

Q 538
.S2S79

Library

Northwest & Alaska Fisheries Center
NOAA, National Marine Fisheries Service
2725 Montlake Boulevard, E
Seattle, Washington 98112

CAES Coastal Zone and Estuarine Studies

**A Study to Define the Migration
Characteristics of Chinook and
Coho Salmon and Steelhead
in the Columbia River Estuary**

by

**Earl M. Dawley, Carl W. Sims,
Richard D. Ledgerwood, David R. Miller,
and Frank P. Thrower**

December 1980

~~NWAFSC037~~

ANNUAL REPORT - 1979

Project 10990061

A STUDY TO DEFINE THE MIGRATION CHARACTERISTICS
OF CHINOOK AND COHO SALMON AND STEELHEAD
IN THE COLUMBIA RIVER ESTUARY

Library
Northwest & Alaska Fisheries Center
NOAA, National Marine Fisheries Service
2725 Montlake Boulevard, E
Seattle, Washington 98112

QL
638
.52
579

by

Earl M. Dawley
Carl W. Sims
Richard D. Ledgerwood
David R. Miller
Frank P. Thrower

Coastal Zone and Estuarine Studies Division
Northwest and Alaska Fisheries Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
2725 Montlake Boulevard East
Seattle, Washington 98112

December 1980

TABLE OF CONTENTS

	Page
INTRODUCTION.	1
METHODS	1
Beach Seine Sampling	1
Purse Seine Sampling	4
Sample Processing.	4
Diel Sampling.	8
Analysis of Marked Fish Recaptures	8
Water Temperature Sampling	11
RESULTS AND DISCUSSION.	11
Migrational Timing	13
Travel Time and Rates of Movement.	18
Diel Catch Patterns.	21
Size Characteristics of Juvenile Migrants.	23
Survival of Marked Fish Groups	25
Relative Survival	25
Absolute Survival	29
Incidental Catch	29
SUMMARY AND CONCLUSIONS	32
LITERATURE CITED.	34
APPENDIXES.	35

INTRODUCTION

The National Marine Fisheries Service (NMFS), in cooperation with the Pacific Northwest Regional Commission (PNRC), has completed a 3-year study of migrational characteristics of juvenile salmon and steelhead in the Columbia River estuary. The objectives of the study were to: 1) define migrational and behavioral characteristics of juvenile salmonids to the Columbia River estuary, 2) develop an estuarine sampling system to evaluate hatchery production techniques and procedures, and 3) define and monitor the survival of selected stocks of hatchery reared juvenile salmonids to the estuary and to examine the relationship of this survival to the number of adult fish returning to the hatchery and/or fishery.

In 1979, the third year of the study, beach seine and purse seine sampling was continued in the upper and lower estuary, and purse seine sampling was initiated in marine areas near the river mouth. This report summarizes the results of research activities conducted during 1979.

METHODS

Beach Seine Sampling

A variable-mesh seine 95 m long by 5 m deep of the type described by Sims and Johnsen (1974) was used to sample the juvenile migrations in the upper estuary at Jones Beach, Oregon at River Kilometer (Rkm) 75 (Figure 1). Sampling at Jones Beach began in January 1979 and continued at various levels throughout the year (Table 1). Beach seine sampling began at sunrise each day and sets were made at 45 min intervals for about 7 h.

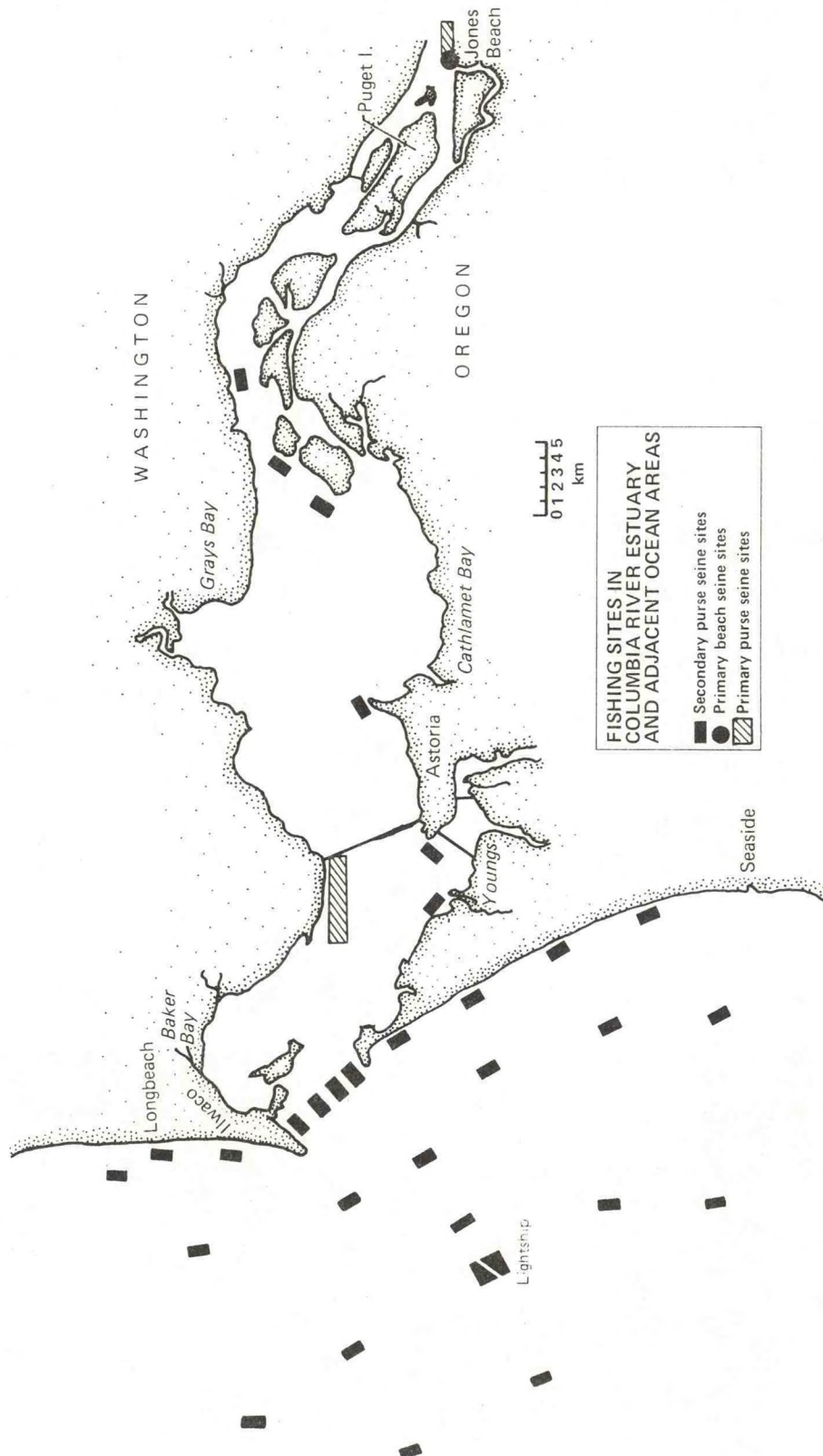


Figure 1.—The Columbia River estuary and Pacific Ocean showing sampling sites used in 1979.

Table 1.--Weekly beach seine catches at Jones Beach, Oregon (RKm 75), 1979.

Date (Mo./day)	No. of days fished	No. set	Chinook				Coho		Steelhead	
			Subyearling		Yearling		Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)
			Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)				
1/01-1/14	0	0	-	-	-	-	-	-	-	-
1/15-1/21	1	2	1	0	1	0	0	0	0	0
1/22-1/28	1	1	1	1	0	0	0	0	0	0
1/29-2/04	1	1	2	2	0	0	0	0	0	0
2/05-2/11	1	1	0	0	0	0	0	0	0	0
2/12-2/18	1	2	6	3	6	3	0	0	0	0
2/19-2/25	0	0	-	-	-	-	-	-	0	0
2/26-3/04	1	2	4	2	9	4	0	0	0	0
3/05-3/11	1	2	6	3	4	2	0	0	0	0
3/12-3/18	3	9	65	7	30	3	0	0	0	0
3/19-3/25	3	9	138	15	22	4	0	0	0	0
3/26-4/01	6	23	2171	94	132	6	0	0	0	0
4/02-4/08	6	32	1072	34	237	7	1	0	0	0
4/09-4/15	6	36	972	27	477	13	144	4	0	0
4/16-4/22	6	51	1683	33	689	14	469	9	14	0
4/23-4/29	6	58	3875	67	654	11	731	13	24	0
4/30-5/06	7	58	7495	129	788	14	593	10	44	1
5/07-5/13	6	52	9874	190	523	10	997	19	41	1
5/14-5/20	7	53	7479	141	155	3	608	11	24	0
5/21-5/27	7	61	6749	111	19	0	97	2	2	0
5/28-6/03	6	52	9357	180	27	0	111	2	3	0
6/04-6/10	7	60	17881	298	42	1	73	1	4	0
6/11-6/17	7	63	5587	89	53	1	27	0	3	0
6/18-6/24	7	64	18262	285	42	1	11	0	4	0
6/25-7/01	6	57	19671	345	14	0	4	0	0	0
7/02-7/08	5	47	17034	362	8	0	3	0	0	0
7/09-7/15	6	57	11571	203	3	0	25	0	0	0
7/16-7/22	6	55	20217	366	0	0	11	0	0	0
7/23-7/29	6	54	18391	340	0	0	0	0	0	0
7/30-8/05	6	54	18447	342	0	0	0	0	0	0
8/06-8/12	6	55	13043	237	0	0	0	0	0	0
8/13-8/19	5	46	6008	131	0	0	0	0	1	0
8/20-8/26	5	46	5460	119	0	0	0	0	0	0
8/27-9/02	4	35	2894	83	0	0	0	0	0	0
9/03-9/09	4	35	2517	72	0	0	0	0	0	0
9/10-9/16	3	24	1802	75	0	0	0	0	0	0
9/17-9/23	1	3	224	75	0	0	0	0	0	0
9/24-9/30	1	3	106	35	0	0	0	0	0	0
10/01-12/31	0	0	-	-	-	-	-	-	-	-
Totals		1263	230065		3935		3905		164	

Purse Seine Sampling

A 206-m long by 11-m deep purse seine was used to sample juvenile salmonids at Jones Beach. A 305-m long and 11-m deep purse seine was used in the lower estuary and in marine areas adjacent to the river mouth. The primary sampling site in the lower estuary was at Rkm 16 (Figure 1). The sampling schedule was dependent on the availability of personnel and equipment (Tables 2-4). Fishing techniques used were as described by Johnsen and Sims (1973). Periodic purse seine sampling was also conducted at selected secondary sites within the estuary (Appendix Table 1).

Sample Processing

Beach seine and purse seine catches at Jones Beach were examined at permanent fish processing facilities on the beach. Fish taken at lower estuary sampling sites were processed on board the purse seine vessel.

All fish were anesthetized with MS-222 or benzocaine, enumerated by species, and examined for identifying marks. Juvenile chinook salmon were separated into subyearling and yearling categories on the basis of fork length. The separation point was determined from length frequency samples. There was a small amount of overlap in the size frequency distributions, but the method was, in general, satisfactory. Mark recaptures were recorded by species, length, sampling gear, sampling site, time, and date. After processing, all fish were placed in fresh water, allowed to recover from the effects of the anesthetic, transported out of the sampling area, and released back into the river.

Up to 100 salmonids with a clipped adipose fin were subsampled and sacrificed per day per specie for identification of coded wire tags (cwt). Extrapolation of the subsample was made to determine the tag distribution of the entire adipose clip sample. Researchers from other agencies

Table 2.--Weekly purse seine catches at Jones Beach, Oregon (RKm 75), 1979.

Date (Mo./day)	No. of days fished	No. sets	Chinook				Coho		Steelhead	
			Subyearling		Yearling		Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)
			Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)				
1/01-1/14	0	0	-	-	-	-	-	-	-	-
1/15-1/21	1	1	0	0	0	0	0	0	0	0
1/22-1/28	1	1	0	0	0	0	0	0	0	0
1/29-2/04	0	0	-	-	-	-	-	-	-	-
2/05-2/11	1	1	0	0	0	0	0	0	0	0
2/12-2/18	1	1	0	0	0	0	0	0	0	0
2/19-2/25	0	0	-	-	-	-	-	-	-	-
2/26-3/04	1	1	0	0	0	0	0	0	0	0
3/05-3/11	1	1	0	0	0	0	0	0	0	0
3/12-3/18	3	3	0	0	2	1	0	0	0	0
3/19-3/25	3	3	1	0	8	3	0	0	1	0
3/26-4/01	3	5	151	30	11	2	0	0	0	0
4/02-4/08	4	8	23	3	88	11	0	0	1	0
4/09-4/15	4	11	0	-	351	32	16	1	14	1
4/16-4/22	5	24	115	5	1138	47	117	5	277	12
4/23-4/29	6	27	1253	46	2543	94	599	22	637	24
4/30-5/06	7	31	397	13	2561	83	1538	50	1254	40
5/07-5/13	6	26	619	24	1572	60	2353	91	2125	82
5/14-5/20	7	29	3366	116	2705	93	4123	142	2455	85
5/21-5/27	6	25	3451	138	1710	68	4131	165	1196	48
5/28-6/03	6	28	2691	96	3392	121	4913	175	1295	46
6/04-6/10	7	29	1757	61	1614	56	4280	148	540	19
6/11-6/17	7	33	1663	50	660	20	3311	100	275	8
6/18-6/24	7	31	3232	104	378	12	841	27	181	6
6/25-7/01	6	25	9121	365	25	1	272	11	45	2
7/02-7/08	3	15	3049	203	30	2	76	5	10	1
7/09-7/15	4	19	1237	65	2	0	1005	53	4	0
7/16-7/22	3	13	1243	96	0	0	93	7	1	0
7/23-7/29	3	9	686	76	0	0	10	1	0	0
7/30-8/05	3	9	1171	130	0	0	3	0	1	0
8/06-8/12	3	9	544	60	2	0	2	0	0	0
8/13-8/19	4	13	1950	150	0	0	1	0	2	0
8/20-8/26	2	5	283	57	0	0	0	0	0	0
8/27-9/02	1	2	40	20	0	0	0	0	0	0
9/03-9/09	1	2	41	20	0	0	0	0	0	0
9/10-9/16	1	2	39	20	0	0	0	0	0	0
9/17-9/23	1	1	18	18	0	0	0	0	0	0
9/24-9/30	1	1	22	22	0	0	0	0	0	0
10/1-12/31	0	0	-	-	-	-	-	-	-	-
Totals		444	38163		18792		27684		10314	

Table 3.--Weekly purse seine catches at Columbia River (Rkm 16), 1979.

Date (Mo./day)	No. of days fished	No. set	Chinook				Coho		Steelhead	
			Subyearling		Yearling		(Juv.)		(Juv.)	
			Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)
1/01-4/22	0	0	0	-	-	-	-	-	-	
4/23-4/29	1	4	0	0	27	7	6	2	1	0
4/30-5/06	1	4	0	0	411	103	224	56	125	31
5/07-5/13	2	7	59	8	528	75	392	56	136	19
5/14-5/20	0	0	0	0	0	0	0	0	0	0
5/21-5/27	2	6	625	104	287	48	422	70	58	10
5/28-6/03	1	3	326	109	65	22	183	61	19	6
6/04-6/10	2	7	2309	330	73	10	114	16	13	2
6/11-6/17	3	9	1423	159	40	4	335	37	24	3
6/18-6/24	2	6	2761	460	11	2	86	14	5	1
6/25-7/01	1	4	867	217	13	3	27	7	3	1
7/02-7/08	2	8	1306	163	2	0	7	1	0	0
7/09-7/15	2	8	837	105	0	0	37	5	0	0
7/16-7/22	4	15	1047	70	0	0	20	1	0	0
7/23-7/29	0	0	0	0	0	0	0	0	0	0
7/30-8/05	2	8	404	50	0	0	0	0	0	0
8/06-8/12	2	8	96	12	0	0	0	0	0	0
8/13-8/19	2	6	270	45	4	1	0	0	0	0
8/20-8/26	2	8	377	47	0	0	0	0	0	0
8/27-9/02	3	14	936	67	1	0	1	0	0	0
9/03-9/09	2	9	376	42	3	0	0	0	0	0
9/10-9/16	3	17	1888	111	0	0	0	0	0	0
9/17-9/23	2	11	712	65	0	0	0	0	0	0
9/24-12/31	0	0	-	-	-	-	-	-	-	-
Totals		162	16619	-	1465	-	1854	-	384	-

Table 4.--Weekly purse seine catches in marine waters adjacent to Columbia River mouth (within 24 km), 1979.

Date (Mo./day)	No. of days fished	No. set	Chinook				Coho		Steelhead	
			Subyearling		Yearling		(Juv.)		(Juv.)	
			Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)
1/01-5/06	0	0	-	-	-	-	-	-	-	
5/07-5/13	1	4	4	1	19	5	2	1	0	0
5/14-5/20	1	4	9	2	20	5	1	0	0	0
5/21-5/27	1	4	14	3	6	1	8	2	0	0
5/28-6/03	0	0	0	0	0	0	0	0	0	0
6/04-6/10	1	3	25	8	7	2	3	1	0	0
6/11-6/17	0	0	0	0	0	0	0	0	0	0
6/18-6/24	1	4	13	3	16	4	0	0	0	0
6/25-7/01	1	2	731	365	15	7	0	0	0	0
7/02-7/08	2	9	286	32	20	2	17	2	0	0
7/09-7/15	1	5	0	0	13	3	16	3	0	0
7/16-7/22	1	5	0	0	3	1	14	3	0	0
7/23-7/29	0	0	0	0	0	0	0	0	0	0
7/30-8/05	2	10	13	1	0	0	3	0	0	0
8/06-8/12	2	10	257	26	10	1	0	0	0	0
8/13-8/19	2	10	91	9	0	0	0	0	0	0
8/20-8/26	2	9	74	8	1	0	2	0	0	0
8/27-9/02	2	10	105	11	16	2	1	0	0	0
9/03-9/09	1	5	3	1	4	1	7	1	0	0
9/10-9/16	1	5	17	3	0	0	0	0	0	0
9/17-9/23	2	10	88	9	0	0	0	0	0	0
9/24-12/31	0	0	-	-	-	-	-	-	-	-
Total		109	1730	150	150	-	74	-	0	-

investigating different aspects of smolt behavior were provided with biological samples taken from the sacrificed fish with cwt. Gill tissue samples were provided to NMFS researchers for adenosine triphosphatase ($\text{Na}^+ - \text{K}^+$ ATPase) analysis^{1/}. Scale samples were provided to Oregon Department of Fish and Wildlife (ODFW) researchers for analysis of timing and survival from the Deschutes, John Day, and Willamette River basins^{2/}. Stomach samples were provided to U.S. Fish and Wildlife Service (USFWS) researchers^{3/} and to members of our own staff for analysis of stomach contents.

Diel Sampling

Purse seine sampling was conducted during the peak of outmigration in mid-river at Jones Beach on 10 and 23 May to examine diel catch patterns of juvenile salmonids. Seining was begun at sunrise and sets were continued every 1-1/2 h for a 24-h period. Data from both sampling periods were averaged to present results.

Analysis of Marked Fish Recaptures

Marked hatchery fish were released at many locations throughout the Columbia River system in 1979 (Figure 2). Recaptures from these marked

^{1/} Earl Prentice, Project Leader, NMFS, Manchester, WA 98353

^{2/} Eugene (Max) Smith, Project Leader, ODFW, Springfield, OR 97477;
Richard Aho, Project Leader, ODFW, Maupin, OR 97037

^{3/} Percy Washington, Project Leader, Northwest Fishery Research Center, USFWS, Sandpoint Naval Air Station, Seattle, WA 98115

Figure 2.--Release locations of marked juvenile salmonids recaptured in Columbia River estuary, 1979.

LEGEND

1. Klaskanine Hatchery
2. Columbia R. @ Hammond
3. Stavebolt Creek
4. Grays R. Hatchery
5. Elokomin Hatchery
6. Big Creek Hatchery
7. Abernathy Research Station
8. Columbia River @ Jones Beach
9. Cowlitz Trout Hatchery
10. Cowlitz Salmon Hatchery
11. Toutle River Hatchery
12. Columbia River @ Prescott
13. Kalama Falls Hatchery
14. Lewis River Hatchery
15. Willamette River, falls area
16. Mollalla River
17. Tualatin River
18. N. F. Santiam - Minto
19. S. Santiam Hatchery
20. Willamette River Hatchery
21. Sandy Hatchery
22. Eagle Creek Hatchery
23. Skamania Hatchery
24. Washougal Hatchery
25. Bonneville Dam
26. Bonneville Salmon Hatchery
27. Cascade Hatchery
28. Carson Hatchery
29. Little White Salmon Hatchery
30. Willard Hatchery
31. Spring Creek Hatchery
32. Big White Rearing Pond
33. Klickitat Hatchery
34. Oak Springs Hatchery
35. Round Butte Hatchery
36. John Day Dam
37. McNary Dam
38. Columbia River @ Pasco
39. Ringold Hatchery
40. Priest Rapids Spawning Channel
41. Leavenworth Hatchery
42. Rocky Reach Spawning Channel
43. Entiat Hatchery
44. Wells Salmon Pond
45. Winthrop Hatchery
46. Ice Harbor Dam
47. Little Goose Dam
48. Lower Granite Dam
49. Clarkston, Wa.
50. Grande Ronde River
51. Wallowa Hatchery
52. Dworshak Hatchery
53. Kooskia Hatchery
54. Riggins, Idaho
55. Rapid River Hatchery
56. S. Fork Salmon River
57. Lochsa River
58. Pahsimeroi
59. Hayden Creek Pond, Lemhi R.
60. Lower Kalama
61. McKenzie @ Leaburg
62. Shears Falls, Deschutes R.
63. Warm Springs River
64. Stayton Pond, Willamette R.
65. Oak Ridge NFH
66. Weyco Pond, Grays R.
67. Chelan
68. Asotin, @ Snake River
69. Upper Salmon, Decker Flats

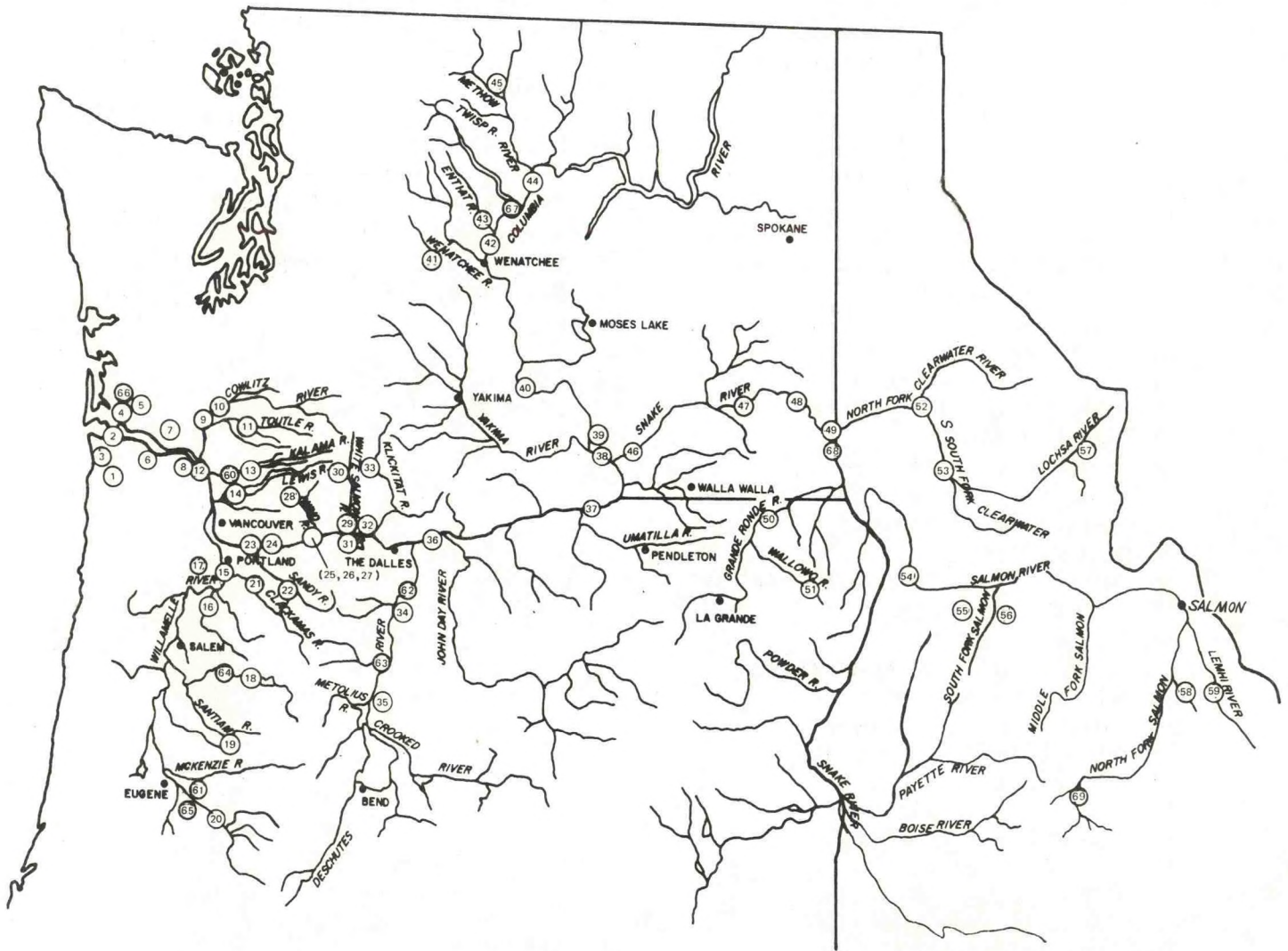


Figure 2.--Release locations of marked juvenile salmonids recaptured in the Columbia River estuary, 1979.

releases were used to define stock composition of the migrant population, to provide sampling efficiencies, and to define migrational timing and rates of downstream movement. Recoveries of replicate tag groups (same release site, date, stock, and size of fish) from several hatcheries were compared using a "G" statistic test to detect inconsistency in estuarine sampling.

Two types of survival estimates were also made using recovery data at Jones Beach. Estimates of relative survival were determined from recovery ratios of fish groups subjected to dissimilar treatments. Control groups of fall chinook salmon from Spring Creek, Little White Salmon, Bonneville, Washougal, and Klickitat Hatcheries were branded and released at Rainier (Rkm 109) or Prescott (Rkm 115), Oregon. Jones Beach catch rates of these control releases were compared to catch rates for tagged groups from the same fish stocks released at the hatchery to determine percent survival.

The marking program to determine relative survival was accomplished with extensive assistance of: Steven Leek, Elmo Barney and his staff, Jack Bodle and his staff at USFWS, William Hopley, Carl Ross and his staff, Richard Johnson and his staff at Washington Department of Fisheries (WDF), George Smalley and Vernon Knowles and his staff at ODFW, and Robert Vreeland (NMFS) and others involved with the "Columbia River Fall Chinook Evaluation".

