BEACH AND PURSE SEINE SAMPLING OF JUVENILE SALMONIDS IN THE COLUMBIA RIVER ESTUARY AND OCEAN PLUME, 1977-1983;

VOLUME I

PROCEDURES, SAMPLING EFFORT, AND CATCH DATA

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ABSTRACT

Procedures for beach and purse seine sampling of juvenile salmon, *Oncorhynchus* spp., and steelhead, *Salmo gairdneri*, in the Columbia River estuary and ocean plume are described. Sampling effort and catch data from 1977 through 1983 are listed and summarized. Included are data summarizing fork lengths of each salmonid species, catches of species incidental to the program, water temperatures, and river flow.

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INTRODUCTION

Natural runs of salmonids in the Columbia River basin have decreased for the past 4 decades or more, as a result of hydroelectric development, poor forest management, and overfishing (Raymond 1979; Netboy 1980). This has necessitated increased salmon culture to augment the numbers of returning adults. Hatcheries are now the primary source of salmon and steelhead for the Columbia River. By the late 1970s, they annually produced about 100 million fall chinook salmon, *Oncorhynchus tshawytscha*; 21 million spring and summer chinook salmon; 30 million coho salmon, *O. kisutch*; and 10 million steelhead, *Salmo gairdneri*.[1/] Even with hatchery production at this level, management agencies agree that, in general, yields of Columbia River salmonids have deteriorated.

Hatchery procedures and facilities are continually being modified to improve the efficiency of production and the quality of juveniles produced to compensate for the loss of natural fish. Various marking techniques were adopted to identify different hatchery fish or experimental groups at ports of landing, back at the hatchery, and on natural spawning grounds. Fish were marked by the excision of combinations of fins and the rear portion of a maxillary bone (Cleaver 1967), freeze branding (Mighell 1969), and implantation of coded wire tags (CWT) (Bergman et al. 1968). A regional marked fish processing center was established to help coordinate marking and recovery programs by various fishery agencies throughout the Pacific Northwest (Johnson 1984).

1/ Unpublished documents from Environmental and Technical Services Division, National Marine Fisheries Service, P.O. Box 4332, Portland, OR 97208.

Initial efforts to evaluate changes in hatchery procedures were dependent upon adult contributions to the fishery and returns to the hatchery. Unfortunately, variations in survival of fish groups occur during ocean residence which sometimes overshadows less significant, but possibly positive, changes resulting from new culture techniques.

To provide observations of survival benefits prior to fish encountering the variable ocean environment, the Northwest and Alaska Fisheries Center, sampled juvenile migrants at the upstream extent of the Columbia River estuary from 1977 through 1983 and at various sites in the lower estuary and nearshore ocean plume from 1978 through 1980. These studies were partially funded by the Pacific Northwest Regional Commission and the Bonneville Power Administration. The sampling provided recovery of marked fish within a few weeks of hatchery release, and thereby an early evaluation of cultural techniques -- an evaluation which would require several years using adult data. In addition, variables that influenced survival during migration to the estuary were isolated from variables that influenced survival in the ocean. The objectives of the sampling were to: 1) define the migrational characteristics of juvenile salmonids to and through the estuary, 2) make various biological observations of migrants, 3) examine the relative survival of marked fish migrating through the Columbia River, and 4) correlate juvenile catch data with adult recovery information to assist in evaluating hatchery production techniques and procedures.

This report, the first of two volumes, describes procedures for beach and purse seine sampling of juvenile salmonids and lists and summarizes sampling effort and catch data from 1977 through 1983. The second volume (Dawley et al. 1985b) lists and summarizes data obtained from marked juvenile salmonids recovered during the same period. Analyses of the data relating to the above objectives are contained in a report entitled: "Migrational

characteristics, biological observations, and relative survival of juvenile salmonids entering the Columbia River estuary, 1977-1983" (Dawley et al. 1985a).

STUDY AREA

The primary sampling site was Jones Beach near Woodson, Oregon, at Columbia River Kilometer (RKm) 75 (Fig. 1). This site is at the upper extent of the estuary, where the river is approximately 1.6 km wide, with a central ship channel maintained at approximately a 14 m depth (Fig. 2). The gradually sloped sandy beach and debris-free channel make the site ideal for sampling. Tidal effects are semidiurnal (roughly 7.5 hours of ebb and 5.0 hours of flood tide); throughout most of the year, water flow reversal occurs during flood tides.

Secondary sampling sites were near the downstream extent of the estuary, at Rkm 16, 9, and 7, where saltwater intrusion occurs. Incidental sites, sampled intermittently, were scattered throughout the estuary and ocean plume (within 24 km of the river mouth) (Fig. 1).

Weekly average water temperatures at Jones Beach during the sampling period are listed in Table 1. Weekly mean Columbia River flows for 1977, 1978-1981 (averaged), 1982, and 1983 are presented in Figure 3.

METHODS

Sampling procedures were consistent between years and sites within the restraints dictated by river and weather conditions. Generally, sampling began at sunrise and continued for about 7 hours. The beach seine was 95 m long and 5 m deep with 1- to 2-cm (stretch measure) webbing (Sims and Johnsen 1974). At Jones Beach, the bunt end of the net was towed upstream at the 1 m

depth contour then arced downstream and back to shore; at lower estuary sites, towing direction was reversed on incoming tides due to high water velocity. The effective fishing depth was about 3 m. The purse seine was 206 m long and 11 m deep with 1- to 2-cm (stretch measure) webbing (Durkin and Park 1967). It was towed upstream in a "U" configuration for 5 minutes prior to closing the net bottom (pursing). The effective fishing depth was about 6 m. Variation in the amount of water strained by the purse seines was minimized in relation to water velocity fluctuations by maintaining constant towing power and allowing the nets to move upstream or downstream with the water flow as each set was made.

Fish captured were processed comparably at all sites; the catch from each set was anesthetized with a 50-mg/liter solution of ethyl p-aminobenzoate (the concentration was varied depending upon water temperature and fish size), enumerated by species, and examined for physical conditions and marks. Fork lengths were generally measured 3 days/week for all sockeye salmon, *O. nerka*, and chum salmon, *O. keta*, and 100-fish subsamples of coho salmon, steelhead, yearling chinook salmon, and subyearling chinook salmon.

Subyearling chinook salmon are predominantly fall and summer races; yearling chinook salmon are predominantly a spring race (Van Hyning 1973). Chinook salmon were separated into subyearling and yearling categories on the basis of fork length, with the separation point adjusted upward through the season to compensate for growth (Table 2). Errors in separation were estimated from the proportion of tagged fish which were misclassified; error rates in 1982 and 1983 were 0.7 and 0.0% for yearling and 3.3 and 3.7% for subyearling chinook salmon, respectively. The greatest error was associated with larger sized subyearling chinook salmon reared in warm water. Yearling chinook salmon were not well represented by tags, and the error rate may be conservative for smaller sized fish emanating from the upper reaches of the

Columbia River basin (generally cooler water). Because of the low percentage of error, no adjustment was made to catch and catch/set data; corrections were made for misclassification of marked fish.

Adjustments for variation of sampling efficiency resulting from changes in river flow were not made except for the between-group comparisons presented by Dawley et al. (1985a). Increased river flow did decrease catch rates but measurements of the magnitude varied widely. Based on available data, catch rates decreased an average of 8.5% for each 1000 m^3/s increase of flow.

SAMPLING EFFORT AND CATCHES

Throughout the spring migration of salmonids, sampling at the Jones Beach site (Rkm 75) was conducted 5 days/week or more. In 1977, beach seining was conducted consistently, but purse seining was intermittent. From 1978 through 1983, both beach and purse seines were used consistently during the migration period. Daily effort in the spring was generally 10 sets with the beach seine and 5 sets with the purse seine; less effort was expended at other times of the year. Extensive effort was also expended in the winter and early spring of 1982-1983. Weekly sampling effort and mean catch/set for subyearling chinook salmon, yearling chinook salmon, coho salmon, and steelhead are listed in Tables 3 and 4. Weekly mean fork lengths are presented in Figures 4-10.

Sampling in the lower estuary and ocean plume was conducted 5 days/week during the spring migration from 1978 through 1980. Purse seining at McGowan (RKm 16) was conducted 1 to 3 days/week in 1978 and 3 to 5 days/week during 1979 and 1980; weekly effort and catch per/set for juvenile salmonids are listed in Table 5. Beach seining at Sand Island (RKm 9) or Clatsop Spit (RKm 7) was conducted 1 to 3 days/week in 1978. Weekly effort and mean catch/set for juvenile salmonids are listed in Table 6. Incidental sites throughout

the estuary were sampled intermittently with the purse seine during 1978 and 1979; weekly effort and catch/set of juvenile salmonids are listed in Table 7. Various ocean sites within 24 km of the river mouth were sampled with the purse seine from 1978 through 1980 on an intermittent basis (as permitted by weather and personnel commitments); weekly effort and catch/set of juvenile salmonids are listed in Table 8.

Monthly catches of salmonids and species incidental to sampling objectives, from 1978 through 1983, are summarized in Tables 9-27.

Daily effort and catch of juvenile salmonids by set for beach and purse seine sampling at each site are presented in the Appendix*

* Appendix not included in this abridged version of NOAA Technical Memorandum NMFS F/NWC-75.

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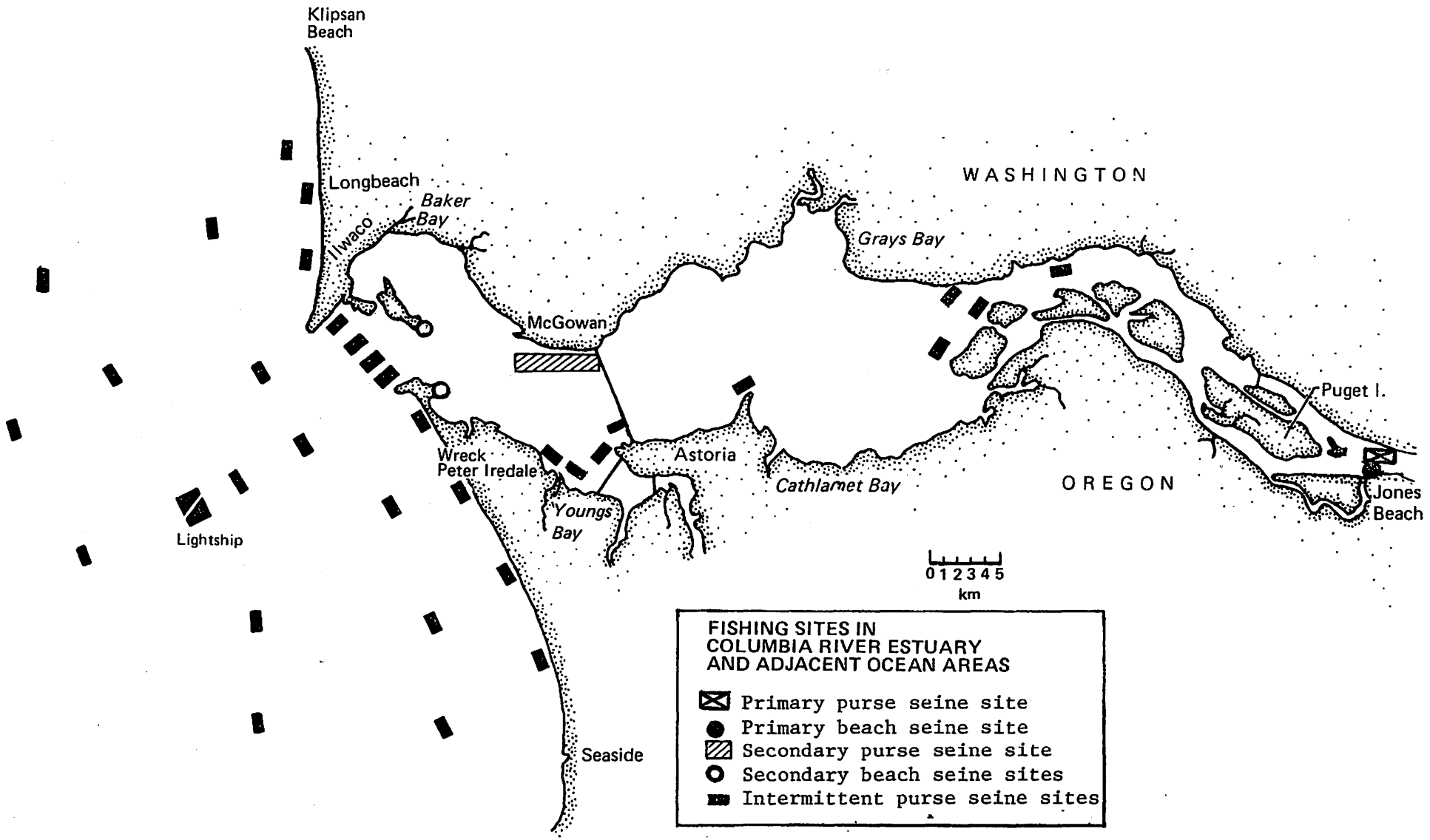

Figure 1.--The Columbia River estuary and adjacent Pacific Ocean showing sampling sites.

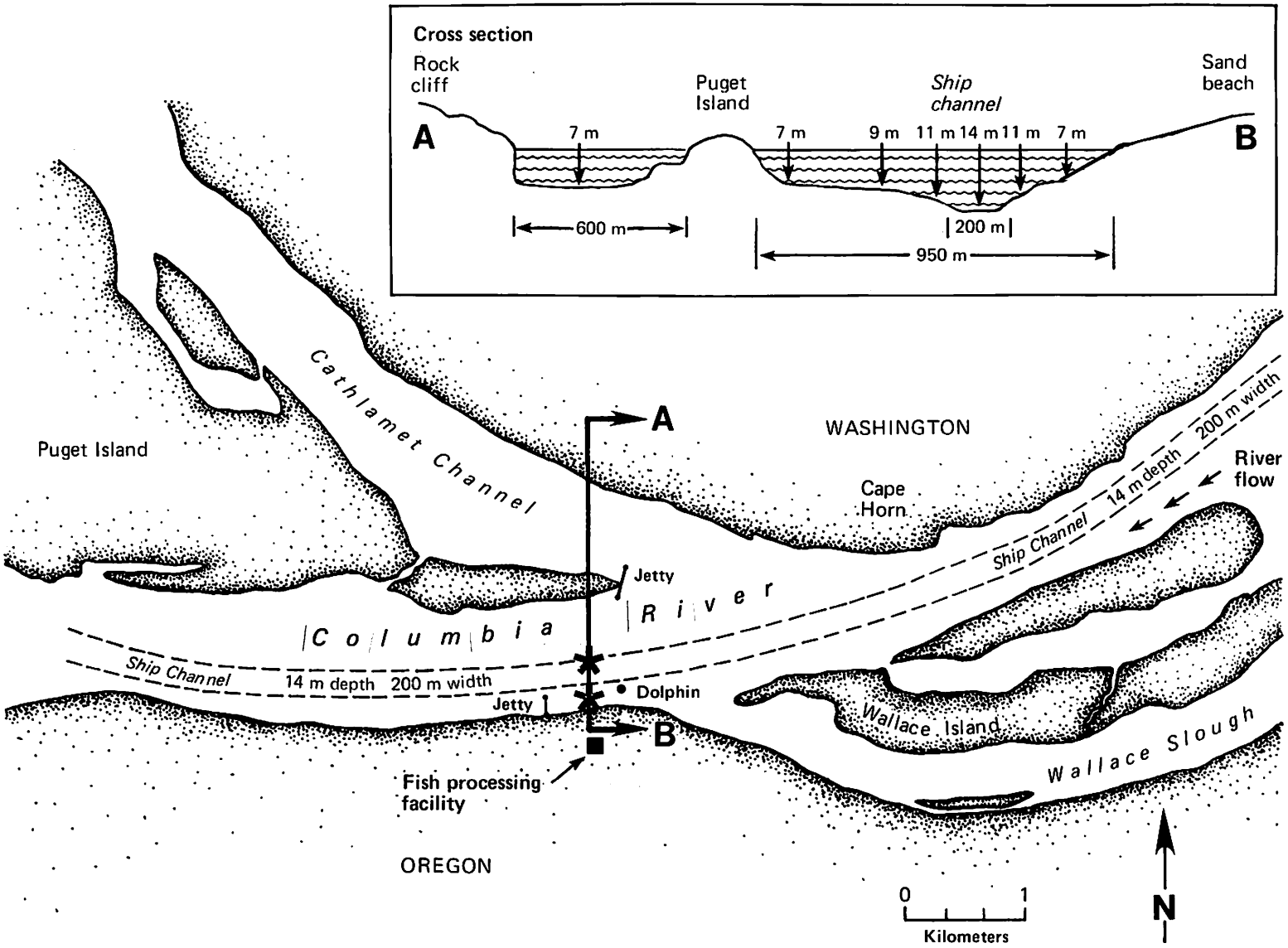

Figure 2.--Jones Beach sampling site. The beach and purse seining areas are denoted on the cross section by the two asterisks.

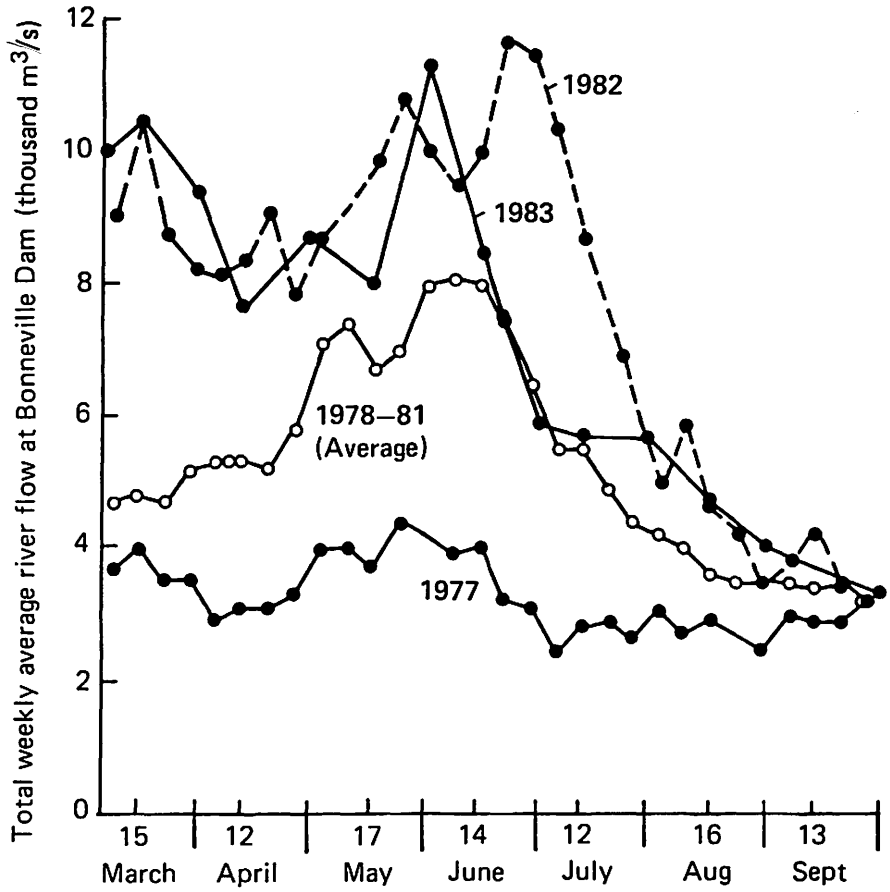

Figure 3.--Weekly mean Columbia River flows for 1977, 1982 and 1983. Weekly mean flows for 1978-1981 averaged.

