	0.360
CLEARWATER R.	0	0	9	0	9	0.216
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	7	0	7	0.168
PAHSIMEROI H.	0	0	1	0	1	0.024
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	24	98	0	122	2.927
PERCENT OF RECOVERY %	0.0	19.7	80.3	0.0		

Appendix Table 10.4.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam on 7 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707D

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

STEELHEAD

Brands Used: RA2 4
Wire Codes Used: 231946

NUMBER RELEASED: 2487

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	4	0	0	4	0.161
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	32	120	0	152	6.112
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	5	7	0	12	0.483
CLEARWATER R.	0	2	14	0	16	0.643
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	2	0	2	0.080
STREAM SURVEY	0	0	0	0	0	0.000
OTHER	0	0	1	0	1	0.040
TOTALS	0	43	144	0	187	7.519
PERCENT OF RECOVERY %	0.0	23.0	77.0	0.0		

Appendix Table 10.5.--Recoveries of adult steelhead transported by barge from Lower Granite Dam to below Bonneville Dam from 8 to 12 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707E

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

STEELHEAD

Brands Used: RAS01
Wire Codes Used: 231947

NUMBER RELEASED: 4298

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	4	2	0	6	0.140
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	19	61	0	80	1.861
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	3	3	0	6	0.140
CLEARWATER R.	0	1	5	0	6	0.140
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.023
HATCHERIES						
DWORSHAK H.	0	0	5	0	5	0.116
PAHSIMEROI H.	0	3	0	0	3	0.070
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	30	77	0	107	2.490
PERCENT OF RECOVERY %	0.0	28.0	72.0	0.0		

Appendix Table 10.6.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 13 to 14 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707F

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE

STEELHEAD

Brands Used: RASU2
Wire Codes Used: 231948

NUMBER RELEASED: 4275

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	7	24	0	31	0.725
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	1	6	0	7	0.164
CLEARWATER R.	0	0	2	0	2	0.047
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
PAHSIMEROI H.	0	0	1	0	1	0.023
HATCHERIES (GENERAL)	0	1	0	0	1	0.023
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	9	33	0	42	0.982
PERCENT OF RECOVERY %	0.0	21.4	78.6	0.0		

Appendix Table 10.7.--Recoveries of adult steelhead transported as juveniles by barge from Lower Granite Dam to below Bonneville Dam from 15 to 27 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8707G

1987 L.GRANITE BARGE INDEX BELOW BONNEVILLE STEELHEAD

Brands Used: RAS03
Wire Codes Used: 232030

NUMBER RELEASED: 4618

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.022
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	7	20	0	27	0.585
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	2	2	0	4	0.087
CLEARWATER R.	0	1	6	0	7	0.152
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	2	0	2	0.043
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	11	30	0	41	0.888
PERCENT OF RECOVERY %	0.0	26.8	73.2	0.0		

Appendix Table 11.0.--Summary of all recoveries of adult spring chinook salmon released as juveniles below McNary Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602A 8602B 8602C 8602D 8602E 8602F 8602G 8602H 8602I 8602J

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LA153 LAIV3 LAID3 LAIM3 LAIF3 LA151 LAIV1 LAID1 LAIM1 LAIF1
Wire Codes Used: 231729 231845 231847 231849 231851 231853 231855 231857 231859 231919

NUMBER RELEASED: 50273

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	1	0	3	0.006
PRIEST RAPIDS TRAP	0	1	3	0	0	4	0.008
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.002
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	0	1	0.002
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
RAPID RIVER H.	0	0	2	0	0	2	0.004
LEAVENWORTH H.	0	0	2	0	0	2	0.004
ENTIAT H.	0	0	1	0	0	1	0.002
	0	0	0	1	0	1	0.002
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	2	11	2	0	15	0.030
PERCENT OF RECOVERY %	0.0	13.3	73.3	13.3	0.0		

Appendix Table 11.1.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 23 April to 5 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602A

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LA153
Wire Codes Used: 231729

NUMBER RELEASED: 5620

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	0	0	1	0.018
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
RAPID RIVER H.		0	0	2	0	0	2	0.036
LEAVENWORTH H.		0	0	1	0	0	1	0.018
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	4	0	0	4	0.071
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0	0.0		

Appendix Table 11.2.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 7 to 9 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602C

1986 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LAID3
Wire Codes Used: 231847

NUMBER RELEASED: 5168

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	1	0	0	1	0.019
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	1	0	0	1	0.019
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0	0.0		

Appendix Table 11.3.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 11 to 12 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602E

1986 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LAIF3
Wire Codes Used: 231851

NUMBER RELEASED: 5329

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
ENTIAT H.		0	0	1	0	0	1	0.019
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	1	0	0	1	0.019
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0	0.0		

Appendix Table 11.4.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 12 to 14 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602F

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LA151
Wire Codes Used: 231853

NUMBER RELEASED: 5158

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	1	0	0	1	0.019
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	1	0	0	1	0.019
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0	0.0		

Appendix Table 11.5.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 14 to 17 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602G

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAIV1
Wire Codes Used: 231855

NUMBER RELEASED: 5043

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.020
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	0	1	0.020
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	2	0	0	0	2	0.040
PERCENT OF RECOVERY %	0.0	100.0	0.0	0.0	0.0		

Appendix Table 11.6.--Recoveries of adult spring chinook salmon released as juveniles below McNary dam from 20 to 24 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602I

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAIM1
Wire Codes Used: 231859

NUMBER RELEASED: 5079

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	1	0	0	1	0.020
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
LEAVENWORTH H.	0	0	1	0	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	3	0	0	3	0.059
PERCENT OF RECOVERY %	0.0	0.0	100.0	0.0	0.0		

Appendix Table 11.7.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 27 May to 6 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8602J

1986 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAIF1
Wire Codes Used: 231919

NUMBER RELEASED: 3472

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	0	2	0.058
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	1	0	1	0.029
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	1	2	0	3	0.086
PERCENT OF RECOVERY	%	0.0	0.0	33.3	66.7	0.0		

Appendix Table 12.0.--Summary of all recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8601A 8601B 8601C 8601D 8601E 8601F 8601G 8601H 8601I 8601J

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAIU1 RAIC3 RAIF1 RAID1 RAIM1 RAIU3 LAIU3 RAIF3 RAID3 RAIM3
Wire Codes Used: 231846 231848 231850 231852 231854 231856 231858 231860 231861 231920

NUMBER RELEASED: 49274

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	2	1	0	3	0.006
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	0	0	1	0.002
PRIEST RAPIDS TRAP	0	1	2	0	0	3	0.006
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
DWORSHAK H.	0	0	0	1	0	1	0.002
WINTHROP H.	0	0	1	0	0	1	0.002
LEAVENWORTH H.	0	1	0	0	0	1	0.002
	0	0	1	0	0	1	0.002
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	2	7	2	0	11	0.022
PERCENT OF RECOVERY %	0.0	18.2	63.6	18.2	0.0		

Appendix Table 12.1.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 23 April to 6 May 1986.