Water Temperature Sampling

Surface water temperatures at Jones Beach were taken with a hand-held thermometer on all days on which sampling was conducted.

RESULTS AND DISCUSSION

Water temperature in January and early February 1979 (0° to 2°C) was considerably colder than normal and remained cold in March (4° to 7°C), (Figure 3). River flow during the spring freshet was about average in

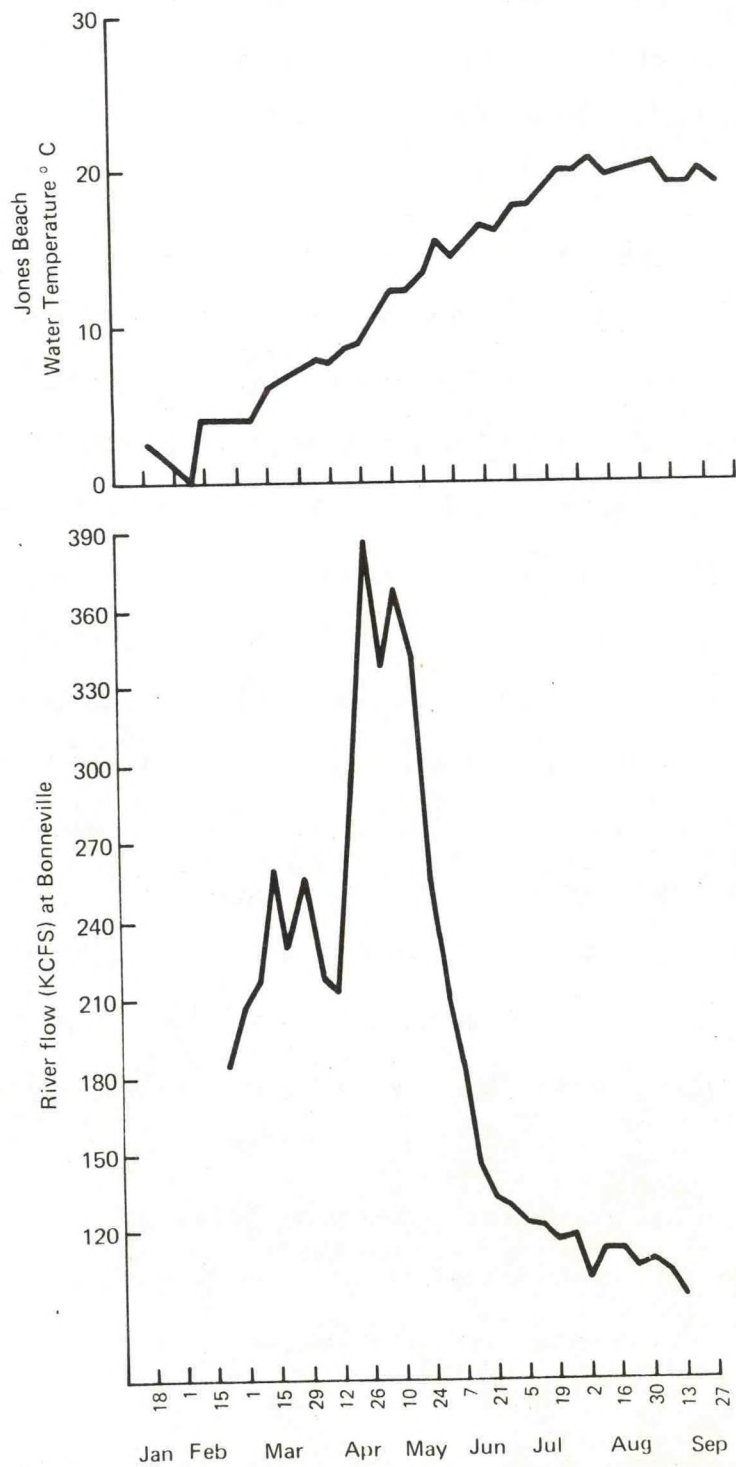


Figure 3.--Water flow and temperature in the Columbia River, 1979.

1979. Flows were about 400 kcfs in early May, but declined slightly earlier than normal in mid-June to 200 kcfs and to 140 kcfs by 1 July.

Sampling at all fishing sites from January through September 1979 (2004 sets) provided a total sample of 288,057 subyearling chinook salmon; 25,893 yearling chinook salmon; 35,190 coho salmon; and 11,041 steelhead. Species catches and sampling effort at the different sampling sites varied throughout the sampling season; weekly summaries are included in Tables 1-4. Recapture rates of marked fish groups ranged from 0 to 1.3% (Appendix Table 2). In total, 15,381 cwt and 4,821 external marks (5.6% of the total catch) were recovered (Table 5). The cwt retention of smolts, as determined by the total number of cwt recovered compared to the total number of fish with clipped adipose fins, averaged 93%. This was similar to cwt retention in 1977 and 1978. Steelhead had the lowest retention rate (84%), whereas subyearling chinook salmon had the highest (94%).

Multiple recapture of fish sampled at Jones Beach was 0.93% for subyearling chinook and 0.00% for other salmonids. Adjustment of recapture data for multiple recapture was not made.

Migrational Timing

The timing of outmigration, based on temporal catch distributions at Jones Beach, varied between subyearling chinook, yearling chinook, and coho salmon, and steelhead (Figure 4). The timing was affected by a combination of hatchery release times and river flows. River flows affected the efficiency of fish recapture. With lower flows, gear efficiency was greater, thus timing peaks were weighted toward low flow periods. Although the magnitude of flow changes throughout a given outmigration, the rate of change each year remains fairly constant in average flow years. Thus large differences in timing between years appeared mostly related to hatchery releases.

Table 5.--Recoveries of marked juvenile salmonids from the Columbia River estuary, 1979.

Species	Number recovered				Total
	Coded wire tags (cwt)	Adipose fin clip (no cwt)	Brands	Fin clips	
Chinook salmon - subyearlings	9980	618	2486	97	13181
Chinook salmon - yearlings	2824	228	1244	50	4346
Coho salmon	2069	151	463	1396	4079
Sockeye salmon	1	0	24	0	25
Steelhead trout	507	79	560	501	1647
Totals	15381	1076	4777	2044	23278

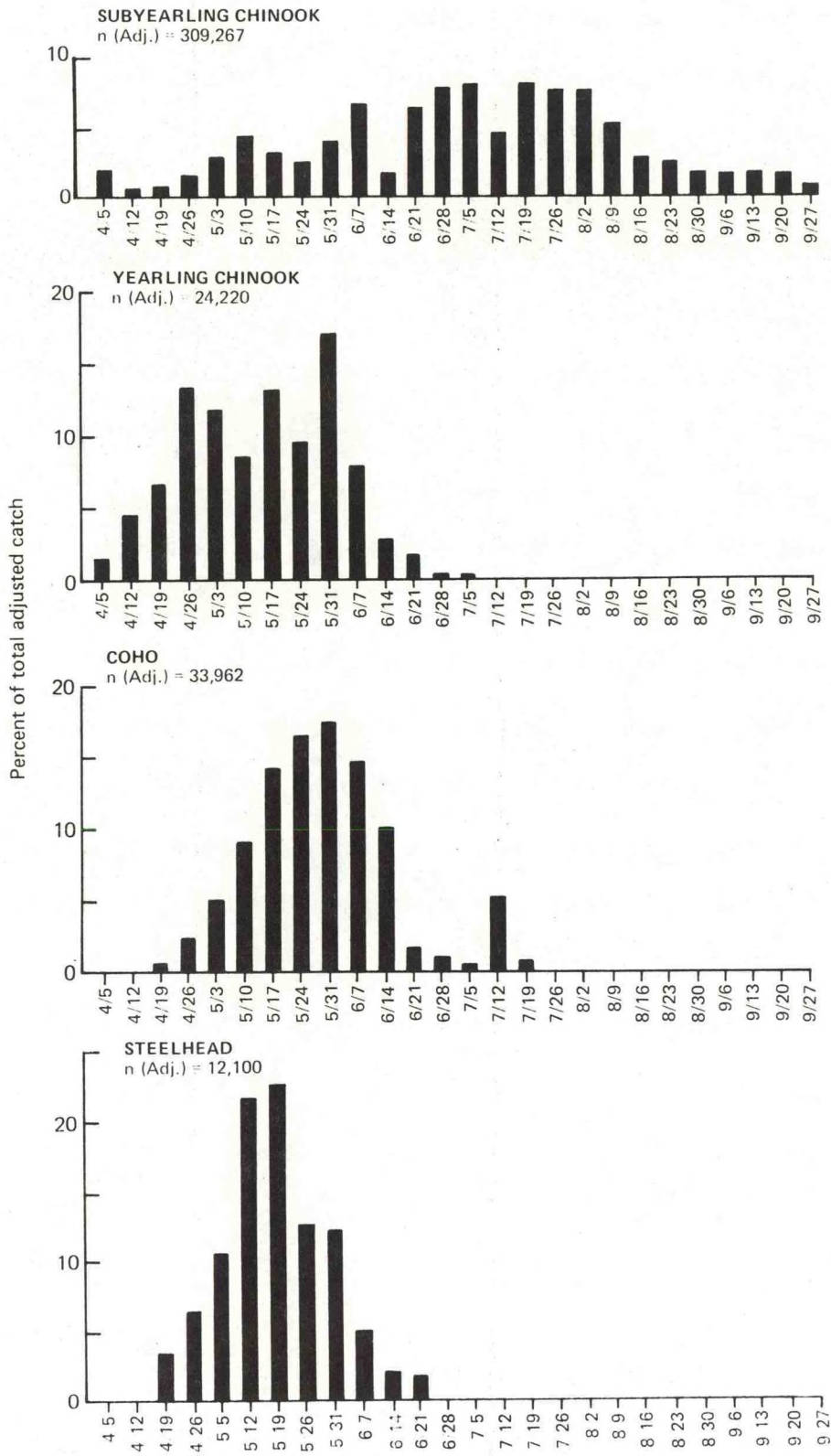


Figure 4.--Temporal catch distribution of subyearling chinook salmon captured using beach seine, and yearling chinook and coho salmon and steelhead outmigrants using purse seine at Jones Beach, OR, 1979.

Migrational timing for subyearling chinook salmon in 1979 showed several peaks of migration between early May and late July (Figure 5). During March and April we captured a substantial number of subyearling chinook salmon averaging 45 mm in length, many more than in past years. We assumed that most of these fish were not smolting and resulted from thinning releases of spring chinook salmon at lower river hatcheries (Foster)^{4/}.

The period of maximum fish passage for subyearling chinook salmon in 1979 was in mid-July as compared to mid-June in 1978 and mid-May 1977 (Figure 5). Periods of maximum fish passage were related to hatchery releases. In 1977, 30 million fish were released from Bonneville Hatchery on 5 May. In 1978, Bonneville released 16 million fish in mid-May and at the same time Little White Salmon Hatchery released 11 million fish. In 1979, Bonneville released 11 million fish in late May and Little White Salmon Hatchery released 11 million fish in late June.

Yearling chinook salmon first arrived in the estuary in mid-February, the migration peaked in mid-April, receded, then peaked again on 1 June (Figure 4). The first peak was related to fish released from hatcheries below the Dalles Dam (excluding Eagle Creek Hatchery), whereas the second peak resulted from hatchery and wild stocks from the Snake River and mid-Columbia River.

Coho salmon migrated by Jones Beach from mid-April to late July producing a later than normal peak near 1 June (Figure 4). This shift in timing (usually peaking in mid-May) was related to hatchery releases made in June and July which had been purposely delayed to examine effects of later release date on adult returns.

^{4/}Robert Foster, Washington Department of Fisheries, Fish Culture Division, Olympia, WA 98504, personal communication, July 1980.

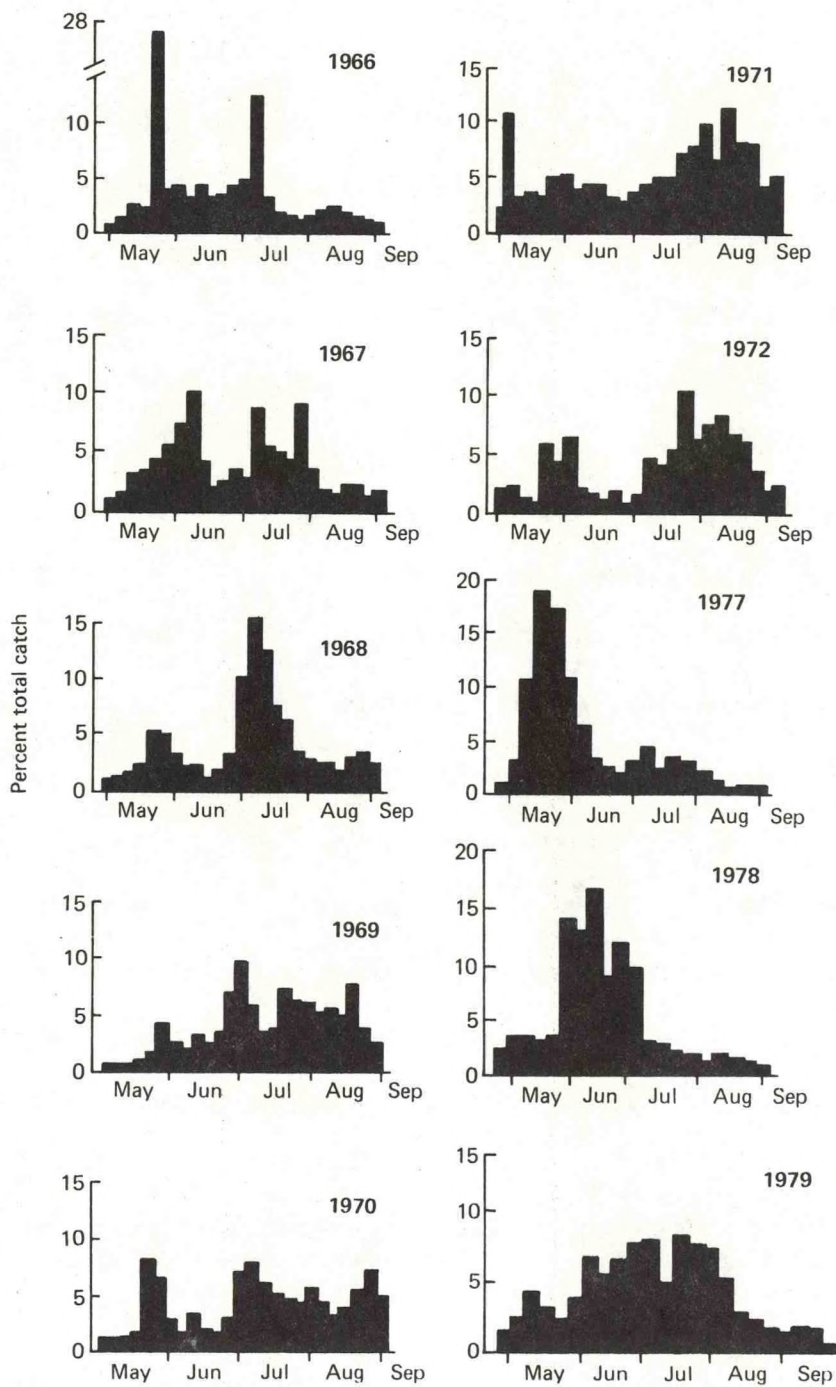


Figure 5.--Temporal catch distribution of subyearling chinook salmon at Jones Beach, OR, 1966-1972 and 1977-1979.

Steelhead migrated by Jones Beach between late April and late June with a peak in mid-May (Figure 4). This appeared to be consistent with past years.

Travel Time and Rates of Movement

Individuals from several groups of marked chinook salmon, released in 1978, were observed to over-winter prior to migrating to the ocean. Recaptures of 119 juveniles from 29 different groups (Table 6) were made at Jones Beach and Rkm 16. The majority of these fish were from fall releases made in the Willamette River system. Only a few were recaptured from spring and summer releases at other sites.

Rates of migration varied dramatically between groups depending upon specie, age, release site, and date of release (Appendix Tables 3-5). For subyearling chinook salmon, higher rates of migration from release site to Jones Beach were positively correlated with: 1) increased fish size (Dawley, et al.),^{5/} 2) increased distances of migration from release sites, and 3) higher river volume (Sims)^{6/}. Similar trends were not apparent with any of the yearling migrants.

Average movement rates from release site to the estuary and through the estuary into the ocean, were generally the same as those observed in 1978 (Table 7). Subyearling and yearling chinook salmon apparently

^{5/}Dawley, E.M., C.W. Sims, R.D. Ledgerwood, D.R. Miller, and F.P. Thrower. 1979. A Study to define the migrational characteristics of chinook and coho salmon and steelhead in the Columbia River estuary. Annual Report to PNR, by NMFS, 2725 Montlake Blvd. E., Seattle, WA 98112.

^{6/}Carl Sims. National Marine Fisheries Service, Coastal Zone and Estuarine Studies Division, 2725 Montlake Blvd. E., Seattle, WA 98112, unpublished report, July 1977.

Table 6.--Chinook salmon recaptured in 1979 from groups released in 1978.

Tag no. ^{a/} (Ag, D1, D2)	Release information		Individuals recaptured by month						Total no. recap	
	Site	Date mo/day	Size no./lb	1979						
				J	F	M	A	M	J	
63-16-63	Klickitat Hatchery	6 JN	87	0	0	0	0	0	1	2 ^{b/}
63-17-49	Priest Rapids	26 JN	45	0	0	1	0	0	0	1
63-18-03	Washougal Hatchery	26 JN	62	0	0	0	3	2	0	5
63-17-46	Kalama Falls Hatchery	12 JL	108	0	0	0	2	0	0	2
63-17-47	Kalama Falls Hatchery	15 SE	34	0	0	0	8	0	0	8
10-03-28	Red River at SF Clearwater	21 SE	6	0	0	0	0	5	1	6
07-16-54	Deschutes River	3 OC	13	0	0	0	1	1	0	2
07-16-55	Deschutes River	3 OC	13	0	0	0	1	1	0	2
07-16-56	Bonneville Hatchery	30 OC	12	0	0	1	4	1	0	6
07-16-58	Bonneville Hatchery	30 OC	20	0	1	0	3	0	0	4
07-16-59	Bonneville Hatchery	30 OC	14	0	0	2	2	0	0	4
07-16-60	Bonneville Hatchery	30 OC	24	0	1	0	3	2	0	6
05-03-52	Little White NFH	1 NO	34	0	0	1	1	0	0	2
05-03-53	Little White NFH	1 NO	34	0	0	0	1	0	0	1
05-03-54	Little White NFH	1 NO	34	0	1	0	0	0	0	1
07-17-27	N Santiam at Minto	6 NO	10	0	0	1	5	4	0	10
07-17-28	N Santiam at Minto	6 NO	8	0	0	0	3	4	1	8
07-17-38	M Fork Willamette	6 NO	8	0	0	1	0	0	0	1
07-17-37	M Fork Willamette	7 NO	9	0	0	1	1	0	0	2
07-17-39	M Fork Willamette	7 NO	14	0	0	1	1	0	0	2
07-19-26	S Santiam at Foster	7 NO	8	0	1	1	1	0	0	3
07-19-27	S Santiam at Foster	7 NO	8	0	0	0	0	1	0	1
07-19-28	S Santiam at Foster	7 NO	7	0	0	1	0	0	0	1
07-19-29	Willamette R Below Falls	7 NO	8	0	0	0	3	0	0	3
07-19-30	Willamette R Below Falls	7 NO	7	0	0	0	7	0	0	7
07-16-26	Mill Creek	8 NO	23	0	0	4	3	2	0	9
07-17-40	M Fork Willamette	8 NO	26	0	0	0	1	1	0	2
07-19-17	Mill Creek	9 NO	22	0	0	3	6	1	0	10
07-19-18	Mill Creek	9 NO	23	0	0	2	2	5	0	9
Total				4	20	62	30	3		119

^{a/} Binary cwt, where: Ag=Agency, D1=data 1, and D2=data 2 codes.

^{b/} Second recapture in September 1979.

Table 7.--Migration rate for selected groups of marked juvenile salmon and steelhead, (1978-1979).

	<u>Release site to Rkm 75^{a/}</u>							
	Chinook				Coho		Steelhead	
	Subyearling		Yearling		1978	1979	1978	1979
	1978	1979	1978	1979	1978	1979	1978	1979
Average (km/day)	15	18	21	23	14	11	22	34
Range (km/day)	3-27	2-48	2-37	6-37	6-19	10-14	8-35	10-61
No. mark groups	11	11	11	11	3	3	4	4

	<u>Rkm 75 to Rkm 16^{b/}</u>							
	Subyearling		Yearling		Coho		Steelhead	
	1978	1979	1978	1979	1978	1979	1978	1979
Average (km/day)	4	3	15	15	26	22	44	-
Range (km/day)	2-63	1-58	8-63	6-58	16-63	12-57	31-63	-
No. mark groups	14	9	8	5	4	3	3	0

	<u>Rkm 16 to Ocean (24-km radius of Col. R.)^{c/}</u>							
	Subyearling		Yearling		Coho		Steelhead	
	1978	1979	1978	1979	1978	1979	1978	1979
Average (km/day)	2	4	<1	1	-	13	-	-
Range (km/day)	1-63	4-37	-	<1-10	-	-	-	-
No. mark groups	19	31	1	9	-	1	-	0

a/ 1979 recaptures are paired to similar groups released in 1978 but are not representative of the entire run. Data from 1979 are listed in Appendix table 3.

b/ All groups recaptured in substantial numbers were averaged for each year. Data from 1979 are listed in Appendix table 4.

c/ All groups recaptured in the Ocean were used for these averages. Data from 1979 are listed in Appendix table 5.

decreased their rate of movement in the estuary. They traveled at an average rate of 18 to 23 km/day, respectively, from site of release to Jones Beach versus 3 and 15 km/day between Jones Beach (Rkm 75) and Rkm 16. At least part of this decrease can be attributed to incoming tidal currents in the estuary. Coho salmon and steelhead appeared to migrate more rapidly than chinook salmon after entering the upper estuary.

Migration rates and timing from Rkm 16 to the ocean were not very precise due to an unknown time of ocean residency prior to capture. Individuals were caught in as few as 10 days and migrated as fast as 35 km/day from release site to the ocean. Spring chinook salmon from groups released 27-30 March at Klickitat Hatchery passed Rkm 16 on 26 April (median date) and were recaptured in the ocean during mid-May, late June^{7/}, and mid-August.

Diel Catch Patterns

Purse seine catches of subyearling chinook salmon in mid-river peaked about 2 hours after sunrise, then decreased throughout the day and night (Figure 6). Beach seine catches in 1978 were bimodal. Catch peaks occurred just after sunrise and just before sunset, followed by a dramatic decrease at night. Sims^{6/} noted similar diel beach seine catch patterns in the estuary and found that tidal cycle had little effect on this catch pattern.

^{7/} Recaptures in June were made by Oregon State University researchers. (Pearcy, 1979) OSU, Dept. of Biology, Corvallis, OR.

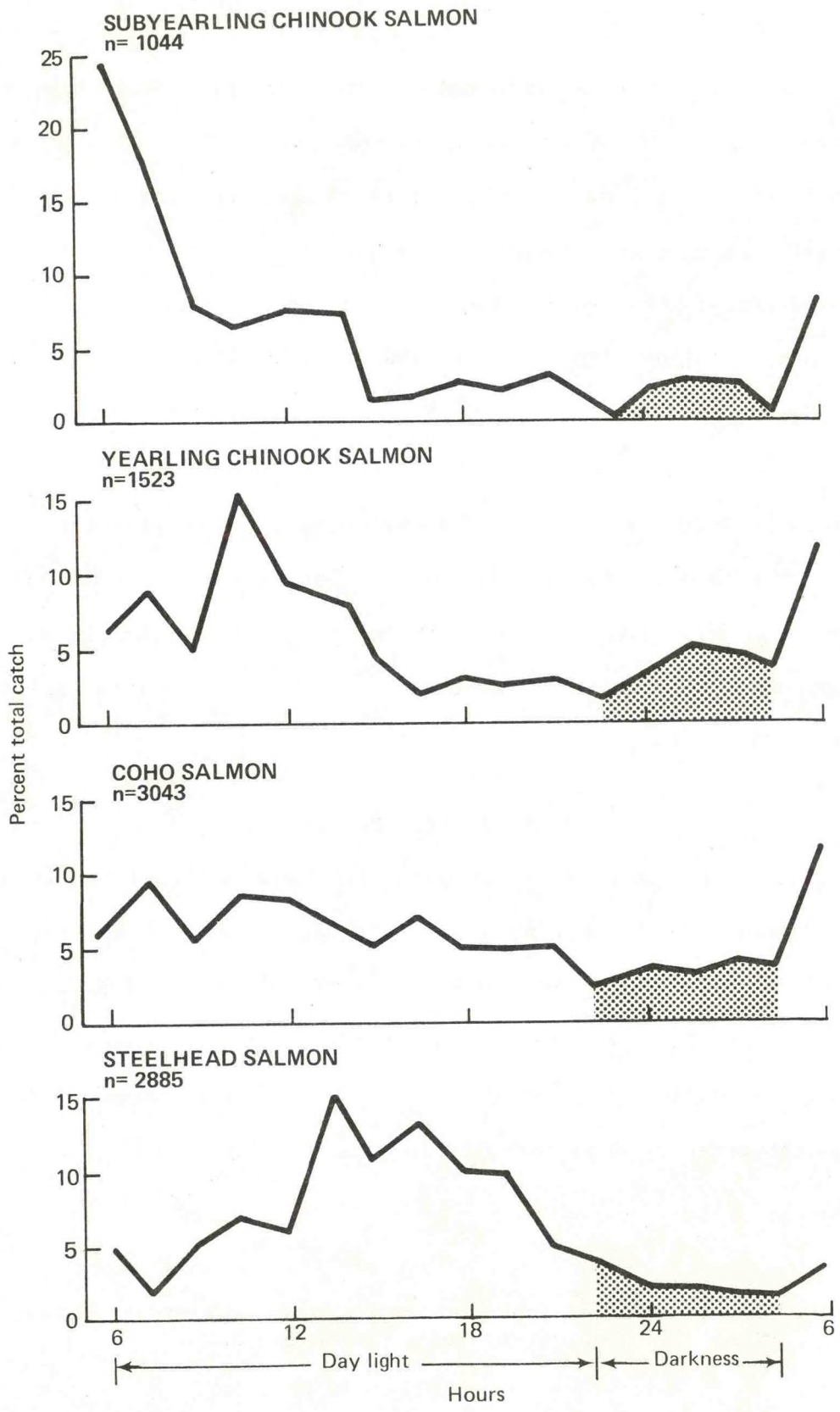


Figure 6.--Average diel catch pattern for chinook salmon, coho salmon, and steelhead from purse seining at Jones Beach, OR, 1979.