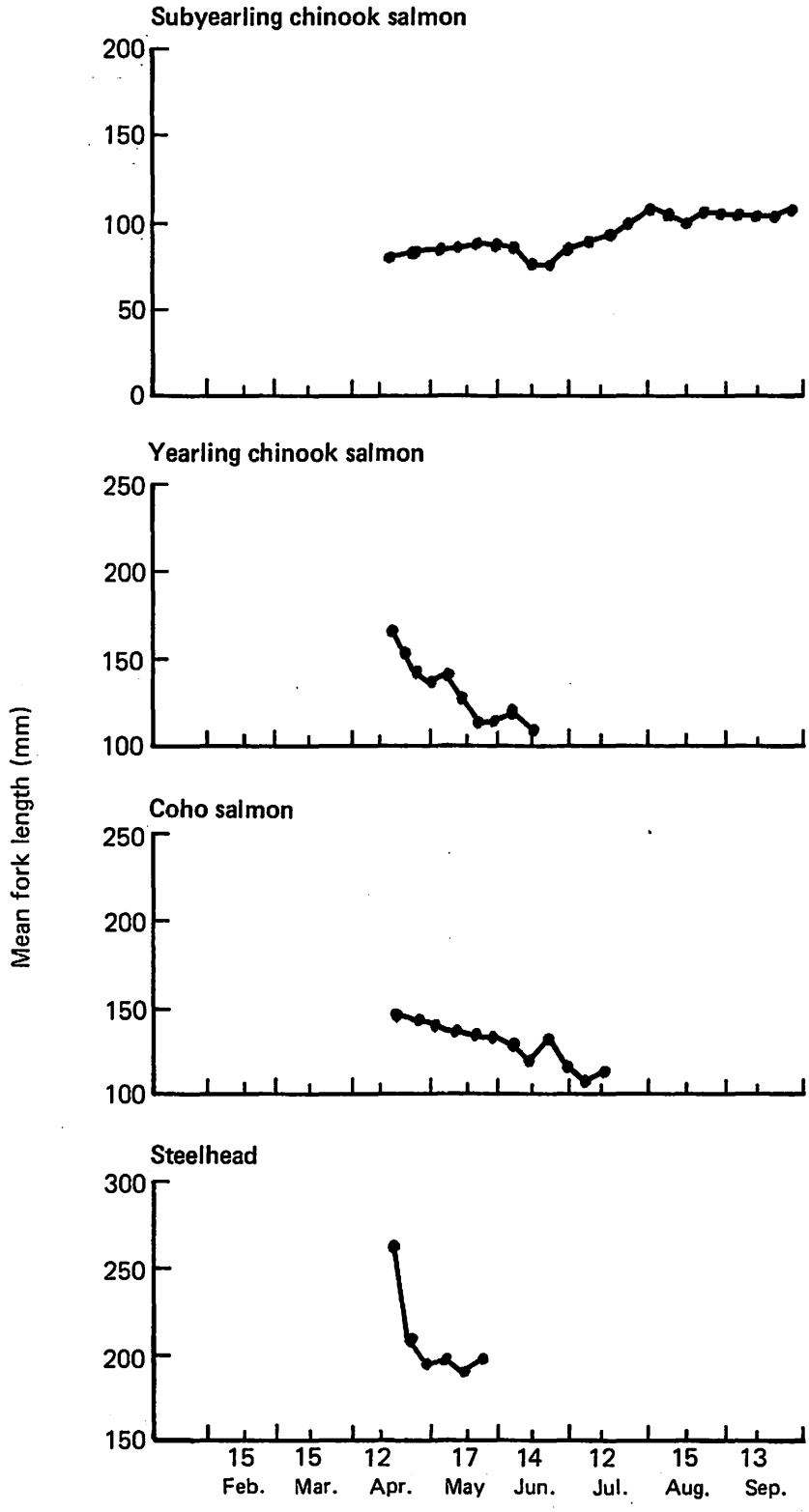

Figure 4.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1977.

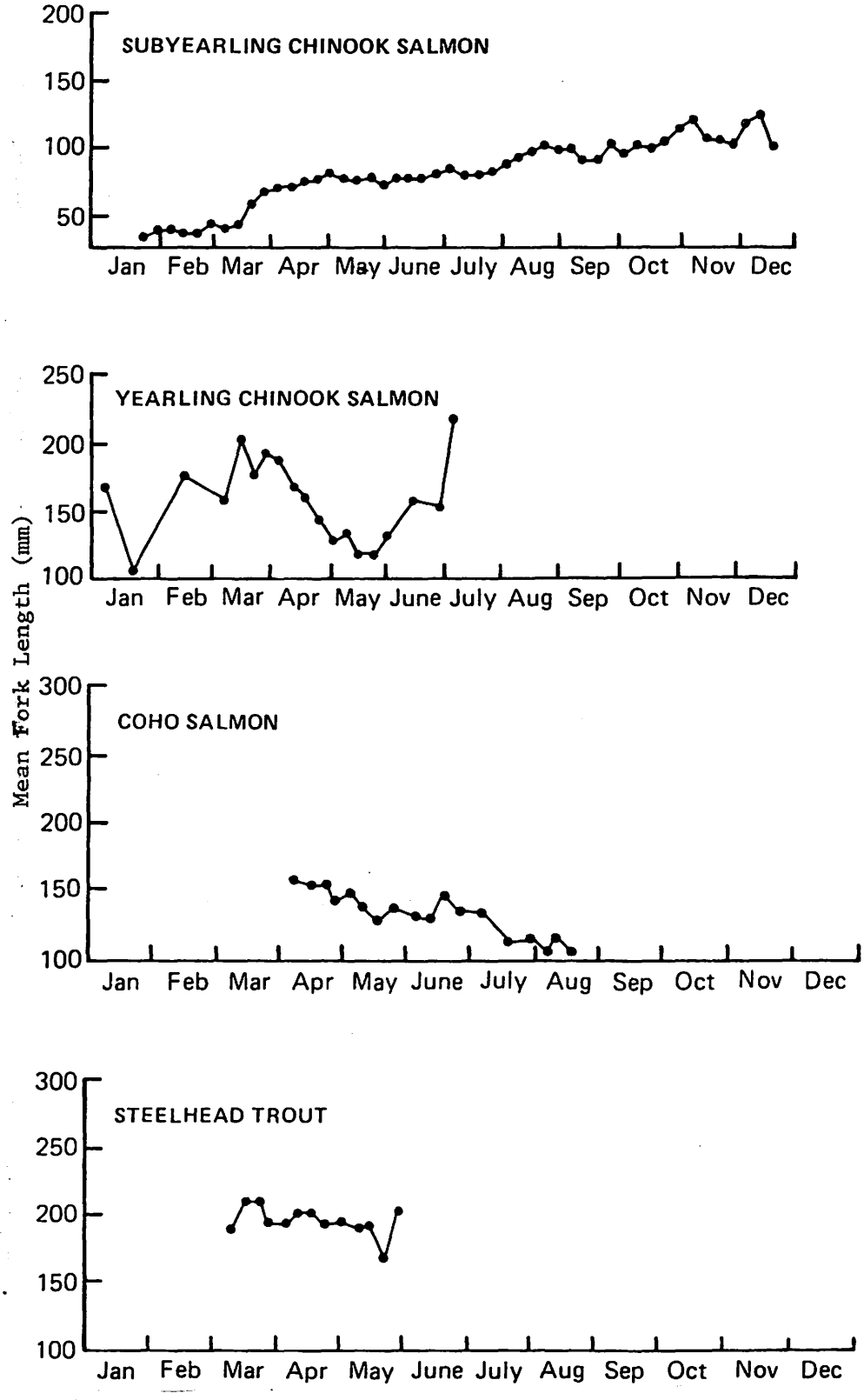

Figure 5.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon, and steelhead juveniles captured at Jones Beach in 1978.

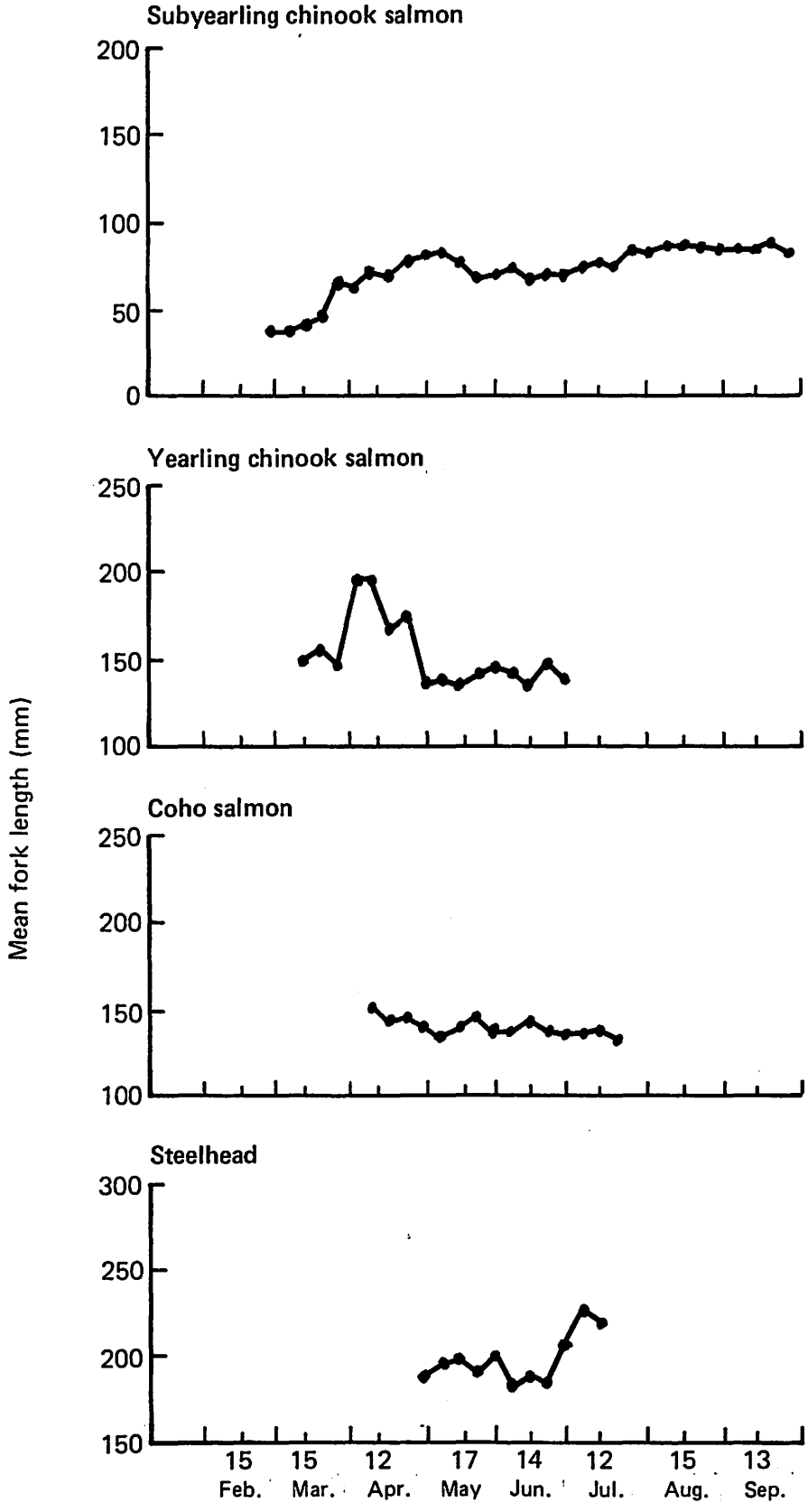

Figure 6.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1979.

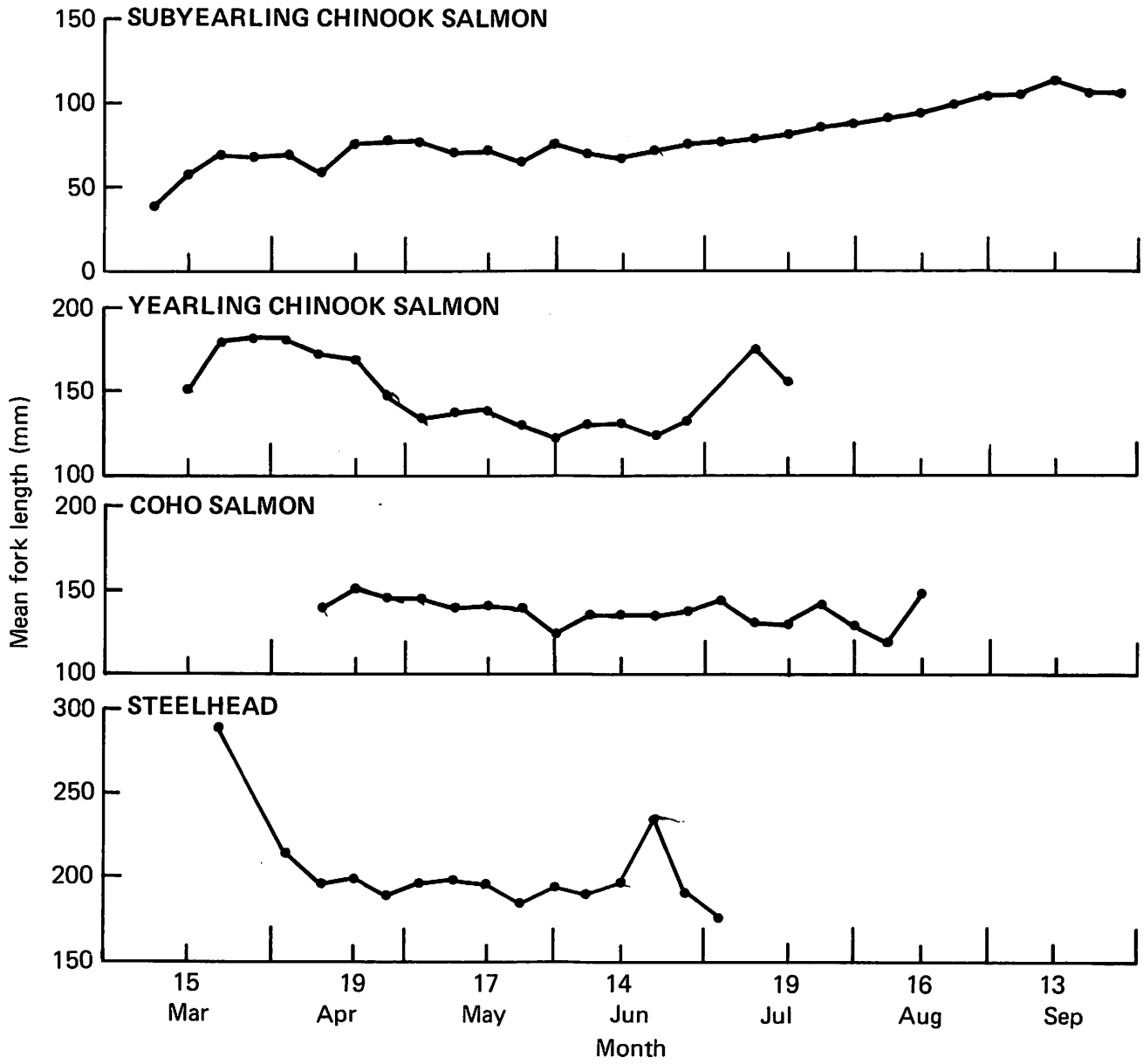

Figure 7.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1980.

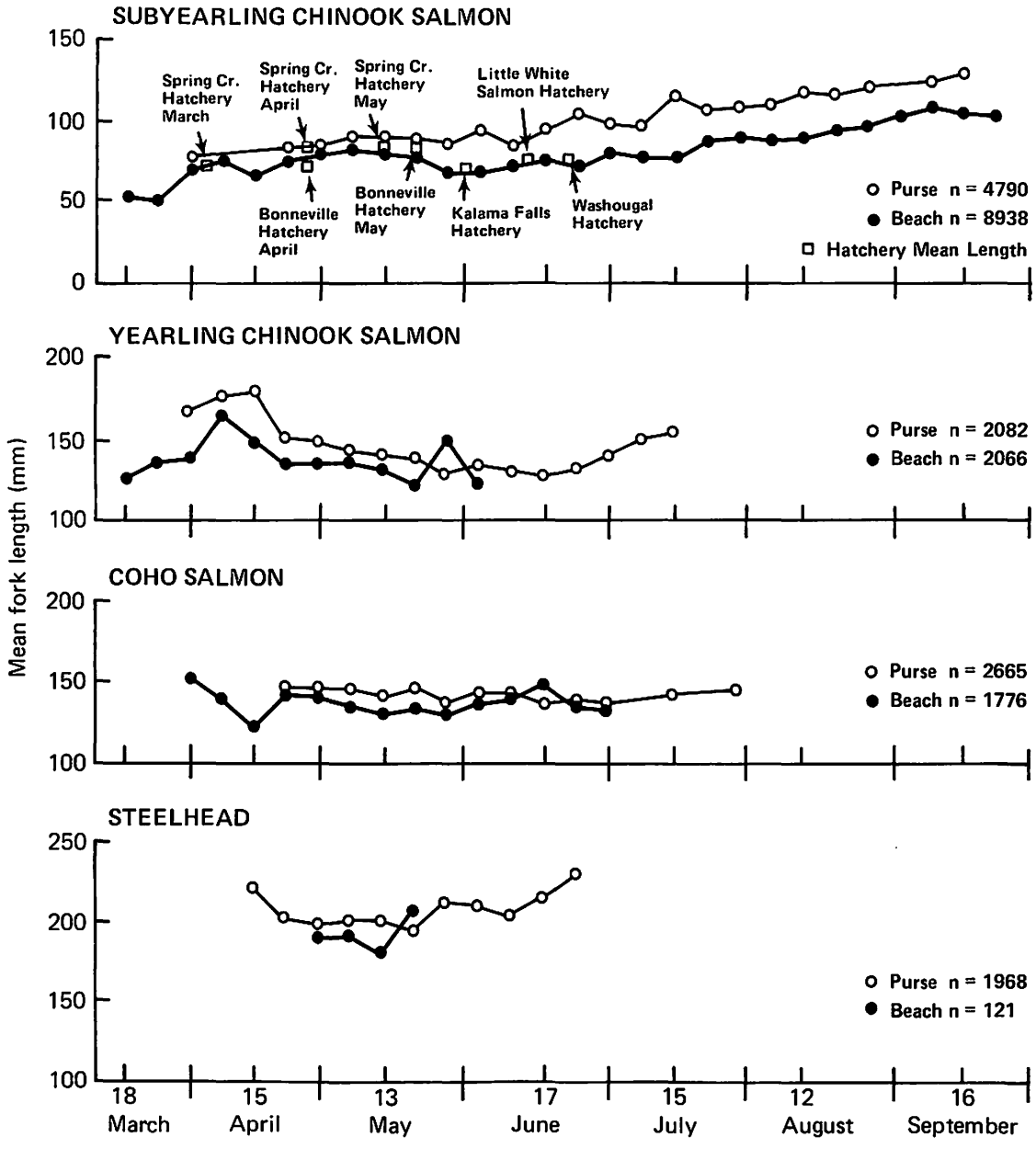

Figure 8.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1981.