Master File Date : 13 July 1990
RELEASE GROUPS INCLUDED: 86011

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAIT;
Wire Codes Used: 23-42

NUMBER RELEASED: 5235

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
DWORSHAK H.		0	0	0	1	0	1	0.019
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	0	0	1	0	1	0.019
PERCENT OF RECOVERY	%	0.0	0.0	0.0	100.0	0.0		

Appendix Table 12.2.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 6 to 7 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8601B

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAIC3
Wire Codes Used: 231343

NUMBER RELEASED: 4936

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	1	0	0	0	1	0.020
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	1	0	0	0	1	0.020
PERCENT OF RECOVERY	%	0.0	100.0	0.0	0.0	0.0		

Appendix Table 12.3.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 17 to 20 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8601H

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAIF3
Wire Codes Used: 231860

NUMBER RELEASED: 5099

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	1	0	0	1	0.020
PERCENT OF RECOVERY %	0.0	0.0	100.0	0.0	0.0		

Appendix Table 12.4.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 20 to 24 May 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8601I

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAID3
Wire Codes Used: 231861

NUMBER RELEASED: 5032

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
LEAVENWORTH H.		0	1	0	0	0	1	0.020
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	1	0	0	0	1	0.020
PERCENT OF RECOVERY	%	0.0	100.0	0.0	0.0	0.0		

Appendix Table 12.5.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 27 May to 6 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8601J

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAIM3
Wire Codes Used: 231920

NUMBER RELEASED: 3513

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	1	0	2	0.057
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	0	0	1	0.028
PRIEST RAPIDS TRAP	0	0	2	0	0	2	0.057
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
WINTHROP H.	0	0	1	0	0	1	0.028
	0	0	1	0	0	1	0.028
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	6	1	0	7	0.199
PERCENT OF RECOVERY %	0.0	0.0	85.7	14.3	0.0		

Appendix Table 13.0.--Summary of all recoveries of adult spring chinook salmon released as juveniles below McNary Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702A 8702B 8702C 8702D 8702E 8702F 8702G 8702H

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAHE1 LAHE2 LAHE3 LAHE4 LAAN1 LAAN2 LART3 LART4
Wire Codes Used: 231949 231950 231951 231952 231953 231954 231955 231956

NUMBER RELEASED: 57902

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	17	1	19	0.033
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	6	0	6	0.010
PRIEST RAPIDS TRAP	0	0	11	2	13	0.022
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	1	0	1	0.002
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	2	0	3	0.005
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	7	0	7	0.012
HATCHERIES						
DWORSHAK H.	0	0	2	0	2	0.003
RAPID RIVER H.	0	0	3	0	3	0.005
LEAVENWORTH H.	0	0	5	0	5	0.009
ENTIAT H.	0	0	4	0	4	0.007
STREAM SURVEY						
OTHER STREAMS	0	0	1	0	1	0.002
TOTALS	0	2	59	3	64	0.111
PERCENT OF RECOVERY %	0.0	3.1	92.2	4.7		

Appendix Table 13.1.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 21 April to 4 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702A

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAHE1
Wire Codes Used: 231949

NUMBER RELEASED: 7365

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	8	0	8	0.109
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	0	2	0.027
PRIEST RAPIDS TRAP	0	0	1	0	1	0.014
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	2	0	2	0.027
HATCHERIES						
RAPID RIVER H.	0	0	1	0	1	0.014
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	14	0	14	0.190
PERCENT OF RECOVERY %	0.0	0.0	100.0	0.0		

Appendix Table 13.2.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 4 to 7 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702B

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAHE2
Wire Codes Used: 231950

NUMBER RELEASED: 7501

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	4	0	4	0.053
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	0	1	0.013
PRIEST RAPIDS TRAP	0	0	6	1	7	0.093
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	1	0	1	0.013
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	0	1	0	1	0.013
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	13	1	14	0.187
PERCENT OF RECOVERY %	0.0	0.0	92.9	7.1		

Appendix Table 13.3.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 7 to 10 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702C

1987 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LAHE3
Wire Codes Used: 231951

NUMBER RELEASED: 7500

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	2	1	3	0.040
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	0	1	0.013
PRIEST RAPIDS TRAP	0	0	0	1	1	0.013
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	1	0	1	0.013
HATCHERIES						
RAPID RIVER H.	0	0	2	0	2	0.027
LEAVENWORTH H.	0	0	1	0	1	0.013
ENTIAT H.	0	0	3	0	3	0.040
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	10	2	12	0.160
PERCENT OF RECOVERY %	0.0	0.0	83.3	16.7		

Appendix Table 13.4.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 10 to 13 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702D

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAHE4
Wire Codes Used: 231952

NUMBER RELEASED: 7500

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.013
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	0	2	0.027
PRIEST RAPIDS TRAP	0	0	2	0	2	0.027
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	1	0	2	0.027
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	1	0	1	0.013
HATCHERIES						
DWORSHAK H.	0	0	1	0	1	0.013
LEAVENWORTH H.	0	0	1	0	1	0.013
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	2	8	0	10	0.133
PERCENT OF RECOVERY %	0.0	20.0	80.0	0.0		

Appendix Table 13.5.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 13 to 17 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702E

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAAN1 LAAN1
Wire Codes Used: 231953 231953

NUMBER RELEASED: 7501

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
LEAVENWORTH H.	0	0	1	0	1	0.013
ENTIAT H.	0	0	1	0	1	0.013
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	2	0	2	0.027
PERCENT OF RECOVERY %	0.0	0.0	100.0	0.0		

Appendix Table 13.6.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 23 to 27 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702G

1987 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LART3
Wire Codes Used: 231955

NUMBER RELEASED: 7591

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	1	0	1	0.013
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL		0	0	2	0	2	0.027
HATCHERIES		0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	0	3	0	3	0.040
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0		

Appendix Table 13.7.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 27 May to 4 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8702H

1987 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LART4
Wire Codes Used: 231956

NUMBER RELEASED: 5529

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	2	0	2	0.036
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	2	0	2	0.036
OCEAN FISHERIES							
ALASKA		0	0	0	0	0	0.000
BRITISH COLUMBIA		0	0	0	0	0	0.000
WASHINGTON		0	0	0	0	0	0.000
OREGON		0	0	1	0	1	0.018
CALIFORNIA		0	0	0	0	0	0.000
OTHER		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL		0	0	1	0	1	0.018
HATCHERIES							
LEAVENWORTH H.		0	0	2	0	2	0.036
STREAM SURVEY							
OTHER STREAMS		0	0	1	0	1	0.018
TOTALS		0	0	9	0	9	0.163
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0		

Appendix Table 14.0.--Summary of all recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701A 8701B 8701C 8701D 8701E 8701F 8701G 8701H

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAPI1 RAPI2 PAPI3 RAPI4 RA3 1 RA3 2 RA3 3 RA3 4
Wire Codes Used: 232008 232009 232010 232011 232012 232013 232014 232015

NUMBER RELEASED: 38487

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	1	11	2	14	0.036
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	5	2	7	0.018
PRIEST RAPIDS TRAP		0	0	17	3	20	0.052
OCEAN FISHERIES							
ALASKA		0	0	0	0	0	0.000
BRITISH COLUMBIA		0	0	0	0	0	0.000
WASHINGTON		0	0	0	0	0	0.000
OREGON		0	1	0	0	1	0.003
CALIFORNIA		0	0	0	0	0	0.000
OTHER		0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.		0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.		0	0	0	0	0	0.000
WENATCHEE R.		0	5	2	2	9	0.023
SNAKE R.		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL		0	0	3	0	3	0.008
HATCHERIES							
DWORSHAK H.		0	1	2	0	3	0.008
RAPID RIVER H.		0	0	1	0	1	0.003
WINTHROP H.		0	0	1	0	1	0.003
LEAVENWORTH H.		0	0	4	0	4	0.010
ENTIAT H.		0	0	1	0	1	0.003
STREAM SURVEY							
OTHER STREAMS		0	0	2	0	2	0.005
TOTALS		0	8	49	9	66	0.171
PERCENT OF RECOVERY	%	0.0	12.1	74.2	13.6		