Spring chinook salmon catches showed a high degree of variability between the two sampling dates, although the total number of fish caught was similar. Sampling in early May showed little change in catch rates throughout the 24-hour period. Sampling in late May, however, showed little change in catch rates throughout the 24-hour period. Sampling in late May, however, showed a very distinct peak near midday followed by a sharp decrease in the afternoon and a slight increase at night. (average of the two sampling periods presented in Figure 6).

Purse seine catches of coho salmon were highest during the day and decreased somewhat at night (Figure 6), with no mid-afternoon peak, as observed in 1978 beach seine catches.

Steelhead catches on both sampling days, although markedly different in total catch, produced similar diel patterns. Catches peaked around mid-day and decreased substantially at night (Figure 6).

Size Characteristics of Juvenile Migrants

Mean fork lengths ranged from 45 mm for subyearling chinook salmon to 230 mm for steelhead in 1979 (Figure 7). Subyearling chinook salmon averaged 45 mm in February and March and probably were nonsmolting fish. Smolts began arriving at Jones Beach in early April at nearly 70 mm and steadily increased in size, leveling off at about 85 mm in August and September; 20 mm less than the same time period in 1978.

Several mark groups of subyearling chinook salmon exhibited increases in mean fork length between the dates of release and recapture at Jones Beach. Five weeks after release, individuals from Kalama Falls Hatchery were consistently larger than their mean length at release. Six weeks after release, the fork lengths of some individuals were greater than the largest fish measured at the date of release.

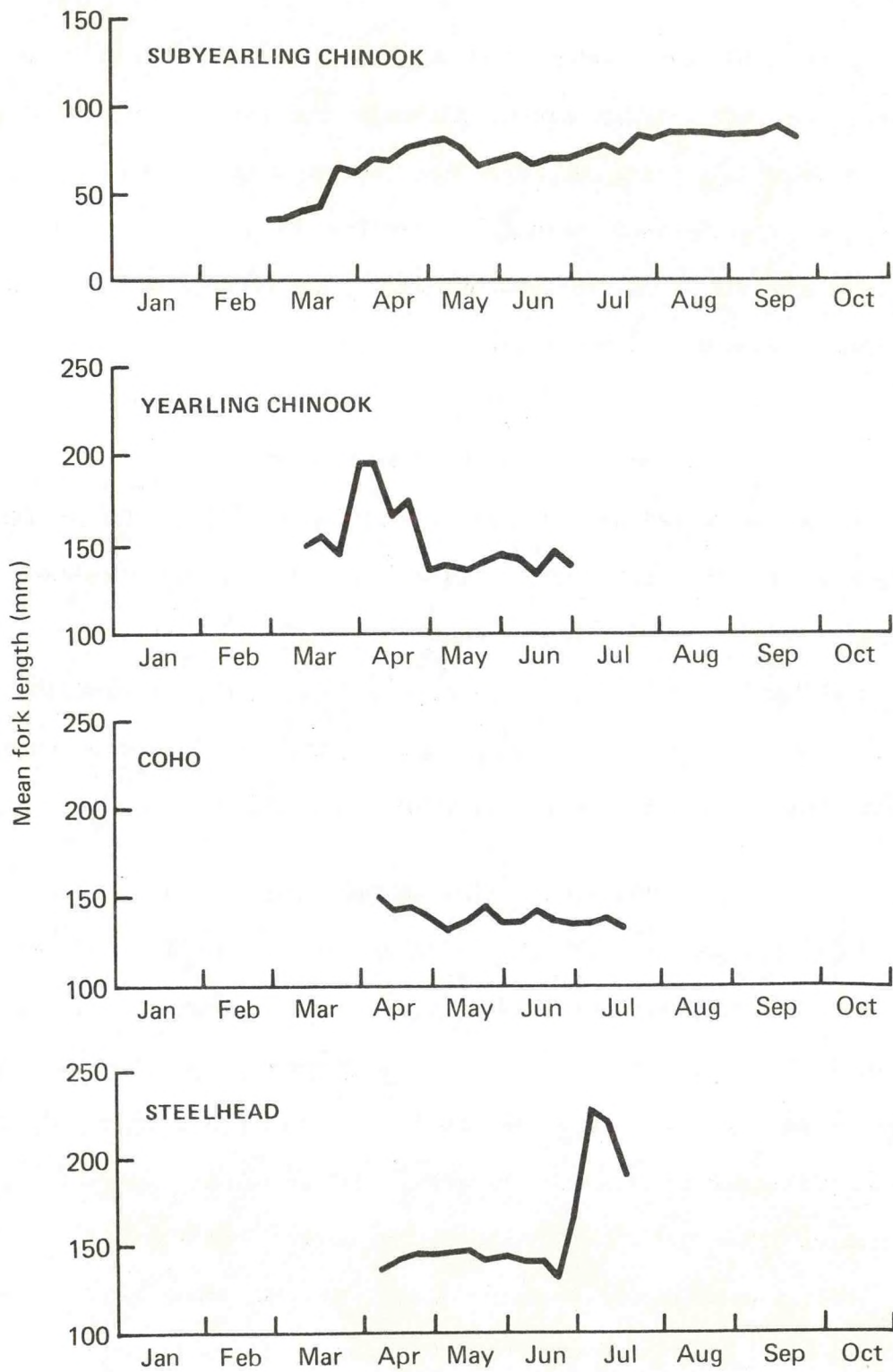


Figure 7.--Mean fork lengths of chinook salmon, coho salmon, and steelhead juveniles at Jones Beach, OR, 1979.

Yearling smolts were fairly consistent in size throughout the migration period, with a few fluctuations representing particular stocks. Overall mean lengths were 153 mm for yearling chinook salmon, 139 mm for coho salmon, and 157 mm for steelhead.

Survival of Marked Fish Groups

Survival estimates to the estuary are dependent upon consistency of recapture. To evaluate consistency of sampling at Jones Beach, catches were compared for all replicate groups released from various sites in the Columbia River basin from 1977 to 1979. Statistical analysis using the "G" test detected no significant difference in 80 of the 91 possible comparisons (Figure 8). When adult return data from hatcheries and sport and commercial fisheries have been obtained, it may be possible to relate differences in adult returns to differences in smolt survival to the estuary.

Relative Survival

Relative survival estimates for chinook salmon and steelhead groups which were transported past dams, and for coho salmon groups released in June and July have been made.

The survival increase for various transported groups ranged from 20 to 1532% (Table 8). The group showing a 1532% increase over control was subyearling chinook salmon reared at Hagerman NFH and transported to Bonneville, compared to a group released into the Snake River at Asotin, Washington. The lowest increase in survival measured (20%) was for yearling chinook salmon transported to Bonneville compared to a similar group released in the Deschutes River. There was no measurable increase in survival for a similar comparison of Deschutes fish released in 1978.

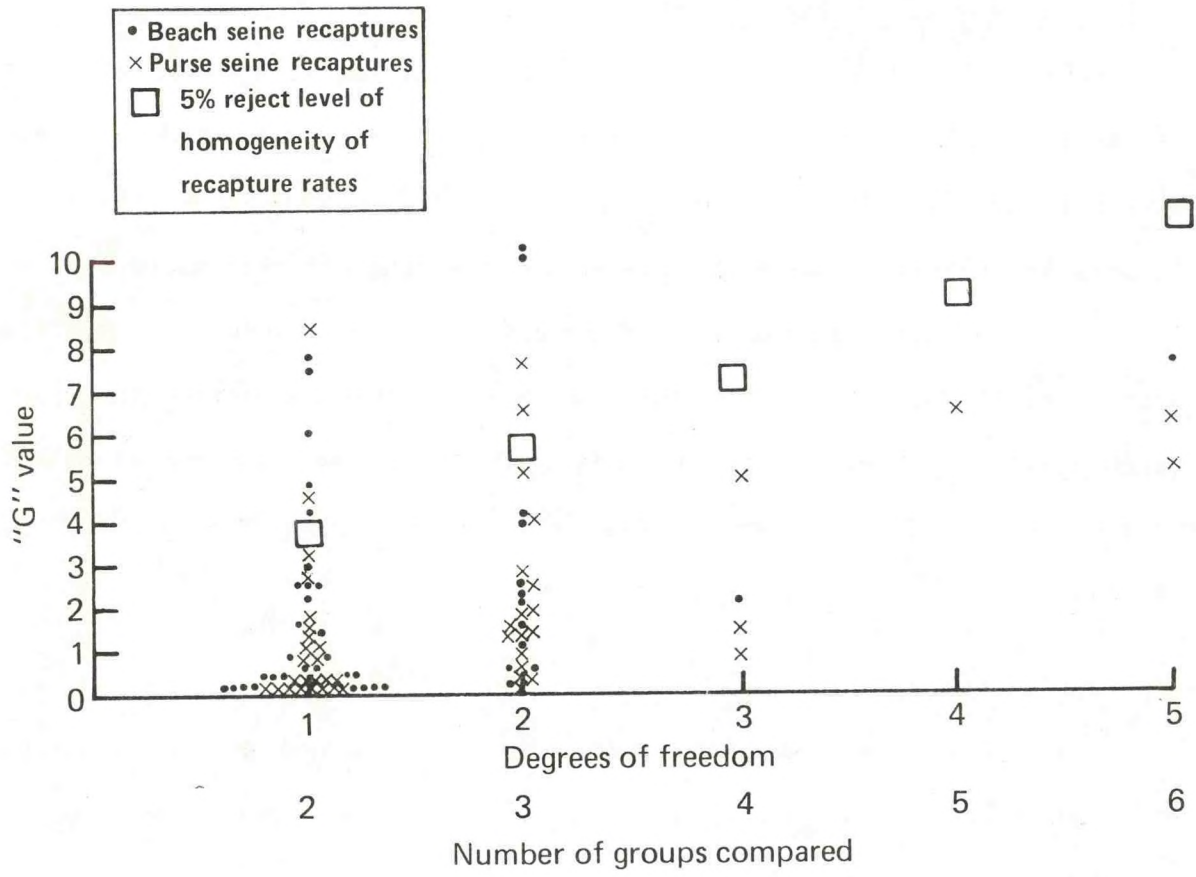


Figure 8.--"G" statistic evaluation of recapture rates for replicate mark groups of juvenile salmonids captured at Jones Beach, OR, using beach and purse seine, 1977-1979.

Table 8.--Survival increase for transported vs control fish groups recaptured at Jones Beach, Oregon November 1978 - September 1979.

Mark (Ag/DL/D2)	Release site	Release date	Size (no./lb)	Recapture percentage adjusted ^{b/}		Avg survival ^{c/} increase from transport (%)
				Beach seine	Beach & purse	
05-04-21	Asotin (Hagerman)	21My	92	0.00	0.01	
05-04-20	trans below Bonn dam	20My	84	0.13	0.18	1532
<u>Subyearling chinook salmon</u>						
<u>Yearling chinook salmon</u>						
07-19-26	S. Santiam	07No78	8	0.00	0.01 ^{d/}	
07-19-27	"	07No78	8	0.00	0.00	
07-19-28	"	07No78	7	0.00	0.01	
07-19-29	trans below Will fall	08No78	8	0.01	0.01 ^{d/}	
07-19-30	"	08No78	8	0.01	0.03 ^{d/}	262
05-04-26	Kooskia	29Ap	40	0.00	0.05	
05-04-27	trans below Bonn dam	03-29My	44	0.04	0.10	102
07-19-19	S. Santiam Hat.	21Mr	9	0.02	0.10	
07-19-20	"	21Mr	8	0.02	0.15	
07-19-21	"	21Mr	9	0.04	0.17	
07-19-22	trans below Will fall	23Mr	9	0.14	0.09	
07-19-23	"	23Mr	10	0.16	0.15	60
07-19-24	"	23Mr	8	0.11	0.13	
07-18-25	Deschutes R. (km 161)	30My	22	0.00	0.24	
07-18-26	"	23My	25	0.00	0.32	
07-18-27	trans below Bonn dam	30My	22	0.03	0.31	20
63-18-10	Leavenworth Hat.	26Ap	16	0.00	0.12	
63-18-09	"	26Ap	16	0.00	0.14	
63-18-08	trans below Priest Rapids dam	15My	16	0.00	0.21	63

Table 8.-cont

Mark ^{a/} (Ag/DL/D2)	Release site	Release date	Size (no./lb)	Recapture percentage adjusted ^{b/}			Avg survival ^{c/} increase from transport (%)
				Beach seine	Purse seine	Beach & Purse	
<u>Yearling chinook salmon</u>							
63/18/11	Winthrop Hat.	20Ap	12	0.00	0.05	0.04	
12	"	24Ap	14	0.00	0.03		
20	trans below Priest Rapid	16My	13	0.00	0.11	0.11	150
<u>Steelhead</u>							
10/05/33	Dworshak Hat.	18My	12	0.00	0.11	0.04	
and RA SU 2							
10/05/34	trans below Bonn dam	14My	12	0.00	0.17	0.17	148

a/ Binary cwt, where: Ag=Agency, DL=data 1, and D2-data 2 codes. RASU 2 is a freeze brand.

b/ Adjusted for standard effect (10 sets/day beach seine and 5 sets/day purse seine--7 days/week) and 100% identifier of cwt.

c/ $\frac{(T\%) - (C\%)}{C\%} \times 100$

d/ Due to decreased sampling in the winter months actual number of recaptures were used.

Series of coho salmon releases from Washougal, Toutle, and Cascade Hatcheries were made to evaluate the effect of release date on survival. Recapture rates at Jones Beach were dramatically different between the May, June, and July releases (Table 9). A consistent increase in survival with time was apparent. Some of this apparent increase was no doubt a consequence of decreased river flow (250 to 175 to 125 kcfs over the recapture period) which increased the recapture efficiency. However, it is unlikely that the 50% lower river flow would have accounted for the increased catch rate of 545% (averaged for the three hatcheries).

Relative survival estimates (obtained by comparing recapture rates at Jones Beach, Appendix Table 2) for groups subjected to various other treatments (diet, rearing density, release timing, and release site) are left to the fish culturist for interpretation.

Absolute Survival

Absolute survival estimates for index groups of wiretagged and branded subyearling chinook from Spring Creek, Little White Salmon, Bonneville, Klickitat, and Washougal Hatcheries ranged from 19 to 62% (Table 10). These values were similar to measurements made at Jones Beach in previous years.

Incidental Catch

Large numbers of fish of non-target species were caught along with juvenile salmonids at the various sampling sites (Appendix Tables 6-9). The two species caught in greatest numbers at Jones Beach were the three-spined stickleback and juvenile shad (Appendix Table 6 and 7). Stickleback catches were the same as 1977 but only one-third of 1978. Shad catches were 36% greater than 1977 and 167% greater than 1978. Incidental

Table 9.--Movement and recapture rates for groups of serially released coho salmon recaptured at Jones Beach, Oregon, 1980.

Mark (Ag/D1/D2)	a/ Release site	Size (no./lb)	Release date	Recap. date of med. fish	Rate of movement (km/day)	Recapture rate	
						Actual (no.)	b/ Adjusted (%)
07-19-08	Bonneville (Cascade Hat.)	23	07My	18My	14	13	0.06
07-19-11		22	07My	20My	12	10	0.04
07-19-07		23	07Jn	13Jn	26	35	0.13
07-19-10		23	07Jn	13Jn	26	32	0.12
07-19-09		22	06J1	13J1	22	50	0.36
07-19-12		23	06J1	13J1	22	54	0.41
63-19-11	Toutle Hat.	18	07My	20My	9	47	0.11
63-19-12		18	07My	19My	7	41	0.12
63-19-13		20	07Jn	13Jn	14	114	0.28
63-17-58		18	07Jn	12Jn	17	121	0.31
63-19-28		18	06J1	13J1	12	217	0.54
63-19-29		18	06J1	13J1	12	201	0.49
63-19-23	Washougal Hat.	17	07My	21My	10	72	0.13
63-19-24		16	07My	21My	10	69	0.11
63-19-25		20	07Jn	17Jn	15	111	0.17
63-19-26		20	07Jn	14Jn	21	107	0.15
63-19-27		20	06J1	13J1	21	183	0.49
63-19-34		20	06J1	13J1	21	187	0.49

a/ Binary cwt where: Ag=Agency, D1=data 1, and D2=data 2 codes.

b/ Adjusted for standard effort (10 sets/day beach seine and 5 sets/day purse seine--7 days/week) and 100% identification of cwt.

Table 10:--Absolute survival of fall (subyearling) chinook salmon from hatchery release site to the upper estuary (Rkm 115) as measured by recaptures at Jones Beach, Oregon, 1979.

Mark ^{a/} or brand (Ag/D1/D2)	(Loc. rot.)	Release site	Distance upriver (km)	Date	Size (no./lb)	Recaptures adjusted (no.) %	Survival %
05-04-46	RD U 1	Spring Cr. H. Prescott	267 115	20Mr 03Ap	125 -	211 122 0.15 0.81	19 -
05-04-34	RD U 2	Spring Cr. H. Rainier	267 109	20Ap 02My	87 83	179 229 0.24 0.21 51 0.26	30 34 -
05-04-33	RD U 4	Spring Cr. H. Rainier	267 109	18My 29My	50 52	25 28 0.02 0.13	16 -
05-04-48	LD U 3	Little White H. Rainier	261 109	22Jn 26Jn	105 114	159 293 0.12 0.15 64 0.32	38 47 -
07-16-08	RD U 3	Bonneville H. Prescott	230 115	01My 16My	78 64	113 52 0.15 0.30	50 -
63-19-49	LD U 1	Klickitat H. Rainier	358 109	01Jn 13Jn	80 78	120 40 0.06 0.19	33 -
63-19-38	LD U 2	Washougal H. Rainier	221 109	14Jn 25Jn	95 74	268 136 0.32 0.65	50 62 -

a/ Binary cwt, where: Ag=agency, D1=data 1, and D2=data 2 codes.

catches at the Rkm 16 site involved many marine and euryhaline species as well as freshwater species (Appendix Table 8). Incidental catches at marine sites involved 30 species (Appendix Table 10). Catches in the lower estuary and ocean were not comparable between years due to variation in effort at differing tidal stages and dates.

SUMMARY AND CONCLUSIONS

1. Beach and purse seines in the upper estuary (Rkm 75) and purse seines in the lower estuary (Rkm 16) and Pacific Ocean near the Columbia River mouth were used to monitor smolt outmigration in 1979.

2. Catches of smolts in 1979 were slightly greater than in 1978.

3. By request, various biological samples were collected from adipose clipped fish for other researchers.

4. The period of maximum subyearling chinook salmon migration in 1979, based on Jones Beach recaptures, was in mid-July as compared to mid-May in 1977 and mid-June in 1978. The differences were related to hatchery releases and changes in catch efficiencies due to river flow.

5. Movement rate of chinook salmon decreased upon entry into the estuary. Residency in the Columbia River plume precluded precise measurements of movement rate into the ocean. Steelhead and coho salmon generally moved rapidly through the estuary and were not recaptured in the ocean.

6. Diel catch patterns at Jones Beach show a decrease at night for subyearling chinook and coho salmon, and steelhead. Patterns for yearling chinook salmon were inconclusive.

7. No significant differences were detected in recapture rates in 80 of 91 possible comparisons between replicate groups. Thus recapture rates generally could be compared between unlike groups, from the same stock, to obtain relative survival measurements.

8. Fish groups transported downstream past dams in the Columbia River basin showed relative increases of 20 to 1500% survival as compared to non-transported fish.

9. Coho salmon groups released in June and July showed a consistently higher relative survival rate than groups released in May.

10. Measurements of absolute survival for fall (subyearling) chinook salmon, from release site to the estuary, ranged from 19 to 62% for index stocks.

11. Adult returns in future years should provide information as to the precision of juvenile survival estimates to the estuary as a predictor of adult return rates.

LITERATURE CITED

Johnsen, R. C., and C. W. Sims.

1973. Purse seining of juvenile salmon and trout in the Columbia River estuary. *Trans. Amer. Fish. Soc.*, 102 (2): 341-345.

Sims, C. W., and R. C. Johnsen.

1974. Variable mesh beach seine for sampling juvenile salmon in the Columbia River estuary. *Mar. Fish. Rev.* 36 (2): 23-26.

APPENDIX

- Table 1. Purse seine catches of juvenile chinook salmon, coho salmon, and steelhead at secondary sampling sites in the lower Columbia River estuary, 1979.
- Table 2. Mark release and recapture information, Columbia River estuary, 1979.
- Table 3. Travel time and rate of movement for selected groups of marked fish from release sites to Jones Beach, Oregon, 1979.
- Table 4. Travel time and rate of movement for selected groups of marked hatchery fish from Jones Beach (km 75) to the lower estuary (km 16), 1979.
- Table 5. Travel time and movement rate to and through the estuary for marked juvenile salmon caught in marine waters adjacent to the mouth of the Columbia River (24-km radius), 1979.
- Table 6. Catch composition of beach seine samples at Jones Beach, Oregon (Rkm 75), January through September, 1979.
- Table 7. Catch composition of purse seine samples at Jones Beach, Oregon (Rkm 75), January through September, 1979.
- Table 8. Catch composition of purse seine samples in the lower Columbia River estuary (Rkm 14-43), April through September, 1979.
- Table 9. Catch composition of purse seine samples in the marine waters adjacent to the mouth of the Columbia River (24-km radius), May through September, 1979.

Appendix Table 1.--Purse seine catches of juvenile chinook salmon, coho salmon, coho steelhead, and steelhead at secondary sampling sites in the lower Columbia River estuary, 1979.

Sampling site	KM	Date	No. of sets	Chinook											
				Subyearling			Yearling			Coho			Steelhead		
				Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)	Total catch (no.)	Catch per set (no.)		
Pillar Rock	43	10SE	36	36	0	0	0	0	0	0	0	0	0	0	
Miller Sands	39	10SE	39	39	0	0	0	0	0	0	0	0	0	0	
Rice Island	36	10SE	70	35	0	0	0	0	0	0	0	0	0	0	
Tongue Point	29	17MY	182	61	89	30	247	82	21	62	21	62	21	21	
Tongue Point	29	18MY	516	258	230	115	1040	520	24	48	24	48	24	24	
Tongue Point	29	6AU	239	80	0	0	0	0	0	0	0	0	0	0	
Tongue Point	29	22AU	47	12	0	0	0	0	0	0	0	0	0	0	
Youngs Bay	18	30MY	153	31	91	18	263	53	4	18	4	18	4	4	
Tansy Point	14	16MY	17	9	19	10	62	31	18	36	18	36	18	18	
Tansy Point	14	25MY	149	149	15	15	31	31	3	3	3	3	3	3	
Tansy Point	14	30MY	1	1	3	3	17	17	1	1	1	1	1	1	
Tansy Point	14	31MY	31	31	4	4	13	13	3	3	3	3	3	3	

Appendix Table 2.--Mark release and recapture information, Columbia River estuary, 1979. (Table 2 is continued on the 32 pages of data tabulation immediately following.)

LEGEND

MARK--Binary wire tag recaptures are listed with a six digit number; the first two digits being agency code; second two being data one; and the third two being data two.
NNNNNN represents fish with excised adipose fin with no CWT.
LLLLLL represents fish with excised adipose fin which were released due to limitation of number sacrificed.
000000 represents fish with blank tag.
Color coded wire tag recaptures are listed with up to eight letters--two per color (see abbreviation list for color codes.)
Brand recaptures are indicated as follows: The first two letters indicate position on fish (e.g., LA-left anterior). The next one or two characters indicate the actual freeze brand used (see abbreviation list for brand codes). The next number (1, 2, 3, or 4) indicates the rotation of the brand on the fish. e.g.

Rotation: 1 2 3 4
Brand: K ↗ ↘ ↙

The next one to six characters are letters indicating the absence of one or more fins in association with that brand. Example of a complete brand with clip:

Left posterior LP "K" brand K 1st position 1
excised adipose and right pectoral fins ADRP

Clip. Recaptures with fin clips exclusively are indicated by the common abbreviations of the excised fin or fins.

*-----An asterisk directly below a mark indicates another associated mark which is listed in parentheses after the purpose.

RELEASE DATE--Day, month, year.

RECAPTURE SITE--Example

Columbia River CO Distance from mouth of the river in miles 46.5
South, Middle or North part of river cross section. A--ocean within
24 km of Columbia River mouth.

GEAR CODE--4 is beach seine; 3 is purse seine.

NO. RECAP.--Recapture numbers, actual and adjusted to 10 sets/day for the beach seine and 5 sets/day for the purse seine for river mile 46.5 only.














RECAPTURE DATE OF MED. FISH--Date on which the 50th percent of the total recapture was recaptured, using the adjusted figures.

MEAN LENGTH--Average fork length of the fish captured on or about (3 days before and after) the date of recapture for the median fish.