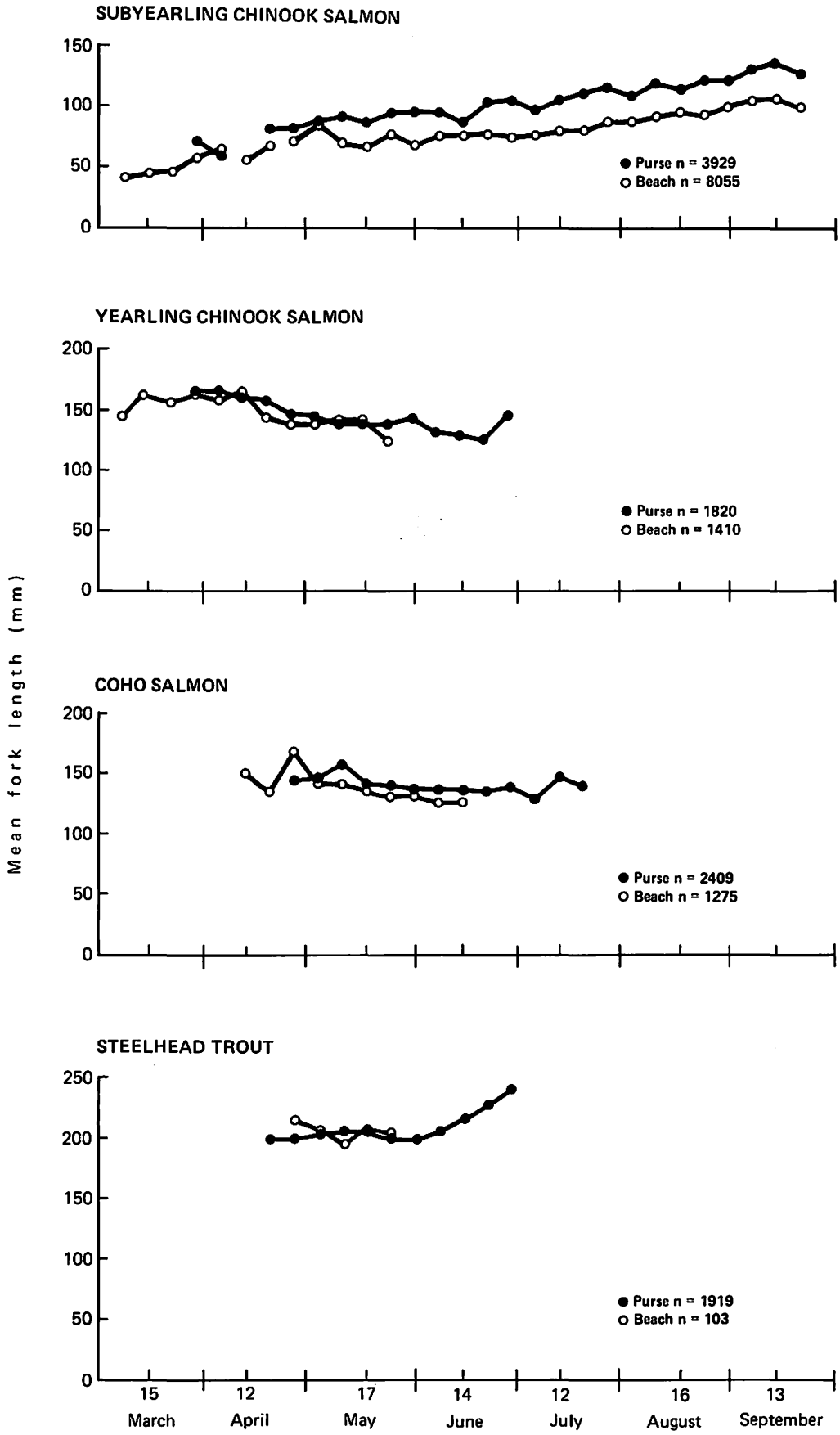

Figure 9.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1982.

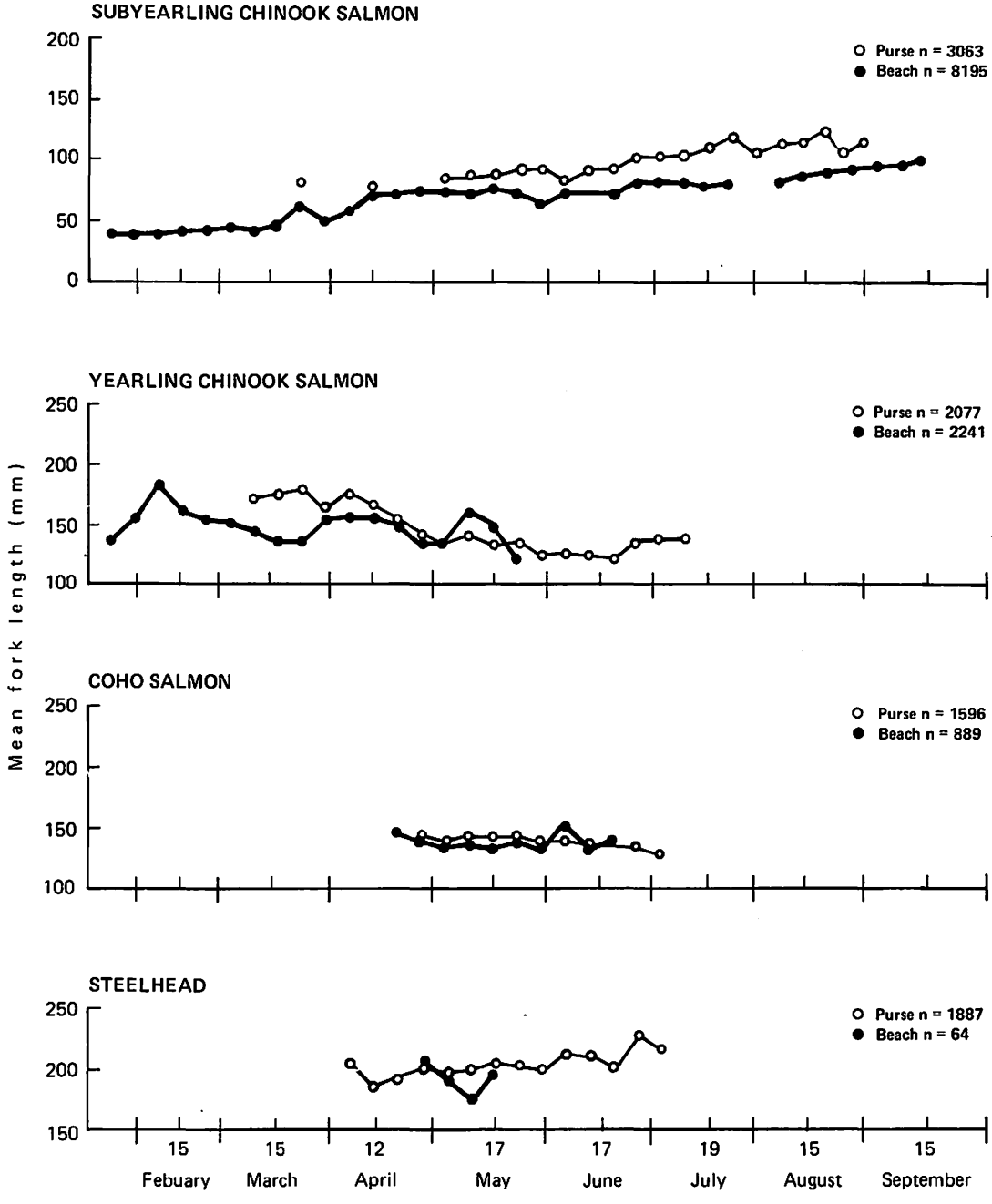

Figure 10.--Weekly mean fork lengths of subyearling and yearling chinook salmon, coho salmon and steelhead juveniles captured at Jones Beach in 1983.

Table 1.--Weekly mean water temperature (°C) of the Columbia River at Jones Beach, 1977-1983.

Date (Mo./day)	1977	1978	1979	1980	1981	1982	1983
1/1 - 1/7	-	4	-	-	-	-	-
1/8 - 1/14	-	-	-	-	-	-	-
1/15 - 1/21	-	-	-	-	-	-	-
1/22 - 1/28	-	6	-	-	-	-	6
1/29 - 2/4	-	5	-	-	-	-	6
2/5 - 2/11	-	6	-	-	-	-	5
2/12 - 2/18	-	6	-	-	-	-	6
2/19 - 2/25	-	7	-	-	-	-	7
2/26 - 3/4	-	8	-	-	-	-	7
3/5 - 3/11	-	6	6	7	-	7	8
3/12 - 3/18	-	7	6	6	8	6	8
3/19 - 3/25	-	8	7	5	8	6	8
3/26 - 4/1	-	10	8	7	9	7	8
4/2 - 4/8	-	11	8	8	9	7	9
4/9 - 4/15	-	10	8	9	9	8	9
4/16 - 4/22	-	10	9	10	9	8	11
4/23 - 4/29	8	11	11	12	10	10	12
4/30 - 5/6	10	11	12	14	12	11	12
5/7 - 5/13	10	12	12	14	12	12	12
5/14 - 5/20	13	13	13	14	13	13	13
5/21 - 5/27	13	13	15	14	13	13	16
5/28 - 6/3	13	14	14	14	15	14	17
6/4 - 6/10	15	17	15	14	15	14	16
6/11 - 6/17	17	17	16	14	15	14	17
6/18 - 6/24	18	17	16	16	15	16	16
6/25 - 7/1	19	17	17	17	16	17	17
7/2 - 7/8	19	17	18	18	17	18	18
7/9 - 7/15	19	18	19	18	18	18	18
7/16 - 7/22	20	19	20	19	18	20	19
7/23 - 7/29	20	21	20	19	19	20	20
7/30 - 8/5	22	20	21	20	20	19	21
8/6 - 8/12	22	21	20	20	21	20	21
8/13 - 8/19	23	21	20	20	21	20	21
8/20 - 8/26	22	19	20	19	21	21	22
8/27 - 9/2	20	19	21	20	20	21	21
9/3 - 9/9	20	18	19	18	20	20	19
9/10 - 9/16	19	18	19	19	20	19	19
9/17 - 9/23	18	17	20	18	19	19	18
9/24 - 9/30	17	17	19	18	18	-	-
10/1 - 10/7	16	16	-	-	-	-	-
10/8 - 10/14	15	16	-	-	14	-	15
10/15- 10/21	14	-	-	-	14	-	15
10/22- 10/28	-	15	-	-	13	-	14
10/29- 11/4	11	12	-	-	12	12	14
11/5 - 11/11	11	10	-	-	12	10	12
11/12- 11/18	9	8	-	-	12	9	12
11/19- 11/25	7	6	-	-	10	8	11
11/26- 12/2	8	5	-	-	8	7	9
12/3 - 12/9	7	6	-	-	8	7	6
12/10- 12/16	-	5	-	-	-	6	-
12/17- 12/23	5	5	-	-	-	-	-
12/24- 12/31	-	2	-	-	-	-	-

Table 2.--Fork length and date used for separation of unmarked subyearling and yearling chinook salmon at Jones Beach (Rkm 75), 1979-1983.

1979		1980		1981	
Dates	Separation point (mm) a/	Dates	Separation point (mm)	Dates	Separation point (mm)
Apr 24	95	Mar 10	75	Mar 18	85
May 09	100	Mar 17	85	Apr 01	90
May 17	105	Apr 11	95	Apr 13	95
May 22	110	May 03	100	Apr 21	100
Jun 15	120	Jun 03	110	May 28	105
Jun 21	130	Jun 24	120	Jun 03	110
Jul 03	150	Jul 01	150	Jun 15	115
				Jun 19	125
				Jul 06	150

1982		1983	
Dates	Separation point (mm)	Dates	Separation point (mm)
Mar 08	85	Jan 26	65
Mar 29	90	Mar 23	95
Apr 19	95	Apr 20	100
May 09	100	May 21	105
May 24	105	May 31	110
May 26	110	Jun 26	130
Jun 16	115		
Jun 23	130		
Jun 30	150		

a/ Fish smaller than separation point were classified as subyearling. Few yearling chinook salmon were captured beyond 15 July in any year.

Table 3.--Weekly beach and purse seine effort at Jones Beach (RKm 75), 1977-1983.

Date (Mo./Day)	1977 Beach No. sets	1977 Beach Fished days No.	1977 Purse No. sets	1977 Purse Fished days No.	1978 Beach No. sets	1978 Beach Fished days No.	1978 Purse No. sets	1978 Purse Fished days No.	1979 Beach No. sets	1979 Beach Fished days No.	1979 Purse No. sets	1979 Purse Fished days No.	1980 Beach No. sets	1980 Beach Fished days No.	1980 Purse No. sets	1980 Purse Fished days No.	1981 Beach No. sets	1981 Beach Fished days No.	1981 Purse No. sets	1981 Purse Fished days No.	1982 Beach No. sets	1982 Beach Fished days No.	1982 Purse No. sets	1982 Purse Fished days No.s	1983 Beach No. sets	1983 Beach Fished days No.	1983 Purse No. sets	1983 Purse Fish day No
1/1 - 1/7	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
1/8 - 1/14	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
1/15 - 1/21	0	0	0	0	2	1	0	0	2	1	1	1	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
1/22 - 1/28	0	0	0	0	1	1	0	0	1	1	1	1	0	0	0	0	-	-	-	-	0	0	0	0	17	3	3	1
1/29 - 2/4	0	0	0	0	2	1	0	0	1	1	0	0	0	0	0	0	-	-	-	-	0	0	0	0	35	5	16	5
2/5 - 2/11	0	0	0	0	2	1	0	0	1	1	1	1	0	0	0	0	-	-	-	-	0	0	0	0	40	5	14	5
2/12 - 2/18	0	0	0	0	2	1	0	0	2	1	1	1	0	0	0	0	-	-	-	-	0	0	0	0	40	5	15	5
2/19 - 2/25	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	32	4	10	4
2/26 - 3/4	0	0	0	0	1	1	0	0	2	1	1	1	0	0	0	0	-	-	-	-	0	0	0	0	36	5	11	4
3/5 - 3/11	0	0	0	0	15	3	0	0	2	1	1	1	4	1	0	0	-	-	-	-	7	2	0	0	35	5	12	5
3/12 - 3/18	0	0	0	0	17	3	9	3	9	3	3	3	18	4	4	2	3	1	0	0	9	3	0	0	30	5	8	5
3/19 - 3/25	0	0	0	0	39	4	5	1	9	3	3	3	27	5	5	3	16	4	0	0	9	3	0	0	37	5	14	5
3/26 - 4/1	0	0	0	0	50	5	11	3	23	6	5	3	34	5	7	4	25	4	8	3	24	4	9	3	38	4	14	5
4/2 - 4/8	0	0	0	0	58	6	15	3	32	6	8	4	38	5	11	5	27	4	10	4	35	5	6	2	38	5	13	5
4/9 - 4/15	6	2	0	0	70	7	15	3	36	6	11	4	39	5	15	5	36	5	14	5	61	7	4	2	39	5	15	5
4/16 - 4/22	37	6	0	0	50	5	15	3	51	6	24	5	39	5	15	5	41	5	18	5	57	6	10	4	50	5	15	5
4/23 - 4/29	47	7	0	0	56	6	34	7	58	6	27	6	41	5	19	5	64	7	13	5	57	6	17	5	57	6	25	5
4/30 - 5/6	62	7	9	3	60	6	28	6	58	7	31	7	45	6	19	6	67	7	21	6	70	7	31	7	70	7	35	7
5/7 - 5/13	60	7	5	3	55	6	29	6	52	6	26	6	56	6	22	6	69	7	18	5	70	7	31	7	70	7	34	7
5/14 - 5/20	63	7	0	0	57	6	25	6	53	7	29	7	46	5	17	5	67	7	28	7	70	7	35	7	70	7	35	7
5/21 - 5/27	67	7	0	0	55	6	28	6	61	7	25	6	22	5	15	5	66	6	24	6	69	7	35	7	69	7	35	7
5/28 - 6/3	70	7	8	3	48	5	23	5	52	6	28	6	43	6	15	5	66	7	26	7	66	7	34	7	67	7	30	7
6/4 - 6/10	67	7	16	3	50	5	24	5	60	7	29	7	54	6	22	5	67	7	26	7	70	7	34	7	70	7	28	7
6/11 - 6/17	68	7	0	0	48	5	20	4	63	7	33	7	59	6	19	6	67	7	25	6	69	7	35	7	70	7	31	7
6/19 - 6/24	70	7	0	0	50	5	20	4	64	7	31	7	58	6	16	5	63	7	22	5	67	7	27	6	67	7	17	7
6/25 - 7/1	70	7	0	0	47	5	24	5	57	6	25	6	60	6	16	5	69	7	14	4	68	7	23	5	64	7	24	7
7/2 - 7/8	46	5	0	0	34	4	3	2	47	5	15	3	38	4	10	4	49	6	11	4	52	6	22	5	46	5	18	5
7/9 - 7/15	66	7	0	0	50	5	9	3	57	6	19	4	52	6	16	6	54	7	15	5	69	7	18	5	61	7	12	5
7/16 - 7/22	50	5	0	0	49	5	8	3	55	6	13	3	48	5	14	5	40	5	11	5	52	6	7	3	49	6	17	6
7/23 - 7/29	50	5	0	0	49	5	9	3	54	6	9	3	50	5	6	3	40	5	11	4	40	5	9	3	40	5	9	3
7/30 - 8/5	70	7	0	0	50	5	9	3	54	6	9	3	41	5	8	3	40	5	12	5	38	5	9	3	38	5	9	3
8/6 - 8/12	67	7	0	0	29	3	9	3	55	6	9	3	48	5	7	3	40	5	10	4	40	5	9	3	40	5	9	3
8/13 - 8/19	69	7	0	0	29	3	8	3	46	5	13	4	48	5	8	3	30	4	4	2	39	5	8	3	37	5	9	3
8/20 - 8/26	68	7	0	0	30	3	6	2	46	5	5	2	48	5	7	3	34	5	1	1	39	5	6	2	39	5	5	2
8/27 - 9/2	50	5	0	0	45	5	1	1	35	4	2	1	37	4	5	2	25	5	2	2	19	3	4	2	39	5	4	2
9/3 - 9/9	40	4	0	0	44	5	1	1	35	4	2	1	39	5	4	2	15	4	1	1	17	3	6	3	27	5	4	3
9/10 - 9/16	49	5	0	0	29	3	0	0	24	3	2	1	38	4	4	2	15	5	3	3	17	3	5	3	34	5	2	1
9/17 - 9/23	50	5	0	0	9	1	1	1	3	1	1	1	29	5	1	1	9	3	0	0	20	3	6	3	7	2	0	0
9/24 - 9/30	37	4	0	0	19	2	2	1	3	1	1	1	11	2	2	1	3	1	0	0	0	0	0	0	0	0	0	0
10/1 - 10/7	3	1	0	0	6	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
10/8 - 10/14	3	1	0	0	7	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	3	1	2	1
10/15 - 10/21	3	1	0	0	7	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	9	3	6	3
10/22 - 10/28	3	1	0	0	5	2	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	8	3	6	3
10/29 - 11/4	3	1	0	0	4	1	1	1	0	0	0	0	0	0	0	0	-	-	-	-	14	2	6	2	9	3	7	3
11/5 - 11/11	3	1	0	0	20	3	9	3	0	0	0	0	0	0	0	0	-	-	6	3	34	5	18	5	9	3	6	3
11/12 - 11/18	2	1	0	0	13	3	5	3	0	0	0	0	0	0	0	0	-	-	10	4	37	6	23	6	8	3	6	3
11/19 - 11/25	2	1	0	0	7	2	2	1	0	0	0	0	0	0	0	0	-	-	7	3	23	4	20	4	6	2	4	2
11/26 - 12/2	2	1	0	0	2	1	1	1	0	0	0	0	0	0	0	0	-	-	2	4	28	5	20	5	9	3	6	3
12/3 - 12/9	2	1	0	0	3	1	2	1	0	0	0	0	0	0	0	0	-	-	3	2	26	5	15	5	6	2	4	2
12/10 - 12/16	0	0	0	0	5	1	2	1	0	0	0	0	0	0	0	0	-	-	-	-	11	2	8	2	0	0	0	0
12/17 - 12/23	3	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0
12/24 - 12/31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	0	0	0

