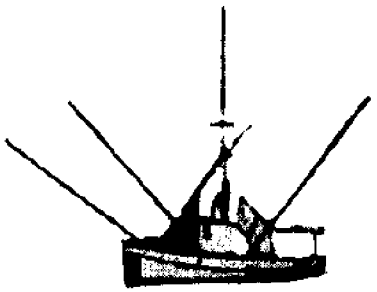
Southeast Alaska Troll Log Book Program 1976 Scientific Report



Sea Grant Report 77-11
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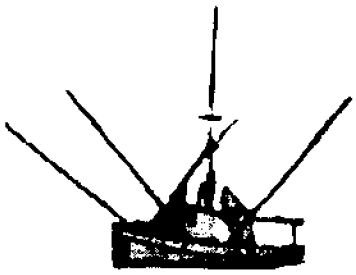

Sea Grant Report 77-11
September 1977

ALASKA TROLLERS ASSOCIATION
P. O. Box 5825
Ketchikan, Alaska 99901

SOUTHEAST ALASKA TROLL LOG BOOK PROGRAM
1976 SCIENTIFIC REPORT

Sea Grant Report 77-11
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ACKNOWLEDGEMENT

We wish to acknowledge the support and effort of all those fishermen who completed log books for the 1976 season. Without the detailed information provided by each fisherman, this program would not have been able to be completed.

This publication results from research sponsored by the Alaska Trollers Association, the National Marine Fisheries Service, and the Alaska Department of Fish and Game. The preparation and printing of this report has been provided by the Alaska Sea Grant Program, cooperatively supported by NOAA, Office of Sea Grant, Department of Commerce, under Grant No. 04-7-158-44006, and by the University of Alaska with funds appropriated by the State of Alaska.

TABLE OF CONTENTS

INTRODUCTION

In 1976, the Alaska Trollers Association initiated, with the cooperation of the University of Alaska Sea Grant Program, National Marine Fisheries Service and the Alaska Department of Fish and Game, a troll log book program for the southeast Alaska troll fishery. About 200 log books were printed and distributed early in April. The instructions and a sample page for the log book are included in Appendix to this report. By February 1977, 51 completed 1976 log books had been returned. These books represent nearly 3,400 days of observations including position, general comments, water temperature, salmon and bottomfish catches, salmon feed species, and marine mammal sightings.

Several detailed computer summaries of the log book data have been produced, including a listing of marine mammal sightings, a general data summary by period and area and selected summaries by area and calendar week. This report is an informal descriptive review of those summaries.

Because of the general lack of comparable data, and because a thorough analysis would require several months, this report is preliminary. There are plans to analyze much of the log book data in detail, but most of this work will be more meaningful when the 1977 data is available for comparison.

Some of the data summaries are organized by calendar week (Sunday through Saturday); in others, 1976 is divided into 3 parts: Early (Jan. 1 through June 14), Middle (June 15 through July 31), and Late (August 1 through December 31). Very little fishing was reported before the last week in April or after the middle of September.

The nine statistical areas selected for data summaries are shown in Figure 1. Initially, Alaska Trollers Association members outlined 14 areas roughly enclosing relatively discrete troll fisheries. Because few of the reporting boats fished in some areas, it was necessary to make a few adjustments. The resulting nine areas shown in Figure 1 are:

Dixon Entrance:	Outside and inside waters south of Cape Muzon and Ketchikan.
Noyes Island:	Outside and coastal waters from Cape Muzon northwest to Cape Decision.
Baranof Island:	Outside coast of Baranof Island southeast of Sitka Sound and including west Chatham Strait.