MVMT RATE--Movement rate is the distance from release point to recapture point divided by the number of days from 1st day of release to the date of recapture for the median fish.

cont next page

Appendix Table 2.--cont

<u>BRAND ABBREVIA.</u>		<u>BRAND ABBREVIA.</u>		<u>BRAND ABBREVIA.</u>	
2	2		PI	+U	+U
4	4	Δ T	DT	+L	+L
9	9) (PP	+Y	+Y
10	10	$\sqrt{\quad}$	SQ	+R	+R
13	13	IF	IF	+F	+F
17	17	IZ	IZ	+K	+K
V	V	IM	IM	+J	+J
R	R	IN	IN	+N	+N
W	W	IV	IV	52	52
P	P	WG	WG		
U	U		EP		
E	E		TT		
T	T	1-	1-	<u>COLOR</u>	<u>ABBREVIA.</u>
J	J		B4	Red	RD
H	H		B2	Green	GN
S	S		B1	Blue	BL
Z	Z		B8	Gray	GY
Y	Y	Δ	D	Brown	BR
L	L	UC	UP	Yellow	YW
+	+		TI	Oxide Yellow	XY
G	G	00	\emptyset	Oxide Red	XR
K	K		EC	Light Blue	LB
I Δ	ID		GL	Light Green	LG
IY	IY		SP	Pink	PK
I+	I+	O	O	Purple	PU
	HE	IH	IH	Orange	OR
IC	IC	+P	+P	Tan	TN
IT	IT	+Z	+Z	White	WH
IJ	IJ	IX	IX	Black	BK
IS	IS	IL	IL	Oxide Brown	XB
IU	IU	IY	IY	Chrome Yellow	CY
X3	X3	IR	IR	Medium Green	MG
	AN	+O	+O	Gold	GD
IK	IK	+T	+T	Dark Green	DG
L	SU	3	3	Dark Red	DR
				Medium Orange	MO
				Mixed	MX
				Metallic Grey	GM
				Lavender	LA

Recapture sites are listed as River miles (RM) in the table. Conversions to kilometers are as follows:

<u>River Mile</u>	<u>River Kilometer</u>
46.5	75
27	43
24	39
22.5	36
18	29
11	18
10	16
9	14

RELEASE AND RECAPTURE INFORMATION - COLUMBIA RIVER ESTUARY 1973

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE	NO. MKO (THOUS)	R. MILE	RECAPT. SITE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN	MM	M/M/T
									ACTUAL NO.	% ADJUSTED				
010104	LEWIS R WILD WILDSOCK	LEWIS RIVER SEINED TAG REL IN RIVER	25AP79-15MY79	300	31.1	C046.5S	4	2	0.087	34	0.103	06JL 29AJ	93	1
						C046.5M	3	7	0.023	19	0.062	06JL 14AJ	86	1
						C010.ON	3	7	0.023			13AJ 15F	128	1
010105	LEWIS R WILD WILDSOCK	LEWIS RIVER SEINED TAG REL IN RIVER	15MY79-30MY79	300	23.8	C046.5S	4	45	0.151	60	0.200	05JL 30JL	83	1
						C046.5M	3	3	0.010	9	0.030	14AJ 17AJ	22AJ	97
						C018.OS	3	1	0.003			06AJ 06AJ	06AJ	105
						C010.ON	3	3	0.010			11SE 11SE	14SE	110
034701	SPRING CREEK CONTROL-NATURAL	BIG WHITE SALMON	28MR79	103	42.4	C046.5S	4	58	0.137	81	0.190	10AP 01MY	06JN 84	6
						C046.5M	3	9	0.021	14	0.032	24AP 22MY	26MY 107	4
						C018.OS	3	1	0.002			17MY 17MY	17MY 94	5
						C010.ON	3	3	0.007			21MY 26MY	04JN 110	4
034801	SPRING CREEK TEST-TRUCK	HAMMOND	30MR79	134	44.4	C009.OS	3	1	0.002			25MY 25MY	25MY 106	0
034901	SPRING CREEK TEST NATURAL	STAVEBOLT	31MR79	118	47.3	C009.OS	3	1	0.002			25MY 25MY	25MY 102	0
035001	SPRING CREEK TEST-NATURAL	STAVEBOLT	19MY79	71	48.2	C011.OS	3	2	0.004			30MY 30MY	30MY 93	2
						C010.ON	3	3	0.006			07JN 14JN	18JN 90	1
						C009.OS	3	1	0.002			25MY 25MY	25MY 95	3
035101	SPRING CREEK TEST-TRUCK	HAMMOND	22MY79	72	49.3	C000.OA	3	1	0.002			03JL 03JL	03JL 120	0
035201	SPRING CREEK CONTROL-NATURAL	BIG WHITE SALMON	19MY79	63	47.8	C045.5S	4	3	0.006	4	0.003	25MY 26MY	27MY 90	2R
						C046.5M	3	18	0.038	28	0.059	23MY 25MY	11JN 96	33
						C010.ON	3	7	0.015			26MY 23MY	11JL 95	26
035301	SPRING CREEK TEST-NATURAL	STAVEBOLT	17MY79	69	47.7	C010.ON	3	1	0.002			07JN 07JN	07JN 105	1
035401	SPRING CREEK TEST-TRUCK	HAMMOND	22MY79	76	46.3	C010.ON	3	1	0.002			18JN 18JN	18JN 95	0
						C009.OS	3	1	0.002			25MY 25MY	25MY 91	0
035501	SPRING CREEK CONTROL-NATURAL	BIG WHITE SALMON R	26JN79	62	28.5	C046.5S	4	5	0.018	7	0.025	23JN 03JL	06JL 90	28
						C046.5M	3	20	0.070	36	0.125	14JN 01JL	09JL 96	39
						C010.ON	3	9	0.032			02JL 02JL	04JL 93	43
035601	SPRING CREEK CONTROL-NATURAL	BIG WHITE SALMON R	26JN79	62	34.8	C046.5S	4	4	0.012	5	0.014	25JN 04JL	19JL 90	25
						C046.5M	3	13	0.037	22	0.063	08JN 01JL	11JL 97	39
						C010.ON	3	7	0.020			02JL 02JL	04JL 97	43
035701	SPRING CREEK CONTROL-NATURAL	BIG WHITE SALMON	26JN79	62	36.3	C046.5S	4	1	0.003	2	0.004	02JL 02JL	02JL 85	33
						C046.5M	3	10	0.028	17	0.048	23JN 01JL	02JL 97	39
						C010.ON	3	17	0.047			02JL 02JL	04JL 95	43
050420	HAGERMAN NFH BARGED VS MIGRATION	BELOW BONNEVILLE	20MY79	71	84	C046.5S	4	58	0.109	69	0.129	26MY 02JN	05JL 77	12
						C046.5M	3	16	0.030	25	0.047	25MY 27MY	29JN 94	22
						C010.ON	3	3	0.006			23MY 14JN	18JN 85	9
050421	HAGERMAN NFH MAINTAIN FALL	ASOTIN-SNAKE RIVER CHINOOK RUN	21MY79	75	92	C046.5M	3	3	0.007	5	0.011	02JL 03JL	16AJ 125	16
						C010.ON	3	2	0.004			11JL 11JL	11JL 137	15
050426	KOOKSIA NFH BARGED VS MIGRATION	CLEAR CREEK	29AP79 (5-4/26FRASU1)	100	40	C046.5M	3	27	0.044	31	0.050	23MY 17JN	02JL 121	16
						C010.ON	3	6	0.010			23MY 22JN	25JN 125	16
050427	KOOKSIA NFH BARGED VS MIGRATION	TRK LEWIS BARGE	80 03MY79-20MY79	100	44	C046.5S	4	15	0.029	21	0.040	11MY 24MY	23MY 97	9
						C046.5M	3	23	0.045	31	0.061	14MY 21MY	02JL 98	7
						C018.OS	3	2	0.004			18MY 18MY	18MY 106	13

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM	ND. MKS (THOUS)	RECAPT. SITE R.MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN MM	M/M/T RATE K/M/UY
								ACTUAL NO.	ADJUSTED %			
050427	KOOSKIA NFH BARGED VS MIGRATION	TRK LEWIS BARGE 80	03MY79-20MY79	100	44	51.5	C010.ON 3	3	0.006	23MY 04JN 04JN	100	7
050433	SP. CR. NFH EVAL & CONTRIB	SP. CR. NFH	18MY79	50	140.3		C046.SS 4 C046.SM 3 C011.OS 3	25 73 1	0.018 0.052 0.001	21MY 23MY 29MY 21MY 22MY 30MY 30MY 30MY 30MY	91 95 92	38 48 21
050434	SP. CR. NFH ERM VACCINE	SP. CR. NFH	20AP79	87	95.6		C010.ON 3 C009.OS 3 C046.SS 4 C046.SM 3 C010.ON 3 C009.OS 3	2 2 179 17 11 2	0.001 0.001 0.187 0.018 0.012 0.002	26MY 07JN 18JN 25MY 25MY 93 25AP 04MY 08JN 25AP 27AP 11JN 21MY 07JN 15JN 25MY 25MY 101	106 93 81 83 105 101	13 36 14 27 5 7
050443	BIG WHITE NFH CONTRIB	WHITE SALMON RIVER	21MY79	69	141.4		C000.OA 3 C046.SS 4 C046.SM 3 C010.ON 3 C000.OA 3	1 30 26 13 2	0.001 0.021 0.018 0.009 0.001	03JL 03JL 03JL 27AP 31MY 08JN 25MY 26MY 08JN 04JN 14JN 02JL 28JN 28JN 28JN	100 83 87 98 102	4 20 39 11 7
050444	SP. CR. NFH EVAL&CONTRIB&ERM CONTROL	SP. CR. NFH	20AP79	78	135.5		C046.SS 4 C046.SM 3 C018.OS 3 C010.ON 3	229 52 2 13	0.169 0.038 0.001 0.010	25AP 04MY 27MY 24AP 26AP 02JN 18MY 18MY 99 21MY 07JN 14JN	83 32 99 102	14 32 9 5
050445	SP. CR. NFH EVAL & CONTRIB	SP. CR. NFH	13AU79	120	19	55.6	C000.OA 3 C046.SM 3 C010.ON 3 C000.OA 3	33 4 1 1	0.059 0.007 0.002 0.001	17AU 18AU 22AU 20AU 20AU 20AU 27AU 23AU 23AU 26MR 08AP 30MY	140 133 140 70	38 36 27 10
050446	SP. CR. NFH EVAL & CONTRIB	SP. CR. NFH	20MR79	125	246.0		C046.SS 4 C046.SM 3 C018.OS 3 C010.ON 3	18 1 1 6	0.086 0.007 0.000 0.002	27MR 09JN 70 18MY 18MY 18MY 21MY 04JN 14JN	70 101 100	27 4 3
050448	L.W.S.NFH EVAL & CONTRIB	L.W.S. NFH	22JN79	105	177.8		C046.SS 4 C046.SM 3 C010.ON 3 C000.OA 3	159 95 12 1	0.089 0.053 0.007 0.001	28JN 05JL 13AU 27JN 30JN 16AU 02JL 13JL 14SE 09AU 09AU 09AU	74 79 93 100	14 23 9 5
050449	L.W.S. NFH EVAL & CONTRIB	L.W.S. NFH	22JN79	123	264.8		C046.SS 4 C046.SM 3 C018.OS 3 C010.ON 3	293 119 4 23	0.111 0.045 0.002 0.009	28JN 06JL 10AU 27JN 30JN 01AU 06AU 06AU 06AU 02JL 13JL 14SE	72 74 102 85	13 23 5 12
050450	ABERNATHY SDCD EVAL & CONTRIB	ABERNATHY SDCD	17AP79-17MY79	118	63.4		C000.OA 3 C046.SS 4 C046.SM 3 C018.OS 3	28 32 3 1	0.044 0.050 0.002 0.002	19AP 30AP 07JN 18AP 17MY 12JN 18MY 18MY 18MY 09AU 09AU 23AU	81 94 89 102	1 1 2 5
050451	ABERNATHY SDCD EVAL & CONTRIB	ABERNATHY SDCD	17AP79-15MY79	43	48.9		C010.ON 3 C046.SS 4 C046.SM 3 C018.OS 3	7 22 13 1	0.011 0.045 0.027 0.002	04JN 07JN 15JN 19AP 30AP 01JN 18AP 18MY 22JN 17MY 17MY 17MY	98 81 87 102	1 1 1 2

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS) R, MILE	NO. MKD (THOUS)	RECAPT. SITE R, MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG		
								ACTUAL	ADJUSTED		1ST MED. LAST	LEN	MM
	PURPOSE OF RELEASE	OTHER MARKS						NO.	%	FISH FISH	FISH	MM	KM/DAY
050451	ABERNATHY SCDC EVAL & CONTRIB	ABERNATHY SCDC	17AP79-15MY79	43	48.9	C010.ON 3	3	2	0.004	21MY 21MY	18JN 110	110	2
071608	BONNEVILLE NFH BONNEVILLE HAT EVAL	TANNER CR.	01MY79	78	96.6	C046.SS 4 C046.SM 3 C018.OS 3	4	113	0.117	143	0.148	06MY 09MY 05JN	80 20
071613	BONNEVILLE NFH BONNEVILLE HATCHERY EVAL	TANNER CR.	29MY79	47	95.6	C046.SS 4 C046.SM 3 C010.ON 3	4	90	0.094	106	0.111	01JN 03JN 22JN	88 31
071835	WILD WILD FISH CONTRIB	WARM SP R TO SHEAR DESCHUTES(LAE2,3;RAE1-4;RDE	11MR79-14JL79	67	283.8	C046.SS 4 C046.SM 3	4	66	0.023	85	0.030	14MY 18MY 24JN	84 17
071836	WILD	SHEARS FALLS T MUJ	11MR79-14JL79	4.9		C046.SM 3	3	3	0.061	3	0.068	16JN 17JN 18JN	97 3
071837	WILD	WILD FISH CONTRIB	(LDT11,2;LPT11,2;RAT11,2;IRD	20.1		C000.OA 3	3	1	0.020			03JL 03JL 03JL	110 3
071841	WILD	WILD FISH CONTRIB	08AP79-14JL79	20.1		C046.SM 3	3	3	0.015	10	0.048	08AJ 02AJ 17AJ	110 3
071842	STAYTON POND FALL CHIN IN WILL R.	WILL.ABOVE D.C.FAL	07MY79-21MY79	67	283.8	C000.OA 3 C046.SS 4 C018.OS 3 C011.OS 3 C010.ON 3 C009.OS 3	3	192	0.068	224	0.079	13MY 17MY 02JL	90 19
071843	BONNEVILLE NFH COL R FALL CHIN EVAL	TANNER CR.	01MY79-29MY79	88	287.9	C000.OA 3 C046.SS 4 C046.SM 3 C018.OS 3 C011.OS 3 C010.ON 3	4	426	0.148	510	0.177	05MY 02JN 26JN	82 5
071844	BONNEVILLE NFH COL R F. CHIN EVAL	TANNER CR.	21MY79	80	15.1	C046.SS 4 C046.SM 3 C010.ON 3 C000.OA 3	4	73	0.025	86	0.030	04MY 02JN 13JL	91 5
071845	BIG CREEK NFH COL R FALL CHIN EVAL	BIG CR-COI R.	21MY79	81	224.9	C011.OS 3 C010.ON 3 C009.OS 3	3	4	0.001			18MY 18MY 30MY	94 7
071846	KLASKANINE NFH COL R FALL CHIN EVAL	KLASKANINE R.	22MY79	71	244.1	C000.OA 3 C010.ON 3 C000.OA 3	3	4	0.001	12	0.081	26MY 31MY 07JN	82 16
631646	GRAYS RIVER NFH COL RIVER FALL CHIN EVAL	GRAYS RIVER	09JN79	95	73.9	C046.SS 4 C010.ON 3	4	7	0.003	2	0.013	26MY 26MY 26MY	70 31
631813	LEWIS RIVER NFH COL RIVER FALL CHIN EVAL	LEWIS RIVER	13JL79	160	60.5	C010.ON 3 C046.SS 4	3	12	0.016	396	0.655	17JL 03AJ 05SE	83 4
631821	PRIEST RAPIDS COL R FALL CHIN EVALUATION	PRIEST RAPIDS	29MY79	74	48.1	C046.SS 4 C010.ON 3	3	5	0.008	48	0.079	23JL 08AJ 16AJ	87 3
								12	0.025	22	0.046	17JN 17JL 01AJ	132 10

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS) R. MILE	NO. MKD	RECAPT. SITE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG M/MT	
								ACTUAL NO.	ADJUSTED NO.			1ST FISH
631821	PRIEST RAPIDS COL R FALL CHIN EVALUATION	PRIEST RAPIDS	23MY79	74	48.1	C010.ON 3	3	0.006		25JN 25JN 27AJ 105	13	
631833	GRAYS RIVER NFH COL RIVER FALL CHIN EVAL	GRAYS RIVER NFH COL RIVER FALL CHIN EVAL	09JN79	95	7.6	C046.5S 4 C046.5M 3 C010.ON 3	2 2 1	0.026 0.026 0.013	2 3	0.030 0.042	13JL 14JL 18JL 85 17JL 18JL 95 05SE 05SE 115	0 0 0
631854	TOUTLE RIVER COL RIVER FALL CHIN EVAL COMBINED	GREEN RIVER COL RIVER FALL CHIN EVAL COMBINED	17JN79	160	144.1	C046.5S 4 C046.5M 3 C018.OS 3 C010.ON 3	63 7 1 4	0.044 0.005 0.001 0.003	85 11	0.059 0.008	30JN 13JL 12SE 82 29JN 01JL 13JL 74 06AJ 06AJ 06AJ 105 19JL 27AJ 17SE 112	3 6 3 2
631856	ELOKOMIN COLUMBIA RIVER FALL CHINOOK EVAL.	ELOKOMIN	15JN79	99	140.0	C010.ON 3	1	0.001		22JN 22JN 22JN 75	11	
631858	LEWIS R WILD WILDSTOCK SEINED TAG REL IN RIVER	LEWIS RIVER WILDSTOCK SEINED TAG REL IN RIVER	18JN79-19JN79	200	26.2	C046.5S 4 C046.5M 3 C010.ON 3	121 3 2	0.461 0.011 0.008	175 11	0.667 0.042	16JL 06AJ 19SE 89 15AJ 04SE 05SE 105 13AJ 13AJ 14SE 105	2 1 3
631859	LEWIS R WILD WILDSTOCK SHINED TAG REL IN RIVER	LEWIS RIVER WILDSTOCK SHINED TAG REL IN RIVER	13JL79-26JL79	200	23.4	C046.5S 4 C046.5M 3	105 2	0.449 0.009	149 5	0.636 0.020	16JL 04AJ 14SE 76 20JL 21JL 15AJ 80	4 11
631902	LEWIS R WILD WILDSTOCK SEINED TAG REL IN RIVER	LEWIS RIVER WILDSTOCK SEINED TAG REL IN RIVER	19JN79-26JN79	200	21.2	C046.5S 4 C046.5M 3 C010.ON 3	91 5 9	0.430 0.042 0.024	127 37	0.601 0.173	09JL 07AJ 14SE 83 20JL 11AJ 05SE 93 11SE 17SE 19SE 111	2 2 2
631910	LEWIS R WILD WILDSTOCK-SEINED, TAG REL. IN RIVER	LEWIS RIVER WILDSTOCK-SEINED, TAG REL. IN RIVER	25MY79-08JN79	250	30.7	C046.5S 4 C046.5M 3 C010.ON 3	95 11 6	0.310 0.036 0.020	119 42	0.389 0.137	13JL 02AJ 05SE 82 06JL 18AJ 26SE 97 29AJ 11SE 19SE 112	1 1 2
631920	LEWIS RIVER NFH COL R. F CH EVAL REARED 3 MONTHS	LEWIS RIVER COL R. F CH EVAL REARED 3 MONTHS	05SE79	28	51.7	C046.5S 4 C027.ON 3 C010.ON 3	18 2 7	0.035 0.004 0.014	81	0.156	10SE 15SE 26SE 99 10SE 10SE 10SE 112 13SE 17SE 119 18	9 24 18
631937	GRAYS RIVER NFH COL RIVER FALL CHIN EVAL	GRAYS RIVER COL RIVER FALL CHIN EVAL	09JN79	95	68.1	C046.5S 4 C046.5M 3 C010.ON 3	2 1 8	0.003 0.001 0.012	3 1	0.004 0.002	27JN 22JL 23JL 90 29JN 29JN 29JN 80 04JL 11SE 14SE 122	0 0 0
631938	WASHOUGAL NFH COL. RIVER FALL CHIN EVAL	WASHOUGAL RIVER COL. RIVER FALL CHIN EVAL	14JN79-02SE79	95	100.1	C046.5S 4 C046.5M 3 C027.ON 3 C010.ON 3	268 30 2 18	0.268 0.030 0.002 0.018	324 46	0.324 0.046	20JN 30JN 12SE 80 20JN 29JN 15AJ 80 10SE 10SE 10SE 115 02JL 31AJ 14SE 115	9 10 2 3
631939	WEYCO POND COL RIVER FALL CHIN EVAL	GRAYS RIVER COL RIVER FALL CHIN EVAL	05JN79	58	92.4	C046.5S 4 C046.5M 3 C010.ON 3	3 1 7	0.003 0.001 0.008	4 4	0.004 0.005	17JL 06AJ 10AJ 100 10AJ 19AJ 10AJ 100	0 0
631941	TOUTLE RIVER COL R. F CH EVAL COMB W 631954	GREEN RIVER COL R. F CH EVAL COMB W 631954	17JN79	160	144.1	C000.OA 3 C046.5S 4 C018.OS 3 C010.ON 3	735 59 1 24	0.510 0.041 0.001 0.017	980 108	0.680 0.075	28JN 28JN 28JN 90 12JN 13JL 19SE 82 20JN 01JL 14AJ 73 22AJ 22AJ 22AJ 115	2 3 6 2
631942	COWLITZ NFH COL RIVER FALL CHIN EVAL	COWLITZ RIVER COL RIVER FALL CHIN EVAL	27JN79-16OC79	85	143.6	C000.OA 3 C046.5S 4 C046.5M 3 C027.ON 3 C010.ON 3	3 247 31 1 16	0.002 0.172 0.022 0.001 0.011	349 100	0.243 0.063	09AJ 15AJ 15AJ 107 03JL 02AJ 19SE 89 02JL 03AJ 05SE 92 10SE 10SE 10SE 100 03AJ 11SE 19SE 112	3 3 3 2 2

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS) R.MILE	NO. PKO	RECAPT. SITE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN	MVMT RATE
								ACTUAL NO.	ADJUSTED %			
631946	WASHOUGAL NFH COL RIVER FALL CHIN EVAL	WASHOUGAL RIVER	14JN79-02SE79	95	158.8	C046.5S 4	521	0.328	539	0.402	19JN 01JL 29AU	80 3
						C046.5M 3	68	0.043	103	0.069	20JN 30JN 14AU	80 9
						C018.0S 3	2	0.001			06AU 06AU 06AU	110 4
						C010.0N 3	21	0.013			02JL 13AU 14SE	115 3
631949	KLICKITAT COL R. FALL CHIN EVAL.	KLICKITAT	01JN79	80	225.4	C046.5S 4	120	0.053	142	0.063	27MY 05JN 03JL	78 71
						C046.5M 3	104	0.046	141	0.062	27MY 10JN 18JL	89 31
						C010.0N 3	22	0.010			29MY 22JN 20JL	94 16
						C000.0A 3	5	0.002			28JN 28JN 03JL	101 13
631950	LEWIS R. WILD COL R F CH EVAL REARED 3 MONTHS	LEWIS RIVER	19JL79	108.2		C046.5S 4	815	0.753	1087	1.004	21JL 02AU 14SE	84 6
						C046.5M 3	15	0.014	46	0.043	20JL 13AU 22AU	102 4
						C018.0S 3	1	0.001			22AU 22AU 22AU	110 4
						C010.0N 3	16	0.015			29AU 11SE 17SE	117 3
						C000.0A 3	1	0.001			09AU 09AU 09AU	99 8
631951	COMLITZ RIVER COL RIVER FALL CHIN EVAL	COMLITZ RIVER	27JN79-160C79	19	11.1	C046.5S 4	2	0.018	2	0.021	02AU 22AU 23AU	85 2
631954	TOULTE RIVER COL R F CH EVAL COMB W 631941	GREEN RIVER	17JN79	160	144.1	C046.5S 4	2	0.001	2	0.002	16JL 17JL 09AU	90 3
631956	ELOKOMIN COLUMBIA RIVER FALL CHINOOK EVAL.	ELOKOMIN	15JN79	99	140.0	C046.5S 4	3	0.002	4	0.003	26JN 01JL 03JL	85 1
						C010.0N 3	17	0.012			22JN 04JL 03AU	92 4
						C000.0A 3	2	0.001			28JN 28JN 28JN	87 7
631957	KALAMA FALLS COL RIVER FALL CHIN EVAL	KALAMA FALLS	22JN79-13JL79	180	209.7	C046.5S 4	2161	1.030	2820	1.344	25JN 27JL 14SE	75 2
						C046.5M 3	68	0.032	175	0.084	24JN 31JL 12SE	85 2
						C010.0N 3	8	0.004			13JL 11SE 17SE	110 2
632002	LEWIS R. WILD WILD STOCK SEINED TAG REL IN RIVER	LEWIS RIVER	02JL79-19JL79	200	18.2	C046.5S 4	96	0.526	133	0.731	16JL 09AU 14SE	78 2
						C046.5M 3	6	0.033	19	0.105	25JL 08AU 17AU	82 2
						C010.0N 3	1	0.005			06SE 06SE 06SE	100 2
632017	PRIEST RAPIDS COL R FALL CHIN EVAL.	PRIEST RAPIDS	28JN79	77	82.2	C046.5M 3	6	0.007	22	0.026	27JL 30JL 17AU	113 18
						C027.0N 3	1	0.001			10SE 10SE 10SE	125 8
						C010.0N 3	2	0.002			13AU 13AU 29AU	125 13
						C000.0A 3	1	0.001			16JL 16JL 16JL	90 35
						C010.0N 3	1	0.002			14SE 14SE 14SE	135 9
WHLBYWLB	M McNARY TAILRACE CONTROL	TAILRACE	24JL79-06AU79 (LAIME2; WHLBYWLB)	40.4		C010.0N 3	1	0.002	1	0.003	03AU 03AU 03AU	110 16
WHLBYWLG	M McNARY TRANSPORT EVAL	TRUCK/BONNEVILLE	24JL79-06AU79 (WHLBYWLG; RAI+2)	41.2		C046.5S 4	4	0.010	4	0.010	11SE 13SE 14SE	128 4
WHROLBYW	M McNARY TRANSPORT EVAL	TRUCK/BONNEVILLE	08AU79-24AU79 (WHRLBYW; RAI+4)	18.5		C046.5M 3	2	0.011	6	0.032	14AU 16AU 17AU	120 19
WHRODLGPK	M McNARY TRANSPORT EVAL.	TRUCK/BONNEVILLE	14MY79-21JN79 (RE32; RA33)	3.4		C010.0N 3	1	0.005	1	0.030	14SE 14SE 14SE	125 6
WHROPKLB	M McNARY TRANSPORT EVAL	TRUCK/BONNEVILLE	12JN79-29JN79 (WHROPKLB; RAI+1)	43.5		C046.5M 3	20	0.059	26	0.071	11JN 11JN 11JL	80 3
WHYWBLLB	M McNARY TRANSPORTATION CONTROL	TRUCK/FOREBAY	05JL79-13AU79 (LAUF1; LAUP2)	19.8		C010.0N 3	1	0.002	25	0.060	15JN 23JN 02JL	107 14
						C018.0S 3	1	0.005	1	0.002	25JN 25JN 25JN	120 16