Appendix Table 14.1.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 21 April to 4 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701A

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAPI1
Wire Codes Used: 232008

NUMBER RELEASED: 4957

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	2	0	3	0.061
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	2	0	2	0.040
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
DWORSHAK H.	0	1	2	0	3	0.061
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	2	6	0	8	0.161
PERCENT OF RECOVERY %	0.0	25.0	75.0	0.0		

Appendix Table 14.2.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 4 to 7 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701B

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAPI2
Wire Codes Used: 232009

NUMBER RELEASED: 5000

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	1	0	1	0.020
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	2	0.040
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES		0	0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	0	2	1	3	0.060
PERCENT OF RECOVERY	%	0.0	0.0	66.7	33.3		

Appendix Table 14.3.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 7 to 10 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701C

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAPI3
Wire Codes Used: 232010

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	3	2	5	0.100
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	3	0	3	0.060
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	1	0	2	0.040
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	1	0	1	0.020
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	8	2	11	0.220
PERCENT OF RECOVERY %	0.0	9.1	72.7	18.2		

Appendix Table 14.4.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 10 to 13 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701D

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAPI4
Wire Codes Used: 232011

NUMBER RELEASED: 5003

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	0	1	0.020
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	1	0.020
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
RAPID RIVER H.	0	0	1	0	1	0.020
STREAM SURVEY						
OTHER STREAMS	0	0	1	0	1	0.020
TOTALS	0	1	3	0	4	0.080
PERCENT OF RECOVERY - %	0.0	25.0	75.0	0.0		

Appendix Table 14.5.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 13 to 17 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701E

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA3 1
Wire Codes Used: 232012

NUMBER RELEASED: 5000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	3	0	3	0.060
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	9	2	11	0.220
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	1	0	0	1	0.020
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	1	1	3	0.060
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
LEAVENWORTH H.	0	0	1	0	1	0.020
ENTIAT H.	0	0	1	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	2	15	3	20	0.400
PERCENT OF RECOVERY %	0.0	10.0	75.0	15.0		

Appendix Table 14.6.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 17 to 22 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701F

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA3 2
Wire Codes Used: 232013

NUMBER RELEASED: 5002

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	1	0	1	0.020
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	2	0	2	0.040
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	1	0.020
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
LEAVENWORTH H.	0	0	1	0	1	0.020
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	4	0	5	0.100
PERCENT OF RECOVERY %	0.0	20.0	80.0	0.0		

Appendix Table 14.7.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 23 to 27 May 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701G

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA3 3
Wire Codes Used: 232014

NUMBER RELEASED: 5000

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	0	1	0	1	0.020
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	2	0	2	0.040
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY							
INDIAN CEREMONIAL		0	0	1	0	1	0.020
HATCHERIES							
LEAVENWORTH H.		0	0	1	0	1	0.020
STREAM SURVEY							
OTHER STREAMS		0	0	1	0	1	0.020
TOTALS		0	0	6	0	6	0.120
PERCENT OF RECOVERY	%	0.0	0.0	100.0	0.0		

Appendix Table 14.8.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 27 May to 3 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8701H

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RA3 4
Wire Codes Used: 232015

NUMBER RELEASED: 3525

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	1	1	0.028
PRIEST RAPIDS TRAP	0	0	2	1	3	0.085
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	1	2	0.057
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
INDIAN CEREMONIAL	0	0	1	0	1	0.028
HATCHERIES						
WINTHROP H.	0	0	1	0	1	0.028
LEAVENWORTH H.	0	0	1	0	1	0.028
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	5	3	9	0.255
PERCENT OF RECOVERY %	0.0	11.1	55.6	33.3		

Appendix Table 15.0.--Summary of recoveries of adult spring chinook salmon released as juveniles below McNary Dam in 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802A 8802B 8802C 8802D 8802E 8802F 8802G 8802H 8802I 8802J

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used:	LAW 1	LAW 2	LAW 3	LAW 4	LAP 1	LAP 2	LAP 3	LAP 4	LAE 1	LAE 2
Wire Codes Used:	232226	232227	232228	232229	232230	232231	232232	232233	232234	232235

NUMBER RELEASED: 75036

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	1	22	23	0.031
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	7	8	0.011
PRIEST RAPIDS TRAP	0	1	14	15	0.020
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT					
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0.000
WENATCHEE R.	0	0	1	1	0.001
SNAKE R.	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES					
RAPID RIVER H.	0	1	0	1	0.001
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	4	44	48	0.064
PERCENT OF RECOVERY %	0.0	8.3	91.7		

Appendix Table 15.1.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 8 to 16 April 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802A

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAW 1
Wire Codes Used: 232226

NUMBER RELEASED: 7504

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	6	6	0.080
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	1	0.013
PRIEST RAPIDS TRAP	0	0	5	5	0.067
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	12	12	0.160
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 15.2.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 16 April to 1 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802B

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAW 2
Wire Codes Used: 232227

NUMBER RELEASED: 7500

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	1	10	11	0.147
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	1	1	2	0.027
PRIEST RAPIDS TRAP	0	0	4	4	0.053
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT					
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0.000
WENATCHEE R.	0	0	1	1	0.013
SNAKE R.	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES					
RAPID RIVER H.	0	1	0	1	0.013
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	3	16	19	0.253
PERCENT OF RECOVERY %	0.0	15.8	84.2		

Appendix Table 15.3.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 1 to 6 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802C

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAW 3
Wire Codes Used: 232228

NUMBER RELEASED: 7503

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	3	3	0.040
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	2	2	0.027
PRIEST RAPIDS TRAP	0	1	1	2	0.027
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	1	6	7	0.093
PERCENT OF RECOVERY %	0.0	14.3	85.7		

Appendix Table 15.4.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 6 to 8 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802D

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAW 4
Wire Codes Used: 232229

NUMBER RELEASED: 7534

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	1	1	0.013
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	2	2	0.027
PRIEST RAPIDS TRAP		0	0	1	1	0.013
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	0	4	4	0.053
PERCENT OF RECOVERY	%	0.0	0.0	100.0		

Appendix Table 15.5.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 8 to 10 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802E

1988 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LAP 1
Wire Codes Used: 232230

NUMBER RELEASED: 7503

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	1	1	0.013
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	1	1	0.013
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	2	2	0.027
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 15.6.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 15 to 19 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 88026

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAP 4
Wire Codes Used: 232233

NUMBER RELEASED: 7505

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	1	1	0.013
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	0	1	1	0.013
PERCENT OF RECOVERY	%	0.0	0.0	100.0		

Appendix Table 15.7.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 19 to 24 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802I

1988 MCNARY TRANS CONTROL BELOW MCNARY
SPRING CHINOOK

Brands Used: LAE 1
Wire Codes Used: 232234

NUMBER RELEASED: 7502

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	1	1	0.013
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	1	1	0.013
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 15.8.--Recoveries of adult spring chinook salmon released as juveniles below McNary Dam from 25 May to 2 June 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8802J