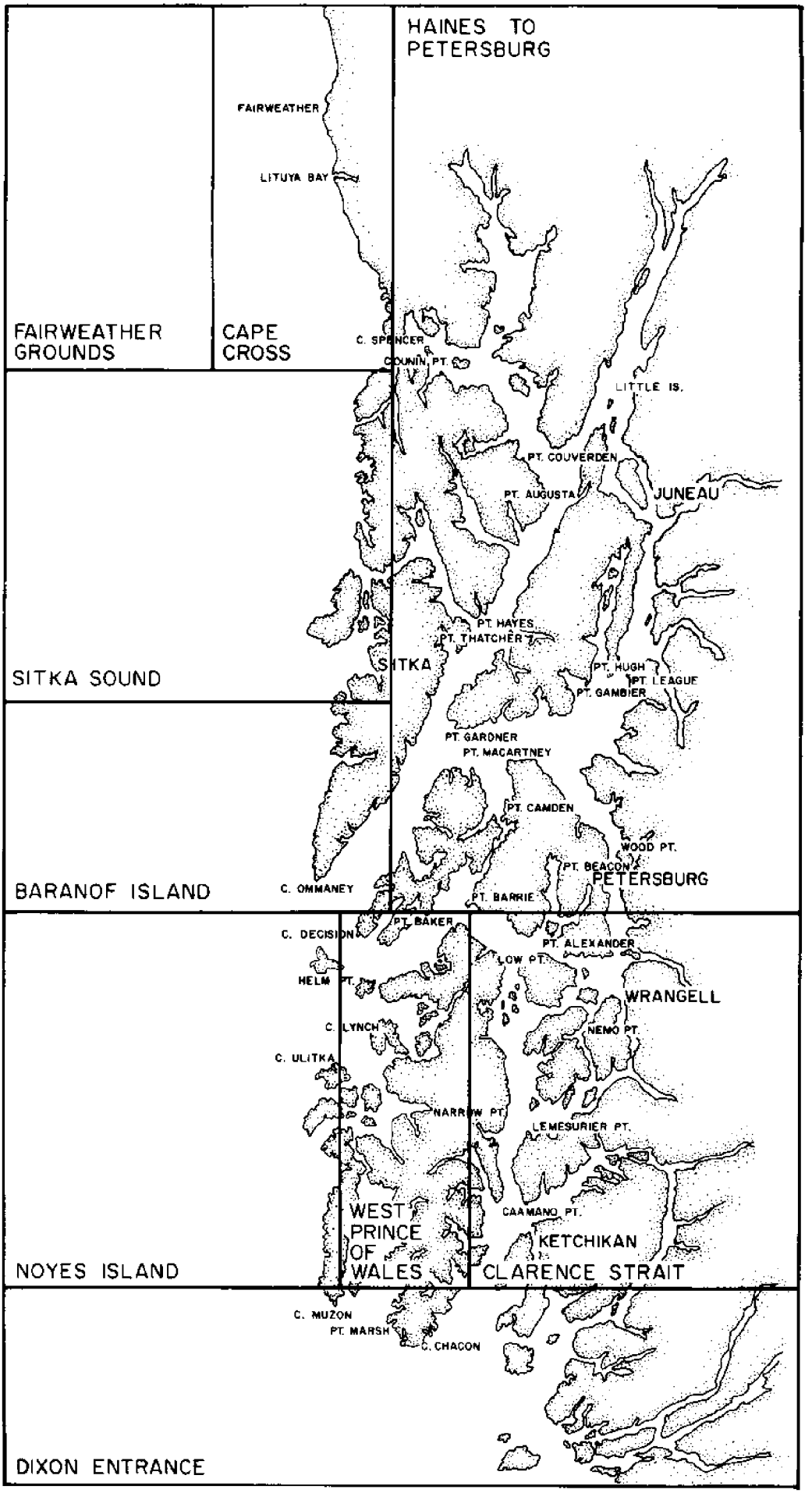

FIGURE 1. Nine statistical areas used for summary of 1976 troll log book data.

Sitka Sound:	Outside coast of Baranof Island from northwest point to southeast of Sitka Sound.
Cape Cross:	Outside waters northwest of Cross Sound but not including the Fairweather Grounds.
Fairweather Grounds:	Outside waters northwest of Cross Sound, west of Cape Cross area to above Cape Fairweather. Includes Fairweather Grounds.
Haines to Petersburg:	Inside waters from Haines to Petersburg.
West Prince of Wales:	Coastal waters of west Prince of Wales Island including Cordova Bay and waters northwest to Sumner Strait.
Clarence Strait:	Inside waters east of Prince of Wales Island from Ketchikan to Petersburg.

While the Noyes Island, Baranof Island, and Sitka Sound areas include offshore waters, almost all reported trolling in these areas was close to shore.

SECTION I

SALMON DISTRIBUTION AND OCEANOGRAPHIC CONDITIONS

Mr. Ivan Frohne
Division of Commercial Fisheries
Alaska Department of Fish and Game

Weekly average salmon catches per boat per day by species and the number of reported fishing days for the nine statistical areas are plotted by week in Figures 2 through 7 of this section. Almost all reported fishing occurred during calendar weeks 18 through 37 (late April through mid-September). None of the individual area plots cover the whole period because few or no reporting boats fished in some weeks. The dashed line on each of the plots shows weekly average surface water temperature, in degrees Fahrenheit. The solid line is the number of reported fishing days during the week in Figure 1, and weekly average catch (number of fish) per day in Figures 2 through 7.