Table 4.----Weekly catch per set averages for yearling chinook salmon, coho salmon and steelhead (purse seine) and subyearling chinook salmon (beach seine) at Jones Beach (RKm 75), 1977-1983.

	Beach seine							Purse seine																					
	Subyearling chinook							Yearling chinook							Juvenile coho						Juvenile steelhead					
	Catch per set							Catch per set							Catch per set						Catch per set					
(Mo/day)	1977	1978	1979	1980	1981	1982	1983	1978	1979	1980	1981	1982	1983	1978	1979	1980	1981	1982	1983	1978	1979	1980	1981	1982	1983
1/1 - 1/7	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/8 - 1/14	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/15 - 1/21	-	0	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-
1/22 - 1/28	-	2	1	-	-	-	6	-	0	-	-	-	1	-	0	-	-	-	0	-	0	-	-	-	0
1/29 - 2/4	-	1	2	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0
2/5 - 2/11	-	2	0	-	-	-	6	-	0	-	-	-	0	-	0	-	-	-	0	-	0	-	-	-	0
2/12 - 2/18	-	2	3	-	-	-	12	-	0	-	-	-	0	-	0	-	-	-	0	-	0	-	-	-	0
2/19 - 2/25	-	6	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0
2/26 - 3/4	-	3	2	-	-	-	5	-	0	-	-	-	0	-	0	-	-	-	0	-	0	-	-	-	0
3/5 - 3/11	-	10	3	24	-	13	12	-	0	2	-	20	-	-	-	3	1	13	-	0	0	-	-	-	0
3/15 - 3/18	-	4	7	54	5	10	8	2	3	1	3	2	13	-	35	-	5	1	9	0	0	0	-	-	0
3/19 - 3/25	-	10	15	60	4	12	23	2	11	3	4	3	15	-	24	-	20	1	3	0	0	0	-	-	0
3/26 - 4/1	-	48	94	50	43	45	13	7	17	2	6	6	21	15	14	5	9	2	1	0	0	0	1	0	0
4/2 - 4/8	-	31	34	14	88	28	13	10	18	11	7	12	15	11	44	11	9	5	7	1	0	0	1	0	0
4/9 - 4/15	75	31	27	37	23	23	40	25	11	32	13	35	18	14	12	5	8	7	3	11	1	0	2	0	0
4/16 - 4/22	124	15	33	64	32	39	43	47	19	47	14	49	22	55	24	10	6	16	3	23	5	2	11	1	0
4/23 - 4/29	100	87	67	79	96	95	23	36	5	94	11	53	12	64	16	16	15	20	8	74	22	30	74	3	4
4/30 - 5/6	222	119	129	95	205	169	94	45	7	83	14	83	9	91	18	27	37	81	16	79	50	125	184	10	28
5/7 - 5/13	739	110	190	161	181	92	70	106[a]	6	60	10	110[a]	15	109[a]	8	30	25	91	7	195	91	152	224[a]	64	89
5/14 - 5/20	1080	96	141	112	163	75	129	58	1	93[a]	3	53	2	64	1	55[a]	3	84[a]	2	211[a]	142	208[a]	186[a]	166	173
5/21 - 5/27	661[a]	121	111	54[b]	112	119	111	57		68		25[b]		26		52		73		119	165	54[b]	166	200[a]	154[a]
5/28 - 6/3	479	580	180	87	74	89	47	43		121		11		22		29		32		100	175[a]	48	96	161	104
6/4 - 6/10	272	482[a]	298	98	90[a]	161	165	27		56		15		9		17		51		99	148	41	60	108	56
6/11 - 6/17	153	634	89	89	77	197	122	28		20		15		12		25		16		37	100	15	7	62	43
6/18 - 6/24	99	298	285	103	56	105[a]	90[a]	14		12		14		10		23		10		23	27	6	42	18	13
6/25 - 7/1	134	434	345	57	130	94	151	10		1		3		6		4		4		11	11	9	9	7	5
7/2 - 7/8	103	179	362[a]	184	353	127	192	2		2		0		7		0		5		1	5	5	0	4	3
7/9 - 7/15	230	95	203	121	100	231	159	8		0		0		1		0		1		1	53	15	6	3	1
7/16 - 7/22	97	90	366	104	74	124	79	4		0		0		0		0		1		1	7	2	1	1	1
7/23 - 7/29	217	72	340	70	57	93	44	1		0		0		0		0		0		0	1	5	2	0	0
7/30 - 8/5	155	63	342	75	42	65	35	0		0		0		0		0		0		0	0	0	0	0	0
8/6 - 8/12	106	23	237	48	18	63	39	0		0		0		0		0		0		0	0	0	0	0	0
8/13 - 8/19	59	62	131	49	23	64	27	0		0		0		0		0		0		0	0	0	0	0	0
8/20 - 8/26	63	44	119	50	10	30	21	0		0		0		0		0		0		0	0	0	0	0	0
8/27 - 9/2	32	41	83	40	8	22	14	0		0		0		0		0		0		0	0	0	0	0	1
9/3 - 9/9	43	18	72	24	13	45	24	0		0		0		0		0		0		0	0	0	0	0	0
9/10 - 9/16	23	23	75	33	15	35	17	-		0		0		0		0		0		0	0	0	0	0	0
9/17 - 9/23	13	23	75	21	15	26	15	0		0		0		0		0		-		0	0	0	0	0	0
9/24 - 9/30	14	17	35	20	17	-	-	0		0		0		0		-		-		0	0	0	0	0	0
10/1 - 10/7	20	15	-	-	-	-	-	1[c]		-		-		-		-		-		0	0	0	0	-	-
10/8 - 10/14	16	12	-	-	-	-	7	-		-		-		-		-		0		0	-	-	-	-	-
10/15 - 10/21	18	11	-	-	-	-	10	-		-		-		-		-		0		0	-	-	-	-	0
10/22 - 10/28	46	7	-	-	-	-	7	-		-		-		-		-		0		0	-	-	-	-	0
10/29 - 11/4	13	8	-	-	-	15	16	2[c]		-		-		-		9[c]		9[c]		0	-	-	-	-	0
11/5 - 11/11	1	11	-	-	-	26	31	10[c]		-		-		9[c]		27[c]		21[c]		0	-	-	-	-	0
11/12 - 11/18	0	3	-	-	-	15	10	7[c]		-		-		37[c]		20[c]		43[c]		0	-	-	-	-	0
11/19 - 11/25	0	2	-	-	-	8	5	8[c]		-		-		40[c]		29[c]		24[c]		0	-	-	-	-	0
11/26 - 12/2	2	2	-	-	-	6	1	6[c]		-		-		24[c]		11[c]		5[c]		0	-	-	-	-	0
12/3 - 12/9	3	4	-	-	-	5	1	9[c]		-		-		2[c]		4[c]		8[c]		0	-	-	-	-	0
12/10 - 12/16	-	4	-	-	-	3	-	2[c]		-		-		-		2[c]		-[c]		0	-	-	-	-	0
12/17 - 12/23	2	1	-	-	-	-	-	-		-		-		-		-		-		0	-	-	-	-	-
12/24 - 12/31	-	0	-	-	-	-	-	-		-		-		-		-		-		-	-	-	-	-	-

a/ Median recapture.
b/ Initial effects from Mount St. Helens
c/ Primarily spring chinook and fall chinook salmon, which were released in the fall as subyearlings, 6-24/lb.

Table 5.--Weekly purse seine effort and catch per set at McGowan (Rkm 16), 1978-1980.

	1978						1979						1980					
	Effort		Catch per set a/				Effort		Catch per set a/				Effort		Catch per set a/			
			Salmon			Steel-			Salmon			Steel-			Salmon			Steel-
	days	sets	chinook		coho	head	days	sets	chinook		coho	head	days	sets	chinook		coho	head
Date period	(no)	(no)	0's	1's	(juv)	(juv)	(no)	(no)	0's	1's	(juv)	(juv)	(no)	(no)	0's	1's	(juv)	(juv)
4/ 2- 4/ 8	1	4	0	10	0	0	0	0	-	-	-	-	0	0	-	-	-	-
4/ 9- 4/15	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
4/16- 4/22	2	11	2	24	10	4	0	0	-	-	-	-	0	0	-	-	-	-
4/23- 4/29	3	14	3	22	31	14	1	4	0	7	2	0	4	10	0	10	0	1
4/30- 5/ 6	3	15	8	59	61	22	1	4	0	103	56	31	4	17	0	13	9	3
5/ 7- 5/13	3	13	11	55	110	85	2	7	8	75	56	19	5	9	3	155	161	145
5/14- 5/20	4	17	27	80	61	73	0	0	0	0	0	0	5	14	22	133	158	68
5/21- 5/27	4	15	203	78	177	63	2	6	104	48	70	10	3	8	38	76	80	68
5/28- 6/ 3	2	8	501	19	88	16	1	3	109	22	61	6	3	8	319	30	20	29
6/ 4- 6/10	3	11	713	12	137	27	2	7	330	10	16	2	0	0	-	-	-	-
6/11- 6/17	3	15	280	2	32	3	3	9	159	4	37	3	0	0	-	-	-	-
6/18- 6/24	4	20	466	2	23	1	2	6	460	2	14	1	1	4	72	6	19	10
6/25- 7/ 1	3	8	418	1	60	0	1	4	217	3	7	1	5	20	157	5	3	1
7/ 2- 7/ 8	3	9	226	1	2	0	2	8	163	0	1	0	2	9	111	6	2	1
7/ 9- 7/15	0	0	-	-	-	-	2	8	105	0	5	0	2	4	99	1	1	0
7/16- 7/22	1	5	257	0	1	0	4	15	70	0	1	0	5	22	119	0	7	0
7/23- 7/29	2	10	225	0	0	0	0	0	-	-	-	-	4	18	93	0	3	0
7/30- 8/ 5	1	5	49	0	1	0	2	8	50	0	0	0	3	13	56	0	0	0
8/ 6- 8/12	1	5	37	0	0	0	2	8	12	0	0	0	1	5	73	1	0	0
8/13- 8/19	0	0	-	-	-	-	2	6	45	1	0	0	2	5	23	0	0	0
8/20- 8/26	1	3	114	0	0	0	2	8	47	0	0	0	2	8	18	0	0	0
8/27- 9/ 2	1	5	13	0	0	0	3	14	67	0	0	0	2	5	10	0	0	0
9/ 3- 9/ 9	1	6	17	0	0	0	2	9	42	0	0	0	1	1	12	0	0	0
9/10- 9/16	2	9	5	0	0	0	3	17	111	0	0	0	0	0	-	-	-	-
9/17- 9/23	1	4	7	0	0	0	2	11	65	0	0	0	0	0	-	-	-	-
9/24- 9/30	1	4	18	0	0	0	0	0	-	-	-	-	0	0	-	-	-	-
10/ 1-10/ 7	1	4	5	0	0	0	0	0	-	-	-	-	0	0	-	-	-	-
10/ 8-10/14	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/15-10/21	1	4	3	0	0	0	0	0	-	-	-	-	0	0	-	-	-	-
10/22-10/28	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/29-11/ 4	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/ 5-11/11	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/12-11/18	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/19-11/25	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/26-12/ 2	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/ 3-12/ 9	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/10-12/16	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/17-12/23	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/24-12/31	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
Totals:	52	224					41	162					54	180				

a/ Subyearling chinook salmon = 0's; yearling chinook salmon = 1's; juveniles = juv.

Table 6.--Weekly beach seine effort and catch per set at Sand Island (Rkm 9) and Clatsop Spit (Rkm 7), 1978.

	1978					
			Catch per set a/			
	Effort		Salmon			Steel-
	days	sets	chinook		coho	head
Date period	(no)	(no)	0's	1's	(juv)	(juv)
4/ 2- 4/ 8	2	14	10	2	0	0
4/ 9- 4/15	3	22	6	1	0	0
4/16- 4/22	3	27	11	0	0	0
4/23- 4/29	2	17	17	1	2	0
4/30- 5/ 6	2	18	21	2	15	2
5/ 7- 5/13	2	18	34	1	5	1
5/14- 5/20	1	7	113	5	127	22
5/21- 5/27	1	9	26	1	1	1
5/28- 6/ 3	2	18	54	1	11	1
6/ 4- 6/10	2	18	94	0	3	1
6/11- 6/17	2	18	66	0	1	0
6/18- 6/24	0	0	-	-	-	-
6/25- 7/ 1	2	18	11	0	0	0
7/ 2- 7/ 8	0	0	-	-	-	-
7/ 9- 7/15	2	18	11	0	0	0
7/16- 7/22	1	9	3	0	0	0
7/23- 7/29	0	0	-	-	-	-
7/30- 8/ 5	1	9	7	0	0	0
8/ 6- 8/12	1	9	5	0	0	0
8/13- 8/19	0	0	-	-	-	-
8/20- 8/26	1	9	3	0	0	0
8/27- 9/ 2	0	0	-	-	-	-
9/ 3- 9/ 9	1	7	3	0	0	0
9/10- 9/16	0	0	-	-	-	-
9/17- 9/23	0	0	-	-	-	-
9/24- 9/30	0	0	-	-	-	-
10/ 1-10/ 7	0	0	-	-	-	-
10/ 8-10/14	0	0	-	-	-	-
10/15-10/21	0	0	-	-	-	-
10/22-10/28	0	0	-	-	-	-
10/29-11/ 4	0	0	-	-	-	-
11/ 5-11/11	0	0	-	-	-	-
11/12-11/18	0	0	-	-	-	-
11/19-11/25	0	0	-	-	-	-
11/26-12/ 2	0	0	-	-	-	-
12/ 3-12/ 9	0	0	-	-	-	-
12/10-12/16	0	0	-	-	-	-
12/17-12/23	0	0	-	-	-	-
12/24-12/31	0	0	-	-	-	-
Totals:	31	265				

a/ Subyearling chinook salmon = 0's; yearling chinook salmon = 1's; juveniles = juv.

Table 7.--Purse seine effort and catch per set at incidental sampling sites (Rkm 1-50), 1978-1979.

Site (Rkm)	Date	number sets	Catch per set[a/] Salmon chinook 0's	chinook 1's	coho (juv)	Steel-head (juv)
			1978			
50	28 July	1	513	1	1	0
47	28 July	1	108	0	0	0
43	28 July	1	112	0	0	0
29	12 Oct.	1	64	0	0	0
	19 Oct.	4	5	0	0	0
21	23 Oct.	3	1	0	0	0
	26 Oct.	2	2	0	0	0
16	8 Sept.	3	5	0	0	0
14	10 May	1	7	17	61	5
	22 May	1	81	3	89	5
13	6 Oct.	2	1	0	0	0
	12 Oct.	2	3	0	0	0
	26 Oct.	1	4	0	0	0
01	6 Oct.	1	0	0	0	0
Total:		24				
			1979			
27	10 Sept.	1	36	0	0	0
24	10 Sept.	1	39	0	0	0
22	10 Sept.	1	37	0	0	0
20	10 Sept.	1	33	0	0	0
18	17 May	3	61	30	21	1
	18 May	2	258	115	24	520
	6 Aug.	3	80	0	0	0
	22 Aug.	4	12	0	0	0
11	30 May	5	31	18	263	4
9	16 May	2	9	10	31	18
	25 May	1	149	15	31	3
	30 May	1	1	3	17	1
	31 May	1	31	4	13	3
Total:		26				

a/ Subyearling chinook salmon = 0's; yearling chinook salmon = 1's; juveniles = juv.