1988 MCNARY TRANS CONTROL BELOW MCNARY

SPRING CHINOOK

Brands Used: LAE 2
Wire Codes Used: 232235

NUMBER RELEASED: 7502

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	0.013
PRIEST RAPIDS TRAP		0	0	1	1	0.013
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	0	2	2	0.027
PERCENT OF RECOVERY	%	0.0	0.0	100.0		

Appendix Table 16.0.--Summary of all recoveries of adult spring chinook salmon transported by barge from McNary Dam to below Bonneville Dam in 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801A 8801B 8801C 8801D 8801E 8801F 8801G 8801H 8801I 8801J

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used:	RAL 1	RAL 2	RAL 3	RAL 4	RAV 1	RAV 2	RAV 3	RAV 4	RAS 1	RAS 2
Wire Codes Used:	232236	232237	232238	232239	232240	232241	232242	232243	232244	232245

NUMBER RELEASED: 50028

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	2	17	19	0.038
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	3	5	8	0.016
PRIEST RAPIDS TRAP	0	0	9	9	0.018
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT					
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0.000
WENATCHEE R.	0	0	1	1	0.002
SNAKE R.	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES					
LEAVENWORTH H.	0	1	0	1	0.002
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	6	32	38	0.076
PERCENT OF RECOVERY - %	0.0	15.8	84.2		

Appendix Table 16.1.--Recoveries of adult spring chinook salmon transported as juvenile by barge from McNary Dam to below Bonneville Dam from 8 to 16 April 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801A

1988 MCNARY TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAL 1
Wire Codes Used: 232236

NUMBER RELEASED: 5001

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	1	7	8	0.160
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	2	2	0.040
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	1	9	10	0.200
PERCENT OF RECOVERY	%	0.0	10.0	90.0		

Appendix Table 16.2.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 16 April to 1 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801B

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 2
Wire Codes Used: 232237

NUMBER RELEASED: 5002

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	6	6	0.120
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	0.020
PRIEST RAPIDS TRAP		0	0	5	5	0.100
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	0	12	12	0.240
PERCENT OF RECOVERY	%	0.0	0.0	100.0		

Appendix Table 16.3.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 1 to 6 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801C

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 3
Wire Codes Used: 232238

NUMBER RELEASED: 5002

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	1	1	0.020
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	1	1	0.020
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 16.4.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 6 to 8 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801D

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAL 4
Wire Codes Used: 232239

NUMBER RELEASED: 5011

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	1	1	0.020
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	1	0.020
PRIEST RAPIDS TRAP	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	2	2	0.040
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 16.5.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 8 to 10 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801E

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 1
Wire Codes Used: 232240

NUMBER RELEASED: 5002

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	2	1	3	0.060
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	2	1	3	0.060
PERCENT OF RECOVERY	%	0.0	66.7	33.3		

Appendix Table 16.6.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dan from 10 to 12 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801F

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 2
Wire Codes Used: 232241

NUMBER RELEASED: 5002

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	1	1	0.020
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	0	1	1	0.020
PERCENT OF RECOVERY	%	0.0	0.0	100.0		

Appendix Table 16.7.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 12 to 15 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801G

1988 MCNARY TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAV 3
Wire Codes Used: 232242

NUMBER RELEASED: 5001

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES						
LEAVENWORTH H.		0	1	0	1	0.020
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	1	0	1	0.020
PERCENT OF RECOVERY	%	0.0	100.0	0.0		

Appendix Table 16.8.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 15 to 19 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801H

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAV 4
Wire Codes Used: 232243

NUMBER RELEASED: 5003

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	1	1	0.020
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	1	0	1	0.020
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	1	1	2	0.040
PERCENT OF RECOVERY	%	0.0	50.0	50.0		

Appendix Table 16.9.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 19 to 25 May 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801I

1988 MCNARY TRANS BARGE BELOW BONNEVILLE
SPRING CHINOOK

Brands Used: RAS 1
Wire Codes Used: 232244

NUMBER RELEASED: 5002

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	0	2	2	0.040
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	0	2	2	0.040
PERCENT OF RECOVERY %	0.0	0.0	100.0		

Appendix Table 16.10.--Recoveries of adult spring chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville dam from 25 May to 2 June 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8801J

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

SPRING CHINOOK

Brands Used: RAS 2
Wire Codes Used: 232245

NUMBER RELEASED: 5002

RECOVERY AREA	YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS					
BONNEVILLE TRAP	0	1	0	1	0.020
MCNARY TRAP	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	1	1	0.020
PRIEST RAPIDS TRAP	0	0	1	1	0.020
OCEAN FISHERIES	0	0	0	0	0.000
RIVER SPORT					
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0.000
WENATCHEE R.	0	0	1	1	0.020
SNAKE R.	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0.000
TOTALS	0	1	3	4	0.080
PERCENT OF RECOVERY %	0.0	25.0	75.0		

Appendix Table 17.0.--Summary of all recoveries of adult fall chinook salmon released as juveniles below McNary Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615A 8615B 8615C 8615D 8615E 8615F 8615G 8615H 8615I 8615J 8615K 8615L

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA173 LA3X3 LA3J3 LA3C3 LA3L3 LA7H3 LA103 LA7H1 LA101 LA171 LA3X1 LA3L1
Wire Codes Used: 231921 231923 231925 231927 231929 231931 231933 231935 231937 231939 231941 231844

NUMBER RELEASED: 115991

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	4	0	0	4	0.003
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	3	0	0	0	3	0.003
OCEAN FISHERIES							
ALASKA	0	0	1	11	0	12	0.010
BRITISH COLUMBIA	0	1	3	11	0	15	0.013
WASHINGTON	0	0	2	2	0	4	0.003
OREGON	0	0	5	0	0	5	0.004
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	1	0	1	0.001
COLUMBIA R. ABOVE SNAKE R.	0	1	0	0	0	1	0.001
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	7	0	7	0.006
COL. R. TEST FSHRY (ORE)	0	0	0	1	0	1	0.001
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	16	0	16	0.014
HATCHERIES							
PRIEST RAPIDS H.	0	0	8	0	0	8	0.007
STREAM SURVEY							
OTHER STREAMS	0	1	0	0	0	1	0.001
TOTALS	0	6	23	49	0	78	0.067
PERCENT OF RECOVERY %	0.0	7.7	29.5	62.8	0.0		

Appendix Table 17.1.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 11 to 18 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615A

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA173 LA173
Wire Codes Used: 231921 231921

NUMBER RELEASED: 9969

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.010
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.020
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	3	0	3	0.030
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	0	6	0	7	0.070
PERCENT OF RECOVERY %	0.0	14.3	0.0	85.7	0.0		

Appendix Table 17.2.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 18 to 21 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615B

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3X3
Wire Codes Used: 231923

NUMBER RELEASED: 9982

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLOMBIA	0	0	0	1	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	2	0	2	0.020
HATCHERIES							
PRIEST RAPIDS H.	0	0	2	0	0	2	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	3	4	0	7	0.070
PERCENT OF RECOVERY %	0.0	0.0	42.9	57.1	0.0		

Appendix table 17.3.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 21 to 27 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615C