Days Fished

The average number of days fished for each week is shown in Figure 1 (solid line). The plots for Noyes Island and Dixon Entrance suggest that days fished gradually increased until mid-June at Noyes Island, when boats began to move to Dixon Entrance, where reported effort peaked in July. Fishing in Sitka Sound peaked in late May and early June, but did not decline to low levels until September. In northern inside areas (Haines to Petersburg) there was little reported fishing until September.

Temperature

The weekly average surface water temperature for each week is shown in Figure 1 (dashed line). This average weekly temperature is also plotted against fish catch in Figure 2 through 7 in order to evaluate possible correlation.

Chinook Catch

For the region as a whole, fishing for large and medium chinook was best in late May and June, with average catches ranging from 8 to 12 per day (Figure 2). There was little reported effort on the Fairweather Grounds and in the Cape Cross area in May and early June, but catches were high in late June and early July. Catches were usually above four per day in Sitka Sound, Noyes Island and Dixon Entrance for most of the period, but declined to lower levels in August and September in other areas. There seemed to be little, if any, correlation of chinook catch with water temperature.

Large Chinook Catch

Catches of large chinook peaked in May near eight fish per day in Sitka Sound; at Noyes Island fishing was better at 12 large chinook per day for a shorter

period (first week of June) (Figure 3). For all areas combined, catches of large chinook averaged five per day before July and about two per day afterward.

Medium Chinook Catch

Medium chinook catches generally ranged from a little over one per day to about four per day and were less variable than larger chinook except on the Fairweather Grounds and in the Cape Cross area, where very large catches were reported in late June (Figure 4). In Dixon Entrance, where catches of large chinook were usually smaller than the southeast average, the medium chinook catch was generally slightly better than average.

Released Chinook

Because some fishermen did not report shaker estimates, the number of released chinook per day should not be compared to the other catch data. More shakers seem to have been encountered in the Cape Cross area, Noyes Island in early June and in northern inside waters (Haines to Petersburg) (Figure 5).

Coho Catch

Coho catches peaked sharply in outside areas during the first week of August but in Dixon Entrance, the average was above 20 per day for July and nearly 15 per day for August and early September (Figure 6). Some dependence of catch on water temperature is shown in many of the plots. Average catch per day tends to increase with increasing water temperature, and vice versa. But since water temperatures are lowered when rough weather brings colder, deeper waters to the surface, this effect may be indirectly due to poor fishing conditions in stormy weather. Whatever the reason, the southeast average weekly catch increased on the average by 50 percent when water temperature increased; when the temperature remained constant or declined, the coho catch also declined, on the average, by 7 percent.

Pink Salmon Catch

Pink catches were largest at Noyes Island, where they exceeded 50 per day in mid-August (Figure 7). Catches were quite small in northern and other outside areas.