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKD (THOUS)	RECAPT. SITE R.MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE		AVG LEN MM	MVRT RATE KM/DAY
								ACTUAL NO.	ADJUSTED %	1ST FISH	LAST FISH		
LD T 2	BONNEVILLE BONN DAM SLUICeway EVAL	BONN DAM TAILRACE	13JUN79	57	51.3	C046.5M 3	35	0.068	39	0.076	16JN 18JN 24JN	96	31
RD T 2	KLATSKANINE BONN DAM SLUICeway EVAL	BONN DAM TAILRACE	13JUN79	61	28.2	C046.5S 4	77	0.273	83	0.294	17JN 21JN 27JN	90	20
LD T 3	BONNEVILLE BONN DAM SLUICeway EVAL	BONN DAM TAILRACE	13JUN79	58	51.4	C046.5S 4	48	0.093	52	0.101	17JN 20JN 26JN	86	22
RD T 3	KLATSKANINE BONN DAM SLUICeway EVAL	BONN DAM TAILRACE	13JUN79	57	29.7	C046.5S 4	80	0.269	87	0.295	17JN 21JN 05JL	87	20
LD T 4	KLATSKANINE DALLE DAM SLUICeway EVAL	HORSE THEIF LAKE	08JUN79	62	50.8	C046.5S 4	18	0.035	20	0.039	15JN 19JN 22JN	87	21
RD T 4	KLATSKANINE BONN DAM SLUICeway EVAL	BONN DAM FOREBAY	14JUN79	60	50.1	C046.5S 4	52	0.104	56	0.112	18JN 21JN 09JL	83	22
LP TI 1	WILD WILD FISH CONTRIB	SHEARS FALLS T MOU	03JUN79-16JUN79		0.6	C046.5S 4	1	0.175	1	0.195	22JN 22JN 22JN	85	15
RD TI 1	WILD WILD FISH CONTRIB	SHEARS FALLS T MOU	08AP79-21AP79		0.4	C046.5M 3	1	0.224	1	0.240	19JN 19JN 19JN	115	4
LD U 1	KLICKITAT SURVIVAL AND EFFICIENCY	RAINIER	13JUN79	78	23.9	C046.5M 3	5	0.021	45	0.188	15JN 18JN 25JN	81	7
RD U 1	SPRING CREEK SURVIVAL AND EFFICIENCY	PRESCOTT	03AP79	72	25.6	C010.0N 3	2	0.008	208	0.811	04AP 08AP 20JN	71	8
LD U 2	WASHOUGAL SURVIVAL AND EFFICIENCY	RAINIER	25JUN79	74	26.0	C046.5S 4	136	0.523	169	0.648	07JN 07JN 11JL	110	2
RD U 2	SPRING CREEK SURVIVAL AND EFFICIENCY	RAINIER	02MY79	84	25.0	C046.5S 4	51	0.204	66	0.264	10AU 10AU 10AU	90	2
LD U 3	L. WHITE SALMON SURVIVAL AND EFFICIENCY	RAINIER	26JUN79	68	25.3	C046.5S 4	64	0.253	82	0.323	04MY 05MY 30JN	85	11
RD U 3	BONNEVILLE SURVIVAL AND EFFICIENCY	PRESCOTT	16MY79	91	25.1	C046.5S 4	52	0.207	75	0.298	17JL 17JL 17JL	120	4
LD U 4	SPRING CREEK SURVIVAL AND EFFICIENCY	RAINIER	13AU79-14AU79	120	20.2	C046.5S 4	3	0.015	4	0.021	15AU 17AU 20AU	110	9
					26	C046.5M 3	26	0.129	45	0.225	15AU 15AU 16AU	124	17
					4	C010.0N 3	4	0.020			04JL 20AU 31AU	132	13

SPECIES: CHINOOK O'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS) R. MILE	NO. MKD (THOUS)	NO. RECAPT. SITE	GEAR CODE	ACTUAL NO. %	RECAPTURES ADJUSTED NO. %	RECAPTURE DATE		AVG LEN MM	MVRT RATE KM/DAY
										1ST FISH	LAST FISH		
RD U 4	SPRINGS CREEK SURVIVAL AND EFFICIENCY	RAINIER	29MY79	88 52	24.9	C046.5S 4	28	0.113	31	0.126	31MY 01JN 09JN	88	11
LA UP 1	MENARY TRANSPORTATION CONTROL	TRUCK/FOREBAY	05JL79-16JL79 (WHYBLLB)			C046.5M 3	4	0.016	4	0.017	31MY 31MY 01JN	98	17
LA W 1	JOHN DAY EFFICIENCY	BLALOCK	25JL79	8.4	0.046	C010.ON 3	4	0.016	20	0.237	04JN 07JN 07JN	96	10
LD W 1	JOHN DAY EFFICIENCY	BLALOCK	26JL79	1.1	0.046	C046.5M 3	1	0.093	3	0.311	01AU 01AU 01AU	125	43
RA W 2	JOHN DAY EFFICIENCY	BLALOCK	03AU79	1.0	0.046	C046.5M 3	1	0.105	3	0.350	08AU 08AU 08AU	125	23
RD W 3	JOHN DAY EFFICIENCY	TOWAL	22AU79	0.5	0.046	C046.5S 4	1	0.195	2	0.295	29AP 29AP 29AP	85	1
LV	BONNEVILLE NFH	TANNER CREEK	21MY79-21MY79	79	277.4	C010.ON 3	30	0.011			07JN 18JN 04JL		
RV	BONNEVILLE NFH	TANNER CREEK	21MY79-21MY79	82	272.9	C010.ON 3	19	0.007			07JN 18JN 22JN		
UC	KLATSKANINE	BONN FOREBAY	12JN79-12JN79	70	56.3	C046.5S 4	22	0.039			09MY 17JN 23JN		
						C046.5M 3	12	0.021			10MY 17JN 02JL		
						C010.ON 3	6	0.011			22JN 02JL 17SE		
						C000.OA 3	1	0.001			03JL 03JL 03JL		

RELEASE AND RECAPTURE INFORMATION - COLUMBIA RIVER ESTUARY 1973

PAGE NO. 11

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKD	RECAPT. SITE R.MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG MGMT	
								ACTUAL	ADJUSTED			1ST FISH
050349	WILLARD NFH YEARLING	LITTLE WHITE RIVER	19AP79	23	31.1	C046.5S 4	12	0.039	14	0.044	30AP 01MY 04MY 121	15
						C046.5M 3	8	0.026	11	0.034	27AP 30AP 01MY 115	17
						C010.ON 3	2	0.006			07MY 07MY 11MY 135	14
050350	WILLARD NFH	LITTLE WHITE RIVER	19AP79	22	31.2	C046.5S 4	10	0.032	11	0.035	26AP 01MY 02MY 125	15
						C046.5M 3	2	0.006	3	0.010	27AP 28AP 30AP 135	21
						C046.5S 4	6	0.018	7	0.022	30AP 03MY 05MY 125	13
050352	LITTLE W.SAL. LATE FALL CHINOOK REL.	LITTLE WHITE SALMU	01NO78	104	39	C046.5S 4	4	0.012	4	0.013	26AP 27AP 02MY 110	23
		L. WHITE SAL.	01NO78	104	35.7	C046.5S 4	2	0.006	17	0.047	06MR 06MR 05AP 105	0
050354	WILLARD NFH	L. WHITE SAL.	01NO78	104	37.0	C046.5S 4	1	0.003	3	0.008	02AP 02AP 16FE 16FE	100
050454	HAYDEN CREEK IDENTIFI EVAL	HAYDEN CREEK REAR TECH	04AP79-07AP79	15	58.2	C046.5M 3	5	0.009	6	0.010	02MY 08MY 23MY 170	33
070106	UPPER JOHN DAY WILD STOCK EVAL.	N. FORK JOHN DAY R	10JN79	75	9.5	C046.5S 4	2	0.021	3	0.027	07MY 28JN 29JN 116	21
		WILLIAM R. @ MILL	08NO78-09NO78	108	51.5	C046.5S 4	1	0.010	1	0.012	17JN 17JN 17JN 110	54
		RELEASE TIMING				C046.5M 3	6	0.012	22	0.043	26MR 27MR 07AP 135	0
						C009.0S 3	2	0.004	14	0.027	16MR 16MR 15MY 150	0
						C046.5S 4	5	0.013	6	0.015	20AP 25AP 01MY 155	27
071653	ROUND BUTTE	DESCHUTES@HATCH	09AP79	9	39.5	C046.5S 4	28	0.071	34	0.085	18AP 30AP 23MY 159	21
						C010.ON 3	9	0.023			04MY 04MY 11MY 161	20
071654	ROUND BUTTE NFH HAT EVAL +VIBRID IMN	DESCHUTES R @ HATC	31MY78-03OC78	13	24.4	C046.5M 3	1	0.004	2	0.006	27AP 27AP 27AP 165	0
						C010.ON 3	1	0.004			07MY 07MY 07MY 145	1
071655	ROUND BUTTE NFH HAT EVAL +NONVIBRID IMN	DESCHUTES R @ HATC	04OC78	13	25.0	C046.5M 3	2	0.008	3	0.011	23AP 23AP 02MY 167	1
071656	BONNEVILLE NFH STOCK EVAL TIME REL TULE	COL R @ BONNEVILLE	30OC78	12	50.9	C046.5S 4	6	0.012	16	0.032	21MR 06AP 01MY 145	0
071657	BONNEVILLE NFH COL STK	COL R @ BONNEVILLE	13MR79	7	47.9	C046.5S 4	91	0.190	170	0.356	21MR 11AP 30AP 171	5
						C018.OS 3	14	0.029	18	0.037	17AP 25AP 14MY 182	4
						C000.OA 3	1	0.002			18MY 18MY 18MY 208	3
071658	BONNEVILLE NFH STOCK EVAL TIME REL TULE	COL R @ BONNEVILLE	30OC78	20	44.8	C046.5S 4	4	0.009	20	0.044	28FE 28FE 25AP 135	0
071659	BONNEVILLE NFH STOCK EVAL TIME REL TULE	COL R @ BONNEVILLE	30OC78	14	37.8	C046.5S 4	4	0.011	12	0.033	26MR 27MR 18AP 140	0
071660	BONNEVILLE NFH STOCK EVAL-TIME REL UPP	COL R @ BONNEVILLE	30OC78	24	44.4	C046.5S 4	6	0.014	22	0.050	16FE 17FE 04MY 105	0
						C018.OS 3	1	0.002			18MY 18MY 18MY 109	0
071661	BONNEVILLE NFH COL STK	COL R @ BONNEVILLE	13MR79	8	32.7	C046.5M 3	47	0.144	88	0.269	26MR 11AP 01MY 172	5
						C046.5M 3	15	0.046	15	0.046	23MR 23MR 05SE 170	16
071725	MARION FORKS WILL R-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	16	49.7	C046.5S 4	1	0.002	1	0.003	30AP 30AP 140	14
						C046.5M 3	31	0.062	38	0.077	30AP 09MY 16JN 143	10
						C010.ON 3	4	0.008			04MY 04MY 07MY 143	14
071726	MARION FORKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	16	49.6	C046.5M 3	21	0.042	26	0.052	01MY 14MY 19JN 143	9
						C018.OS 3	1	0.002			17MY 17MY 17MY 139	10

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKS	RECAPT. SITE R-MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN MM	MVMT RATE KM/DAY	
								ACTUAL NO.	ADJUSTED %				1ST MED. FISH
071726	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	16	49.6	C010.ON 3	3	0.006		11MY 21MY	21MY 140	9	
071727	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	06ND78	113	43.9	C046.5M 3	10	0.023	25	0.057	28MR 13AP	17MY 131	0
071728	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	06ND78	110	43.0	C046.5M 3	8	0.016	9	0.013	17AP 02MY	12JN 124	0
071729	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	16	45.0	C046.5S 4	1	0.002	1	0.002	03MY 03MY	03MY 125	13
071730	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	19	48.2	C010.ON 3	4	0.009	4	0.009	07MY 07MY	07MY 140	13
071731	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	16	49.4	C046.5M 3	35	0.071	45	0.090	25AP 07MY	19MY 141	11
071732	MARION FURKS WILL R.-CARSON STOCK COMP.	N.SANTIAM @ MINTO	03AP79-05AP79	17	50.6	C010.ON 3	1	0.002	47	0.093	20AP 08MY	21MY 136	11
071737	DEXTER NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	07ND78	9	23.0	C010.ON 3	12	0.024	15	0.067	23MR 24MR	05AP 140	1
071738	DAKRIDGE NFH IMPR HATCH PROU TIME/GRAD	M.FK. WILL. R.	06ND78	8	24.0	C046.5S 4	1	0.004	3	0.011	30MR 30MR	30MR 190	1
071739	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	07ND78	14	28.9	C046.5S 4	1	0.003	8	0.029	19MR 19MR	19MR 180	1
071740	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	08ND78	26	29.4	C046.5S 4	1	0.003	1	0.004	18AP 18AP	18AP 169	1
071741	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	19MR79-20MR79	14	32.0	C046.5S 4	4	0.013	6	0.018	12AP 14AP	19AP 151	16
071742	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	20MR79	8	29.5	C010.ON 3	36	0.113	51	0.158	10AP 21AP	31MY 152	13
071743	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	20MR79	12	30.2	C046.5S 4	2	0.007	3	0.011	17AP 17AP	17AP 165	15
071744	DAKRIDGE NFH IMPR HATCH PROU GRAD/TIME	M.FK. WILL. R.	20MR79	6	32.8	C046.5S 4	5	0.015	80	0.271	19MR 21AP	30AP 176	13
071747	EAGLE CR. NFH STOCK EVAL (PNRC)	EAGLE CR.-CLACK.	01MY79	13	46.2	C046.5S 4	1	0.002	6	0.019	19AP 20AP	02MY 136	13
071748	EAGLE CR. NFH STOCK EVAL (PNRC)	EAGLE CR.-CLACK.	01MY79	13	48.3	C046.5M 3	38	0.082	46	0.099	07MY 17MY	12JN 138	11
071824	ROUND BUTTE NFH HATCH EVAL & TIME RELEASE	ROUND BUTTE, LADDE	01MR79	91	13.2	C000.OA 3	3	0.006	35	0.267	18MY 18MY	18MY 140	13

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKD	RECAPT. SITE (R, MILE)	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG		
								ACTUAL NO.	ADJUSTED NO.		1ST FISH	LAST FISH	LEN
071825	ROUND BUTTE NFH HATCH EVAL & TIME RELEASE	DESCHUTES, KM 161	30MY79-31MY79	22	50.2	C046.55 4	4	1	0.002	23JN 23JN	23JN	145	17
						C046.5M 3	3	106	0.239	04JN 08JN	02JL	127	46
						C010.ON 3	3	7	0.014	07JN 14JN	22JN	125	31
071826	ROUND BUTTE NFH HATCH EVAL & TIME RELEASE	DESCHUTES, KM 161	23MY79	25	48.9	C046.55 4	4	1	0.002	10JN 10JN	10JN	150	23
						C046.5M 3	3	132	0.270	27MY 03JN	22JN	126	37
						C011.OS 3	3	2	0.004	30MY 30MY	30MY	125	67
						C010.ON 3	3	5	0.010	29MY 11JN	22JN	130	25
071827	ROUND BUTTE NFH HATCH EVAL & TIME RELEASE	8KM BELOW BONNE DA	30MY79	22	49.7	C046.55 4	4	11	0.022	01JN 03JN	07JN	118	37
						C046.5M 3	3	138	0.278	01JN 02JN	07JN	123	49
						C010.ON 3	3	10	0.020	04JN 04JN	04JN	122	41
071917	BONNEVILLE STOCK EVAL; COWH.ITZ STOCK	WILL. R. MILL. CR.	09NO78	110	48.2	C046.55 4	4	7	0.015	06MR 22MR	25AP	150	0
						C046.5M 3	3	3	0.006	26MR 26MR	17MY	130	0
						C046.55 4	4	4	0.008	28MR 30MR	04MY	152	0
						C046.5M 3	3	4	0.008	17AP 15MY	21MY	122	0
						C010.ON 3	3	1	0.002	04MY 04MY	04MY	145	0
071919	DAKRIDGE NFH EVAL FALL&SPR RELEASES	S. SANTIAM	21MR79	9	31.7	C046.55 4	4	3	0.003	10AP 13AP	17AP	147	7
						C046.5M 3	3	21	0.056	05AP 18AP	25AP	160	6
						C010.ON 3	3	2	0.006	04MY 04MY	04MY	165	5
						C046.55 4	4	5	0.015	19AP 20AP	31MY	169	6
071920	DAKRIDGE NFH EVAL FALL&SPR RELEASES	S. SANTIAM	21MR79	8	32.9	C046.55 4	4	27	0.082	09AP 12AP	27AP	192	8
						C046.5M 3	3	7	0.022	05AP 11AP	20AP	178	8
						C046.55 4	4	31	0.036	05AP 12AP	27AP	193	8
						C000.OA 3	3	1	0.003	03JL 03JL	03JL	220	2
071922	DAKRIDGE NFH EVAL FALL&SPR RELEASES	BLW WILLIAM FALLS	23MR79	9	34.3	C046.55 4	4	26	0.076	28MR 08AP	26JN	181	8
						C046.5M 3	3	19	0.055	04AP 19AP	02MY	168	5
						C010.ON 3	3	1	0.003	04MY 04MY	04MY	140	4
						C046.55 4	4	29	0.034	30MR 09AP	23AP	187	8
						C046.5M 3	3	31	0.030	05AP 23AP	06MY	174	4
						C010.ON 3	3	2	0.006	04MY 04MY	04MY	160	4
071924	DAKRIDGE NFH EVAL FALL&SPR RELEASES	BLW WILLIAM FALLS	23MR79	8	35.4	C046.55 4	4	22	0.062	03AP 12AP	21AP	182	7
						C046.5M 3	3	24	0.068	06AP 22AP	02MY	172	4
						C010.ON 3	3	4	0.011	26AP 04MY	11MY	152	4
071925	DAKRIDGE GRADING AND PRODUCTION	DEXTER	05NO79-08NO79	6	14.9	C046.5M 3	3	2	0.013	15AU 15AU	17AU	107	4
071926	SOUTH SANTIAM SMOLT SURVIVAL (EFFECTS OF RELEASE	FOSTER	07NO78	165	8	C046.55 4	4	2	0.004	28FE 01MR	16MR	190	0
						C046.5M 3	3	1	0.002	17AP 17AP	17AP	168	0
071927	S. SANTIAM FALL REL. EVAL.	FOSTER	07NO78	161	8	C046.5M 3	3	1	0.003	02MY 02MY	02MY	165	0
071928	SOUTH SANTIAM SMOLT SURVIVAL (EFFECTS OF RELEASE	FOSTER	07NO78	167	7	C046.55 4	4	1	0.005	14MR 14MR	14MR	160	0
071929	SOUTH SANTIAM SMOLT SURVIVAL (EFFECTS OF RELEASE	BELOW DR. CITY FAL	07NO78	166	8	C046.55 4	4	2	0.006	05AP 06AP	06AP	149	0
						C046.5M 3	3	1	0.003	18AP 18AP	18AP	135	0
071930	SOUTH SANTIAM SMOLT SURVIVAL (EFFECTS OF RELEASE	BELOW DR. CITY FAL	07NO78	169		C046.55 4	4	3	0.009	14AP 15AP	19AP	140	0
						C046.5M 3	3	4	0.012	10AP 19AP	30AP	146	0
100325	MCCALL SUMMER CHINOOK EVALUATION	SF SALMON	12AP79-18AP79	14	116.2	C046.5M 3	3	32	0.028	02MY 24MY	14JN	159	26
						C010.ON 3	3	3	0.003	11MY 21MY	07JN	150	29

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKD (THOUS)	RECAPT. SITE R. MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE		AVG MYMT LEN MM	MYMT RATE KM/DAY			
								ACTUAL NO.	% ADJUSTED	1ST FISH	LAST FISH					
10032R	RED RIVER EVALUATION	SF CLEARWATER	21SE78	34	37.0	C046.5M 3	3	6	0.016	7	0.020	02MY	20MY	06JN	120	1
100348	MACKAY EVALUATION	UP SALMON DECKER F	03AP79-05AP79	21	122.0	C046.5M 3	3	37	0.030	47	0.039	27AP	05MY	19MY	140	45
100415	RAPID RIVER CONTRIBUTION-EVALUATION	LITTLE SALMON	15MR79-15AP79	15	127.0	C046.5S 4	4	1	0.001	1	0.001	03JN	03JN	03JN	155	11
100424	RAPID RIVER CONTRIBUTION-EVALUATION	LITTLE SALMON	15MR79-15AP79	15	122.0	C046.5S 4	4	2	0.002	2	0.002	20AP	03MY	13MY	136	18
631663	KLICKITAT HAT. PRODUCTION EVAL.	KLICKITAT R.	06JN78	87	136.3	C010.ON 3	3	29	0.023	35	0.028	20AP	03MY	13MY	140	17
631732	KLICKITAT NFH STOCK EVAL.	KLICKITAT	30MR79	10	94.6	C046.5S 4	4	15	0.016	22	0.023	12AP	19AP	27AP	158	14
631733	KLICKITAT NFH STOCK EVAL	KLICKITAT	27MR79	7	106.3	C046.5S 4	4	30	0.032	39	0.041	18AP	01MY	20MY	157	9
631734	KLICKITAT NFH STOCK EVAL	KLICKITAT	30MR79	10	103.3	C046.5S 4	4	6	0.006	2	0.002	04MY	04MY	07MY	155	10
631746	KALAMA FALLS	KALAMA R.	12JL78	68	108	C046.5S 4	4	2	0.001	2	0.001	13JN	28JN	29JN	270	3
631747	KALAMA FALLS ATPASE RELEASE	KALAMA FALLS	15SE78	34	140.3	C046.5S 4	4	92	0.087	125	0.117	10AP	27AP	08JN	176	10
631750	KLICKITAT NFH STOCK EVAL	KLICKITAT	30MR79	10	94.2	C046.5S 4	4	8	0.008	26AP	07MY	19SE	15AJ	15AJ	340	3
631803	WASHOUGAL PRODUCTION EVAL.	HATCHERY	26JN78	62	151.3	C010.ON 3	3	18	0.017	27	0.026	10AP	17AP	10JN	167	16
631808	LEAVENWORTH NFH HAULING STUDY	PRIEST RAPIDS	15MY79	16	94.8	C046.5S 4	4	62	0.060	85	0.082	05AP	27AP	27MY	162	10
631809	LEAVENWORTH NFH HATCHERY EVAL	ICICLE RIVER	26AP79	16	97.5	C046.5S 4	4	12	0.012	26AP	04MY	07MY	159	10	8	
631810	LEAVENWORTH NFH HAULING STUDY	ICICLE RIVER	26AP79	16	100.4	C046.5S 4	4	1	0.001	5	0.003	06AP	06AP	06AP	116	0
631811	WINTHROP NFH HATCHERY EVAL	METHOW RIVER	20AP79	12	86.2	C046.5M 3	3	8	0.006	16	0.012	02AP	08AP	23AP	123	0
								19	0.020	28	0.030	06AP	17AP	01MY	183	16
								68	0.072	94	0.033	03AP	24AP	06JN	183	11
								7	0.007	2	0.001	25AP	03MY	10MY	110	0
								3	0.002	4	0.003	27AP	29AP	02MY	134	0
								2	0.002	2	0.003	01JN	08JN	09JN	140	23
								162	0.171	195	0.206	19MY	30MY	18JN	147	37
								2	0.002	30MY	30MY	30MY	30MY	155	41	
								6	0.006	26MY	29MY	11JN	165	44	44	
								1	0.001	1	0.001	22MY	22MY	22MY	130	27
								103	0.106	136	0.139	12MY	23MY	08JN	145	22
								3	0.003	30MY	30MY	30MY	125	23	23	
								2	0.002	26MY	26MY	07JN	140	26	26	
								86	0.086	115	0.115	17MY	28MY	05JN	144	22
								1	0.001	17MY	17MY	17MY	179	36	36	
								2	0.002	30MY	30MY	30MY	148	23	23	
								1	0.001	14JN	14JN	14JN	150	16	16	
								34	0.039	47	0.054	16MY	27MY	18JN	158	23
								1	0.001	30MY	30MY	30MY	151	23	23	

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKO	RECAPT. SITE R.MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN	MM	M/M/T RATE		
								ACTUAL NO.	ADJUSTED %						
WHROPKL G	MCNARY	BARGE/FOREBAY	03MY79-23MY79	24.7	046.5M	3	1	0.004	1	0.004	16MY	16MY	115	31	
*	TRANSPORT FOREBAY CONTROL		(LAX31; 5053RELK1M230)								17MY	17MY	107	32	
WHROYWLB	LOWER GRANITE	GRANITE TAILRACE	24AP79-18MY79	25.5	046.5M	3	1	0.004	1	0.004	02MY	02MY	145	91	
*	TAILRACE CONTROL		(LAK3; LAK4)												
WHROYWLG	MCNARY	BARGE/BONNEVILLE	24AP79-22MY79	35.1	046.5M	3	11	0.031	17	0.048	27AP	28AP	25MY	165	33
*	TRANSPORT EVAL. BARGE		LAR3;RAR1;RAR2				1	0.003	6	0.023	21MY	21MY	145	8	
WHROYWJH	LOWER GRANITE	BARGE/BONNEVILLE	23AP79-19MY79	27.3	046.5M	3	5	0.018	6	0.023	27AP	07MY	19MY	130	11
*	TEST		(RAF1;RAF2)												
WHROYWPK	MCNARY	BARGE/BONNEVILLE	25MY79	5.0	046.5S	4	1	0.020	1	0.021	01AU	01AU	134	2	
*	TRANSPORT EVAL BARGE		(WHROYWPK;RAR3)				1	0.020	1	0.020	03AU	03AU	120	3	