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3J3
Wire Codes Used: 231925

NUMBER RELEASED: 9972

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.010
OCEAN FISHERIES							
ALASKA	0	0	0	2	0	2	0.020
BRITISH COLUMBIA	0	0	0	3	0	3	0.030
WASHINGTON	0	0	1	0	0	1	0.010
OREGON	0	0	1	0	0	1	0.010
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	1	0	1	0.010
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	2	0	2	0.020
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	4	8	0	13	0.130
PERCENT OF RECOVERY %	0.0	7.7	30.8	61.5	0.0		

Appendix Table 17.4.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 27 June to 8 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615D

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3C3
Wire Codes Used: 231927

NUMBER RELEASED: 10745

RECOVERY AREA		YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS								
BONNEVILLE TRAP		0	0	0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	1	0	0	0	1	0.009
OCEAN FISHERIES								
ALASKA		0	0	0	2	0	2	0.019
BRITISH COLUMBIA		0	0	1	3	0	4	0.037
WASHINGTON		0	0	0	1	0	1	0.009
OREGON		0	0	3	0	0	3	0.028
CALIFORNIA		0	0	0	0	0	0	0.000
OTHER		0	0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0	0.000
HATCHERIES								
PRIEST RAPIDS H.		0	0	3	0	0	3	0.028
STREAM SURVEY		0	0	0	0	0	0	0.000
TOTALS		0	1	7	6	0	14	0.130
PERCENT OF RECOVERY	%	0.0	7.1	50.0	42.9	0.0		

Appendix Table 17.5.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 9 to 15 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615E

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3L3
Wire Codes Used: 231929

NUMBER RELEASED: 9937

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	1	0	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	1	0	1	0.010
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	2	3	0	5	0.050
PERCENT OF RECOVERY %	0.0	0.0	40.0	60.0	0.0		

Appendix Table 17.6.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 15 to 19 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615F

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA7H3
Wire Codes Used: 231931

NUMBER RELEASED: 9949

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	1	0	1	0	2	0.020
WASHINGTON	0	0	1	0	0	1	0.010
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	1	0	1	0.010
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	3	4	0	8	0.080
PERCENT OF RECOVERY %	0.0	12.5	37.5	50.0	0.0		

Appendix Table 17.7.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 19 to 21 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615G

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA103
Wire Codes Used: 231933

NUMBER RELEASED: 9968

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	1	0	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.010
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	1	0	0	0	1	0.010
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY							
OTHER STREAMS	0	1	0	0	0	1	0.010
TOTALS	0	2	3	2	0	7	0.070
PERCENT OF RECOVERY %	0.0	28.6	42.9	28.6	0.0		

Appendix Table 17.8.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 21 to 22 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615H

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA7H1
Wire Codes Used: 231935

NUMBER RELEASED: 9850

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	0	1	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COL. R. TEST FSHRY (ORE)	0	0	0	1	0	1	0.010
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	0	4	0	4	0.041
PERCENT OF RECOVERY %	0.0	0.0	0.0	100.0	0.0		

Appendix Table 17.9.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 22 to 23 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86151

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA101
Wire Codes Used: 231937

NUMBER RELEASED: 9867

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	1	0	1	0.010
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	2	0	2	0.020
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	0	3	0	3	0.030
PERCENT OF RECOVERY %	0.0	0.0	0.0	100.0	0.0		

Appendix Table 17.10.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 23 to 28 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615J

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA171
Wire Codes Used: 231939

NUMBER RELEASED: 9978

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	1	0	1	0.010
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.020
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	0	4	0	4	0.040
PERCENT OF RECOVERY %	0.0	0.0	0.0	100.0	0.0		

Appendix Table 17.11.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 29 July to 1 August 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615K

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3X1
Wire Codes Used: 231941

NUMBER RELEASED: 9976

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	1	0	0	1	0.010
BRITISH COLUMBIA	0	0	0	1	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	2	0	2	0.020
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	1	3	0	4	0.040
PERCENT OF RECOVERY %	0.0	0.0	25.0	75.0	0.0		

Appendix Table 17.12.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 1 to 7 August 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8615L

1986 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA3L1
Wire Codes Used: 231844

NUMBER RELEASED: 5798

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.017
BRITISH COLUMBIA	0	0	0	1	0	1	0.017
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	0	2	0	2	0.034
PERCENT OF RECOVERY %	0.0	0.0	0.0	100.0	0.0		

Appendix Table 18.0.--Summary of all recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam in 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616A 8616B 8616C 8616D 8616E 8616F 8616G 8616H 8616I 8616J 8616K 8616L

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA171 RA3X1 RA3J1 RA3C1 RA3L1 RA7H1 RA101 RA7H3 RA103 RA173 RA3J3 RA3C3
Wire Codes Used: 231922 231924 231926 231928 231930 231932 231934 231936 231938 231940 231942 231832

NUMBER RELEASED: 114653

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	4	0	0	4	0.003
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	8	0	0	0	8	0.007
OCEAN FISHERIES							
ALASKA	0	0	2	18	0	20	0.017
BRITISH COLUMBIA	0	2	6	22	0	30	0.026
WASHINGTON	0	0	5	2	0	7	0.006
OREGON	0	0	15	0	0	15	0.013
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	2	0	0	2	0.002
COLUMBIA R. ABOVE SNAKE R.	0	3	0	0	0	3	0.003
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	3	0	17	0	20	0.017
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	36	0	36	0.031
HATCHERIES							
WELLS H.	0	0	1	0	0	1	0.001
PRIEST RAPIDS H.	0	0	8	0	0	8	0.007
STREAM SURVEY							
OTHER STREAMS	0	0	0	4	0	4	0.003
TOTALS	0	16	43	99	0	158	0.138
PERCENT OF RECOVERY %	0.0	10.1	27.2	62.7	0.0		

Appendix Table 18.1.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 11 to 18 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616A

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA171
Wire Codes Used: 231922

NUMBER RELEASED: 9974

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.010
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	0	3	0	3	0.030
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.010
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	3	0	3	0.030
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	1	7	0	9	0.090
PERCENT OF RECOVERY %	0.0	11.1	11.1	77.8	0.0		

Appendix Table 18.2.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville dam from 18 to 21 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616B

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3X1
Wire Codes Used: 231924

NUMBER RELEASED: 9981

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	2	0	2	0.020
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	1	0	0	1	0.010
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	2	2	0	4	0.040
PERCENT OF RECOVERY %	0.0	0.0	50.0	50.0	0.0		

Appendix Table 18.3.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 21 to 27 June 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616C

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3J1
Wire Codes Used: 231926

NUMBER RELEASED: 9971

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	0	1	0	1	0.010
OREGON	0	0	2	0	0	2	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0	0.000
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES							
PRIEST RAPIDS H.	0	0	2	0	0	2	0.020
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	4	3	0	7	0.070
PERCENT OF RECOVERY %	0.0	0.0	57.1	42.9	0.0		

Appendix Table 18.4.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 27 June to 8 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616D

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3C1
Wire Codes Used: 231928

NUMBER RELEASED: 10745

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.009
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	1	0	1	0.009
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	3	0	0	3	0.028
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	1	0	0	1	0.009
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.019
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	3	0	3	0.028
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.009
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	5	6	0	12	0.112
PERCENT OF RECOVERY %	0.0	8.3	41.7	50.0	0.0		