Table 8.--Weekly purse seine effort and catches in marine waters within 24 km of the Columbia River, 1978-1980.

	1978						1979						1980					
	Effort		Catch per set a/				Effort		Catch per set a/				Effort		Catch per set a/			
			Salmon			Steel-			Salmon			Steel-			Salmon			Steel-
	days	sets	chinook		coho	head	days	sets	chinook		coho	head	days	sets	chinook		coho	head
Date period	(no)	(no)	0's	1's	(juv)	(juv)	(no)	(no)	0's	1's	(juv)	(juv)	(no)	(no)	0's	1's	(juv)	(juv)
4/ 2- 4/ 8	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
4/ 9- 4/15	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
4/16- 4/22	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
4/23- 4/29	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
4/30- 5/ 6	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
5/ 7- 5/13	0	0	-	-	-	-	1	4	1	5	1	0	0	0	-	-	-	-
5/14- 5/20	0	0	-	-	-	-	1	4	2	5	0	0	0	0	-	-	-	-
5/21- 5/27	0	0	-	-	-	-	1	4	3	1	2	0	0	0	-	-	-	-
5/28- 6/ 3	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
6/ 4- 6/10	0	0	-	-	-	-	1	3	8	2	1	0	0	0	-	-	-	-
6/11- 6/17	0	0	-	-	-	-	0	0	-	-	-	-	1	4	17	0	0	0
6/18- 6/24	0	0	-	-	-	-	1	4	3	4	0	0	0	0	-	-	-	-
6/25- 7/ 1	0	0	-	-	-	-	1	2	365	7	0	0	2	8	10	1	0	0
7/ 2- 7/ 8	1	5	75	1	0	0	2	9	32	2	2	0	1	3	7	2	0	0
7/ 9- 7/15	0	0	-	-	-	-	1	5	0	3	3	0	0	0	-	-	-	-
7/16- 7/22	1	4	78	1	0	0	1	5	0	1	3	0	1	5	34	1	0	0
7/23- 7/29	2	9	33	0	0	0	0	0	-	-	-	-	2	10	6	1	0	0
7/30- 8/ 5	2	4	353	1	0	0	2	10	1	0	0	0	2	10	6	0	0	0
8/ 6- 8/12	1	4	2	0	0	0	2	10	26	1	0	0	1	5	36	0	0	0
8/13- 8/19	0	0	0	0	0	0	2	10	9	0	0	0	3	12	67	0	0	0
8/20- 8/26	2	8	18	0	0	0	2	9	8	0	0	0	2	10	7	1	0	0
8/27- 9/ 2	1	5	3	0	0	0	2	10	11	2	0	0	0	0	-	-	-	-
9/ 3- 9/ 9	1	5	5	0	0	0	1	5	1	1	1	0	0	0	-	-	-	-
9/10- 9/16	1	5	2	0	0	0	1	5	3	0	0	0	0	0	-	-	-	-
9/17- 9/23	0	0	-	-	-	-	2	10	9	0	0	0	0	0	-	-	-	-
9/24- 9/30	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/ 1-10/ 7	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/ 8-10/14	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/15-10/21	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/22-10/28	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
10/29-11/ 4	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/ 5-11/11	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/12-11/18	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/19-11/25	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
11/26-12/ 2	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/ 3-12/ 9	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/10-12/16	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/17-12/23	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
12/24-12/31	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
Totals:	12	49					24	109					15	67				

a/ Subyearling chinook salmon = 0's; yearling chinook salmon = 1's; juveniles = juv.

Table 9.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1978.

Species	Months:	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	Total	Average per set
	No. sets:	9	6	121	234	246	214	202	166	109	25	46	12	1390	
		1978													
Chinook-subyearling *Oncorhynchus tshawytscha*		5	19	3021	9582	37142	103447	21720	7918	2470	286	306	35	185951	133.8
Chinook-yearling *Oncorhynchus tshawytscha*		3	1	1338	2623	940	69	16	0	0	0	0	0	4990	3.6
Coho-juvenile *Oncorhynchus kisutch*		0	0	0	2016	3584	327	6	0	0	0	0	0	5933	4.3
Steelhead-juvenile *Salmo gairdneri*		0	0	0	41	104	25	0	0	0	0	0	0	170	0.1
Sockeye-juvenile *Oncorhynchus nerka*		0	0	3	18	8	13	2	1	0	0	0	0	45	0.0
Chum-juvenile *Oncorhynchus keta*		0	0	1	65	17	5	1	0	0	0	0	0	89	0.1
Coastal cutthroat *Salmo clarki*		0	0	4	35	38	6	6	50	31	2	2	0	174	0.1
Threespine stickleback *Gasterosteus aculeatus*		54	51	5939	10242	6968	11543	40042	49230	10513	3091	965	139	138777	99.8
American shad-juv. *Alosa sapidissima*		0	0	0	0	22	497	1226	6013	6578	1292	227	3	15858	11.4
Eulachon *Thaleichthys pacificus*		4	2	72	12	0	0	0	0	0	0	0	0	90	0.1
Starry flounder *Platichthys stellatus*		55	80	221	195	67	80	240	374	340	78	95	46	1871	1.4
Carp *Cyprinus carpio*		2	0	2	13	37	13	7	4	2	1	0	0	81	0.1
Sucker *Catostomus* sp.		0	0	8	3	10	9	84	54	10	1	4	3	186	0.1
Crappie *Pomoxis* sp.		1	0	1	2	15	0	59	33	1	0	0	0	112	0.1
Largemouth bass *Micropterus salmoides*		0	0	0	1	1	1	2	2	3	1	1	0	12	0.0
Peamouth *Mylocheilus caurinus*		3	0	877	689	1664	1365	1775	2015	545	75	15	1	9024	6.5
Sculpin *Cottus* sp.		0	1	66	16	21	53	224	17	2	4	0	2	406	0.3
Mountain whitefish *Prosopium williamsoni*		0	0	1	1	0	1	24	17	6	2	0	2	54	0.1
Yellow perch *Perca flavescens*		0	0	8	15	5	30	326	6	2	1	0	0	393	0.3
Northern squawfish *Ptychocheilus oregonensis*		0	0	1	4	2	25	84	95	23	0	0	0	234	0.2
Pacific lamprey *Lampetra tridentata*		0	0	0	0	0	1	0	0	0	0	0	0	1	0.0
White sturgeon *Acipenser transmontanus*		0	0	0	0	0	0	3	0	0	0	0	0	3	0.0
Sand roller *Percopsis transmontana*		0	0	0	0	0	0	0	1	0	0	0	0	1	0.0
Shiner Perch *Cymatogaster aggregata*		0	0	0	0	0	0	0	1	0	0	0	0	1	0.0
Catfish *Ictalurus* sp.		0	0	0	0	0	0	0	0	0	0	0	0	1	0.0
Goldfish *Carassin auratus*		0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pumpkinseed *Lepomis gibbosus*		0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Sunfish *Lepomis* sp.		0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Chinook-adult *Oncorhynchus tshawytscha*		0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Coho-adult *Oncorhynchus kisutch*		0	0	12	3	4	28	14	6	36	0	1	0	104	0.1
Steelhead-adult *Salmo gairdneri*		0	0	0	0	0	0	0	0	8	0	0	0	8	0.0
Sockeye-adult *Oncorhynchus nerka*		3	0	8	5	7	9	6	0	0	0	1	0	39	0.0
		0	0	0	0	0	2	0	0	0	0	0	0	2	0.0

Table 10.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1978.

Species	Month / No. sets	MARCH 25	APRIL 79	MAY 120	JUNE 96	JULY 37	AUG. 30	SEPT. 4	OCT. 1	NOV. 18	DEC. 4	Total 414	Average per set
Chinook-subyearling *Oncorhynchus tshawytscha*		47	948	5004	7211	3041	1019	36	1	144	21	17472	42.2
Chinook-yearling *Oncorhynchus tshawytscha*		101	2448	7976	2159	240	5	0	0	0	0	12929	31.2
Coho-juvenile *Oncorhynchus kisutch*		0	3029	17485	5045	44	2	0	0	0	0	25605	62.1
Steelhead-juvenile *Salmo gairdneri*		0	971	12280	1205	3	0	0	0	0	0	14459	34.9
Sockeye-juvenile *Oncorhynchus nerka*		0	10	1592	1017	2	0	0	0	0	2	2623	6.3
Chum-juvenile *Oncorhynchus keta*		0	3	1	0	0	0	0	0	0	0	4	0.0
Coastal cutthroat *Salmo clarki*		0	9	104	28	0	3	1	0	0	0	145	0.4
Threespine stickleback *Gasterosteus aculeatus*		26	35	32	105	19	111	33	0	0	0	361	0.9
American shad-juv. *Alosa sapidissima*		0	0	33	87	25	26	0	0	78	194	443	1.1
Eulachon *Thaleichthys pacificus*		193	117	0	0	0	0	0	0	0	0	310	0.7
Starry flounder *Platichthys stellatus*		2	11	14	3	1	4	1	0	3	0	39	0.1
Carp *Cyprinus carpio*		1	1	12	4	1	0	0	0	0	0	19	0.0
Sucker *Catostomus* sp.		0	1	11	5	1	0	0	0	0	0	18	0.0
Crappie *Pomoxis* sp.		0	1	1	1	0	3	0	0	0	0	6	0.0
Peamouth *Mylocheilus caurinus*													
Sculpin *Cottus* sp.		0	21	489	844	207	251	1	0	1	0	1814	4.4
Mountain whitefish *Prosopium williamsoni*		0	0	1	3	1	0	0	0	0	0	5	0.0
Yellow perch *Perca flavescens*		0	0	1	0	0	0	0	0	0	0	1	0.0
Northern squawfish *Ptychocheilus oregonensis*		0	0	1	1	1	0	0	0	0	0	3	0.0
Sunfish *Lepomis* sp.		0	0	3	12	5	0	0	0	0	0	20	0.0
Pacific lamprey *Lampetra tridentata*		0	0	1	0	0	0	0	0	0	0	1	0.0
American shad-adult *Alosa sapidissima*		0	3	5	1	0	0	0	0	0	0	9	0.0
Chinook-adult *Oncorhynchus tshawytscha*		0	1	69	16	1	0	6	0	0	0	87	0.2
Coho-adult *Oncorhynchus kisutch*		1	5	4	2	0	0	0	0	0	0	12	0.0
Steelhead-adult *Salmo gairdneri*		0	0	0	1	0	0	0	0	0	0	1	0.0
		11	33	22	4	0	0	0	0	0	0	70	0.2

Table 11.--Catch composition by month for purse seine samples at McGowan (Rkm 16), 1978.

Species	1978 APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	Total	Average per set
Month	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	Total	Average per set
No. Sets	29	60	62	24	18	23	8	224	
Chinook-subyearling *Oncorhynchus tshawytscha*	65	3780	28708	5566	842	249	33	39243	175.2
Chinook-yearling *Oncorhynchus tshawytscha*	620	4123	370	8	1	0	0	5122	22.9
Coho-juvenile *Oncorhynchus kisutch*	540	6039	3618	26	5	0	0	10228	45.7
Steelhead-juvenile *Salmo gairdneri*	237	3615	493	4	0	0	0	4349	19.4
Sockeye-juvenile *Oncorhynchus nerka*	0	419	618	4	1	0	0	1042	4.7
Chum-juvenile *Oncorhynchus keta*	0	1	0	0	0	0	0	1	0.0
Threespine stickleback *Gasterosteus aculeatus*	30	300	0	0	0	0	0	330	1.5
Carp *Cyprinus carpio*	0	0	0	0	1	0	0	1	0.0
Peamouth *Mylocheilus caurinus*	0	0	3	1	0	0	0	4	0.0
Chiselmouth *Acrocheilus alutaceus*	0	0	0	1	0	0	0	1	0.0
Sucker *Catostomus* sp.	0	0	2	0	0	0	0	2	0.0
Troutperch *Percopsis omiscomaycus*	0	0	0	1	0	0	0	1	0.0
Starry flounder *Platichthys stellatus*	2	53	63	54	13	18	9	212	0.9
Sand Sole *Paettichthys melanostictus*	1	2	0	0	0	0	0	3	0.0
Surf Smelt a/ *Hypomesus pretiosus*		23000	4400	5000	950	500	250	34100	152.2
Long Fin Smelt *Spirinchus dilatus*	0	0	225	136	93	33	0	487	2.2
Eulachon *Thaleichthys pacificus*	66	7	0	0	0	0	0	73	0.3
American shad-juv. a/ *Alosa sapidissima*	10	2200	12000	1900	800	200	50	17160	76.6
American shad-adult *Alosa sapidissima*	1	82	109	15	18	1	0	226	1.0
Northern Anchovy a/ *Engraulis mordax*	10	5100	1500	36000	45000	10000	4000	101610	453.6
Herring a/ *Clupea pallasii*	120	640	580	500	1250	300	150	3540	15.8
Red Tailed Surf Perch *Holconotus rhodoterus*	17	600	250	125	37	29	11	1069	5.0
Walleye Sea Perch *Hyperprosopon argenteum*	0	0	0	0	0	1	0	1	0.0
Shiner Perch *Cymatogaster aggregata*	0	60	200	75	100	700	63	1198	5.3
Pacific Hake *Merluccius productus*	0	0	1	0	0	0	0	1	0.0
Pacific Snake Blenny *Lumpenus sagitta*	0	0	1	0	0	2	0	3	0.0
Pacific Pompano *Palometa simillima*	0	1	0	0	1	0	0	2	0.0
Pacific Sandfish *Trichodon trichodon*	1	0	0	0	0	0	0	1	0.0
Kelp Greenling *Hexagrammos decagrammus*	0	1	0	0	0	0	0	1	0.0
Tom Cod *Microgadus proximus*	0	1	3	0	0	2	0	6	0.0
White sturgeon *Acipenser transmontanus*	1	1	0	0	0	0	0	2	0.0
Green Sturgeon *Acipenser medirostris*	0	0	1	0	0	0	0	1	0.0
Sculpin *Cottus* sp.	3	36	38	20	2	1	0	100	0.4
Pacific lamprey *Lampetra tridentata*	2	1	1	4	1	1	0	10	0.0
Dungeness Crab - juv. *Cancer magister*	2	0	0	1	0	4	0	7	0.0
Dungeness Crab - adult *Cancer magister*	1	0	0	0	0	1	0	2	0.0
Chinook-jack *Oncorhynchus tshawytscha*	0	1	0	1	4	0	0	6	0.0
Chinook-adult *Oncorhynchus tshawytscha*	0	0	2	0	2	0	0	4	0.0
Steelhead-adult *Salmo gairdneri*	2	22	12	2	0	0	0	38	0.2
Coho-jack *Oncorhynchus kisutch*	0	0	1	0	1	0	0	2	0.0
Sockeye-adult *Oncorhynchus nerka*	0	0	1	0	0	0	0	1	0.0
Cutthroat Trout - adult *Salmo clarkii clarkii*	2	24	16	13	18	13	2	88	0.4
Coho-adult *Oncorhynchus kisutch*	0	0	0	0	0	3	1	4	0.0

Table 12.--Catch composition by month for seine samples at Sand Island (Rkm 9) and Clatsop Spit (Rkm 7), 1978.

Species / Month / No. sets	APRIL 80	MAY 70	JUNE 54	JULY 36	AUGUST 18	SEPT. 7	Total 265	Average per set
Chinook-subyearling *Oncorhynchus tshawytscha*	747	2978	3079	291	70	23	7188	27.1
Chinook-yearling *Oncorhynchus tshawytscha*	61	124	5	2	0	0	192	0.7
Coho-Juvenile *Oncorhynchus kisutch*	48	1464	86	6	0	0	1604	6.1
Steelhead-Juvenile *Salmo gairdneri*	4	67	11	0	0	0	82	0.3
Sockeye-Juvenile *Oncorhynchus nerka*	0	13	0	0	0	0	13	0.0
Chum-Juvenile *Oncorhynchus keta*	180	73	0	0	0	0	253	1.0
Coastal cutthroat *Salmo clarki*	0	6	4	4	1	0	15	0.1
Crappie *Pomoxis sp.*	0	1	0	0	0	0	1	0.0
Largemouth bass *Micropterus salmoides*	0	1	0	0	0	0	1	0.0
Threespine stickleback *Gasterosteus aculeatus*	325	450	600	500	400	0	2275	8.6
Carp *Cyprinus carpio*	4	11	8		1	0	24	0.1
Peamouth *Mylocheilus caurinus*	0	5	15	34	45	0	99	0.4
Chiselmouth *Acrocheilus alutaceus*	0	0	2	4	2	0	8	0.0
Starry flounder *Platichthys stellatus*	199	204	192	98	56	25	774	2.9
Sand Sole *Psettichthys melanostictus*	28	24	29	12	3	7	103	0.4
Rex Sole - Juv. *Glyptocephalus zachirus*	0	0	1	2	1	0	4	0.0
Pacific Sand Dab *Citharichthys sp.*	64	84	73	34	19	13	287	1.1
Surf Smelt *Hypomesus pretiosus*	5600	6650	8350	2200	6000	50	28850	108.9
Long Fin Smelt *Spirinchus dilatus*	0	0	270	105	200	0	575	2.2
Eulachon *Thaleichthys pacificus*	2	0	0	0	0	0	2	0.0
Pacific lamprey *Lampetra tridentata*	0	0	3	4	1	0	8	0.0
American shad-Juv. *Alosa sapidissima*	1	30	60	74	200	0	365	1.4
American shad-adult *Alosa sapidissima*	0	0	2	3	0	0	5	0.0
Northern Anchovy *Engraulis mordax*	0	220	1440	550	3000	0	5210	19.7
Herring *Clupea pallasii*	0	10	95	176	100	0	381	1.4
Tom Cod *Microgadus proximus*	0	0	12	3	0	0	15	0.1
Red Tailed Surf Perch - Juv. *Holconotus rhodoterus*	36	185	410	390	150	0	1171	4.4
Red Tailed Surf Perch - adult *Holconotus rhodoterus*	1	5	35	46	26	0	113	0.4
White Sea Perch - Juv. *Phanerodon furcatus*	0	0	8	1	0	0	9	0.0
Striped Sea Perch - Juv. *Embiotoca lateralis*	0	0	0	0	2	0	2	0.0
Walleye Sea Perch-Juv. *Hypsurus caryi*	0	0	8	2	0	0	10	0.0
Shiner Perch *Cymatogaster aggregata*	9	28	199	231	500	0	967	3.6
Pacific Hake *Merluccius productus*	0	0	3	1	0	0	4	0.0
Pacific Snake Blenny *Lumpenus sagitta*	0	0	1	1	0	0	2	0.0
Pacific Sand Lance *Ammodytes hexapterus*	0	0	12	4	0	0	16	0.1
Bay Pipefish *Syngnathus griseolineatus*	1	1	0	0	0	0	2	0.0
Tube Snout *Aulorhynchus flavidus*	1	0	0	0	0	0	1	0.0
White Spotted Greenling *Hexagrammos stelleri*	0	0	0	1	0	0	1	0.0
White sturgeon *Acipenser transmontanus*	2	1	1	1	0	0	5	0.0
Green Sturgeon *Acipenser medirostris*	0	0	1	0	1	0	2	0.0
Sculpin *Cottus sp.*	4	26	209	412	300	0	951	3.6
Dungeness Crab - Juv. *Cancer magister*	28	68	55	26	15	3	195	0.7
Dungeness Crab - adult *Cancer magister*	2	5	6	0	0	0	13	0.0
Chinook-jack *Oncorhynchus tshawytscha*	3	3	2	0	0	0	8	0.0
Chinook-adult *Oncorhynchus tshawytscha*	4	1	0	0	0	0	5	0.0
Steelhead-adult *Salmo gairdneri*	1	2	1	1	0	0	5	0.0
Coho-adult *Oncorhynchus kisutch*	0	0	0	0	0	1	1	0.0

Table 13.--Catch composition by month for purse seine samples in marine waters within 24 km of the Columbia River, 1978.