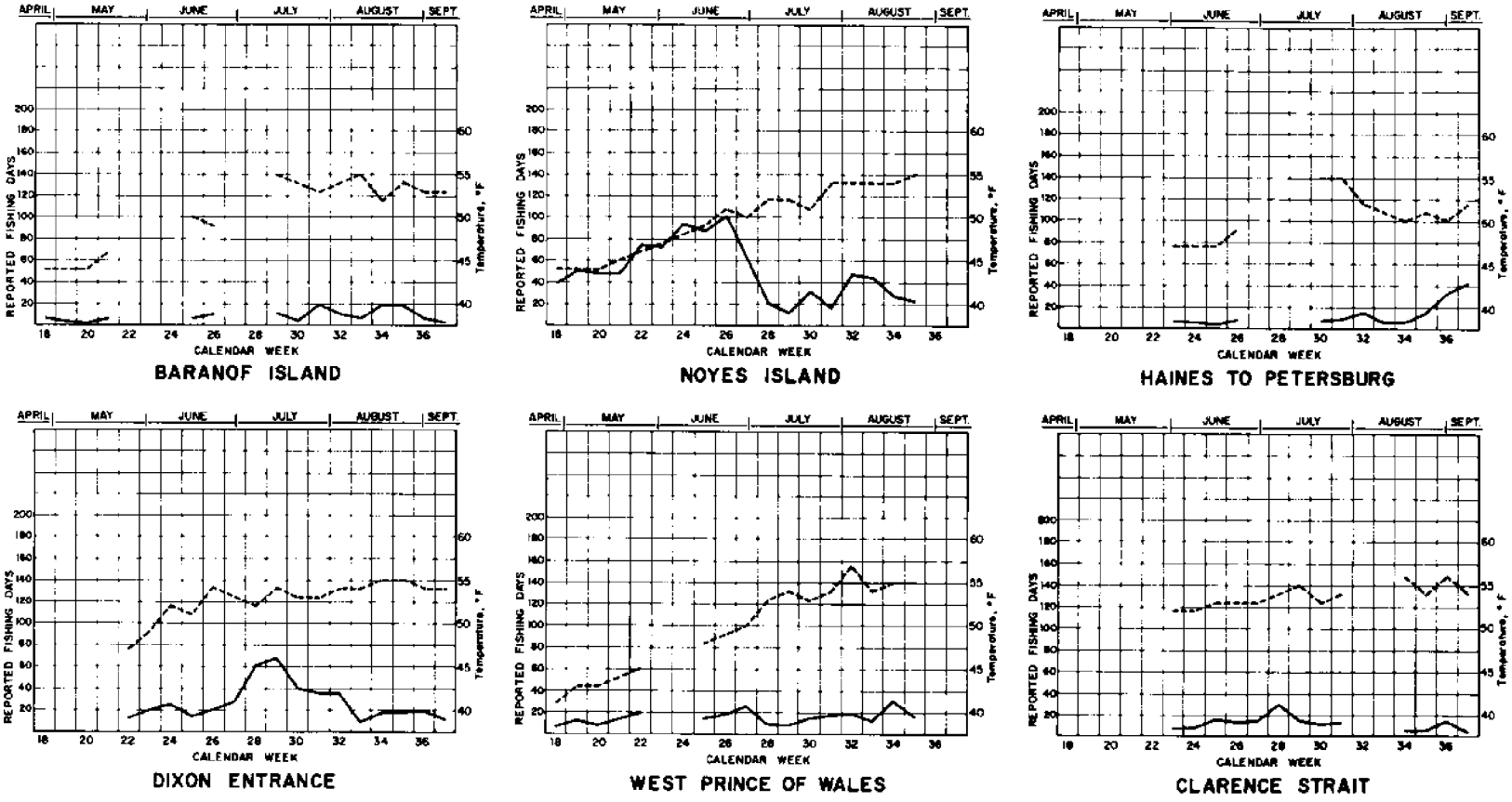

FIGURE 1. Reported fishing days (solid line) and weekly average surface water temperature for nine statistical areas and for Southeast in total.