Appendix Table 18.5.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 9 to 15 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616E

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3L1
Wire Codes Used: 231930

NUMBER RELEASED: 9959

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	2	0	0	0	2	0.020
OCEAN FISHERIES							
ALASKA	0	0	1	2	0	3	0.030
BRITISH COLUMBIA	0	0	0	2	0	2	0.020
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	4	0	0	4	0.040
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	1	0	0	0	1	0.010
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	1	0	2	0	3	0.030
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	8	0	8	0.080
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	4	5	14	0	23	0.231
PERCENT OF RECOVERY %	0.0	17.4	21.7	60.9	0.0		

Appendix Table 18.6.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 15 to 19 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616F

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA7H1 RA7H1
Wire Codes Used: 231932 231932

NUMBER RELEASED: 9972

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	2	0	0	2	0.020
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.010
OCEAN FISHERIES							
ALASKA	0	0	1	0	0	1	0.010
BRITISH COLUMBIA	0	1	2	7	0	10	0.100
WASHINGTON	0	0	2	0	0	2	0.020
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	3	0	3	0.030
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.010
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY							
OTHER STREAMS	0	0	0	2	0	2	0.020
TOTALS	0	2	7	13	0	22	0.221
PERCENT OF RECOVERY %	0.0	9.1	31.8	59.1	0.0		

Appendix Table 18.7.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 19 to 21 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616G

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA101 RA101
Wire Codes Used: 231934 231934

NUMBER RELEASED: 9953

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	1	0	0	0	1	0.010
OCEAN FISHERIES							
ALASKA	0	0	0	3	0	3	0.030
BRITISH COLUMBIA	0	0	2	3	0	5	0.050
WASHINGTON	0	0	1	0	0	1	0.010
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	1	0	0	0	1	0.010
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.020
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	6	0	6	0.060
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	2	4	14	0	20	0.201
PERCENT OF RECOVERY %	0.0	10.0	20.0	70.0	0.0		

Appendix Table 18.8.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 21 to 22 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616H

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA7H3
Wire Codes Used: 231936

NUMBER RELEASED: 9840

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	1	0	0	0	1	0.010
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	2	0	0	2	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.020
INDIAN FISHERY	0	0	0	0	0	0	0.000
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	1	4	3	0	8	0.081
PERCENT OF RECOVERY %	0.0	12.5	50.0	37.5	0.0		

Appendix Table 18.9.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 22 to 23 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 86161

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA103
Wire Codes Used: 231938

NUMBER RELEASED: 9906

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	5	0	5	0.050
BRITISH COLUMBIA	0	0	0	1	0	1	0.010
WASHINGTON	0	0	1	0	0	1	0.010
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	1	0	0	1	0.010
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	1	0	1	0.010
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	2	0	2	0.020
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	2	9	0	11	0.111
PERCENT OF RECOVERY %	0.0	0.0	18.2	81.8	0.0		

Appendix Table 18.10.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 23 to 28 July 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616J

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA173
Wire Codes Used: 231940

NUMBER RELEASED: 9938

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	4	0	4	0.040
BRITISH COLUMBIA	0	0	1	2	0	3	0.030
WASHINGTON	0	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT							
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	1	0	0	0	1	0.010
WENATCHEE R.	0	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	1	0	2	0	3	0.030
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	8	0	8	0.080
HATCHERIES							
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY							
OTHER STREAMS	0	0	0	2	0	2	0.020
TOTALS	0	2	2	18	0	22	0.221
PERCENT OF RECOVERY %	0.0	9.1	9.1	81.8	0.0		

Appendix Table 18.11.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 29 July to 1 August 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616K

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3J3
Wire Codes Used: 231942

NUMBER RELEASED: 9887

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	2	0	0	0	2	0.020
OCEAN FISHERIES							
ALASKA	0	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	1	1	0	2	0.020
WASHINGTON	0	0	0	1	0	1	0.010
OREGON	0	0	2	0	0	2	0.020
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	1	0	1	0	2	0.020
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	3	0	3	0.030
HATCHERIES							
WELLS H.	0	0	1	0	0	1	0.010
PRIEST RAPIDS H.	0	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	3	5	6	0	14	0.142
PERCENT OF RECOVERY %	0.0	21.4	35.7	42.9	0.0		

Appendix Table 18.12.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 1 to 7 August 1986.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8616L

1986 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA3C3
Wire Codes Used: 231832

NUMBER RELEASED: 4527

RECOVERY AREA	YEAR OF RETURN 1986	1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP	0	0	1	0	0	1	0.022
MCNARY TRAP	0	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0	0.000
OCEAN FISHERIES							
ALASKA	0	0	0	1	0	1	0.022
BRITISH COLUMBIA	0	0	0	0	0	0	0.000
WASHINGTON	0	0	1	0	0	1	0.022
OREGON	0	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0	0.000
RIVER COMMERCIAL							
COMMERCIAL NET	0	0	0	2	0	2	0.044
INDIAN FISHERY							
FALL INDIAN NET	0	0	0	1	0	1	0.022
HATCHERIES	0	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0	0.000
TOTALS	0	0	2	4	0	6	0.133
PERCENT OF RECOVERY %	0.0	0.0	33.3	66.7	0.0		

Appendix Table 19.0.--Summary of all recoveries of adult fall chinook salmon released as juveniles below McNary Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708A 8708B 8708C 8708D 8708E 8708F 8708G

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LAIX1 LAIX3 LA2C1 LA2C3 LA2J1 LA2J3 LAIJ1
Wire Codes Used: 232002 232003 232004 232005 232006 232007 231957

NUMBER RELEASED: 68291

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	8	0	0	8	0.012
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	1	0	1	0.001
BRITISH COLUMBIA	0	1	1	0	2	0.003
WASHINGTON	0	1	0	0	1	0.001
OREGON	0	2	0	0	2	0.003
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	1	0	0	1	0.001
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.001
HATCHERIES						
PRIEST RAPIDS H.	0	4	0	0	4	0.006
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	17	3	0	20	0.029
PERCENT OF RECOVERY %	0.0	85.0	15.0	0.0		

Appendix Table 19.1.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 18 to 23 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708A

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LAIX1
Wire Codes Used: 232002

NUMBER RELEASED: 10000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	1	0	1	0.010
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	1	0	1	0.010
PERCENT OF RECOVERY - %	0.0	0.0	100.0	0.0		

Appendix Table 19.2.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 23 to 25 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708B

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LAIX3
Wire Codes Used: 232003

NUMBER RELEASED: 9146

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	1	0	0	1	0.011
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES						
PRIEST RAPIDS H.	0	2	0	0	2	0.022
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	3	0	0	3	0.033
PERCENT OF RECOVERY %	0.0	100.0	0.0	0.0		

Appendix Table 19.3.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 1 to 8 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708D

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA2C3
Wire Codes Used: 232005

NUMBER RELEASED: 10000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	2	0	0	2	0.020
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	1	0	0	1	0.010
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	1	0	0	1	0.010
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	1	0	0	1	0.010
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	0	0	0	0	0.000
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.010
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	5	1	0	6	0.060
PERCENT OF RECOVERY %	0.0	83.3	16.7	0.0		

Appendix Table 19.4.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 8 to 14 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708E

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA2J1
Wire Codes Used: 232006