Species	Month / No. sets	JULY 18	AUGUST 16	SEPT. 15	Total 49	Average per set
Chinook Sal. - subyearling *Onchorynchus tshawytsch*		977	1558	47	2582	52.7
Chinook Sal. - yearling *Onchorynchus tshawytscha*		12	2	0	14	0.3
Starry Flounder - juv. *Platichthys stellatus*		83	140	65	288	5.9
Starry Flounder - adult *Platichthys stellatus*		12	15	21	48	1.0
Sand Sole - juv. *Psettichthys melanostictus*		61	120	73	254	5.2
Sand Sole - adult *Psettichthys melanostictus*		4	28	13	45	0.9
Rex Sole - juv. *Glyptocephalus zachirus*		35	50	0	85	1.7
Rex Sole - adult *Glyptocephalus zachirus*		6	11	0	17	0.3
Sanddab *Citharichthys* sp.		101	217	83	401	8.2
Surf Smelt a/ *Hypomesus pretiosus*		9000	101456	1500	111956	2284.8
Longfin Smelt *Spirinchus dilatus*		50	250	41	341	7.0
American Shad - juv. a/ *Alosa sapidissima*		300	150	0	450	9.2
Anchovy a/ *Engraulis mordax*		800	1500	500	2800	57.1
Herring a/ *Clupea pallasii*		400	618	600	1618	33.0
Red Tailed Surf Perch - juv. a/ *Holconotus rhodoterus*		96	200	134	430	8.8
Red Tailed Surf Perch - adult *Holconotus rhodoterus*		4	9	6	19	0.4
Pacific Hake *Merluccius productus*		0	1	0	1	0.0
Pacific Pompano *Palometa simillima*		9	1	0	10	0.2
Pacific Sandfish *Trichodon trichodon*		0	1	0	1	0.0
Rock Greenling *Hexagrammos lagocephalus*		0	1	0	1	0.0
Tom Cod *Microgadus proximus*		0	0	1	1	0.0
White Sturgeon *Acipenser transmontanus*		2	0	0	2	0.0
Green Sturgeon *Acipenser medirostris*		3	1	0	4	0.1
Dogfish *Squalus suckleyi*		4	1	0	5	0.1
Sculpin *Hamilepidotus hemilepidotus*, *Leptocottus armatus*		25	41	24	90	1.8
Pacific Lamprey *Lampetra tridentatus*		3	1	0	4	0.1
Big Skate *Raja binoculata*		0	5	0	5	0.1
Squid		7	0	0	7	0.1
Dungeness Crab - juv. *Cancer magister*		83	210	211	504	10.3
Dungeness Crab - adult *Cancer magister*		69	93	54	216	4.4
Chinook Salmon - Jack *Onchorynchus tshawytscha*		1	3	1	5	0.1
Chinook Salmon - adult *Onchorynchus tshawytscha*		0	2	0	2	0.0
Coho Salmon - adult *Onchorynchus kisutch*		0	0	1	1	0.0

a/ Includes estimated catches.

Table 14.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1979.

Species	Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
	No. sets	4	5	43	186	244	267	231	218	65	1263	
Chinook salmon-subyearling *Oncorhynchus tshawytscha*		4	10	2380	9049	32537	68371	72803	40262	4649	230065	182.2
Chinook salmon-yearling *Oncorhynchus tshawytscha*		1	15	188	2303	1250	167	11	0	0	3935	3.1
Coho salmon-juvenile *Oncorhynchus kisutch*		0	0	0	1460	2246	160	39	1	0	3906	3.1
Sockeye salmon-juvenile *Oncorhynchus nerka*		0	0	3	10	1	30	4	2	0	50	0.0
Steelhead trout-juvenile *Salmo gairdneri*		0	0	0	48	101	14	0	1	0	164	0.1
Chum salmon-juvenile *Oncorhynchus keta*		0	0	3	10	8	0	0	0	0	21	0.0
Stickleback *Gasterosteus aculeatus*		24	80	1770	9581	11194	6262	3677	6981	3074	42643	33.8
Shad-juvenile *Alosa sapidissima*		0	0	0	0	11	30	768	14744	12662	28215	22.3
Columbia River smelt *Thaleichthys pacificus*		0	14	55	10	2	0	0	0	0	81	0.1
Starry flounder *Platichthys stellatus*		5	20	103	133	103	148	471	800	319	2102	1.7
Carp *Cyprinus carpio*		0	0	3	36	74	19	13	12	2	159	0.1
Sucker *Catostomus* sp.		0	3	2	70	39	34	243	81	24	496	0.4
Shad-adult *Alosa sapidissima*		0	0	0	0	0	3	1	1	0	5	0.0
Crappie *Pomoxis nigromaculatus*		0	0	0	8	9	3	0	2	2	24	0.0
Bluegill *Lepomis macrochirus*		0	0	1	0	2	0	0	0	0	3	0.0
Bass *Micropterus salmoides*		0	0	0	0	1	1	3	5	6	16	0.0
Peamouth *Mylocheilus caurinus*		0	15	91	274	2517	2116	3830	2062	348	11253	8.9
Squawfish *Ptychocheilus oregonensis*		0	0	0	1	10	37	135	205	69	457	0.4
Whitefish *Prosopium williamsoni*		0	0	0	1	2	4	62	21	1	91	0.1
Yellow perch *Perca flavenscens*		0	0	5	12	25	5	8	5	0	60	0.0
Lamprey *Lampetra tridentata*		0	0	1	1	0	0	0	1	0	3	0.0
Goldfish *Carassium auratus*		0	0	1	1	0	0	0	0	0	2	0.0
Longfin smelt *Spirinchus dilatus*		0	0	2	0	0	0	0	0	0	2	0.0
Sturgeon *Acipenser transmontanus*		0	0	0	0	0	6	1	0	0	7	0.0
Sculpin *Cottus asper*		0	6	3	19	37	27	100	8	4	204	0.2
Redside shiner *Richardsonius balteatus*		0	0	0	0	0	2	3	0	0	5	0.0
Coastal cutthroat trout *Salmo clarki*		0	0	0	54	27	5	22	42	24	174	0.1
Steelhead trout-adult *Salmo gairdneri*		0	0	1	2	10	7	6	5	0	31	0.0
Chinook salmon-jack *Oncorhynchus tshawytscha*		0	0	0	0	5	20	41	24	12	102	0.1
Chinook salmon-adult *Oncorhynchus tshawytscha*		0	0	0	9	12	0	5	15	36	77	0.1
Sockeye salmon-adult *Oncorhynchus nerka*		0	0	0	0	0	6	10	1	0	17	0.0
Coho salmon-adult *Oncorhynchus kisutch*		0	0	0	0	0	0	0	3	9	12	0.0

Table 15.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1979.

Species	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	
Chinook salmon-subyearling *Oncorhynchus tshawytscha*		0	0	152	1425	8087	18175	6564	3639	120	38163	86.0
Chinook salmon-yearling *Oncorhynchus tshawytscha*		0	0	21	4378	10291	4068	32	2	0	18792	42.3
Coho salmon-juvenile *Oncorhynchus kisutch*		0	0	0	807	14546	11141	1185	5	0	27684	62.4
Sockeye salmon-juvenile *Oncorhynchus nerka*		0	0	1	16	1488	1302	14	1	0	2822	6.4
Chum salmon-juvenile *Oncorhynchus keta*		0	0	0	0	2	0	0	0	0	2	0.0
Steelhead trout-juvenile *Salmo gairdneri*		0	0	1	1057	7649	1595	17	2	0	10321	23.2
Coastal cutthroat trout *Salmo clarki*		0	0	0	20	62	17	1	1	0	101	0.2
Stickleback *Gasterosteus aculeatus*		0	0	1	230	16	51	15	25	0	338	0.8
Shad-juvenile *Alosa sapidissima*		0	0	0	1	0	26	8	163	76	274	0.6
Columbia River smelt *Thaleichthys pacificus*		0	10	1960	78	4	0	0	0	0	2052	4.6
Starry flounder *Platichthys stellatus*		0	2	0	7	6	4	6	4	0	29	0.1
Carp *Cyprinus carpio*		0	0	0	1	19	4	0	0	0	24	0.1
Sucker *Catostomus* sp.		0	0	0	1	22	19	1	0	0	43	1.0
Black crappie *Pomoxis nigromaculatus*		0	0	0	0	1	1	0	0	0	2	0.0
Peamouth chub *Mylocheilus caurinus*		0	0	4	31	1502	2338	224	115	23	4237	9.5
Northern squawfish *ptychocheilus oregonensis*		0	0	0	0	3	15	8	14	0	40	0.1
Lamprey-juvenile *Lampetra tridentata*		0	0	1	0	0	1	2	1	0	5	0.0
Sculpin *Cottus asper*		0	0	0	0	3	1	3	0	0	7	0.0
Steelhead trout-adult *Salmo gairdneri*		0	0	7	27	25	11	1	0	0	71	0.2
Chinook salmon-adult *Oncorhynchus tshawytscha*		0	0	0	1	2	2	0	0	3	8	0.0
Shad-adult *Alosa sapidissima*		0	0	0	2	62	32	10	22	0	128	0.3
Lamprey-adult *Lampetra tridentata*		0	0	0	3	7	5	1	0	0	16	0.0
Sockeye salmon-adult *Oncorhynchus nerka*		0	0	0	0	0	2	2	0	0	4	0.0

Table 16.--Catch composition by month for purse seine samples in the lower Columbia River estuary (Rkm 14-43), 1979.

Species	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
Month / No. sets	4	35	26	35	47	41	188	
Chinook salmon-subyearling *Oncorhynchus tshawytscha*	0	2059	7360	3290	2269	3121	18099	96.3
Chinook salmon-yearling *Oncorhynchus tshawytscha*	27	1742	137	2	5	3	1916	10.2
Coho salmon-juvenile *Oncorhynchus kisutch*	6	2894	562	64	1	0	3527	18.8
Sockeye salmon-juvenile *Oncorhynchus nerka*	0	46	42	0	0	0	88	0.5
Chum salmon-juvenile *Oncorhynchus keta*	0	11	0	0	0	0	11	0.1
Steelhead trout-juvenile *Salmo gairdneri*	1	510	45	0	0	0	556	3.0
Coastal cutthroat trout-juvenile *Salmo clarki*		4	0	0	0	0	4	0.0
Stickleback[a/] *Gasterosteus aculeatus*	160	484	17	11	9	3	684	3.6
Peamouth Chub *Mylocheilus caurinus*	0	33	2	2	0	0	37	0.2
Sucker *Catostomus* sp.	0	2	0	0	0	0	2	0.0
Carp *Cyprinus carpio*	0	1	1	0	0	0	2	0.0
Yellow perch *Perca flavescens*	1	0	1	0	0	0	2	0.0
Largemouth black bass-juvenile *Micropterus salmoides*		0	0	1	0	0	1	0.0
Shad-juvenile[a/] *Alosa sapidissima*	0	144	13	17	160	8	342	1.8
Shad-adult[a/] *Alosa sapidissima*	0	15	30	93	6	0	144	0.8
Herring-juvenile[a/] *Clupea pallasii*	0	1157	405	516	1600	1000	4678	24.9
Herring-adult[a/] *Clupea pallasii*	0	20	252	58	107	0	437	2.3
Anchovy-juvenile[a/] *Engraulis mordax*	0	1300	380	26	0	0	1706	9.1
Anchovy-adult[a/] *Engraulis mordax*	0	16000	30130	31600	203450	57350	338530	1801.1
Surf smelt-juvenile[a/] *Hypomesus pretiosus*	4	1835	20577	3790	3500	250	29956	159.3
Surf smelt-adult[a/] *Hypomesus pretiosus*	0	40	75	100	36	0	251	1.3
Longfin smelt-juvenile[a/] *Spirinchus dilatus*	13	415	2259	920	530	64	4237	22.5
Longfin smelt-adult[a/] *Spirinchus dilatus*	0	0	17	9	15	0	41	0.2
Eulachon *Thaleichthys pacificus*	3	6	0	0	0	0	9	0.0
Starry flounder-juvenile *Platichthys stellatus*	0	19	36	14	13	15	97	0.5
Starry flounder-adult *Platichthys stellatus*	0	0	17	9	15	0	41	0.2
Shiner perch[a/] *Cymatogaster aggregata*	0	18	244	152	200	250	864	4.6
Red tailed surf perch-juvenile *Holconotus rhodoterus*		1	7	0	0	0	8	0.0
Red tailed surf perch-adult *Holconotus rhodoterus*		0	0	1	0	1	2	0.0
Pacific hake-adult *Merluccius productus*	0	0	0	0	2	0	2	0.0
Tom cod-juvenile *Microgadus proximus*	0	3	0	0	0	0	3	0.0
Tom cod-adult *Microgadus proximus*	0	1	0	1	0	0	2	0.0
Kelp greenling *Hexagrammos decagrammus*	0	2	0	1	0	0	3	0.0
Staghorn sculpin *leptocottus armatus*	0	5	5	6	7	9	32	0.2
Buffalo sculpin *Enophrys bison*	0	0	0	1	1	0	2	0.0
Red irishlord *Hemilepidotus hemilepidotus*	0	0	1	2	0	1	4	0.0
Sturgeon poacher-juvenile *Agonus acipenserinus*		0	0	1	0	0	1	0.0
Blacktail snailfish-juvenile *Careproctus melanurus*		0	0	0	1	0	1	0.0
Snake prickleback-adult *Lumpenus sagitta*		0	0	1	1	0	2	0.0
Sandfish-adult *Trichodon trichodon*	0	0	1	0	0	0	1	0.0
Pompano *Peprilus simillimus*	0	1	0	0	0	0	1	0.0
Green sturgeon *Acipenser medirostris*	0	0	1	0	1	0	2	0.0
White sturgeon *Acipenser transmontanus*	0	2	0	0	3	0	5	0.0
Pacific lamprey[a/] *Lampetra tridentatus*	0	25	264	764	59	16	1128	6.0
Dungeness crab-juvenile *Cancer magister*	0	1	3	2	0	3	9	0.0
Coastal cutthroat trout-adult *Salmo clarki*		13	0	81	89	35	218	1.2
Steelhead trout-adult *Salmo gairdneri*		9	2	1	0	0	12	0.1
Chinook salmon-jack *Oncorhynchus tshawytscha*	0	0	0	1	4	8	13	0.1
Chinook salmon-adult *Oncorhynchus tshawytscha*		0	0	0	9	40	49	0.3
Coho salmon-jack *Oncorhynchus kisutch*	0	0	0	0	1	0	1	0.0
Coho salmon-adult *Oncorhynchus kisutch*	0	0	0	0	13	10	23	0.1

a/ Includes estimated catches.

Table 17.--Catch composition by month for purse seine samples in marine waters within 24 km of the Columbia River, 1979.

Species	Month / No. sets	May 12	June 9	July 19	Aug. 49	Sept. 20	Yearly total 109	CPUE
Chinook salmon-subyearling *Oncorhynchus tshawytscha*		27	769	286	540	108	1730	15.9
Chinook salmon-yearling *Oncorhynchus tshawytscha*		45	38	36	27	4	150	1.4
Coho salmon-juvenile *Oncorhynchus kisutch*		11	3	47	6	7	74	0.7
Sockeye salmon-juvenile *Oncorhynchus nerka*		0	1	0	1	0	2	0.0
Chum salmon-juvenile *Oncorhynchus keta*		22	0	0	0	0	22	0.2
Stickleback *Gasterosteus aculeatus*		15	2	0	9	0	26	0.2
Starry flounder-juvenile *Platichthys stellatus*		3	5	2	83	34	127	1.2
Starry flounder-adult *Platichthys stellatus*		1	8	1	18	6	34	0.3
Sand sole-juvenile *Psettichtys melanostictus*		40	13	0	119	12	184	1.7
Sand sole-adult *Psettichtys melanostictus*		0	2	0	7	2	11	0.1
Rex sole-juvenile *Glyptocephalus zachirus*		0	9	0	7	9	25	0.2
Rex sole-adult *Glyptocephalus zachirus*		0	0	0	4	0	4	0.0
English sole-juvenile *Parophrys vetulus*		0	15	0	90	7	112	1.0
English sole-adult *Parophrys vetulus*		0	3	0	1	0	4	0.0
Sanddab-juvenile *Citharichthys* sp.		0	16	0	613	204	833	7.6
Herring-juvenile *Clupea pallasii*		137	20	0	425	0	582	5.3
Herring-adult *Clupea pallasii*		0	87	9	420	0	516	4.7
Anchovy-juvenile *Engraulis mordax*		14000	7000	260	0	0	21260	195.0
Anchovy-adult *Engraulis mordax*		0	1	0	405200	12000	417201	3827.5
Surf smelt-juvenile *Hypomesus pretiosus*		59	61	630	2700	33	3483	32.0
Surf smelt-adult *Hypomesus pretiosus*		0	150	0	127	0	277	2.5
Longfin smelt-juvenile *Spirinchus dilatus*		4	26	250	100	17	397	3.6
Longfin smelt-adult *Spirinchus dilatus*		0	0	21	12	5	38	0.3
Red tailed surf perch-juvenile *Holconotus rhodoterus*		125	104	0	400	0	629	5.8
Red tailed surf perch-adult *Holconotus rhodoterus*		3	8	0	16	0	27	0.2
Shiner perch *Cymatogaster aggregata*		0	0	40	1600	588	2228	20.4
Pacific hake-juvenile *Merluccius productus*		0	2	0	0	0	2	0.0
Pacific pompano-adult *Palometa simillima*		0	16	0	0	0	16	0.2
Pacific sandfish-adult *Trichodon trichodon*		0	0	0	2	0	2	0.0
Pacific sandlance-juvenile *Ammodytes hexapterus*		0	20	0	60	0	80	0.7
Jack mackeral *Trachurus symmetricus*		0	0	1	0	0	1	0.0
Rock greenling-juvenile *Hexagrammos lagocephalus*		0	0	0	1	0	1	0.0
Rock greeling-adult *Hexagrammos lagocephalus*		0	0	0	1	0	1	0.0
Tom cod-juvenile *Microgadus proximus*		0	11	0	7	0	18	0.2
Tom cod-adult *Microgadus proximus*		0	0	0	2	0	2	0.0
Sturgeon poacher-juvenile *Agonus acipenserinus*		0	0	0	6	0	6	0.1
Tubenose poacher-juvenile *Pallasina barbata aix*		0	0	0	4	0	4	0.0
Ocean sunfish *Mola mola*		0	0	0	2	0	2	0.0
White sturgeon *Acipenser transmontanus*		0	1	0	0	0	1	0.0
Green sturgeon *Acipenser medirostris*		0	5	0	0	0	5	0.0
Wolf eel *Anarrhichthys ocellatus*		0	2	6	10	3	21	0.2
Staghorn sculpin *leptoctus armatus*		2	1	0	16	5	24	0.2
Red irish lord *Hemilepidotus hemilepidotus*		0	0	0	2	1	3	0.0
Dogfish *Squalus suckleyi*		0	4	0	0	3	7	0.1
Big skate-juvenile *Raja binoculata*		0	0	0	1	0	1	0.0
Big skate-adult *Raja binoculata*		0	2	0	23	2	27	0.2
Pacific lamprey-juvenile *Lampetra tridentatus*		0	0	3	0	0	3	0.0
Squid *Loligo opalescens*		0	2	0	300	0	302	2.8
Dungeness crab-juvenile *Cancer magister*		8	6	0	84	0	98	0.9
Dungeness crab-adult *Cancer magister*		0	23	0	153	26	202	1.9
Chinook salmon-adult *Oncorhynchus tshawytscha*		0	0	0	44	6	50	0.5
Coho salmon-jack *Oncorhynchus kisutch*		0	0	0	1	1	2	0.0
Coho salmon-adult *Oncorhynchus kisutch*		0	0	0	15	1	16	0.1

Table 18.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1980.