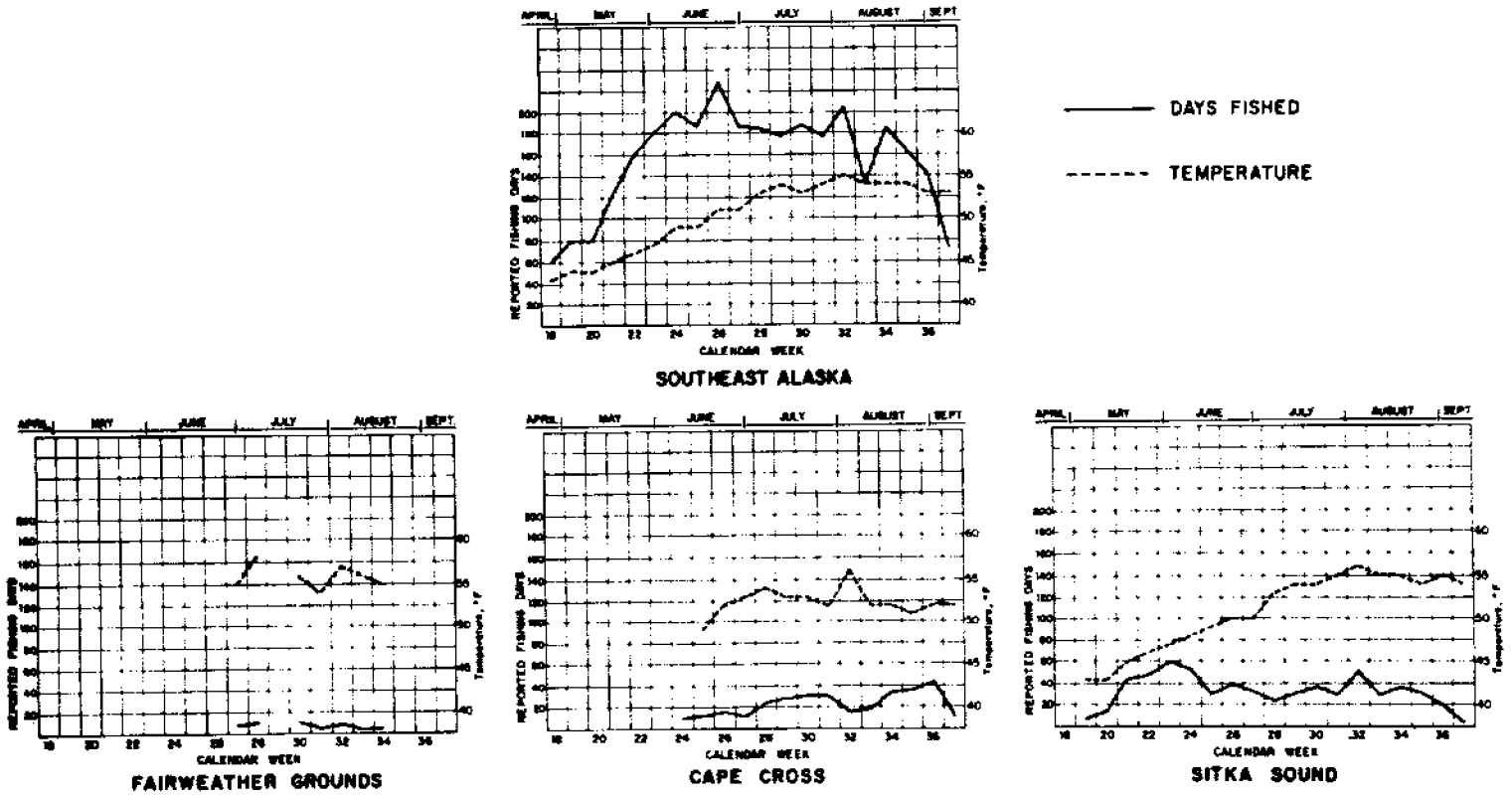

FIGURE 1 (cont.) Reported fishing days (solid Line) and weekly average surface water temperature for nine statistical areas and for Southeast in total.