NUMBER RELEASED: 10000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	1	0	2	0.020
PERCENT OF RECOVERY %	0.0	50.0	50.0	0.0		

Appendix Table 19.5.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 15 to 30 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708F

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LA2J3
Wire Codes Used: 232007

NUMBER RELEASED: 9392

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	0	0	0	0.000
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	1	0	0	1	0.011
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	0	0	1	0.011
PERCENT OF RECOVERY %	0.0	100.0	0.0	0.0		

Appendix Table 19.6.--Recoveries of adult fall chinook salmon released as juveniles below McNary Dam from 30 July to 13 August 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8708G

1987 MCNARY TRANS CONTROL BELOW MCNARY

FALL CHINOOK

Brands Used: LAIJ1
Wire Codes Used: 231957

NUMBER RELEASED: 10000

RECOVERY AREA		YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS							
BONNEVILLE TRAP		0	5	0	0	5	0.050
MCNARY TRAP		0	0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0	0.000
OCEAN FISHERIES		0	0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0	0.000
RIVER COMMERCIAL		0	0	0	0	0	0.000
INDIAN FISHERY		0	0	0	0	0	0.000
HATCHERIES							
PRIEST RAPIDS H.		0	2	0	0	2	0.020
STREAM SURVEY		0	0	0	0	0	0.000
TOTALS		0	7	0	0	7	0.070
PERCENT OF RECOVERY	%	0.0	100.0	0.0	0.0		

Appendix Table 20.0.--Summary of all recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam in 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709A 8709B 8709C 8709D 8709E 8709F 8709G

1987 MCNARY TRANS TEST/TRUCK BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RA141 RA143 RAIR1 RAIR3 RAIS1 RAIS3 RAIK1
Wire Codes Used: 231959 231960 231961 231962 231963 232001 232016

NUMBER RELEASED: 68376

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	24	0	0	24	0.035
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	1	3	0	4	0.006
BRITISH COLUMBIA	0	2	7	0	9	0.013
WASHINGTON	0	4	1	0	5	0.007
OREGON	0	1	1	0	2	0.003
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	1	0.001
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET	0	0	5	0	5	0.007
INDIAN FISHERY						
FALL INDIAN NET	0	0	7	0	7	0.010
HATCHERIES						
PRIEST RAPIDS H.	0	6	0	0	6	0.009
STREAM SURVEY						
OTHER STREAMS	0	0	2	0	2	0.003
TOTALS	0	39	26	0	65	0.095
PERCENT OF RECOVERY %	0.0	60.0	40.0	0.0		

Appendix Table 20.1.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 18 to 23 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709A

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
FALL CHINOOK

Brands Used: RA141
Wire Codes Used: 231959

NUMBER RELEASED: 10003

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	1	2	0	3	0.030
WASHINGTON	0	1	0	0	1	0.010
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT						
COLUMBIA R. BELOW SNAKE R.	0	0	0	0	0	0.000
COLUMBIA R. ABOVE SNAKE R.	0	0	0	0	0	0.000
WENATCHEE R.	0	1	0	0	1	0.010
SNAKE R.	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	3	0	3	0.030
HATCHERIES						
PRIEST RAPIDS H.	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	5	6	0	11	0.110
PERCENT OF RECOVERY %	0.0	45.5	54.5	0.0		

Appendix Table 20.2.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 23 to 25 June 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709B

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
FALL CHINOOK

Brands Used: RA143
Wire Codes Used: 231960

NUMBER RELEASED: 9146

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	0	0	0	0	0.000
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	1	0	1	0.011
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET	0	0	1	0	1	0.011
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	0	2	0	2	0.022
PERCENT OF RECOVERY %	0.0	0.0	100.0	0.0		

Appendix Table 20.3.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 25 June to 1 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709C

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
FALL CHINOOK

Brands Used: RAIR1
Wire Codes Used: 231961

NUMBER RELEASED: 9834

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	1	0	0	1	0.010
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	1	0	1	0.010
BRITISH COLUMBIA	0	0	1	0	1	0.010
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET	0	0	2	0	2	0.020
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	1	4	0	5	0.051
PERCENT OF RECOVERY %	0.0	20.0	80.0	0.0		

Appendix Table 20.4.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 1 to 8 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709D

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RAIR3
Wire Codes Used: 231962

NUMBER RELEASED: 10001

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	2	0	0	2	0.020
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.010
HATCHERIES						
PRIEST RAPIDS H.	0	1	0	0	1	0.010
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	3	1	0	4	0.040
PERCENT OF RECOVERY %	0.0	75.0	25.0	0.0		

Appendix Table 20.5.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 8 to 14 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709E

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE
FALL CHINOOK

Brands Used: RAIS1
Wire Codes Used: 231963

NUMBER RELEASED: 10000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	4	0	0	4	0.040
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	1	0	0	1	0.010
WASHINGTON	0	0	0	0	0	0.000
OREGON	0	0	1	0	1	0.010
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL	0	0	0	0	0	0.000
INDIAN FISHERY	0	0	0	0	0	0.000
HATCHERIES	0	0	0	0	0	0.000
STREAM SURVEY	0	0	0	0	0	0.000
TOTALS	0	5	1	0	6	0.060
PERCENT OF RECOVERY %	0.0	83.3	16.7	0.0		

Appendix Table 20.6.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 15 to 30 July 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709F

1987 MCNARY TRANS TEST/BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RAIS3
Wire Codes Used: 232001

NUMBER RELEASED: 9392

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	5	0	0	5	0.053
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	1	1	0	2	0.021
BRITISH COLUMBIA	0	0	1	0	1	0.011
WASHINGTON	0	0	1	0	1	0.011
OREGON	0	1	0	0	1	0.011
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET	0	0	1	0	1	0.011
INDIAN FISHERY						
FALL INDIAN NET	0	0	1	0	1	0.011
HATCHERIES						
PRIEST RAPIDS H.	0	1	0	0	1	0.011
STREAM SURVEY						
OTHER STREAMS	0	0	1	0	1	0.011
TOTALS	0	8	6	0	14	0.149
PERCENT OF RECOVERY %	0.0	57.1	42.9	0.0		

Appendix Table 20.7.--Recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam from 30 July to 14 August 1987.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8709G

1987 MCNARY TRANS TEST/TRUCK BELOW BONNEVILLE
FALL CHINOOK

Brands Used: RAIK1
Wire Codes Used: 232016

NUMBER RELEASED: 10000

RECOVERY AREA	YEAR OF RETURN 1987	1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP	0	11	0	0	11	0.110
MCNARY TRAP	0	0	0	0	0	0.000
LOWER GRANITE TRAP	0	0	0	0	0	0.000
PRIEST RAPIDS TRAP	0	0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA	0	0	0	0	0	0.000
BRITISH COLUMBIA	0	0	2	0	2	0.020
WASHINGTON	0	3	0	0	3	0.030
OREGON	0	0	0	0	0	0.000
CALIFORNIA	0	0	0	0	0	0.000
OTHER	0	0	0	0	0	0.000
RIVER SPORT	0	0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET	0	0	1	0	1	0.010
INDIAN FISHERY						
FALL INDIAN NET	0	0	2	0	2	0.020
HATCHERIES						
PRIEST RAPIDS H.	0	3	0	0	3	0.030
STREAM SURVEY						
OTHER STREAMS	0	0	1	0	1	0.010
TOTALS	0	17	6	0	23	0.230
PERCENT OF RECOVERY %	0.0	73.9	26.1	0.0		

Appendix Table 21.0.--Summary of all recoveries of adult fall chinook salmon transported as juveniles by barge from McNary Dam to below Bonneville Dam in 1988.