Species	Mar.	April	May	June	July	Aug.	Sept.	Yearly total	CPUE
Month									
No. sets	76	172	191	234	218	196	125	1212	
Chin.-subyearling *Oncorhynchus tshawytscha*	4,186	8,439	20,868	21,565	23,643	10,422	3,148	92,271	76.0
Chin.-yearling *Oncorhynchus tshawytscha*	1,253	2,698	1,359	74	10	1	0	5,395	4.4
Coho-juvenile *Oncorhynchus kisutch*	1	1,364	4,513	370	37	1	1	6,287	5.2
Sockeye-juvenile *Oncorhynchus nerka*	8	16	3	5	3	0	0	35	0.0
Chum-juvenile *Oncorhynchus keta*	2	1	6	1	0	0	0	10	0.0
Steelhead-juvenile *Salmo gairdneri*	0	38	202	393	84	3	2	722	0.6
Coastal Cutthroat Tr. *Salmo clarki*	3	95	21	58	69	99	34	379	0.3
Threespine stickleback *Gasterosteus aculeatus*	595	1,536	2,555	1,809	5,009	2,140	927	14,571	12.0
American Shad-juv-year l. *Alosa sapidissima*	1	34	162	761	647	356	50	2,111	1.7
American Shad-juv-subyear. *Alosa sapidissima*	0	0	0	1	12	64	12,414	18,906	15.6
Eulachon *Thaleichthys pacificus*	64	4	0	0	0	0	0	68	0.1
Starry Flounder *Platichthys stellatus*	93	143	192	49	180	688	503	1,848	1.5
Carp *Cyprinus carpio*	31	23	33	147	25	5	4	268	0.2
Sucker *Catostomus* sp.	49	30	196	109	59	42	33	518	0.4
Black Crappie *Pomoxis nigromaculatus*	0	5	9	5	1	4	0	24	0.0
Bluegill *Lepomis macrochirus*	0	0	0	0	1	0	0	1	0.0
Largemouth Bass *Micropterus salmoides*	0	1	1	0	0	1	0	3	0.0
Peamouth *Mylocheilus caurinus*	95	106	3,706	2,345	1,980	2,016	1,125	11,373	9.4
Northern Squawfish *Ptychocheilus oregonensis*	0	2	107	110	184	198	98	762	0.6
Mountain Whitefish *Prosopium williamsoni*	2	3	1	5	50	23	14	98	0.1
Prickly Sculpin *Cottus asper*	10	1	763	385	270	93	129	1,651	1.4
Pacific Lamprey-adult *Lampetra tridentata*	0	0	2	6	1	0	0	9	0.0
Steelhead -adult *Salmo gairdneri*	10	19	9	58	20	13	1	130	0.1
Chinook Salmon-adult *Oncorhycnhus tshawytscha*	0	5	6	18	3	23	17	72	0.1
Chinook Salmon-jack *Oncorhynchus tshawytscha*	0	1	4	206	22	13	18	264	0.2
Coho Salmon-adult *Oncorhynchus kisutch*	0	0	0	0	0	9	15	23	0.0
Coho Salmon-jack *Oncorhynchus kisutch*	0	0	0	0	0	2	14	16	0.0
Sockeye Salmon-adult *Oncorhynchus nerka*	0	0	0	162	20	0	0	182	0.2
American Shad-adult *Alosa sapidissima*	0	0	0	1	4	1	0	6	0.0
Goldfish *Carassium auratus*	1	1	0	2	2	0	0	6	0.0
Yellow Perch *Perca flavescens*	2	16	11	14	56	11	2	112	0.1
White Sturgeon *Acipenser transmontanus*	1	0	38	9	12	1	0	43	0.0
Redside shiner *Richardsonius balteatus*	0	0	18	12	6	0	0	36	0.0
Bullhead *Ictalurus* sp.	0	0	2	0	0	0	0	2	0.0
Sand Roller *Percopsis transmontana*	0	0	3	4	0	0	0	7	0.0
Longfin Smelt *Spirinchus thaleichthys*	0	1	0	0	0	0	0	1	0.0
Leopard Dace *Rhinichthys falcatus*	0	0	0	0	1	1	1	3	0.0

Table 19.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1980.

Species	Month / No. sets	Mar. 15	April 65	May 78	June 76	July 52	Aug. 30	Sept. 13	total 329	CPUE
Chin. subyearling *Onocorhynchus tshawytscha*		14	389	4,903	3,147	3,004	1,002	341	12,800	38.9
Chin. yearling *Oncorhynchus tshawytscha*		48	2,572	4,978	766	5	1	0	8,370	25.4
Coho-juvenile *Oncorhynchus kisutch*		0	735	10,455	1,553	326	2	0	13,071	39.7
Sockeye-juvenile *Oncorhynchus nerka*		0	13	235	99	0	0	0	347	1.1
Steelhead-juvenile *Salmo gairdneri*		1	1,612	7,913	473	5	0	0	10,004	30.4
Chum-juvenile *Oncorhynchus keta*		0	0	0	0	0	0	0	0	0.0
Coastal Cuthroat Trout *Salmo clarki*		0	45	57	14	1	3	2	122	0.4
Threespine Stickleback *Gasterosteus aculeatus*		0	17	5	20	44	43	12	141	0.4
American Shad-juv-year 1. *Alosa sapidissima*		0	0	3	51	58	96	87	295	0.9
American Shad-juv-subyear. *Alosa sapidissima*		0	0	0	0	0	72	714	796	2.4
Eulachon *Thaleichthys pacificus*		249	7	0	0	0	0	0	256	0.8
Starry Flounder *Platichthys stellatus*		4	4	30	0	0	5	5	48	0.1
Carp *Cyprinus carpio*		0	2	6	6	0	0	1	15	0.0
Sucker *Catostomus* sp.		0	2	26	32	7	1	1	69	0.2
Black Crappie *Pomoxis nigromaculatus*		0	0	1	0	0	1	0	2	0.0
Bluegill *Lepomis macrochirus*		0	0	0	0	0	0	0	0	0.0
Largemouth Bass *Micropterus salmoides*		0	0	0	0	0	0	0	0	0.0
Peamouth *Mylocheilus caurinus*		2	4	505	1,035	658	239	49	2,492	7.6
Northern Squawfish *Ptychocheilus oregonensis*		0	0	10	4	12	2	1	29	0.1
Mountain Whitefish *Prosopium williamsoni*		0	0	0	0	2	0	0	2	0.0
Prickly Sculpin *Cottus asper*		0	0	13	0	0	0	0	13	0.0
Pacific Lamprey-adult *Lampetra tridentata*		0	1	3	0	0	0	0	4	0.0
Steelhead-adult *Salmo gairdneri*		2	39	16	8	0	0	0	64	0.2
Chinook salmon-adult *Oncorhycnhus tshawytscha*		0	2	0	0	0	2	0	4	0.0
Chinook salmon-jack *Oncorhynchus tshawytscha*		0	0	0	3	0	0	1	4	0.0
Coho salmon-adult *Oncorhynchus kisutch*		0	0	0	0	0	0	4	4	0.0
Coho salmon-jack *Oncorhynchus kisutch*		0	0	0	0	0	0	2	2	0.0
Sockeye salmon-adult *Oncorhynchus nerka*		0	0	0	0	1	0	0	1	0.0
American Shad-adult *Alosa sapidissima*		0	0	13	29	15	5	18	80	0.2

Table 20.--Catch composition by month for purse seine samples at McGowan (Rkm 16), 1980.

Species	Month / No. sets	April 29	May 37	June 33	July 62	Aug. 19	Yearly total 180	CPUE
Chin.-subyearling *Oncorhynchus tshawytscha*		7	3,186	4,422	5,793	316	13,724	76
Chin.-yearling *Oncorhynchus tshawytscha*		450	3,949	165	11	2	4,581	25
Coho-juvenile *Oncorhynchus kisutch*		203	4,410	165	206	0	4,984	28
Sockeye-juvenile *Oncorhynchus nerka*		1	60	5	0	0	67	0
Chum-juvenile *Oncorhynchus keta*		0	5	0	0	0	5	0
Steelhead-juvenile *Salmo gairdneri*		176	2,907	70	0	0	3,151	17
Coastal Cuthroat Tr. *Salmo clarki*		4	0	28	76	15	123	0
American Shad-juvenile *Alosa sapidissima*		15	182	640	369	364	1,570	9
American Shad-adult *Alosa sapidissima*		1	2	10	9	1	23	0
Pacific Herring-juvenile *Clupea pallasii*		10	12,500	4,520	21,000	5,250	43,280	239
Pacific Herring-adult *Clupea pallasii*		100	664	72	647	64	1,547	9
Northern Anchovy-juvenile *Engraulis mordax*		0	139	50	96	2	287	2
Northern Anchovy-adult *Engraulis mordax*		0	435	20	127	31	613	3
Whitebait Smelt *Allosmerus elongatus*		0	105	485	80	0	670	4
Surf Smelt-juvenile *Hypomesus pretiosus*		32	44	1,130	3,500	230	4,936	27
Surf Smelt-adult *Hypomesus pretiosus*		2	14	83	255	155	509	3
Longfin Smelt-juvenile *Spirinchus thaleichthys*		0	215	4,100	1,460	43	5,818	32
Longfin Smelt-adult *Spirinchus thaleichthys*		0	850	546	150	140	1,186	7
Eulachon *Thaleichthys pacificus*		43	3	0	0	0	46	0
Pacific Tomcad-juvenile *Microgadus proximus*		0	0	0	2	2	4	0
Tube-Snout *Aulorhynchus flavidus*		0	19	0	0	0	19	0
Stickleback *Gasterosteus aculeatus*		288	72	58	89	4	511	3
Bay Pipefish *Syngnathus griseolineatus*		0	2	0	0	1	3	0
Redtail Surfperch-adult *Amphistichus rhodoterus*		0	0	0	29	2	31	0
Shiner Perch *Cymatogaster aggregata*		0	114	73	1,475	75	1,737	10
Walleye Surfperch-juvenile *Hyperprosopon argenteum*		0	0	1	2	0	3	0
Snake Prickleback *Lumpenius sagitta*		0	2	0	0	0	2	0
Pacific Sand Lance *Ammodytes hexapterus*		12	0	0	0	0	12	0
Pacific Pompano *Peprilus simillim*		0	1	0	0	0	1	0
Rockfish-juvenile *Sebastes* sp.		0	0	0	7	0	7	0
Kelp Greenling-juvenile *Hexagrammos decagrammus*		0	2	0	0	0	2	0
Prickly Sculpin *Cottus asper*		0	9	16	15	1	41	0
Pacific Staghorn Sculpin *Leptrcottis armetus*		0	33	39	42	0	114	1
Cabezon-juvenile *Scorpaenichthys marmontus*		0	0	0	2	0	2	0
Starry Flounder-juvenile *Platichthys stellatus*		0	107	19	44	15	185	1
Starry Flounder-adult *Platichthys stellatus*		0	3	1	1	1	6	0
White Sturgeon *Acipenser transmontanus*		1	1	0	0	0	2	0
Pacific Lamprey-juvenile *Lampetra tridentatus*		1	44	106	21	14	246	1
Pacific Lamprey-adult *Lampetra tridentatus*		2	1	0	0	0	3	0
River Lamprey *Lampetra yresi*		0	12	43	133	72	260	1
Dungeness Crab-juvenile *Cancer magister*		1	3	0	0	0	4	0
Dungeness Crab-adult *Cancer magister*		0	1	0	0	0	1	0
Sand Shrimp *Crangon* sp.		0	200	880	375	27	1,482	8
Largescale Sucker *Catostomus macrochelus*		0	0	1	1	0	2	0
Peamouth *Mylocheilus caurinus*		0	0	1	3	0	4	0
Chin.-adult *Oncorhynchus tshawytscha*		0	0	0	1	0	1	0
Coho-adult *Oncorhynchus kisutch*		0	0	0	0	1	1	0
Steelhead-adult *Salmo gairdneri*		5	5	1	0	0	11	0

Table 21.--Catch composition by month for purse seine samples in marine waters within 24 km of the Columbia River, 1980.

Species	Month June	July	Aug.	Yearly total	CPUE
No.sets	12	18	37	67	
Chin. subyearling *Oncorhynchus tshawytscha*	147	255	1106	1508	23
Chin. yearling *Oncorhynchus tshawytscha*	5	21	16	42	1
Chin. adult *Oncorhynchus tshawytscha*	0	2	0	2	0
Coho juvenile *Oncorhynchus kisutch*	4	0	2	6	0
Coho adult *Oncorhynchus kisutch*	0	1	3	4	0
Starry flounder juvenile *Platichthys stellatus*	1	20	34	55	1
Starry flounder adult *Platichthys stellatus*	0	2	5	7	0
Sand sole juvenile *Psettichthys melanostictus*	3	17	15	35	1
Sand sole adult *Psettichthys melanostictus*	0	1	2	3	0
Rex sole *Glyptocephalus zachirus*	2	6	5	13	0
Englis sole *Parophrys vetulus*	5	3	21	29	0
Sanddab *Citharichthys sp*	21	46	76	143	2
American shad *Alosa sapidissima*	0	38	58	96	1
Pacific herring *Clupea harengus*	383	719	951	2,053	31
Northern anchovy *Engraulis mordax*	105	35,229	580	35,914	536
Surf smelt *Hypomesus pretiosus*	522	3,283	1,192	4,996	75
Longfin smelt *Spirinchus thaleichthys*	17	181	177	395	6
Redtail surfperch *Amphistichus rhodoterus*	0	16	69	85	1
Shiner perch *Cymatogaster aggregata*	0	350	780	1,130	17
Pacific pompano *Peprilus simillimus*	1	0	5	6	0
Snake prickleback *Lumprnus sagitta*	0	0	1	1	0
Pacific Sandlance *Ammodytes hexapterus*	19	0	88	107	1
Pacific Tomcod *Microgadus proximus*	0	0	9	9	0
Rockfish *Sebastes sp*	8	7	0	15	0
Staghorn sculpin *Leptocotus armatus*	0	8	37	45	1
Red irish lord *Hemilepidotus hemilepidotus*	0	1	3	4	0
Cabezon *Scorpaenichthys marmoratus*	0	4	3	7	0
White Sturgeon *Acipenser transmontanus*	0	1	1	2	0
Green sturgeon *Acipenser medirostris*	0	2	1	3	0
Spiny dogfish *Squalus acanthias*	0	9	2	11	0
Big skate *Raja binoculata*	0	0	2	2	0
Dungeness crab *Cancer magister*	0	88	89	177	3

Table 22.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1981.