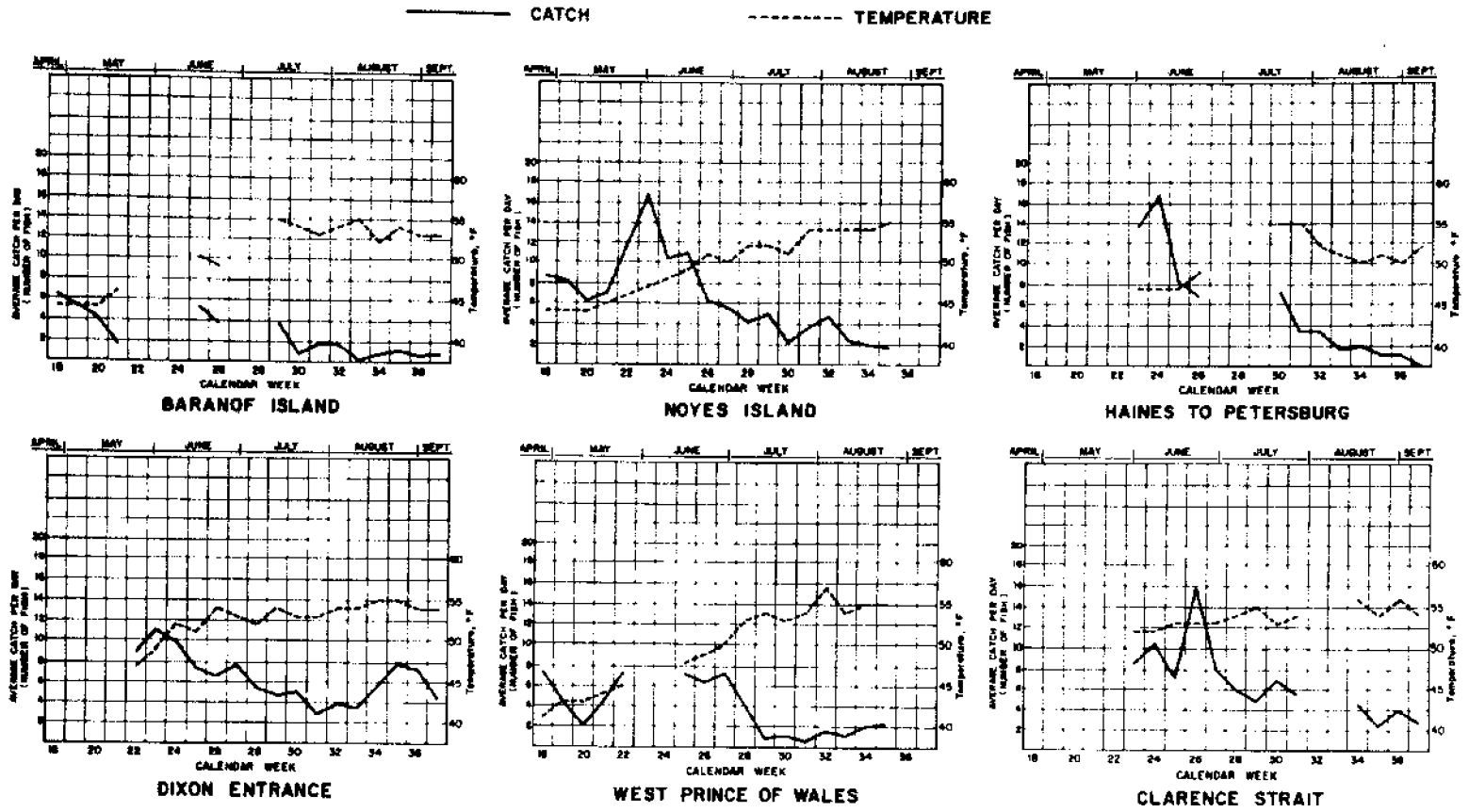

FIGURE 2. Weekly average Chinook catch per boat per day for nine statistical areas and for Southeast in total.