RELEASE AND RECAPTURE INFORMATION - COLUMBIA RIVER ESTUARY 1979
PAGE NO. 17

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE	NO. MKD (THOUS)	NO. RECAPT. SITE	GEAR CODE	RECAPTURES ACTUAL	RECAPTURES ADJUSTED	1ST FISH	REC. DATE	AVG LEN	MMT	
	PURPOSE OF RELEASE	OTHER MARKS	MM	MM	R. MILE		NO.	%	%	FISH	LAST FISH	MM	KM/DAY	
RA 3 1	MCNARY	TRUCK/BONNEVILLE	16AP79-02JL79		23.2	C046.5M	3	18	0.078	26	0.112	19AP 29AP	11JN 167	12
*	TRANSPORT EVAL	TRUCK	(WH;RA31)			C018.0S	3	1	0.004			18MY 18MY	18MY 150	6
RA 3 2	MCNARY	TRUCK/BONNEVILLE	14MY79-31MY79		10.1	C046.5M	3	10	0.039	14	0.140	30AP 26MY	06JN 135	13
*	TRANSPORT EVAL	TRUCK	(WHRDLGPK)											
RA 3 3	MCNARY	TRUCK/BONNEVILLE	04JN79-21JN79		8.9	C046.5M	3	17	0.131	19	0.208	06JN 07JN	14JN 130	52
*	TRANSPORT EVAL	TRUCK	(WHRDLGPK)			C010.0N	3	3	0.034			07JN 22JN	22JN 147	12
						C000.0A	3	1	0.011			04SE 04SE	04SE 215	3
RA 3 4	MCNARY	TRUCK/BONNEVILLE	25JN79-06JL79		0.5	C046.5S	4	1	0.184	1	0.240	30AP 30AP	30AP 150	2
*	TRANSPORT EVAL	TRUCK	(WHRDLGPK)			C046.5M	3	1	0.184	3	0.552	06JL 06JL	06JL 135	14
LA 5 1	MCNARY	TAILRACE	11AP79-03JL79		19.0	C046.5S	4	1	0.005	2	0.002	03JL 03JL	03JL 210	5
*	TRANSPORT TAILRACE CONTRL		(BLACK;LA51)			C046.5M	3	17	0.089	23	0.119	20AP 21MY	08JN 150	10
						C010.0N	3	1	0.005			26MY 26MY	26MY 140	10
LA 5 2	MCNARY	TAILRACE	14MY79-31MY79		10.1	C046.5M	3	23	0.228	28	0.275	21MY 31MY	08JN 140	23
*	TRANSPORT TAILRACE CONTRL		(WHRDLGYM)			C011.0S	3	2	0.020			30MY 30MY	30MY 140	28
LA 5 3	MCNARY	TAILRACE	04JN79-21JN79		1.9	C046.5M	3	2	0.104	3	0.133	30AP 01MY	07JN 125	11
*	TRANSPORT TAILRACE CONTRL		(WHRDLGYM)											
LA AN 1	CARSON	PASCO	23AP79	20	39.1	C046.5S	4	1	0.003	2	0.005	12MY 12MY	12MY 145	23
*	CONTROL-NATURAL		(WHLBGM;LAAN1)			C046.5M	3	27	0.069	34	0.087	06MY 13MY	20MY 138	22
						C011.0S	3	1	0.003			30MY 30MY	30MY 140	14
LA AN 4	CARSON	CARSON	03MY79	20	41.0	C046.5S	4	2	0.005			21MY 21MY	26MY 135	18
*	CONTROL-NATURAL		(WHLBGM;LAAN4)			C046.5M	3	7	0.017	10	0.024	10MY 12MY	16MY 128	22
						C046.5M	3	19	0.046	24	0.058	07MY 14MY	20MY 132	18
LA E 2	WILD	WARM SP R TO SHEAR	25MR79-07AP79		0.2	C018.0S	3	1	0.002			18MY 18MY	18MY 125	16
*	WILD FISH CONTRIB		DESCHUTES(7-18/33)			C046.5M	3	1	0.575	1	0.674	04MY 04MY	04MY 130	9
RA F 1	LOWER GRANITE	BARGE/BONNEVILLE	23AP79-07MY79		16.7	C046.5S	4	1	0.006	1	0.006	02MY 02MY	02MY 110	17
*	TEST		(WHRDYDR)			C046.5M	3	9	0.054	10	0.060	02MY 06MY	03JN 123	12
						C018.0S	3	2	0.012			17MY 17MY	18MY 130	8
						C011.0S	3	1	0.006			30MY 30MY	30MY 130	6
RA F 2	LOWER GRANITE	BARGE/BONNEVILLE	03MY79-13MY79		10.7	C010.0N	3	4	0.024			04MY 04MY	07MY 146	19
*	TEST		(WHRDYDR)			C046.5M	3	13	0.122	17	0.157	15MY 15MY	16MY 115	22
						C018.0S	3	1	0.009			18MY 18MY	18MY 150	22
LD GL 2	WILD	MAUPIN TRAP	20MY79-02JN79		0.0	C000.0A	3	1	###			21JN 21JN	21JN 140	13
*	WILD FISH CONTRIB		DESCHUTES(7-18/38)											
LD IH 1	LEAVENWORTH	VANTAGE	11MY79		49.8	C046.5S	4	2	0.004	2	0.005	02JN 03JN	13JN 155	26
	TURBINE MORTALITY CONTROL					C046.5M	3	83	0.167	100	0.201	27MY 30MY	17JN 146	32
RD IH 1	LEAVENWORTH	WANAPUM TURBINES	13MY79		38.4	C010.0N	3	5	0.010			29MY 04JN	04JN 148	27
	TURBINE MORTALITY TEST					C046.5M	3	1	0.003	1	0.003	05JN 05JN	05JN 150	26
LA IN 1	LOWER GRANITE	CLARKSTON DOCK	09AP79-19AP79		11.3	C046.5S	4	91	0.237	112	0.292	25MY 30MY	27JN 152	35
	FOREBAY CONTROL					C046.5M	3	13	0.115	16	0.145	27AP 03MY	25MY 125	28
						C018.0S	3	1	0.009			18MY 18MY	18MY 140	18
LA IN 2	LOWER GRANITE	CLARKSTON DOCK	21MY79-04JN79		9.3	C010.0N	3	3	0.026			04MY 07MY	26MY 155	26
	FOREBAY CONTROL					C046.5M	3	12	0.129	14	0.147	30MY 03JN	22JN 121	51

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE	NO. MKD /LB (THOUS)	NO. R-MILE	RECAPT. SITE	GEAR CODE	RECAPTURES ACTUAL	RECAPTURES ADJUSTED	1ST FISH	REC. DATE	AVG LEN	MMVT RATE	
	PURPOSE OF RELEASE	OTHER MARKS		MM					NO. %	%	FISH	MM	MM	MM/DAY	
RD IS 1	ICE HARBOR FOREBAY CONTROL	FISHHOOK PARK	21MY79-24MY79	0.9		0.9	C046.5M 3	3	2	0.227	2	0.250	01JN 02JN 03JN	137	38
LD IS 2	ICE HARBOR FOREBAY CONTROL	FISHHOOK PARK	30AP79-05MY79	3.9		3.9	C046.5M 3	3	2	0.052	3	0.088	14MY 02JL 03JL	240	7
LD IS 3	ICE HARBOR FOREBAY CONTROL	FISHHOOK PARK	05MY79-12MY79	3.9		3.9	C046.5M 3	3	3	0.076	3	0.085	17MY 21MY 06JN	155	29
LD IS 4	ICE HARBOR FOREBAY CONTROL	FISHHOOK PARK	14MY79-18MY79	3.8		3.8	C046.5S 4	4	1	0.027	1	0.028	31MY 31MY 31MY	125	32
LD IZ 1	LEAVENWORTH TURBINE MORTALITY CONTROL	VANTAGE	12MY79	62.6		62.6	C046.5M 3	3	95	0.152	117	0.187	28MY 30MY 09JN	144	33
RD IZ 1	LEAVENWORTH TURBINE MORTALITY TEST	WANAPUM	13MY79	49.0		49.0	C046.5S 4	4	2	0.004	2	0.004	05JN 24JN 25JN	190	14
LD IZ 2	LEAVENWORTH TURBINE MORTALITY CONTROL	VANTAGE	14MY79	52.4		52.4	C046.5S 4	4	2	0.004	2	0.004	05JN 05JN 17JN	147	35
RD IZ 2	LEAVENWORTH TURBINE MORTALITY TEST	VANTAGE	12MY79	50.0		50.0	C046.5M 3	3	94	0.188	118	0.236	23MY 30MY 09JN	144	33
RD IZ 3	LEAVENWORTH TURBINE MORTALITY CONTROL	WANAPUM TURBINES	14MY79	62.5		62.5	C046.5M 3	3	100	0.160	129	0.205	23MY 30MY 12JN	143	37
RD IZ 4	LEAVENWORTH TURBINE MORTALITY CONTROL	VANTAGE	11MY79	55.9		55.9	C046.5M 3	3	94	0.168	125	0.223	22MY 29MY 09JN	150	33
LA K 1	LOWER GRANITE FOREBAY CONTROL	GRANITE FOREBAY	21AP79-04MY79 (WHRDYWGGM)	17.3		17.3	C046.5M 3	3	16	0.092	19	0.109	02MY 07MY 18MY	122	45
LA K 2	LOWER GRANITE FOREBAY CONTROL	GRANITE FOREBAY	09MY79-16MY79 (WHRDYWGGM)	7.2		7.2	C046.5M 3	3	14	0.195	17	0.235	16MY 18MY 09JN	111	81
LA K 3	LOWER GRANITE TAIL RACE CONTROL	GRANITE TAILRACE	24AP79-04MY79 (WHRDYWLGB)	19.8		19.8	C046.5S 4	4	1	0.005	1	0.005	21MY 21MY 21MY	135	65
LA K 4	LOWER GRANITE TAIL RACE CONTROL	GRANITE TAILRACE	08MY79-18MY79 (WHRDYWLGB)	5.8		5.8	C046.5M 3	3	13	0.225	17	0.291	07MY 20MY 14JN	125	60
RA R 1	MCNARY TRANSPORT EVAL BARGE	BARGE/BONNEVILLE	24AP79-04MY79 (WHRDYWLG)	7.7		7.7	C046.5S 4	4	1	0.013	2	0.028	12MY 12MY 12MY	145	9
RA R 2	MCNARY TRANSPORT EVAL BARGE	BARGE/BONNEVILLE	08MY79-16MY79 (WHRDYWLG)	18.4		18.4	C046.5S 4	4	1	0.005	1	0.006	07JN 07JN 23S	5	5
LA R 3	MCNARY TRANSPORT EVAL BARGE	BARGE/BONNEVILLE	20MY79-22MY79 (WHRDYWLG)	9.1		9.1	C046.5M 3	3	1	0.011	1	0.013	04MY 04MY 04MY	140	9

SPECIES: CHINOOK 1'S

MARK	HATCH/ORIGIN	PURPOSE OF RELEASE	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE	NO. MKD (THOUS)	RECAPT. SITE (R-MILE)	GEAR CODE	RECAPTURES		RECAPTURE DATE		AVG LEN MM	M/M/T RATE
									ACTUAL NO.	ADJUSTED %	1ST FISH	LAST FISH		
RA R 3	MENARY	BARGE/BONNEVILLE	25MY79	20	40.4	5.0	C046.5M	3	4	0.080	7	0.139	23MY 25MY	138 155
*	TRANSPORT EVAL	BARGE	(WHRDYWPK;RAB3)				C010.ON	3	3	0.060			26MY 26MY	121 214
LP SP 1	JOHN DAY	BLALOCK	03MY79			0.2	C046.5M	3	1	0.430	1	0.515	16MY 16MY	150 37
RA T 1	CARSON	TRUCK-BONNEVILLE	04MY79	20	40.4	40.4	C046.5S	4	12	0.030	15	0.041	09MY 11MY	16MY 133 22
*	TEST-SINGLE IMPRINT		(WHLBYWYW;RAT1)				C046.5M	3	17	0.042	23	0.058	07MY 14MY	26MY 137 16
RA T 2	CARSON	TRUCK-BONNEVILLE	07MY79	19	39.8	39.8	C046.5S	4	6	0.015	8	0.021	11MY 14MY	18MY 130 14
*	TEST-SEQUENTIAL IMPRINT		(WHLBYWYX;RAT2)				C018.OS	3	2	0.025			18MY 18MY	18MY 123 22
RA T 3	CARSON	TRUCK-HAMMOND	08MY79	21	38.5	38.5	C046.5M	3	8	0.020	9	0.023	09MY 15MY	17MY 126 19
*	TEST-SEQUENTIAL IMPRINT		(WHLBYR;RAT3)				C046.5M	3	1	0.003	1	0.003	15MY 15MY	15MY 120 8
LA X3 1	MENARY	BARGE/FOREBAY	03MY79-19MY79			14.3	C046.5M	3	2	0.014	3	0.021	15MY 26MY	27MY 140 18
*	TRANSPORT FOREBAY CONTROL		(5053 REL KIR230)(WHRDPKLG)				C018.OS	3	4	0.028			17MY 17MY	18MY 142 32
LA X3 3	MENARY	BARGE/FOREBAY	18MY79-28MY79			10.4	C046.5M	3	8	0.077	11	0.104	25MY 04JN	07JN 139 24
*	TRANSPORT FOREBAY CONTROL		(WHRDPKLG)				C010.ON	3	1	0.007			11MY 11MY	11MY 195 58
RA Y 1	CARSON	TRUCK-BONNEVILLE	21AP79	20	38.3	38.3	C046.5S	4	14	0.037	17	0.044	26AP 03MY	09MY 129 13
*	TEST-TRUCK		(WHLBWHLB;RAY1)				C046.5M	3	22	0.057	27	0.070	30AP 05MY	14MY 131 11
							C018.OS	3	2	0.005			17MY 17MY	18MY 140 8
							C010.ON	3	1	0.003			21MY 21MY	21MY 140 7
RA Y 4	CARSON	BARGE-BONNEVILLE	28AP79	20	36.3	36.3	C009.OS	3	1	0.003			16MY 16MY	16MY 155 9
*	TEST-BARGE		(WHLBBL;RAY4)				C046.5S	4	3	0.008	4	0.010	03MY 04MY	05MY 135 26
							C046.5M	3	24	0.056	23	0.078	01MY 06MY	17MY 126 19
							C018.OS	3	1	0.003			18MY 18MY	18MY 130 10
UC	JOHN DAY	JOHN DAY	18MY79-28MY79			0.0	C010.ON	3	2	0.006			04MY 04MY	07MY 120 35
							C046.5M	3	6	0.000			03JN 04JN	11JN

RELEASE AND RECAPTURE INFORMATION - COLUMBIA RIVER ESTUARY 1979
PAGE NO. 20

SPECIES: COHO

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	ND. MKS	RECAPT. SITE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN	MM/MT RATE	
								ACTUAL	ADJUSTED				
PURPOSE OF RELEASE		OTHER MARKS						NO.	%	FISH	FISH	MM KM/DAY	
071746	EAGLE CR. NFH STOCK EVAL (PNRC)	EAGLE CR. -CLACK	22MY79	18	69.3	C046.5S C046.5M C011.0S C010.0N	4 3 125 3	3 0.004 0.180 0.001	3 0.005 0.215	05JN 31MY 30MY	11JN 28JN 30MY	145 146 140	11 10 29
071749	SANDY NFH NUTRITION & PHYSIO.	SANDY HATCHERY	01MY79	19	27.5	C046.5S C046.5M C018.0S	4 3 5	4 0.015 0.018	4 0.016 0.115	08MY 13MY 18MY	16MY 25MY 18MY	138 142 133	17 13 12
071750	SANDY NFH NUTRITION & PHYSIO.	SANDY HATCHERY	01MY79	20	27.4	C046.5S C046.5M C018.0S	4 3 2	2 0.007 0.084	2 0.003 0.105	07MY 06MY 18MY	09MY 13JN 18MY	135 135 143	22 9 12
071751	SANDY NFH NUTRITION & PHYSIO.	SANDY HATCHERY	01MY79	19	27.5	C046.5S C046.5M C018.0S	4 3 1	1 0.004 0.113	2 0.006 0.145	11MY 17MY 17MY	11MY 23MY 17MY	140 135 133	16 10 13
071752	SANDY NFH NUTRITION & PHYSIO.	SANDY HATCHERY	01MY79	19	27.3	C046.5S C046.5M C018.0S	4 3 2	3 0.011 0.083	3 0.012 0.103	10MY 15MY 18MY	17MY 23MY 18MY	133 145 137	17 11 12
071808	BIG CREEK GENETIC	BIG CREEK	20AP79	18	0.8	C009.0S C018.0S	3 1	1 0.004	1 0.004	07MY 16MY 17MY	07MY 16MY 17MY	145 135 148	36 14 1
071819	BIG CREEK GENETIC	BIG CREEK	20AP79	18	1.4	C018.0S	3	1	0.073	18MY	18MY	144	1
071822	BIG CREEK GENETIC	BIG CREEK	20AP79	18	0.4	C010.0N C009.0S	3 1	1 0.241	1 0.241	26MY 16MY	26MY 16MY	155 129	1 1
071901	BIG CREEK NFH COHO TIME RELEASE	BIG CREEK	05JL79	19	27.7	C010.0N	3	1	0.004	13JL	13JL	130	4
071903	BIG CREEK NFH COHO TIME RELEASE	BIG CREEK	07MY79	19	28.5	C018.0S C009.0S	3 1	2 0.007	2 0.004	18MY 16MY	18MY 16MY	140 136	2 4
071904	BIG CREEK NFH COHO TIME RELEASE	BIG CREEK	07JN79	18	26.5	C010.0N	3	1	0.004	11JN	11JN	135	8
071906	BIG CREEK NFH COHO TIME RELEASE	BIG CREEK	07JN79	19	25.3	C010.0N	3	2	0.008	11JN	11JN	135	8
071907	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	07JN79	23	27.2	C046.5S C046.5M C010.0N	4 3 3	2 0.007 0.129	2 0.008 0.146	12JN 11JN 13JN	20JN 26JN 26JN	140 135 135	26 26 27
071908	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	07MY79	23	27.9	C046.5S C046.5M C018.0S	4 3 5	5 0.018 0.047	7 0.024 0.059	14JN 15MY 14MY	15JN 18MY 23MY	126 131 129	27 17 14
071909	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	06JL79	22	24.6	C046.5M C010.0N	3 3	5 0.018	102 0.413	18MY 11JL 13JL	18MY 18JL 18JL	129 135 112	18 22 19
071910	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	07JN79	23	25.9	C046.5M	3	3	0.012	13JL	17JL	132	19
071911	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	07MY79	22	26.9	C046.5S C046.5M	4 3	8 0.030	10 0.036	14JN 15MY	22JN 18MY	120 128	27 14
071912	CASCADE NFH COHO TIME RELEASE	BONNEVILLE	06JL79	23	25.2	C046.5S C046.5M	4 3	2 0.008	2 0.003	12JL 13JL	13JL 30JL	137 133	22 22

SPECIES: COHO

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKO (THOUS)	RECAPT. SITE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN MM	MVMT RATE KM/DAY
								ACTUAL NO.	ADJUSTED NO.			
071912	CASCADE NFH COHU TIME RELEASE	BONNEVILLE	06JL79	23	25.2	C010.ON 3	3	2	0.008	18JL 18JL 20JL	134	18
071915	BIG CREEK NFH WILL. R. COHU STUDY	SCOGGINS CREEK	01MY79-03MY79	20	74.6	C046.5S 3 C011.OS 3	3	77	0.103	21MY 04JN 13JL 30MY 30MY 30MY	135 138 144	12 7 10
071916	BIG CREEK NFH WILL. R. COHU STUDY	SCOGGINS CREEK	01MY79-03MY79	19	81.2	C046.5S 4 C046.5M 3	4	1	0.001	01JN 01JN 01JN 18MY 30MY 22JN	145 144	7 8
631751	KLICKITAT NFH	KLICKITAT	14MY79	14	60.0	C046.5M 3	3	2	0.002	26MY 26MY 22JN	140	12
631753	GRAYS RIVER NFH DIET STUDY	GRAYS RIVER	18AP79	18	50.9	C010.ON 3	3	1	0.002	21MY 21MY 21MY	130	49
631758	TOUITLE RIVER SIZE & TIME OF RELEASE	GREEN RIVER	07JN79	18	39.8	C010.ON 3 C046.5M 3	3	1	0.002	07MY 07MY 07MY	145	2
631911	TOUITLE RIVER SIZE & TIME OF RELEASE	GREEN RIVER	07MY79	18	42.4	C046.5S 4 C046.5M 3	4	8	0.019	10 0.024 14MY 17MY 18MY 47 0.111 15MY 20MY 09JN	140 139	9 7
631912	TOUITLE RIVER SIZE & TIME OF RELEASE	GREEN RIVER	07MY79	18	34.7	C010.ON 3 C046.5M 3	3	1	0.002	17MY 17MY 18MY 21MY 21MY 21MY	144 145	13 10
631913	TOUITLE RIVER SIZE & TIME OF RELEASE	GREEN RIVER	07JN79	20	40.5	C046.5S 4 C046.5M 3	4	2	0.005	12JN 12JN 12JN 11JN 13JN 25JN	142 136	17 14
631923	WASHOUGAL RIVER SIZE & TIME OF RELEASE	WASHOUGAL RIVER	07MY79	17	74.4	C010.ON 3 C046.5S 4	3	6	0.015	14JN 15JN 15JN 14MY 15MY 22MY	137 140	18 18
631924	WASHOUGAL RIVER SIZE & TIME OF RELEASE	WASHOUGAL RIVER	07MY79	16	80.7	C046.5S 4 C046.5M 3	4	72	0.097	08MY 21MY 22JN 18MY 18MY 18MY	143 142	10 17
631925	WASHOUGAL RIVER SIZE & TIME OF RELEASE	WASHOUGAL RIVER	07JN79	20	73.0	C011.OS 3 C046.5M 3	3	3	0.004	30MY 30MY 30MY 21MY 21MY 29MY	137 130	9 15
631926	WASHOUGAL RI SIZE & TIME OF RELEASE	WASHOUGAL RIVER	07JN79	20	82.9	C011.OS 3 C046.5S 4	3	4	0.005	17MY 17MY 18MY 30MY 30MY 30MY	139 130	19 9
631927	WASHOUGAL RIVER SIZE & TIME OF RELEASE	WASHOUGAL RIVER	06JL79	20	81.0	C046.5S 4	4	14	0.017	15JN 22JN 02JL 12JN 15JN 19JN	137 133	14 18

RELEASE AND RECAPTURE INFORMATION - COLUMBIA RIVER ESTUARY 1979
PAGE NO. 23

SPECIES: COHO

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS) R.MILE	NO. RECAPT. MKD.	GEAR CODE	ACTUAL NO. %	RECAPTURES ADJUSTED NO. %	1ST FISH	MED. FISH	LAST FISH	AVG LEN. MM	MVMT RATE
RA 3 2 *	MCNARY	TRUCK/BONNEVILLE	14MY79-31MY79 (WHRDLGPK)	0.6 C010.ON 3	1	0.169			26MY	26MY	26MY	125	18
LA 5 2 *	MCNARY	TAILRACE	14MY79-31MY79 (WHRDLGYW)	0.4 C046.5M 3	1	0.223	1	0.262	21MY	21MY	21MY	155	56
LA 5 3 *	MCNARY	TAILRACE	04JN79-21JN79 (WHRDLGYW)	0.1 C010.ON 3	1	1.299			22JN	22JN	22JN	125	25
LA 5 4 *	MCNARY	TAILRACE	25JN79-05JL79 (WHRDLGYW)	0.0 C010.ON 3	1	###			14JN	14JN	14JN	140	-40
RA IL 1	TURTLE ROCK	ROCK ISLAND	15MY79	101.5 C046.5M 3	71	0.070	78	0.077	29MY	01JN	19JN	131	38
RA IL 2	TURTLE ROCK	ROCK ISLAND	15MY79	102.7 C046.5S 4	1	0.001	1	0.001	05JN	05JN	05JN	120	31
RA IL 4	TURTLE ROCK	ROCK ISLAND	15MY79	102.5 C046.5S 4	2	0.002	2	0.002	02JN	03JN	04JN	122	34
LD IT 1	JONES BEACH	JONES BEACH	03MY79	0.3 C010.ON 3	1	0.348			11MY	11MY	11MY	145	7
RA IY 1	TURTLE ROCK	ROCK ISLAND	13MY79	79.3 C046.5M 3	47	0.059	57	0.072	25MY	31MY	08JN	137	36
RA IY 2	TURTLE ROCK	ROCK ISLAND	13MY79	101.4 C046.5S 4	2	0.002	2	0.002	05JN	05JN	05JN	135	28
RA IY 4	TURTLE ROCK	ROCK ISLAND	13MY79	101.8 C046.5M 3	76	0.075	86	0.085	22MY	01JN	12JN	132	34
RA R 2 *	MCNARY	BARGE/BONNEVILLE	08MY79-16MY79 (WHRDYWLG)	0.2 C046.5M 3	1	0.408	2	0.752	13MY	13MY	13MY	125	31
RA R 3 *	MCNARY	BARGE/BONNEVILLE	25MY79 (WHRDYWPK;RARE3)	0.3 C046.5M 3	1	0.294	1	0.301	31MY	31MY	31MY	110	26
ADRV	BIG CREEK NPH	BIG CREEK	07MY79-05JL79 19	173.5 C018.0S 3	1	0.001			18MY	18MY	18MY		
UC	JOHN DAY	JOHN DAY	28MY79-28MY79	0.0 C046.5M 3	2	0.000			04JN	18JN	18JN		

SPECIES: STEELHEAD

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM /LB (THOUS)	NO. MKD (THOUS)	RECAPT. SITE R.MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG	
								ACTUAL NO.	% ADJUSTED		1ST FISH	LAST FISH
RA T 4	TUCANNON	BARGE-BONNEVILLE	17MY79 (WHLBY;RAT4)	9	20.7	C046.5M	3	74	0.357	96	0.461	19MY 19MY 22MY 179 78
*	TEST BARGE-100% SP WCT							3	0.014			17MY 17MY 18MY 203 201
LA X3 1	MCNARY	BARGE/FOREBAY	03MY79-19MY79		6.2	C046.5M	3	5	0.080	7	0.108	12MY 14MY 15MY 200 37
*	TRANSPORT FOREBAY CONTROL		(2064 REL KME30)(WHRDPKLG)									
LA X3 3	MCNARY	BARGE/FOREBAY	18MY79-29MY79		1.9	C046.5M	3	2	0.105	3	0.165	25MY 26MY 03JN 200 50
*	TRANSPORT FOREBAY CONTROL		(WHRDPKLG)									
RA Y 1	CHELAN	BARGE-BONNEVILLE	28AP79	4	23.3	C046.5M	3	28	0.120	36	0.153	03MY 03MY 10JN 227 14
*	10 DAY TEST		(RAY1;WHLBWH)					1	0.004			18MY 18MY 18MY 185 10
RA Y 2	CHELAN	BARGE-BONNEVILLE	28AP79	4	24.3	C046.5M	3	7	0.029	7	0.030	01MY 02MY 08MY 216 39
*	2 DAY TEST		(RAY2;WHLBRD)									
RA Y 3	CHELAN	BARGE-BONNEVILLE	28AP79	5	22.8	C046.5S	4	1	0.004	1	0.004	02MY 02MY 02MY 200 39
*	4 HOUR TEST		(RAY3;WHLBOR)					11	0.048	14	0.063	01MY 10MY 16MY 238 13
RA Y 4	TUCANNON	BARGE-BONNEVILLE	17MY79	8	22.1	C046.5S	4	1	0.005	1	0.006	07MY 07MY 07MY 130 -15
*	TEST-BARGE 20% SP 80% TLC		(WHLBPKLB;RAY4)					39	0.177	51	0.233	10MY 19MY 20MY 177 78
UC	JOHN DAY	JOHN DAY	18MY79-28MY79		0.2	C046.5M	3	1	0.500			13MY 13MY 13MY
LMV RV	ROUND BUTTE	DESCHUTES	08AP79-09AP79	4	27.6	C046.5M	3	11	0.040			30AP 15MY 25MY
LMVR	ROUND BUTTE	DESCHUTES	06AP79-08AP79	5	49.1	C046.5M	3	23	0.047			11MY 11MY 11MY
LV	SKAMANIA	WASHOUGAL	16MY79-17MY79	6	26.0	C046.5M	3	85	0.327			19AP 12MY 01JN
								6	0.023			29AP 15MY 09JN
								6	0.023			17MY 17MY 18MY
								1	0.004			30MY 30MY 30MY
								1	0.004			21MY 21MY 21MY