Species	Numbers of individuals (no. of sets)								Catch per unit of effort
	Mar (37)	Apr (184)	May (289)	Jun (284)	Jul (209)	Aug (141)	Sep (54)	Total (1,199)	
Chin.-subyearling *Oncorhynchus tshawytscha*	766	14,792	42,991	21,407	32,895	2,816	676	116,343	97.0
Chin.-yearling *Oncorhynchus tshawytscha*	732	4,016	1,678	32	4	0	9	6,462	5.4
Coho-juvenile *Oncorhynchus kisutch*	2	5,368	7,780	374	15	0	0	13,539	11.3
Sockeye-juvenile *Oncorhynchus nerka*	0	2	95	7	26	2	0	132	0.1
Chum-juvenile *Oncorhynchus keta*	2	7	0	1	0	0	0	10	0.0
Steelhead-juvenile *Salmo gairdneri*	1	90	309	12	2	0	0	414	0.3
Coastal cutthroat trout *Salmo clarki*	7	53	55	0	2	31	40	188	0.2
Threespine stickleback *Gasterosteus aculeatus*	398	1,932	3,117	4,110	23,621	21,525	6,162	60,865	50.8
American shad-juvenile yearling *Alosa sapidissima*	13	108	5,421	2,893	1,079	183	47	9,744	8.1
American shad-juvenile subyearling *Alosa sapidissima*	0	0	0	0	10	13,560	9,502	23,072	19.2
Eulachon *Thaleichthys pacificus*	1	9	0	1	0	0	0	11	0.0
Starry flounder *Platichthys stellatus*	104	187	174	171	222	203	96	1,157	1.0
Carp *Cyprinus carpio*	11	38	63	98	10	4	1	225	0.2
Sucker *Catostomus* sp.	27	60	109	82	159	266	34	737	0.6
Crappie *Pomoxis* sp.	3	16	50	10	4	67	3	153	0.1
Redside shiner *Richardsonius balteatus*	0	0	2	5	18	2	0	27	0.0
Sand roller *Percopsis transmontana*	0	0	0	3	0	0	0	3	0.0
Leopard dace *Rhinichthys falcatus*	0	0	1	1	0	0	0	2	0.0
Killifish *Fundulus* sp.	0	0	0	0	1	0	0	1	0.0
Largemouth bass *Micropterus salmoides*	0	3	1	1	1	1	0	7	0.0
Peamouth *Mylocheilus caurinus*	20	279	3,847	2,603	3,168	3,239	361	13,517	11.3
Northern squawfish *Ptychocheilus oregonensis*	0	1	209	718	468	272	86	1,754	1.5
Mountain whitefish *Prosopium williamsoni*	0	0	1	26	47	47	5	126	0.1
Prickly sculpin *Cottus asper*	14	22	38	187	70	26	3	360	0.3
Pacific lamprey-adult *Lampetra tridentata*	0	0	2	0	0	0	0	2	0.0
Steelhead-adult *Salmo gairdneri*	4	15	13	44	12	3	0	91	0.8
Chinook salmon-adult *Oncorhynchus tshawytscha*	1	3	13	18	3	2	18	58	0.5
Chinook salmon-jack *Oncorhynchus tshawytscha*	0	0	2	108	32	1	4	147	0.1
Coho salmon-adult *Oncorhynchus kisutch*	0	0	0	0	0	0	4	4	0.0
Coho salmon-jack *Oncorhynchus kisutch*	0	0	0	0	1	0	2	3	0.0
Sockeye salmon-adult *Oncorhynchus nerka*	0	0	1	112	2	0	0	115	0.1
American shad-adult *Alosa sapidissima*	0	0	9	1	1	5	0	16	0.0
Goldfish *Carassius auratus*	0	0	1	2	0	0	0	3	0.0
Yellow perch *Perca flavescens*	1	5	9	6	4	1	0	26	0.0
White sturgeon *Acipenser transmontanus*	0	0	0	2	19	2	0	23	0.0

Table 23.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1981.

Species	Numbers of individuals (no. of sets)											Catch per unit of effort
	Mar (5)	Apr (58)	May (109)	Jun (97)	Jul (52)	Aug (24)	Sep (5)	Oct (0)	Nov (24)	Dec (5)	Total (379)	
Chin.-subyearling *Oncorhynchus tshawytscha*	200	995	5,775	3,092	4,037	1,096	190	-	726	0	16,111	42.5
Chin.-yearling *Oncorhynchus tshawytscha*	64	2,184	6,838	934	59	0	0	-	16	0	10,085	26.6
Coho-juvenile *Oncorhynchus kisutch*	4	1,198	18,514	4,233	143	2	0	-	0	0	24,094	63.6
Sockeye-juvenile *Oncorhynchus nerka*	0	3	1,115	256	27	5	0	-	0	0	1,406	3.7
Steelhead-juvenile *Salmo gairdneri*	0	769	10,227	881	21	0	0	-	0	0	11,898	31.4
Chum-juvenile *Oncorhynchus keta*	0	1	0	0	0	0	0	-	0	0	1	0.0
Coastal cutthroat trout *Salmo clarki*	0	24	46	0	0	3	0	-	0	0	73	0.2
Threespine stickleback *Gasterosaus aculeatus*	0	41	142	84	179	55	4	-	19	0	524	1.4
American shad-juvenile yearling *Alosa sapidissima*	0	4	89	45	12	6	1	-	1,233	111	1,501	4.0
Eulachon *Thaleichthys pacificus*	0	13	1	0	0	0	0	-	0	0	14	0.0
Starry flounder *Platichthys stellatus*	0	4	8	0	1	0	0	-	6	0	19	0.1
Carp *Cyprinus carpio*	0	0	4	8	1	0	0	-	0	0	13	0.0
Sucker *Catostomus* sp.	0	1	24	23	3	0	0	-	0	0	51	0.1
Crappie *Pomoxis* sp.	0	0	2	0	0	0	0	-	1	0	3	0.0
Bluegill *Lepomis macrochirus*	0	0	1	0	0	0	0	-	0	0	1	0.0
Largemouth bass *Micropterus salmoides*	0	0	1	0	0	0	0	-	0	0	1	0.0
Peamouth *Mylocheilus caurinus*	0	8	834	1,030	134	30	0	-	201	0	2,237	5.9
Northern squawfish *Ptychocheilus oregonensis*	0	0	15	14	11	2	0	-	0	0	42	0.1
Prickly sculpin *Cottus asper*	0	0	2	0	0	0	0	-	0	0	2	0.0
Pacific lamprey-adult *Lampetra tridentata*	0	0	4	3	0	1	0	-	0	0	8	0.0
Steelhead-adult *Salmo gairdneri*	0	22	19	3	1	0	0	-	0	0	45	0.1
Chinook salmon-adult *Oncorhynchus tshawytscha*	0	0	1	0	1	0	0	-	0	0	2	0.0
Chinook salmon-jack *Oncorhynchus tshawytscha*	0	0	3	1	0	0	0	-	0	0	4	0.0
Sockeye salmon-adult *Oncorhynchus nerka*	0	0	0	3	0	0	0	-	0	0	3	0.0
American shad-adult *Alosa sapidissima*	0	1	56	21	37	1	0	-	0	0	116	0.3

Table 24.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1982.

Species	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
No. sets	42	227	305	294	229	162	60	0	123	49	1,491
Chinook-subyearling *Oncorhynchus tshawytscha*	1,168	11,832	32,214	41,487	33,940	8,342	2,078	-	1,962	235	133,258
Chinook-yearling *Oncorhynchus tshawytscha*	431	2,354	4,739	129	2	0	0	-	0	0	7,658
Coho-juvenile *Oncorhynchus kisutch*	2	741	10,540	353	6	0	0	-	9	1	11,652
Sockeye-juvenile *Oncorhynchus nerka*	0	4	31	6	3	3	0	-	1	0	48
Steelhead-juvenile *Salmo gairdneri*	0	61	351	22	0	0	0	-	5	1	441
Chum-juvenile *Oncorhynchus keta*	0	9	2	2	0	0	0	-	0	0	13
Coastal cutthroat *Salmo clarki*	1	62	83	5	7	38	50	-	23	0	269
Threespine stickleback *Gasterosteus aculeatus*	1,941	9,281	8,791	8,840	10,235	8,360	16,432	-	68,000	3,600	127,120
American shad-juv.-suby. *Alosa sapidissima*	0	0	0	0	77	1,940	5,297	-	3,800	470	11,514
American shad-juv.-year. *Alosa sapidissima*	0	3	531	3,363	706	248	63	-	0	0	4,914
Eulachon *Thaleichthys pacificus*	102	10	0	0	0	0	0	-	0	0	112
Longfin Smelt *Spirinchus thaleichthys*	0	0	0	0	0	0	0	-	9	0	9
Starry flounder *Platichthys stellatus*	181	128	1,437	165	135	77	45	-	176	38	2,382
Carp *Cyprinus carpio*	7	89	170	61	39	17	3	-	5	0	389
Sucker *Catostomus* sp.	18	56	472	117	344	125	47	-	14	1	1,194
Crappie *Pomoxis* sp.	1	17	34	5	236	89	4	-	67	21	474
Largemouth bass *Micropterus salmonides*	0	0	0	3	6	22	5	-	7	43	86
Bluegill *Lepomis macrochirus*	0	0	1	0	0	0	0	-	0	1	2
Peamouth *Mylocheilus caurinus*	693	1,680	12,731	4,103	3,933	3,411	475	-	1,623	397	29,046
Northern squawfish *Ptychocheilus oregonensis*	1	9	270	293	469	238	135	-	2	0	1,417
Mountain whitefish *Prosopium williamsoni*	0	2	12	16	50	49	13	-	4	1	147
Sculpin *Cottus* sp.	26	90	46	187	231	31	6	-	32	46	695
Yellow perch *Perca florescens*	6	15	6	5	79	20	1	-	5	1	137
Redside shiner *Richardsonius balteatus*	0	0	0	7	6	0	0	-	0	0	13
Pacific lamprey *Lampetra tridentata*	0	1	2	4	0	0	0	-	1	1	9
Sand roller *Percopsis transmontana*	0	1	1	4	3	0	0	-	0	0	9
White sturgeon *Acipenser transmontanus*	0	0	4	23	101	19	0	-	0	0	147
Walleye *Stizostedion vitreum vitreum*	0	0	0	0	1	0	0	-	0	0	1
Chinook-adult *Oncorhynchus tshawytscha*	0	0	9	66	21	5	23	-	1	1	126
Chinook-jack *Oncorhynchus tshawytscha*	1	0	4	216	90	13	13	-	0	0	324
Coho-adult *Oncorhynchus kisutch*	0	0	0	0	0	0	12	-	0	2	14
Steelhead-adult *Salmo gairdneri*	4	15	56	67	29	11	2	-	1	1	186
Sockeye-adult *Oncorhynchus nerka*	0	0	0	73	57	0	0	-	0	0	130
American shad-adult *Alosa sapidissima*	0	0	30	20	9	1	0	-	0	0	60

Table 25.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1982.

Species	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Month	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
No. sets	6	45	146	129	64	31	19	0	77	33	550
Chinook-subyearling *Oncorhynchus tshawytscha*	39	121	3,389	11,219	5,424	980	1,045	-	1,596	155	23,968
Chinook-yearling *Oncorhynchus tshawytscha*	22	718	5,950	2,497	6	1	0	-	0	0	9,194
Coho-juvenile *Oncorhynchus kisutch*	0	102	18,415	8,610	187	3	0	-	0	0	27,317
Sockeye-juvenile *Oncorhynchus nerka*	0	9	2,338	1,639	407	2	0	-	2	0	4,397
Steelhead-juvenile *Salmo gairdneri*	0	250	12,471	3,048	43	0	0	-	4	0	15,816
Chum-juvenile *Oncorhynchus keta*	0	0	2	0	0	0	0	-	0	0	2
Coastal Cutthroat *Salmo clarki*	0	11	92	13	0	3	1	-	5	1	126
Threespine stickleback *Gasterosteus aculeatus*	0	4	31	82	212	56	51	-	738	51	1,225
American shad-juv.-suby. *Alosa sapidissima*	0	0	0	0	0	13	83	-	9,107	2,997	12,200
American shad-juv.-year. *Alosa sapidissima*	0	0	16	35	77	4	23	-	40	0	195
Eulachon *Thaleichthys pacificus*	3	2	1	1	0	0	0	-	0	0	7
Longfin smelt *Spirinchus thaleichthys*	0	0	0	0	0	0	0	-	290	7	297
Starry flounder *Platichthys stellatus*	0	4	3	2	1	0	0	-	6	1	17
Carp *Cyprinus carpio*	0	2	6	4	1	1	0	-	0	0	14
Sucker *Catostomus* sp.	0	0	55	17	2	0	0	-	0	0	74
Crappie *Pomoxis* sp.	0	0	0	1	1	1	0	-	1	2	6
Bluegill *Lepomis macrochirus*	0	0	0	1	0	0	0	-	0	0	1
Peamouth *Mylocheilus caurinus*	0	266	1,125	2,434	334	112	12	-	910	42	5,235
Northern squawfish *Ptychocheilus oregonensis*	0	1	7	6	25	10	7	-	0	0	56
Mountain whitefish *Prosopium williamsoni*	0	0	2	0	1	0	0	-	0	0	3
Redside shiner *Richardsonius balteatus*	0	0	0	0	0	1	0	-	0	0	1
Pacific lamprey *Lampetra tridentata*	0	1	4	2	0	0	1	-	3	53	64
White sturgeon *Acipenser transmontanus*	0	0	1	0	0	0	0	-	1	0	2
Chinook-adult *Oncorhynchus tshawytscha*	0	0	0	2	0	1	4	-	1	0	8
Chinook-jack *Oncorhynchus tshawytscha*	0	0	0	0	1	1	0	-	0	0	2
Coho-adult *Oncorhynchus kisutch*	0	0	0	0	0	0	4	-	1	0	5
Steelhead-adult *Salmo gairdneri*	0	4	37	19	0	0	0	-	1	2	63
American shad-adult *Alosa sapidissima*	0	2	40	33	56	3	0	-	1	2	137

Table 26.--Catch composition by month for beach seine samples at Jones Beach (Rkm 75), 1983.

Months:	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
No. sets:	23	148	161	202	306	291	206	177	84	24	35	9	1,666
Species													
Chinook-subyearling													
Oncorhynchus tshawytscha	155	1,179	2,094	6,153	29,596	35,000	25,724	4,993	1,571	187	521	7	107,180
Chinook-yearling													
Oncorhynchus tshawytscha	45	291	934	1,233	1,579	45	2						4,129
Coho-juvenile													
Oncorhynchus kisutch			2	283	6,406	545	26	13	1		10		7,286
Sockeye-juvenile													
Oncorhynchus nerka		1	5	4	129	8	26	1					174
Steelhead-juvenile													
Salmo gairdneri			4	53	349	12	1					1	420
Chum-juvenile													
Oncorhynchus keta			6	5	5	1							17
Coastal cutthroat													
Salmo clarki		1	11	153	61	3	14	46	49	16	14	1	369
Threespine stickleback													
Gasterosteus aculeatus	2,473	9,206	18,785	9,673	4,090	9,873	4,132	8,785	7,735	12,704	13,845	710	102,011
American shad-juv.-sub.													
Alosa sapidissima						1	57	3,306	6,150	2,327	2,134	11	13,986
American shad-juv.-year.													
Alosa sapidissima	1			5	1,219	1,617	83	10	1				2,936
Eulachon													
Thaleichthys pacificus	236	383	28	1							1		649
Starry flounder													
Platichthys stellatus	36	157	244	93	58	39	81	139	103	85	145	3	1,183
Carp													
Cyprinus carpio	1	16	34	24	44	22	2	4					147
Sucker													
Catostomus sp.	1	2	17	18	32	38	77	229	86	49	4		553
Crappie													
Pomoxis sp.	1		1	8	21	13	4	5		1	5		59
Largemouth bass													
Micropterus salmoides			1	1	2	1		6	1		1		13
Bluegill													
Lepomis macrochirus					2								2
Peamouth													
Mylocheilus caurinus	113	520	277	693	2,728	2,132	1,054	2,384	634	258	2,179	13	12,985
Northern squawfish													
Ptychocheilus oregonensis				3	211	276	189	149	49	1	2		880
Mountain whitefish													
Prosopium williamsoni			2	1	7	35	57	33	5	1			141
Sculpin													
Cottus sp.	8	26	22	2	12	18	23	13	2		72		198
Yellow perch													
Perca flavescens		2	9	8	6	5	16	2	1		3	1	53
Redside shiner													
Richardsonius balteatus					1			1					2
Pacific lamprey													
Lampetra tridentata	2	1		2	4	3							12
Sand roller													
Percopsis transmontana					1		1	1	2		1		6
White sturgeon													
Acipenser transmontanus					2	14	31	24	4				75
Walleye													
Stizostedion vitreum													0
Dace													
Rhinichthys sp.							2		1				3
Killifish													
Fundulus diaphanus					1	1	5						7
Goldfish													
Carassin auratus					1								1
Catfish													
Ictalurus sp.													0
Chinook-adult													
Oncorhynchus tshawytscha			1	18	8	18	1	8	10				64
Chinook-jack													
Oncorhynchus tshawytscha	1				6	141	30	5	19				202
Coho-adult													
Oncorhynchus kisutch									1	1			2
Coho-jack													
Oncorhynchus kisutch							1		1				2
Steelhead-adult													
Salmo gairdneri	4	12	8	3	8	15	8	2	6				66
Sockeye-adult													
Oncorhynchus nerka						97	20	1					118
American shad-adult													
Alosa sapidissima					1	3	2						6

Table 27.--Catch composition by month for purse seine samples at Jones Beach (Rkm 75), 1983.

Month:	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
No. sets:	7	53	54	76	149	111	60	35	7	16	25	6	599
Species													
Chinook-subyearling													
Oncorhynchus tshawytscha		4	19	330	6,005	14,043	8,737	637	79	84	550	19	29,901
Chinook-yearling													
Oncorhynchus tshawytscha	5	13	52	1,104	11,946	2,478	121						15,719
Coho-juvenile													
Oncorhynchus kisutch				130	16,575	5,175	101	9	1		1		21,992
Sockeye-juvenile													
Oncorhynchus nerka				46	3,869	404	174	2				1	4,496
Steelhead-juvenile													
Salmo gairdneri			5	1,082	19,056	3,956	27	1					24,127
Chum-juvenile													
Oncorhynchus keta				1									1
Coastal cutthroat													
Salmo clarki			1	37	90	12	2	1				1	144
Threespine stickleback													
Gasterosteus aculeatus	28	13	11	22	62	67	38	25	66	24	576	113	1,045
American shad-juv.-suby.													
Alosa sapidissima					1			15	9	450	1,467	86	2,028
American shad-juv.-year.													
Alosa sapidissima	1				22	33	11	1		2			70
Eulachon													
Thaleichthys pacificus	1,370	813	63										2,246
Starry flounder													
Platichthys stellatus			5		1	5	1		1		2		15
Carp													
Cyprinus carpio		5		2	3	1							11
Sucker													
Catostomus sp.		1			10	5							16
Crappie													
Pomoxis sp.				1	1							1	3
Largemouth bass													
Micropterus salmoides								1					1
Bluegill													
Lepomis macrochirus													0
Peamouth													
Mylocheilus caurinus	6	15	24	60	1,331	2,831	237	51	1	8	201	1	4,766
Northern squawfish													
Ptychocheilus oregonensis					9	11	11	1					32
Mountain whitefish													
Prosopium williamsoni													0
Sculpin													
Cottus sp.											6		6
Yellow perch													
Perca flavescens			1										1
Pacific lamprey													
Lampetra tridentata	1	2	4	1	7	1					4		20
Redside shiner													
Richardsonius balteatus													0
White sturgeon													
Acipenser transmontanus													0
Chinook-adult													
Oncorhynchus tshawytscha					1								1
Chinook-jack													
Oncorhynchus tshawytscha						4	1	1					6
Coho-adult													
Oncorhynchus kisutch													0
Steelhead-adult													
Salmo gairdneri	1	4	11	7	16	7	1				1		48
Sockeye-adult													
Oncorhynchus nerka							1						1
American shad-adult													
Alosa sapidissima					16	14	53	14	1	1	3		102