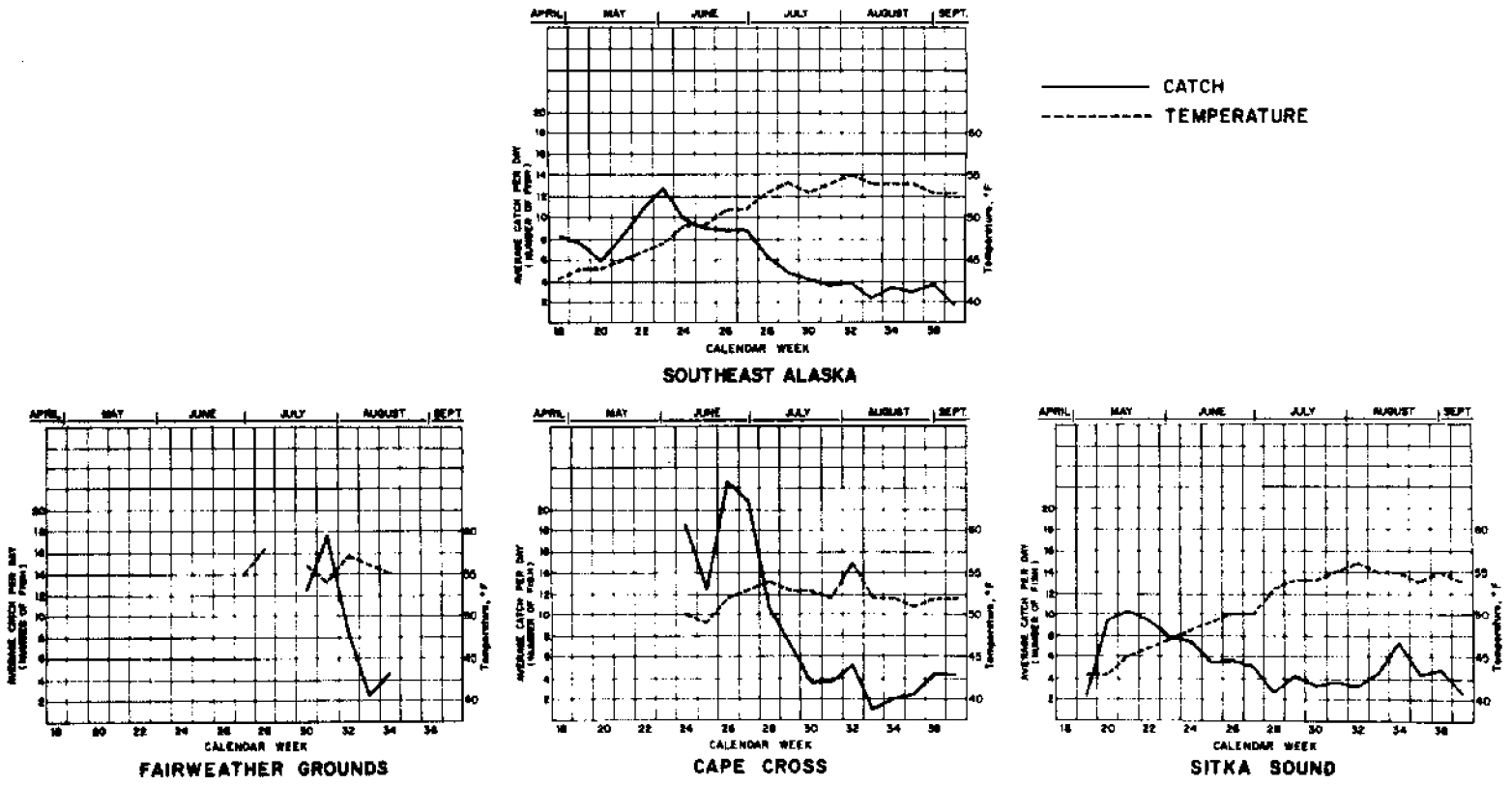

FIGURE 2 (cont.) Weekly average Chinook catch per boat per day for nine statistical areas and for Southeast in total.

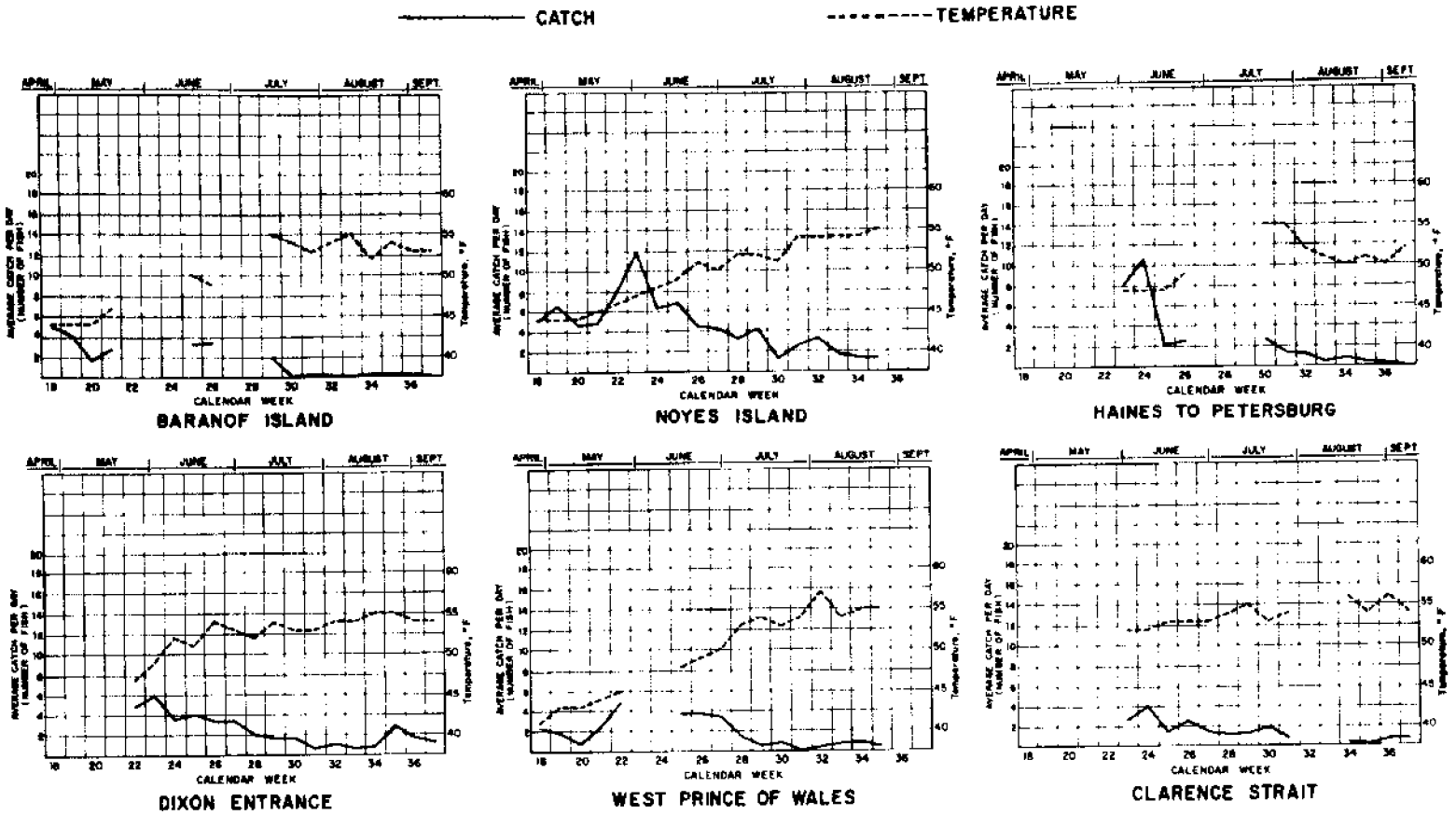

FIGURE 3. Weekly average large Chinook catch per boat per day for nine statistical areas and for Southeast in total.