NO RELEASE INFORMATION WAS FOUND FOR THE FOLLOWING MARKS

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE	NO. MKD (THOUS)	RECAPT. SITE R. MILE	GEAR CODE	RECAPTURES		RECAPTURE DATE	AVG LEN	MVMT RATE
								ACTUAL	ADJUSTED			
	PURPOSE OF RELEASE	OTHER MARKS		MM	/LB			NO.	%	FISH	MM	KM/DAY
RA I+ 3	SOCKEYE					C046.5M 3	3	1		13JL 13JL	13JL	120
LA Y 1	SOCKEYE					C046.5M 3	3	1		25MY 25MY	25MY	115
RA F 4	COHO					C046.5M 3	3	2		29MY 30MY	03JN	140
LD IL 2	COHO					C046.5M 3	3	1		03JN 03JN	03JN	135
LA IL 3	COHO					C046.5M 3	3	1		03JN 03JN	03JN	130
RD IV 3	COHO					C046.5M 3	3	1		01JN 01JN	01JN	145
RA IY 3	COHO					C046.5M 3	3	1		03JN 03JN	03JN	136
RD IY 3	COHO					C046.5M 3	3	1		02JN 02JN	02JN	135
RD U 1	COHO					C010.ON 3	3	1		03JL 03JL	03JL	170
LD Y 1	COHO					C046.5M 3	3	1		03MY 03MY	03MY	135
LD Y 1	COHO					C011.OS 3	3	1		30MY 30MY	30MY	120
LD Y 1	COHO					C010.ON 3	3	2		04MY 04MY	26MY	140
RD 12 2	CHINOOK 1'S					C009.OS 3	3	1		31MY 31MY	31MY	135
LA AN 3	CHINOOK 1'S					C046.5M 3	3	2		21MY 06JN	07JN	170
RA AN 3	CHINOOK 1'S					C046.5M 3	3	1		21MY 21MY	21MY	135
LD B8	CHINOOK 1'S					C046.5M 3	3	1		25MY 25MY	25MY	155
LA H	CHINOOK 1'S					C010.ON 3	3	1		11MY 11MY	11MY	140
LA IH 4	CHINOOK 1'S					C046.5M 3	3	1		30MY 30MY	30MY	142
LD IH 4	CHINOOK 1'S					C046.5M 3	3	1		29MY 29MY	29MY	140
LD IK 1	CHINOOK 1'S					C000.OA 3	3	1		21JN 21JN	21JN	105
RD IL 3	CHINOOK 1'S					C046.5M 3	3	1		31MY 31MY	31MY	130
LA IU 1	CHINOOK 1'S					C046.5M 3	3	1		30JL 30JL	30JL	140
LA IV 1	CHINOOK 1'S					C046.5M 3	3	1		07MY 07MY	07MY	125
RA IV 1	CHINOOK 1'S					C046.5M 3	3	1		30AP 30AP	30AP	130
RA IZ	CHINOOK 1'S					C046.5M 3	3	1		09JN 09JN	09JN	155
RD N 1	CHINOOK 1'S					C046.5M 3	3	1		29AP 29AP	29AP	210
LA R 4	CHINOOK 1'S					C010.ON 3	3	1		14SE 14SE	14SE	155
RA SU 1	CHINOOK 1'S					C046.5M 3	3	2		04JN 17JN	18JN	125
RA SU 1	CHINOOK 1'S					C000.OA 3	3	1		03JL 03JL	03JL	215
RD SU 1	CHINOOK 1'S					C018.OS 3	3	1		18MY 18MY	18MY	140
LD SU 2	CHINOOK 1'S					C000.OA 3	3	1		23AU 23AU	23AU	135
RA T 4	CHINOOK 1'S					C046.5M 3	3	2		02MY 02MY	02MY	120
RA W 3	CHINOOK 1'S					C046.5S 4	4	1		29AP 29AP	29AP	135
RD Y 2	CHINOOK 1'S					C046.5M 3	3	1		03JN 03JN	03JN	130
RD Y 3	CHINOOK 1'S					C046.5M 3	3	1		04MY 04MY	04MY	190
LA Y 4	CHINOOK 1'S					C018.OS 3	3	1		18MY 18MY	18MY	135
RD 2 3	STEELHEAD					C010.ON 3	3	1		29MY 29MY	29MY	255
RD 52 1	STEELHEAD					C046.5M 3	3	1		27MY 27MY	27MY	250
LA DT 4	STEELHEAD					C046.5M 3	3	1		04MY 04MY	04MY	202
LA F 4	STEELHEAD					C046.5M 3	3	1		29AP 29AP	29AP	165
LA G 2	STEELHEAD					C046.5M 3	3	1		02JN 02JN	02JN	201
LA IK 3	STEELHEAD					C046.5M 3	3	1		22JN 22JN	22JN	135
LA IN 3	STEELHEAD					C010.ON 3	3	1		11JN 11JN	11JN	240
LA IU 1	STEELHEAD					C046.5M 3	3	16		20AP 09MY	31MY	205
RA IU 1	STEELHEAD					C046.5M 3	3	1		04MY 04MY	04MY	185
LA IU 2	STEELHEAD					C046.5M 3	3	1		30MY 30MY	30MY	210
LA IZ 2	STEELHEAD					C046.5M 3	3	1		30MY 30MY	30MY	230
RA KE 2	STEELHEAD					C046.5M 3	3	1		09MY 09MY	09MY	225
LA SU 1	STEELHEAD					C046.5M 3	3	2		14MY 15MY	17MY	160
RA SU 1	STEELHEAD					C046.5M 3	3	4		05MY 01JN	23JN	260
RA T	STEELHEAD					C046.5M 3	3	1		12MY 12MY	12MY	199

LA T 3	STEELHEAD				1		18MY 18MY 18MY 179
RA T 3	STEELHEAD		C046.5M 3		1		18MY 19MY 19MY 179
LP U 2	STEELHEAD		C046.5M 3		1		29AP 29AP 29AP 202
RP U 2	STEELHEAD		C046.5M 3		1		29AP 29AP 29AP 220
RP U 3	STEELHEAD		C046.5M 3		1		29AP 29AP 29AP 225
RA U 4	STEELHEAD		C046.5M 3		2		29AP 30AP 13MY 220
RA D 2	CHINOOK O'S		C000.OA 3		2		03JL 03JL 03JL 95
RA F 2	CHINOOK O'S		C046.5M 3		4		19MY 19MY 20MY 100
RA F 4	CHINOOK O'S		C046.5M 3		1		24JN 24JN 24JN 107
LA I+ 4	CHINOOK O'S		C010.ON 3		2		20AU 20AU 20AU 125
LD IC 4	CHINOOK O'S		C010.ON 3		3		14JN 14JN 15JN 105
LA IH 3	CHINOOK O'S		C000.OA 3		1		09AU 09AU 09AU 139
LD K 3	CHINOOK O'S		C010.ON 3		2		14JN 14JN 15JN 103
RD K 3	CHINOOK O'S		C010.ON 3		1		14JN 14JN 14JN 107
RD K 4	CHINOOK O'S		C010.ON 3		1		14JN 14JN 14JN 105
RP L 1	CHINOOK O'S		C046.5M 3		1		07JN 07JN 07JN 100
RA R 3	CHINOOK O'S		C011.OS 3		1		30MY 30MY 30MY 110
LD SU 1	CHINOOK O'S		C046.5S 4		1		20JN 20JN 20JN 75
RA SU 1	CHINOOK O'S		C046.5S 4		1		24MY 24MY 24MY 90
RA SU 1	CHINOOK O'S		C046.5M 3		3		16JN 17JN 18JN 115
RA SU 1	CHINOOK O'S		C010.ON 3		1		29MY 29MY 29MY 110
RA SU 2	CHINOOK O'S		C011.OS 3		1		30MY 30MY 30MY 90
RA SU 2	CHINOOK O'S		C010.ON 3		1		26MY 26MY 26MY 85
LD SU 4	CHINOOK O'S		C000.OA 3		1		21AU 21AU 21AU 135
LA T 2	CHINOOK O'S		C046.5S 4		2		17JN 18JN 19JN 89
LA T 4	CHINOOK O'S		C046.5M 3		2		16JN 28JN 29JN 100
LA U 1	CHINOOK O'S		C010.ON 3		2		21MY 21MY 07JN 110
LD Y 3	CHINOOK O'S		C046.5S 4		1		19JN 19JN 29AP 95
LP	CHINOOK O'S		C046.5M 3		2		15JN 25JN 25JN
	CHINOOK O'S		C010.ON 3		2		25JN 25JN 25JN
LM	CHINOOK I'S		C046.5M 3		1		18JN 18JN 18JN
LP	CHINOOK I'S		C046.5M 3		9		25AP 27MY 06JN
LV	CHINOOK I'S		C046.5M 3		2		12MY 16MY 16MY
RP	CHINOOK I'S		C046.5M 3		7		30MY 03JN 07JN
RV	CHINOOK I'S		C046.5S 4		3		11MY 11MY 11MY
ADLP	COHO		C046.5S 4		1		16JN 16JN 16JN
ADRP	COHO		C046.5S 4		2		15MY 05JN 05JN
LP	COHO		C046.5S 4		60		02MY 17MY 13JL
	COHO		C046.5M 3		492		01MY 31MY 18MY
	COHO		C018.OS 3		9		17MY 18MY 18MY
	COHO		C011.OS 3		4		30MY 30MY 30MY
	COHO		C010.ON 3		29		07MY 04JN 13JL
	COHO		C009.OS 3		2		15MY 31MY 31MY
	COHO		C046.5S 4		3		15MY 29MY 01JN
LPRP	COHO		C046.5M 3		28		09MY 13JN 13JL
	COHO		C010.ON 3		5		15JN 15JN 13JL
LV	COHO		C046.5M 3		2		12MY 05JN 05JN
	COHO		C018.OS 3		2		15MY 18MY 18MY
	COHO		C046.5S 4		69		30AP 15MY 13JL
	COHO		C046.5M 3		642		30AP 02JN 18JL
	COHO		C018.OS 3		7		17MY 18MY 18MY
	COHO		C011.OS 3		3		30MY 30MY 30MY
	COHO		C010.ON 3		23		07MY 29MY 13JL
	COHO		C009.OS 3		3		15MY 25MY 25MY
	COHO		C010.ON 3		1		11JN 11JN 11JN
RV	CHINOOK O'S		C046.5M 3		1		21JN 21JN 21JN
RP	CHINOOK O'S		C018.OS 3		1		06AU 06AU 06AU
			C010.ON 3		1		25JN 25JN 25JN

MARK	HATCH/ORIGIN	RELEASE SITE	RELEASE DATE	SIZE AT RELEASE MM	NO. MKD (THOUS)	RECAPT. SITE R. MILE	GEAR CODE	RECAPTURES ACTUAL NO. %	RECAPTURES ADJUSTED NO. %	1ST FISH	RECAPTURE MED FISH	DATE LAST FISH	AVE LEN (MM)	MVMT RATE (KM/D)
ADDO	STEELHEAD					C046.5M	3	1		09MY 09MY	09MY			
ADLP	STEELHEAD					C046.5S	4	1		01MY 01MY	01MY			
						C046.5M	3	9		01MY 19MY	16JN			
ADLPRP	STEELHEAD					C046.5M	3	1		25MY 25MY	25MY			
ADLV	STEELHEAD					C046.5M	3	1		12MY 12MY	12MY			
ADLVRV	STEELHEAD					C046.5M	3	3		03JN 04JN	04JN			
ADRM	STEELHEAD					C046.5M	3	1		22JN 22JN	22JN			
ADRP	STEELHEAD					C046.5S	4	1		02MY 02MY	02MY			
						C046.5M	3	12		01MY 02MY	01JN			
ADRV	STEELHEAD					C046.5M	3	1		02MY 02MY	02MY			
DO	STEELHEAD					C046.5M	3	9		24AF 10MY	13MY			
DOLP	STEELHEAD					C046.5M	3	2		13MY 15MY	15MY			
LM	STEELHEAD					C046.5M	3	62		18AP 09MY	24JN			
						C018.0S	3	3		17MY 18MY	18MY			
						C010.0N	3	4		05MY 11MY	11MY			
						C046.5M	3	1		03MY 03MY	03MY			
LMLPRP	STEELHEAD					C046.5M	3	22		08MY 14MY	25MY			
LMLV	STEELHEAD					C046.5M	3	3		27AP 30AP	03MY			
LMRM	STEELHEAD					C046.5M	3	3		20AP 20AP	29AP			
LMRP	STEELHEAD					C046.5M	3	1		11MY 11MY	11MY			
LP	STEELHEAD					C046.5M	3	45		20AP 19MY	18JN			
						C018.0S	3	1		18MY 18MY	18MY			
						C010.0N	3	2		26MY 29MY	29MY			
						C046.5M	3	1		16MY 16MY	16MY			
LPLV	STEELHEAD					C046.5M	3	10		27AP 05MY	12JN			
LPRP	STEELHEAD					C0.465M	3	1		15MY 15MY	15MY			
LPRV	STEELHEAD					C046.5M	3	26		08MY 22MY	28JN			
LVRM	STEELHEAD					C011.0S	3	1		30MY 30MY	30MY			
						C046.5M	3	2		07MY 09MY	09MY			
LVRMRV	STEELHEAD					C046.5M	3	1		08JN 08JN	08JN			
LVRP	STEELHEAD					C046.5M	3	1		03MY 03MY	03MY			
LMLVRPRV	STEELHEAD					C046.5M	3	1		03MY 03MY	03MY			
LVRPRV	STEELHEAD					C046.5M	3	12		03MY 09MY	19JN			
LVRV	STEELHEAD					C046.5M	3	1		02JN 02JN	02JN			
RDRM	STEELHEAD					C046.5M	3	39		30AP 18MY	24JN			
RM	STEELHEAD					C018.0S	3	4		17MY 18MY	18MY			
						C010.0N	3	1		21MY 21MY	21MY			
						C046.5M	3	14		10MY 25MY	21JN			
RMRV	STEELHEAD					C046.5S	4	1		21AP 21AP	21AP			
RP	STEELHEAD					C046.5M	3	36		02MY 15MY	15JN			
						C018.0S	3	1		18MY 18MY	18MY			
						C046.5M	3	1		18MY 18MY	18MY			
RPRV	STEELHEAD					C046.5S	4	1		19AP 19AP	19AP			
RV	STEELHEAD					C045.5M	3	26		13AP 09MY	19JN			
						C018.0S	3	1		18MY 18MY	18MY			
						C010.0N	3	1		11MY 11MY	11MY			
						C010.0N	3	2		11MY 11MY	11MY			
						C046.5M	3	10		10MY 14MY	16MY			
RP	CHINOOK 1'S					C018.0S	3	2		17MY 18MY	18MY			
RV	CHINOOK 1'S					C010.0N	3	14		11MY 11MY	11MY			

Appendix Table 3.--Travel time and rate of movement for selected groups^{a/} of marked hatchery fish from release sites to Jones Beach, Oregon, 1979.

Mark (Ag, D1, D2) ^{b/}	Release information			Recapture information			Average movement rate	
	Site	Date	Size (no./lb)	No. (thous.)	Adjusted catch ^{c/} (no.) (%)	Date of median recapture (mo/day)	(days)	Release site to Rkm75 (km/day)
Subyearling Chinook Salmon								
050446	Spring Creek NFH	20MR	125	246.0	424 0.172	07AP	18	11 ^{d/}
034701	Big White Salmon	28MR	109	42.4	95 0.222	04MY	37	5 ^{d/}
050434, & 050444	Spring Creek NFH	20AP	82	231.1	602 0.261	02MY	12	16 ^{d/}
050426	Clear Creek (Kooskia)	29AP	40	62.0	31 0.050	17JN	49	16
071608	Tanner Creek (Bonneville)	01MY	78	96.0	161 0.167	09MY	8	19
071841	Will. abv. OC Fall	07MY	67	283.8	309 0.109	17MY	10	13 ^{d/}
050433	Spring Creek NFH	18MY	50	140.9	122 0.087	22MY	4	48 ^{d/}
035201	Big White Salmon	19MY	63	47.8	32 0.068	25MY	6	33
050420	Below Bonn. (Hagerman)	20MY	84	53.0	94 0.176	01JN	12	13 ^{d/}
050443	Big White Salmon	21MY	69	141.4	82 0.058	28MY	7	28 ^{d/}
631821	Priest Rapids	23MY	74	48.1	22 0.046	17JL	55	10
071613	Tanner Cr. (Bonneville)	29MY	47	95.6	164 0.171	03JN	5	31 ^{d/}
631949	Klickitat	01JN	80	225.4	283 0.125	07JN	6	47 ^{d/}
631938, & 631946	Washougal River	14JN	95	100.1	1116 0.442	01JL	17	9 ^{d/}
631941, & 631854, & 631954	Green River (Toutle)	17JN	160	144.1	1186 0.823	12JL	25	3 ^{d/}
631858	Lewis River	18JN	200	26.2	186 0.709	06AU	49	2 ^{d/}
050449	L. W. S. NFH	22JN	123	264.8	588 0.222	04JL	12	16 ^{d/}
050448	L. W. S. NFH	22JN	105	177.8	371 0.209	03JL	11	17 ^{d/}
631957	Kalama Falls	22JN to 13JL	180	209.7	2995 1.428	27JL	35	2 ^{d/}
035501, & 035601	Big White Salmon	26JN	62	63.3	70 0.111	01JL	5	39
631942	Cowlitz River	27JN to 16OC	85	143.6	449 0.313	02AU	36	3 ^{d/}
632017	Priest Rapids	28JN	77	82.2	21 0.026	30JL	32	18 ^{d/}
631813	NFH Lewis River	13JL	160	60.5	444 0.734	03AU	21	4
631950	Lewis River	19JL	--	108.2	1133 1.047	02AU	14	6
050445	Spring Creek	13AU	--	55.6	100 0.180	18AU	5	38
631920	Lewis River Hatchery	05SE	28	51.7	81 0.156	14SE	9	10

Appendix table 3.--continued.

Mark (Ag, D1, D2) ^{b/}	Release information			Recapture information			Average movement rate	
	Site	Date	Size (no./lb)	No. (thous.)	Adjusted catch ^{c/} (no.) (%)	Date of median recapture (mo/day)	(days)	Release site to Rkm75 (km/day)
Yearling Chinook Salmon								
071824	Round Butte-Ladd	01MR	91	13.2	35 0.267	06JN	97	4
071657, & 071661	Bonneville Hatchery	13MR	7	80.6	291 0.361	11AP	29	5
100415, & 100424	Little Salmon River at Rapid Riv. Hat.	15MR	15	249.0	94 0.029	04MY	50	18 ^{d/}
071741, & 071742, 071743, 071744	M. Fork Will. at Dexter	19MR	11	124.5	290 0.233	18AP	30	14
071919, & 071920, 071921	S. Santiam	21MR	9	97.0	161 0.166	13AP	23	15
071922, & 071923, 071924	Below Willamette Falls	23MR	9	105.2	276 0.262	15AP	23	6 ^{d/}
631732, & 631733, 631734, 631750	Klickitat	27MR	9	398.4	422 0.106	25AP	29	10 ^{d/}
071725, & 071726, 071729, 071730, 071731, 071732	N. Santiam at Minto	03AP	17	292.3	241 0.082	09MY	36	10 ^{d/}
100348	Decker Flats, Salmon River	03AP to 05AP	21	122.0	47 0.030	05MY	32	49
071653	Deschutes at Rd. Butte NFH	09AP	9	39.5	40 0.100	29AP	20	22
100325	S. Fork, Salmon River from (McCall Hat.)	12AP to 18AP	14	116.2	42 0.036	24MY	42	26
631811, & 631812	NFH Methow from (Winthrop Hat.)	20AP to 24AP	13	153.5	68 0.047	28MY	38	20 ^{d/}
631815, & 631816, 631817, 631818	Cowlitz River	23AP	5	95.9	186 0.194	20AP	6	19 ^{d/}
631809, & 631810	NFH Icicle River at Leavenworth Hat.	26AP	16	197.9	250 0.217	29MY	33	22 ^{d/}
071747, & 071748	Eagle Creek, Clack.	01MY	13	94.5	111 0.117	16MY	15	11 ^{d/}

Appendix table 3.--continued.

Mark (Ag, D1, D2) ^{b/}	Release information			Recapture information			Average movement rate	
	Site	Date	Size (no./lb)	No. (thous.)	Adjusted catch _{c/} (no.) (%)	Date of median recapture (mo/day)	(days)	Release site to Rkm75 (km/day)
<u>Yearling Chinook Salmon</u>								
631808	Priest Rapids from Leavenworth Hat.	15MY	16	94.8	197 0.209	30MY	15	37 ^{d/}
631820	Priest Rapids from Winthrop Hat.	16MY	13	77.6	86 0.110	01JN	16	35
071826	Deschutes at Rd. Butte Hat.	23MY	25	48.9	157 0.322	03JN	11	37 ^{d/}
071825	Deschutes km 161	30MY to 31MY	22	50.2	121 0.241	08JN	9	46 ^{d/}
071827	Below Bonn. (Rd. Butte)	30MY	22	49.7	167 0.338	02JN	3	52 ^{d/}
<u>Coho Salmon</u>								
071749, & 071750, 071751, 071752	Sandy Hatchery	01MY	19	27.5	142 0.129	16MY	15	10 ^{d/}
071915, & 071916	Scoggins Creek	01MY	20	155.8	166 0.106	02JN	32	7
071908, & 071911	Bonneville (Cascade)	07MY	23	58.7	45 0.077	18MY	11	14 ^{d/}
631911, & 631912	Green River (Toutle)	07MY	18	77.1	105 0.136	20MY	13	7
631923, & 631924	Washougal River	07MY	17	155.1	215 0.139	21MY	14	10
071746	Eagle Creek, Clack.	22MY	18	69.3	152 0.220	08JN	17	10 ^{d/}
071907, & 071910	Bonneville (Cascade)	07JN	23	58.5	78 0.133	13JN	6	26
631758, & 631913	Green River (Toutle)	07JN	19	80.3	238 0.296	12JN	5	17
631925, & 631926	Washougal River	07JN	20	155.9	269 0.172	16JN	9	16

Appendix table 3.--continued.

Mark (Ag, D1, D2) ^{b/}	Release information			Recapture information			Average movement rate	
	Site	Date	Size (no./lb) (thous.)	No. (no.) (%)	Adjusted catch _{c/} (no.) (%)	Date of median recapture (mo/day)	(days)	Release site to R _{km75} (km/day)
<u>Coho Salmon</u>								
071909, & 071912	Bonnevillle (Cascade)	06JL	22	56.8	221 0.389	13JL	7	22
631928, & 631929	Green River (Toutle)	06JL	18	80.9	425 0.526	13JL	7	12
631934, & 631927	Washougal River	06JL	20	163.1	820 0.503	13JL	7	21
<u>Steelhead</u>								
050422, & 050423	Pahsimeroi River	01AP	5	116.3	45 0.387	27MY	56	22 ^{d/}
631804	Ringold Col. River	18AP to 27AP	7	129.8	89 0.069	17MY	29	17 ^{d/}
WHLBYW	Icicle River (Leavenworth)	26AP		24.0	21 0.087	27MY	31	23 ^{d/}
071745	Eagle Creek Clack.	01MY	7	78.0	126 0.161	19MY	18	10 ^{d/}
100344	Pahsimeroi River	04MY	6	60.1	23 0.039	30MY	26	47
050439	Warm Spring River Hat.	10MY	15	87.4	34 0.039	10JN	31	13
100534	Trucked to Lower Granite then barged to Bonn. to 17MY	14MY	12	32.4	56 0.174	20MY	6	26
WHLBPKLB, & WHLBXY	Barge to Bonneville	17MY	8	42.8	57 0.133	19MY	2	78
100533	Clearwater (Dworshak)	18MY to 23MY	12	30.1	21 0.069	30MY	12	61 ^{d/}

a/ Groups with greatest recapture rates (replicate groups averaged), released in 1979.

b/ Binary coded wire tags where Ag-Agency code, D1-Data 1 code, D2-Data 2, code.

c/ All #'s recaptured and dates combined beach and purse seine catches.

d/ Groups used to construct Table 7 for comparison to similar releases in 1978.

Appendix Table 4.---Travel time and rate of movement for selected groups^{a/} of marked hatchery fish from Jones Beach (km 75) to the lower estuary (km 16), 1979.

Mark ^{c/} (Ag, D1, D2)	Release site	Recapture information ^{b/}				Average movement rate					
		Adjusted #recap	Date		Adjusted no. recap	date		Ist	last	(days)	(km/day)
			Ist	median		last	median				
<u>Subyearling Chinook Salmon</u>											
071841	Will above OC Falls	224	13MY	17MY	02JL	6	21MY	04JN	22JN	18	3
071842	Tanner Creek	510	05MY	02JN	26JN	43	04JN	18JN	04JL	16	4
071613	Tanner Creek	106	01JN	03JN	22JN	16	04JN	07JN	22JN	4	15
631949	Klickitat	142	27MY	05JN	09JL	22	29MY	22JN	20JL	17	3
631941	Green River (ToutleH)	980	12JN	13JL	19SE	24	11JL	20AU	14SE	38	2
631946, and 631938	Washougal River	963	19JN	01JL	29AU	39	02JL	27AU	14SE	57	1
050449	L.W.S. River	402	28JN	06JL	10AU	23	02JL	13JL	14SE	7	8
035701	Big White Salmon	17	29JN	01JL	02JL	17	02JL	02JL	04JL	1	58
631942	Cowlitz River	349	03JL	02AU	19SE	16	03AU	11SE	19SE	40	1
<u>Yearling Chinook Salmon</u>											
631733, and 631734, 631750	Klickitat	299	05AP	25AP	08JN	27	26AP	04MY	11MY	9	6
071653	Deschutes @ Rd Butte H	34	18AP	30AP	29AP	9	04MY	04MY	11MY	4	15
071732	N. Santiam @ Minto	47	20AP	08MY	21MY	12	04MY	07MY	21MY	-	>58
071827	8km below Bonn. Dam	154	01JN	02JN	07JN	10	04JN	04JN	04JN	2	29
071825	Deschutes, km 161	120	04JN	08JN	02JL	7	07JN	14JN	22JN	6	10
<u>Coho Salmon</u>											
631758	Green River (Toutle H)	121	10JN	12JN	26JN	9	14JN	15JN	22JN	3	19
631925	Washougal River	124	13JN	17JN	30JN	7	15JN	22JN	02JL	5	12
631934	Washougal River	399	11JL	13JL	20JL	8	13JL	13JL	19JL	0	>58

a/ Groups with the greatest recapture rates at both sites during periods of consistent sampling effort (replicate groups averaged).

b/ All #'s recap. and dates represent purse seine catches.

c/ Binary coded wire tags were Ag-Agency code, D1-Data 1 code, D2-Data, 2 code.

Appendix Table 5.--Travel time and movement rate to and through the estuary for marked juvenile salmon caught in marine waters adjacent to the mouth of the Columbia River (24-km radius), 1979.