Master File Date : 18 July 1990
RELEASE GROUPS INCLUDED: 8803A 8803B 8803C 8803D 8803E 8803F

1988 MCNARY TRANS BARGE BELOW BONNEVILLE

FALL CHINOOK

Brands Used: RAIU1 RAIU2 RAIU3 RAIU4 RAID1 RAID3
Wire Codes Used: 232260 232261 232301 232302 232303 232304

NUMBER RELEASED: 60613

RECOVERY AREA		YEAR OF RETURN 1988	1989	1990	TOTAL	% RETURN
RIVER SYSTEM TRAPS						
BONNEVILLE TRAP		0	0	0	0	0.000
MCNARY TRAP		0	0	0	0	0.000
LOWER GRANITE TRAP		0	0	0	0	0.000
PRIEST RAPIDS TRAP		0	0	0	0	0.000
OCEAN FISHERIES						
ALASKA		0	0	0	0	0.000
BRITISH COLUMBIA		0	1	0	1	0.002
WASHINGTON		0	0	0	0	0.000
OREGON		0	0	0	0	0.000
CALIFORNIA		0	0	0	0	0.000
OTHER		0	0	0	0	0.000
RIVER SPORT		0	0	0	0	0.000
RIVER COMMERCIAL						
COMMERCIAL NET		0	1	0	1	0.002
INDIAN FISHERY		0	0	0	0	0.000
HATCHERIES		0	0	0	0	0.000
STREAM SURVEY		0	0	0	0	0.000
TOTALS		0	2	0	2	0.003
PERCENT OF RECOVERY	%	0.0	100.0	0.0		

Appendix Table 22.--Summary of tagging dates, numbers collected, numbers tagged and released, and maximum, minimum, and average lengths and weights of wild/natural chinook salmon parr PIT tagged in various streams of Idaho and Oregon in August-September, 1989.

	IDAHO									OREGON		
	SULPHUR CREEK	ELK CREEK	MARSH CREEK	BEAR VALLEY CREEK	VALLEY CREEK	ALTURAS LAKE CREEK	BIG CREEK	SESECH RIVER	OVERALL TOTALS AND AVERAGES	LOSTINE RIVER	IMNAHA RIVER	OVERALL TOTALS AND AVERAGES
TAGGING DATES	8/8 TO 8/10	8/11	8/12 TO 8/14	8/15 TO 8/16	8/17 TO 8/19	8/20	8/23 TO 8/25	8/27 TO 8/29	8/8 TO 8/29	9/19	9/20,9/26	9/19 TO 9/26
TOTAL NUMBER COLLECTED	2599	16	2810	1610	3342	1107	2456	2542	16,482	84	2106	2190
TOTAL NUMBER TAGGED	2520	16	2517	1558	2514	1044	2038	2373	14,580	84	2008	2092
TOTAL NUMBER TAGGED FISH RELEASED	2509	16	2496	1557	2498	1036	2026	2359	14,497	84	1986	2070
MAXIMUM LENGTH OF TAGGED FISH	106	84	92	88	112	109	96	100	112	104	108	108
MINIMUM LENGTH OF TAGGED FISH	53	64	48	50	49	54	49	53	48	58	55	55
AVERAGE LENGTH OF TAGGED FISH	70	73	67	68	66	77	65	66	68	70	73	73
MAXIMUM WEIGHT OF TAGGED FISH	16.6	6.2	8.8	8.4	11.6	14.3	11.5	7.8	16.6	6.5	11.1	11.1
MINIMUM WEIGHT OF TAGGED FISH	1.3	3.0	1.2	2.1	1.3	1.7	1.0	1.0	1.0	3.1	1.2	1.2
AVERAGE WEIGHT OF TAGGED FISH	3.8	4.2	3.6	4.2	3.7	5.7	3.7	3.1	3.7	4.8	3.8	3.8

Appendix Table 23.--Summary of collecting methods, collecting mortality, post-tagging mortality, 24-hour post-tagging mortality, tag loss, maximum, minimum, and average lengths and weights of tagging mortality of wild/natural chinook salmon parr PIT tagged in various streams of Idaho and Oregon, August - September 1989.

	IDAHO									OREGON		
	SULPHUR CREEK	ELK CREEK	MARSH CREEK	BEAR VALLEY CREEK	VALLEY CREEK	ALTURAS LAKE CREEK	BIG CREEK	SESECH RIVER	OVERALL TOTALS, TOTAL PERCENTS, AND AVERAGES	LOSTINE RIVER	IMNAHA RIVER	OVERALL TOTALS, TOTAL PERCENTS AND AVERAGES
COLLECTING METHOD	BEACH SEINE	BEACH SEINE	BEACH SEINE	SEINE & SHOCK	BEACH SEINE	BEACH SEINE	SEINE & SHOCK	BEACH SEINE		BEACH SEINE	BOX TRAP	
COLLECTION MORTALITY	4	0	2	2	3	3	9	1	24	0	0	0
PERCENT COLLECTION MORTALITY	0.2	0	0.1	0.1	0.1	0.3	0.4	0	0.1	0	0	0
NUMBER (1/2-3H) POST-TAGGING MORTALITY	8	0	4	1	10	8	7	7	45	0	22	22
PERCENT (1/2-3H) POST-TAGGING MORTALITY	0.3	0	0.2	0.1	0.4	0.8	0.3	0.3	0.3	0	1.1	1.1
NUMBER HELD FOR 24H POST-TAGGING MORTALITY AND TAG LOSS	352	0	302	215	255	0	224	138	1486	0	0	0
NUMBER 24H POST-TAGGING MORTALITY	3	0	17	0	6	0	2	7	35	0	0	0
PERCENT 24H POST-TAGGING MORTALITY	0.9	0	5.6	0	2.4	0	0.9	5.1	2.4	0	0	0
NUMBER LOST TAGS FROM 24H HOLD	0	0	0	0	0	0	1	0	1	0	0	0
PERCENT LOST TAGS FROM 24H HOLD	0	0	0	0	0	0	0.5	0	0.1	0	0	0
MAXIMUM LENGTH OF POST-TAGGING MORTALITY	76	0	78	59	69	85	69	66	85	0	99	99
MINIMUM LENGTH OF POST-TAGGING MORTALITY	56	0	52	59	53	60	50	57	50	0	59	59
AVERAGE LENGTH OF POST-TAGGING MORTALITY	65	0	59	59	59	70	58	60	61	0	72	72
MAXIMUM WEIGHT OF POST-TAGGING MORTALITY	4.6	0	3.0	3.1	3.8	4.6	4.2	3.2	4.6	0	9.4	9.4
MINIMUM WEIGHT OF POST-TAGGING MORTALITY	1.9	0	1.3	3.1	1.9	2.3	1.5	1.9	1.3	0	1.6	1.6
AVERAGE WEIGHT OF POST-TAGGING MORTALITY	3.4	0	2.0	3.1	2.9	3.1	2.8	2.5	2.7	0	3.7	3.7