Mark (Ag, D1, D2) brand	Release information				Recapture information				Average movement rate			
	Site	Date (no./lb)	Size (no./lb)	RKm75 ^a / median (no.) date	RKm16 median (no.) date	Ocean median (no.) date	Rel. site to RKm75 (days) (km/day)	RKm75 to RKm16 (days) (km/day)	RKm16 to ocean ^b / (days) (km/day)	Rel. site to RKm75 (days) (km/day)	RKm75 to RKm16 (days) (km/day)	RKm16 to ocean ^b / (days) (km/day)
<u>Subyearling chinook salmon</u>												
050434	Spring Creek	20AP	87	21 27AP	11 07JN	1 03JL	7 27	10 6	26 2			
050444	Spring Creek Hat.	20AP	78	69 26AP	13 07JN	1 03JL	6 32	11 5	26 <1			
071608	Bonneville Hatchery	01MY	78	18 08MY	14 07JN	1 28JN	7 22	30 2	21 2			
071842	Bonneville Hatchery to 29MY	01MY	88	86 02JN	43 18JN	4 28JN	32 5	16 4	10 4			
071841	Will. R. abv. Falls to 21MY	07MY	67	224 17MY	26 04JN	1 03JL	10 13	18 3	29 1			
RD U 3	Prescott, Oregon	16MY	64	6 23MY	1 22JN	1 03JL	7 6	29 2	11 4			
050443	Big White River	21MY	69	26 26MY	13 14JN	2 28JN	5 39	19 3	14 3			
071843	Bonneville Hatchery	21MY	80	2 26MY	4 14JN	1 03JL	5 31	19 3	19 2			
071844	Big Creek Hatchery	21MY	80	-- --	34 18JN	3 28JN	-- --	-- 1 ^c / --	4 10			
035101	Hammond, Oregon	22MY	72	-- --	-- --	1 03JL	-- --	-- 42	1 1			
071845	Klaskanine Hatchery	22MY	72	-- --	25 18JN	7 28JN	-- --	-- 1 ^c / --	10 4			
071613	Bonneville Hatchery	29MY	47	58 02JN	16 07JN	2 28JN	4 39	5 2	21 2			
631949	Klickitat Hatchery	01JN	80	102 09JN	22 22JN	5 28JN	8 31	13 4	6 7			
631939	Grays River	05JN	58	-- --	7 22JN	3 28JN	-- --	-- 6	7 7			
LD IC 3	John Day Dam	06JN	--	21 14JN	7 15JN	1 28JN	8 34	1 58	13 3			
RD PI 3	John Day	06JN	--	22 13JN	9 18JN	1 28JN	7 39	5 12	10 4			
LD T 4	abv. The Dalles Dam	08JN	62	62 17JN	6 18JN	1 28JN	9 26	1 58	10 4			
RA I+ 1	below Bonneville Dam to 29JN	12JN	--	149 26JN	18 22JN	4 28JN	14 11	-4 21 ^c / --	6 7			
RD T 3	below Bonneville Dam	13JN	57	22 19JN	10 22JN	3 28JN	6 26	3 19	6 7 ^c / --			
631938 ^d	Washougal Hatchery	14JN	95	46 29JN	9 13JL	2 28JN	15 10	14 4	-15 18 ^c / --			
RD T 4	abv. Bonneville Dam	14JN	60	28 21JN	11 25JN	1 28JN	7 22	4 15	3 13 ^c / --			
631956	Elokomin River	15JN	99	-- --	17 04JL	2 28JN	-- --	19 4	-6 9 ^c / --			
631941	Toutle Riv. Hatchery	17JN	160	108 01JL	24 20AU	3 15AU	14 6	50 1	-5 2 ^e / --			
050448	Little White S. H.	22JN	105	150 30JN	12 19JL	1 09AU	8 23	19 3	21 2			
050449	Little White S. H.	22JN	123	186 30JN	23 13JL	2 09AU	8 23	13 4	27 1			
LD U 2	Rainier, Oregon	25JN	116	24 28JN	3 18JL	1 10AU	3 11	20 3	23 2 ^c / --			
632017	Priest Rapids	28JN	77	21 30JL	2 13AU	1 16JL	32 18	14 4	-28 37 ^c / --			
631950	Lewis River	19JL	--	46 13AU	16 11SE	1 09AU	25 4	29 2	-33 9 ^c / --			

Appendix Table 5.--continued.

Mark (Ag, D1, D2) brand	Release information			Recapture information			Average movement rate								
	Site	Date (no./lb)	Size (no.)	RKm75 ^{a/}	RKm16	Ocean	Rel. site to RKm75	RKm75 to RKm16	RKm16 to ^{b/} ocean	RKm16 (days)	RKm75 (days)	RKm16 (days)			
				median (no.)	median (no.)	median (no.)							date	date	date
<u>Subyearling chinook salmon</u>															
RA 1+ 2	below Bonneville Dam to 06AU	24JL to 06AU	--	87	04AU	11	13AU	2	10AU	11	14	9	6	-3	16 ^{e/}
RA 1+ 4	below Bonneville Dam to 24AU	06AU to 24AU	--	44	15AU	21	06SE	5	18SE	9	22	22	3	12	3
050445	Spring Creek Hat.	13AU	19	100	18AU	4	20AU	1	23AU	5	38	2	29	3	13
<u>Yearling chinook salmon</u>															
071657	Bonneville Hatchery	13MR	7	18	25AP	1	18MY ^{f/}	1	21JN	43	4	23	3 ^{f/}	34	2 ^{f/} 1 ^{e/}
071921	S. Fork Santiam	21MR	9	57	12AP	0	--	1	03JL	22	8	--	--	--	--
631733	Klickitat	27MR	7	125	26AP	8	26AP	1	15AU	30	9	<1	58	111	<1
631734	Klickitat	30MR	10	85	27AP	12	26AP	1	14MY	28	10	<1	58	18	2
631815	Cowlitz Hatchery	23AP	5	35	30AP	2	04MY	1	14MY	7	16	4	15	10	4
071748	Eagle Creek	01MY	13	61	16MY	2	21MY	1	21JN	15	11	5	12	31	1
RA R 1	below Bonneville Dam to 04MY	24AP to 04MY	--	4	02MY	4	07MY	1	05JL	8	19	5	12	59	<1
RD IZ 1	Wanapum Dam	13MY	--	123	30MY	3	04JN	1	08JN	17	35	5	12	4	10
LD GL 2	Maupin Trap	20MY to 02JN	--	0	--	0	--	1	21JN	--	--	--	--	--	13 ^{c/}
RA 3 3	below Bonneville Dam to 21JN	04JN to 21JN	--	19	07JN	3	22JN	1	04SE	3	52	15	4	74	<1
<u>Coho salmon</u>															
631929	Toutle River Hat.	06JL	18	95	12JL	5	13JL	1	16JL	6	12	1	58	3	13

a/ Adjusted recaptures from purse seine.
b/ Movement rate calculated on distance of 40km.
c/ Movement rate calculated from release site.
d/ Catches and movement rates represent first release group only.
e/ Movement rate calculated from RKm75.
f/ No. of days and movement rate calculated from recapture at km29.

Appendix Table 6.--Catch composition of beach seine samples at Jones Beach, Oregon (Rkm 75), January through September, 1979.

Species	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
	No. sets	5	43	186	244	267	231	218	65		
<u>Chinook salmon-subyearling</u>	4	10	2380	9049	32537	68371	72803	40262	4649	230065	182.2
<u>Oncorhynchus tshawytscha</u>	1	15	188	2303	1250	167	11	0	0	3935	3.1
<u>Chinook salmon-yearling</u>	0	0	0	1460	2246	160	39	1	0	3906	3.1
<u>Oncorhynchus tshawytscha</u>	0	0	0	10	1	30	4	2	0	50	0.0
<u>Coho salmon-juvenile</u>	0	0	0	48	101	14	0	1	0	164	0.1
<u>Oncorhynchus kisutch</u>	0	0	3	10	8	0	0	0	0	21	0.0
<u>Sockeye salmon-juvenile</u>	0	0	0	10	8	0	0	0	0	21	0.0
<u>Oncorhynchus nerka</u>	0	0	0	48	101	14	0	1	0	164	0.1
<u>Steelhead trout-juvenile</u>	0	0	0	10	8	0	0	0	0	21	0.0
<u>Salmo gairdneri</u>	0	0	3	10	8	0	0	0	0	21	0.0
<u>Chum salmon-juvenile</u>	24	80	1770	9581	11194	6262	3677	6981	3074	42643	33.8
<u>Oncorhynchus keta</u>											
<u>Stickleback</u>											
<u>Gasterosteus aculeatus</u>											
<u>Shad-juvenile</u>	0	0	0	0	11	30	768	14744	12662	28215	22.3
<u>Alosa sapidissima</u>	0	14	55	10	2	0	0	0	0	81	0.1
<u>Columbia River smelt</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Thaleichthys pacificus</u>	5	20	103	133	103	148	471	800	319	2102	1.7
<u>Starry flounder</u>											
<u>Platichthys stellatus</u>	0	0	3	36	74	19	13	12	2	159	0.1
<u>Carp</u>											
<u>Cyprinus carpio</u>	0	3	2	70	39	34	243	81	24	496	0.4
<u>Sucker</u>											
<u>Catostomus sp.</u>	0	0	0	0	0	3	1	1	0	5	0.0
<u>Shad-adult</u>											
<u>Alosa sapidissima</u>	0	0	0	8	9	3	0	2	2	24	0.0
<u>Crappie</u>											
<u>Pomoxis nigromaculatus</u>	0	0	1	0	2	0	0	0	0	3	0.0
<u>Bluegill</u>											
<u>Lepomis macrochirus</u>	0	0	0	0	1	1	3	5	6	16	0.0
<u>Bass</u>											
<u>Micropterus salmoides</u>	0	15	91	274	2517	2116	3830	2062	348	11253	8.9
<u>Peamouth</u>											
<u>Mylocheilus caurinus</u>	0	0	0	1	10	37	135	205	69	457	0.4
<u>Squawfish</u>											
<u>Ptychocheilus oregonensis</u>											

Appendix Table 6.--continued.

Species	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
	No. sets	5	43	186	244	267	231	218	65		
Whitefish	0	0	0	1	2	4	62	21	1	91	0.1
<u>Prosopium williamsoni</u>											
Yellow perch	0	0	5	12	25	5	8	5	0	60	0.0
<u>Perca flavescens</u>											
Lamprey	0	0	1	1	0	0	0	1	0	3	0.0
<u>Lampetra tridentata</u>											
Goldfish	0	0	1	1	0	0	0	0	0	2	0.0
<u>Carassius auratus</u>											
Longfin smelt	0	0	2	0	0	0	0	0	0	2	0.0
<u>Spirinchus dilatatus</u>											
Sturgeon	0	0	0	0	0	6	1	0	0	7	0.0
<u>Acipenser transmontanus</u>											
Sculpin	0	6	3	19	37	27	100	8	4	204	0.2
<u>Cottus asper</u>											
Redside shinner	0	0	0	0	0	2	3	0	0	5	0.0
<u>Richardsonius balteatus</u>											
Coastal cutthroat trout	0	0	0	54	27	5	22	42	24	174	0.1
<u>Salmo clarki</u>											
Steelhead trout-adult	0	0	1	2	10	7	6	5	0	31	0.0
<u>Salmo gairdneri</u>											
Chinook salmon-jack	0	0	0	0	5	20	41	24	12	102	0.1
<u>Oncorhynchus tshawytscha</u>											
Chinook salmon-adult	0	0	0	9	12	0	5	15	36	77	0.1
<u>Oncorhynchus tshawytscha</u>											
Sockeye salmon-adult	0	0	0	0	0	6	10	1	0	17	0.0
<u>Oncorhynchus nerka</u>											
Coho salmon-adult	0	0	0	0	0	0	0	3	9	12	0.0
<u>Oncorhynchus kisutch</u>											

Appendix Table 7.--Catch composition of purse seine samples at Jones Beach, Oregon (Rkm 75), January through September, 1979.

Species	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Total	Average
	2	3	12	75	121	131	59	35	6	444	per set
<u>Chinook salmon-subyearling</u>	0	0	152	1426	8087	18175	6564	3639	120	38163	86.0
<u>Oncorhynchus tshawytscha</u>	0	0	21	4378	10291	4068	32	2	0	18792	42.3
<u>Chinook salmon-yearling</u>	0	0	0	807	14546	11141	1185	5	0	27684	62.4
<u>Oncorhynchus tshawytscha</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Coho salmon-juvenile</u>	0	0	1	16	1488	1302	14	1	0	2822	6.4
<u>Oncorhynchus kisutch</u>	0	0	0	0	2	0	0	0	0	2	0.0
<u>Sockeye salmon-juvenile</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Oncorhynchus nerka</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Chum salmon-juvenile</u>	0	0	1	1057	7649	1595	17	2	0	10321	23.2
<u>Oncorhynchus keta</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Steelhead trout-juvenile</u>	0	0	0	20	62	17	1	1	0	101	0.2
<u>Salmo gairdneri</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Coastal cutthroat trout</u>	0	0	1	230	16	51	15	25	0	338	0.8
<u>Salmo clarki</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Stickleback</u>	0	0	0	1	0	26	8	163	76	274	0.6
<u>Gasterosteus aculeatus</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Shad-juvenile</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Alosa sapidissima</u>	0	10	1960	78	4	0	0	0	0	2052	4.6
<u>Columbia River smelt</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Thaleichthys pacificus</u>	0	2	0	7	6	4	6	4	0	29	0.1
<u>Starry flounder</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Platichthys stellatus</u>	0	0	0	1	19	4	0	0	0	24	0.1
<u>Carp</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Cyprinus carpio</u>	0	0	0	1	22	19	1	0	0	43	1.0
<u>Sucker</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Catostomus sp.</u>	0	0	0	0	1	1	0	0	0	2	0.0
<u>Black crappie</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Pomoxis nigromaculatus</u>	0	0	4	31	1502	2338	224	115	23	4237	9.5
<u>Peamouth chub</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>Mylocheilus caurinus</u>	0	0	0	0	3	15	8	14	0	40	0.1
<u>Northern squawfish</u>	0	0	0	0	0	0	0	0	0	0	0.0
<u>ptychocheilus oregonensis</u>	0	0	0	0	0	0	0	0	0	0	0.0

Appendix Table 7.--continued.

Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Total	Average per set
No. sets	2	3	12	75	121	131	59	35	6	444	
<u>Species</u>											
Lamprey-juvenile	0	0	1	0	0	1	2	1	0	5	0.0
<u>Lampetra tridentata</u>	0	0	0	0	3	1	3	0	0	7	0.0
Sculpin											
<u>Cottus asper</u>	0	0	7	27	25	11	1	0	0	71	0.2
Steelhead trout-adult											
<u>Salmo gairdneri</u>	0	0	0	1	2	2	0	0	3	8	0.0
Chinook salmon-adult											
<u>Oncorhynchus tshawytscha</u>	0	0	0	2	62	32	10	22	0	128	0.3
Shad-adult											
<u>Alosa sapidissima</u>	0	0	0	3	7	5	1	0	0	16	0.0
Lamprey-adult											
<u>Lampetra tridentata</u>	0	0	0	0	0	2	2	0	0	4	0.0
Sockeye salmon-adult											
<u>Oncorhynchus nerka</u>											

Appendix Table 8.--Catch composition of purse seine samples in the lower Columbia River estuary (Rkm 14-43), April through September, 1979.

Month	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
No. sets	4	35	26	35	47	41	188	
<u>Species</u>								
Chinook salmon-subyearling <u>Oncorhynchus tshawytscha</u>	0	2059	7360	3290	2269	3121	18099	96.3
Chinook salmon-yearling <u>Oncorhynchus tshawytscha</u>	27	1742	137	2	5	3	1916	10.2
Coho salmon-juvenile <u>Oncorhynchus kisutch</u>	6	2894	562	64	1	0	3527	18.8
Sockeye salmon-juvenile <u>Oncorhynchus nerka</u>	0	46	42	0	0	0	88	0.5
Chum salmon-juvenile <u>Oncorhynchus keta</u>	0	11	0	0	0	0	11	0.1
Steelhead trout-juvenile <u>Salmo gairdneri</u>	1	510	45	0	0	0	556	3.0
Coastal cutthroat trout-juvenile <u>Salmo clarki</u>		4	0	0	0	0	4	0.0
Stickleback ^{a/} <u>Gasterosteus aculeatus</u>	160	484	17	11	9	3	684	3.6
Peamouth Chub <u>Mylocheilus caurinus</u>	0	33	2	2	0	0	37	0.2
Sucker <u>Catostomus sp.</u>	0	2	0	0	0	0	2	0.0
Carp <u>Cyprinus carpio</u>	0	1	1	0	0	0	2	0.0
Yellow perch <u>Perca flavescens</u>	1	0	1	0	0	0	2	0.0
Largemouth black bass-juvenile <u>Micropterus salmoides</u>		0	0	1	0	0	1	0.0
Shad-juvenile ^{a/} <u>Alosa sapidissima</u>	0	144	13	17	160	8	342	1.8
Shad-adult ^{a/} <u>Alosa sapidissima</u>	0	15	30	93	6	0	144	0.8
Herring-juvenile ^{a/} <u>Clupea pallasii</u>	0	1157	405	516	1600	1000	4678	24.9
Herring-adult ^{a/} <u>Clupea pallasii</u>	0	20	252	58	107	0	437	2.3
Anchovy-juvenile ^{a/} <u>Engraulis mordax</u>	0	1300	380	26	0	0	1706	9.1
Anchovy-adult ^{a/} <u>Engraulis mordax</u>	0	16000	30130	31600	203450	57350	338530	1801.1
Surf smelt-juvenile ^{a/} <u>Hypomesus pretiosus</u>	4	1835	20577	3790	3500	250	29956	159.3
Surf smelt-adult ^{a/} <u>Hypomesus pretiosus</u>	0	40	75	100	36	0	251	1.3
Longfin smelt-juvenile ^{a/} <u>Spirinchus dilatatus</u>	13	415	2259	920	530	64	4237	22.5
Longfin smelt-adult ^{a/} <u>Spirinchus dilatatus</u>	0	0	17	9	15	0	41	0.2
Eulachon <u>Thaleichthys pacificus</u>	3	6	0	0	0	0	9	0.0
Starry flounder-juvenile <u>Platichthys stellatus</u>	0	19	36	14	13	15	97	0.5
Starry flounder-adult <u>Platichthys stellatus</u>	0	0	17	9	15	0	41	0.2

Appendix Table 8.--continued.

Month	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
No. sets	4	35	26	35	47	41	188	
<u>Species</u>								
Shiner perch ^{a/}	0	18	244	152	200	250	864	4.6
<u>Cymatogaster aggregata</u>								
Red tailed surf perch-juvenile		1	7	0	0	0	8	0.0
<u>Holconotus rhodoterus</u>								
Red tailed surf perch-adult		0	0	1	0	1	2	0.0
<u>Holconotus rhodoterus</u>								
Pacific hake-adult	0	0	0	0	2	0	2	0.0
<u>Merluccius productus</u>								
Tom cod-juvenile	0	3	0	0	0	0	3	0.0
<u>Microgadus proximus</u>								
Tom cod-adult	0	1	0	1	0	0	2	0.0
<u>Microgadus proximus</u>								
Kelp greenling	0	2	0	1	0	0	3	0.0
<u>Hexagrammos decagrammus</u>								
Staghorn sculpin	0	5	5	6	7	9	32	0.2
<u>leptocottus armatus</u>								
Buffalo sculpin	0	0	0	1	1	0	2	0.0
<u>Enophrys bison</u>								
Red irishlord	0	0	1	2	0	1	4	0.0
<u>Hemilepidotus hemilepidotus</u>								
Sturgeon poacher-juvenile		0	0	1	0	0	1	0.0
<u>Agonus acipenserinus</u>								
Blacktail snailfish-juvenile		0	0	0	1	0	1	0.0
<u>Careproctus melanurus</u>								
Snake prickpleback-adult		0	0	1	1	0	2	0.0
<u>Lumpenus sagitta</u>								
Sandfish-adult	0	0	1	0	0	0	1	0.0
<u>Trichodon trichodon</u>								
Pompano	0	1	0	0	0	0	1	0.0
<u>Peprilus simillimus</u>								
Green sturgeon	0	0	1	0	1	0	2	0.0
<u>Acipenser medirostris</u>								
White sturgeon	0	2	0	0	3	0	5	0.0
<u>Acipenser transmontanus</u>								
Pacific lamprey ^{a/}	0	25	264	764	59	16	1128	6.0
<u>Lampetra tridentatus</u>								
Dungeness crab-juvenile	0	1	3	2	0	3	9	0.0
<u>Cancer magister</u>								
Coastal cutthroat trout-adult		13	0	81	89	35	218	1.2
<u>Salmo clarki</u>								
Steelhead trout-adult		9	2	1	0	0	12	0.1
<u>Salmo gairdneri</u>								
Chinook salmon-jack	0	0	0	1	4	8	13	0.1
<u>Oncorhynchus tshawytscha</u>								
Chinook salmon-adult		0	0	0	9	40	49	0.3
<u>Oncorhynchus tshawytscha</u>								
Coho salmon-jack	0	0	0	0	1	0	1	0.0
<u>Oncorhynchus kisutch</u>								
Coho salmon-adult	0	0	0	0	13	10	23	0.1
<u>Oncorhynchus kisutch</u>								

a/ Includes estimated catches.

Appendix Table 9.--Catch composition of purse seine samples in the marine waters adjacent to the mouth of the Columbia River (24km radius), May through September, 1979.

Month	May	June	July	Aug.	Sept.	Yearly total	CPUE
No. sets	12	9	19	49	20	109	
<u>Species</u>							
Chinook salmon-subyearling <u>Oncorhynchus tshawytscha</u>	27	769	286	540	108	1730	15.9
Chinook salmon-yearling <u>Oncorhynchus tshawytscha</u>	45	38	36	27	4	150	1.4
Coho salmon-juvenile <u>Oncorhynchus kisutch</u>	11	3	47	6	7	74	0.7
Sockeye salmon-juvenile <u>Oncorhynchus nerka</u>	0	1	0	1	0	2	0.0
Chum salmon-juvenile <u>Oncorhynchus keta</u>	22	0	0	0	0	22	0.2
Stickleback <u>Gasterosteus aculeatus</u>	15	2	0	9	0	26	0.2
Starry flounder-juvenile <u>Platichthys stellatus</u>	3	5	2	83	34	127	1.2
Starry flounder-adult <u>Platichthys stellatus</u>	1	8	1	18	6	34	0.3
Sand sole-juvenile <u>Psettichtys melanostictus</u>	40	13	0	119	12	184	1.7
Sand sole-adult <u>Psettichtys melanostictus</u>	0	2	0	7	2	11	0.1
Rex sole-juvenile <u>Glyptocephalus zachirus</u>	0	9	0	7	9	25	0.2
Rex sole-adult <u>Glyptocephalus zachirus</u>	0	0	0	4	0	4	0.0
English sole-juvenile <u>Parophrys vetulus</u>	0	15	0	90	7	112	1.0
English sole-adult <u>Parophrys vetulus</u>	0	3	0	1	0	4	0.0
Sanddab-juvenile <u>Citharichthys sp.</u>	0	16	0	613	204	833	7.6
Herring-juvenile <u>Clupea pallasii</u>	137	20	0	425	0	582	5.3
Herring-adult <u>Clupea pallasii</u>	0	87	9	420	0	516	4.7
Anchovy-juvenile <u>Engraulis mordax</u>	14000	7000	260	0	0	21260	195.0
Anchovy-adult <u>Engraulis mordax</u>	0	1	0	405200	12000	417201	3827.5
Surf smelt-juvenile <u>Hypomesus pretiosus</u>	59	61	630	2700	33	3483	32.0
Surf smelt-adult <u>Hypomesus pretiosus</u>	0	150	0	127	0	277	2.5
Longfin smelt-juvenile <u>Spirinchus dilatatus</u>	4	26	250	100	17	397	3.6
Longfin smelt-adult <u>Spirinchus dilatatus</u>	0	0	21	12	5	38	0.3
Red tailed surf perch-juvenile <u>Holconotus rhodoterus</u>	125	104	0	400	0	629	5.8
Red tailed surf perch-adult <u>Holconotus rhodoterus</u>	3	8	0	16	0	27	0.2

Appendix Table 9.--continued.

Species	Month	May	June	July	Aug.	Sept.	Yearly	CPUE
	No. sets	12	9	19	49	20	total 109	
Shiner perch		0	0	40	1600	588	2228	20.4
<u>Cymatogaster aggregata</u>								
Pacific hake-juvenile		0	2	0	0	0	2	0.0
<u>Merluccius productus</u>								
Pacific pompano-adult		0	16	0	0	0	16	0.2
<u>Palometa simillima</u>								
Pacific sandfish-adult		0	0	0	2	0	2	0.0
<u>Trichodon trichodon</u>								
Pacific sandlance-juvenile		0	20	0	60	0	80	0.7
<u>Ammodytes hexapterus</u>								
Jack mackerel		0	0	1	0	0	1	0.0
<u>Trachurus symmetricus</u>								
Rock greenling-juvenile		0	0	0	1	0	1	0.0
<u>Hexagrammos lagocephalus</u>								
Rock greeling-adult		0	0	0	1	0	1	0.0
<u>Hexagrammos lagocephalus</u>								
Tom cod-juvenile		0	11	0	7	0	18	0.2
<u>Microgadus proximus</u>								
Tom cod-adult		0	0	0	2	0	2	0.0
<u>Microgadus proximus</u>								
Sturgeon poacher-juvenile		0	0	0	6	0	6	0.1
<u>Agonus acipenserinus</u>								
Tubenose poacher-juvenile		0	0	0	4	0	4	0.0
<u>Pallasina barbata aix</u>								
Ocean sunfish		0	0	0	2	0	2	0.0
<u>Mola mola</u>								
White sturgeon		0	1	0	0	0	1	0.0
<u>Acipenser transmontanus</u>								
Green sturgeon		0	5	0	0	0	5	0.0
<u>Acipenser medirostris</u>								
Wolf eel		0	2	6	10	3	21	0.2
<u>Anarrhichthys ocellatus</u>								
Staghorn sculpin		2	1	0	16	5	24	0.2
<u>leptoctus armatus</u>								
Red irish lord		0	0	0	2	1	3	0.0
<u>Hemilepidotus hemilepidotus</u>								
Dogfish		0	4	0	0	3	7	0.1
<u>Squalus suckleyi</u>								
Big skate-juvenile		0	0	0	1	0	1	0.0
<u>Raja binoculata</u>								
Big skate-adult		0	2	0	23	2	27	0.2
<u>Raja binoculata</u>								
Pacific lamprey-juvenile		0	0	3	0	0	3	0.0
<u>Lampetra tridentatus</u>								
Squid		0	2	0	300	0	302	2.8
<u>Loligo opalescens</u>								
Dungeness crab-juvenile		8	6	0	84	0	98	0.9
<u>Cancer magister</u>								
Dungeness crab-adult		0	23	0	153	26	202	1.9
<u>Cancer magister</u>								
Chinook salmon-adult		0	0	0	44	6	50	0.5
<u>Oncorhynchus tshawytscha</u>								
Coho salmon-jack		0	0	0	1	1	2	0.0
<u>Oncorhynchus kisutch</u>								
Coho salmon-adult		0	0	0	15	1	16	0.1
<u>Oncorhynchus kisutch</u>								