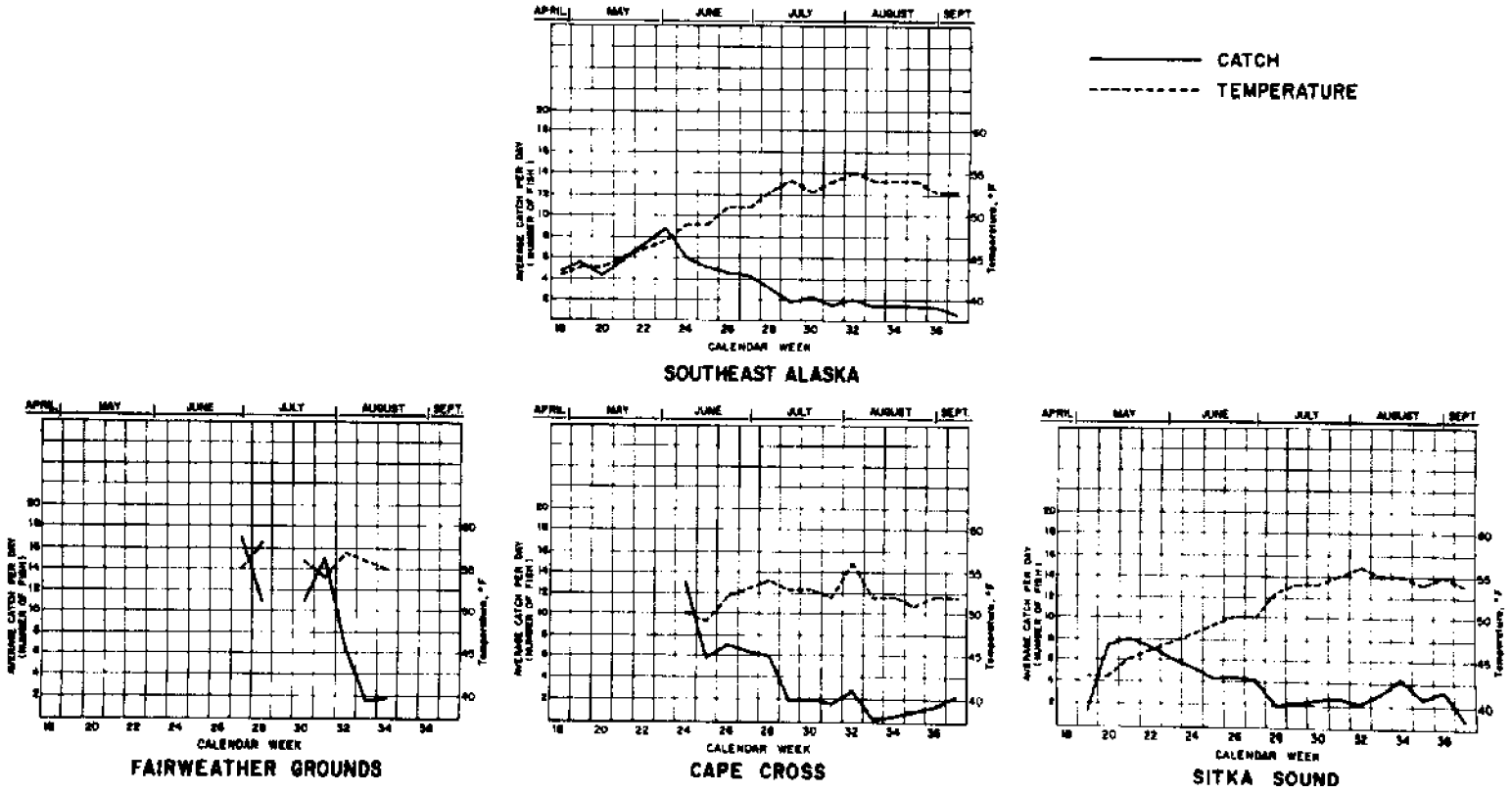

FIGURE 3 (cont.) Weekly average large Chinook catch per boat per day for nine statistical areas and Southeast in total.

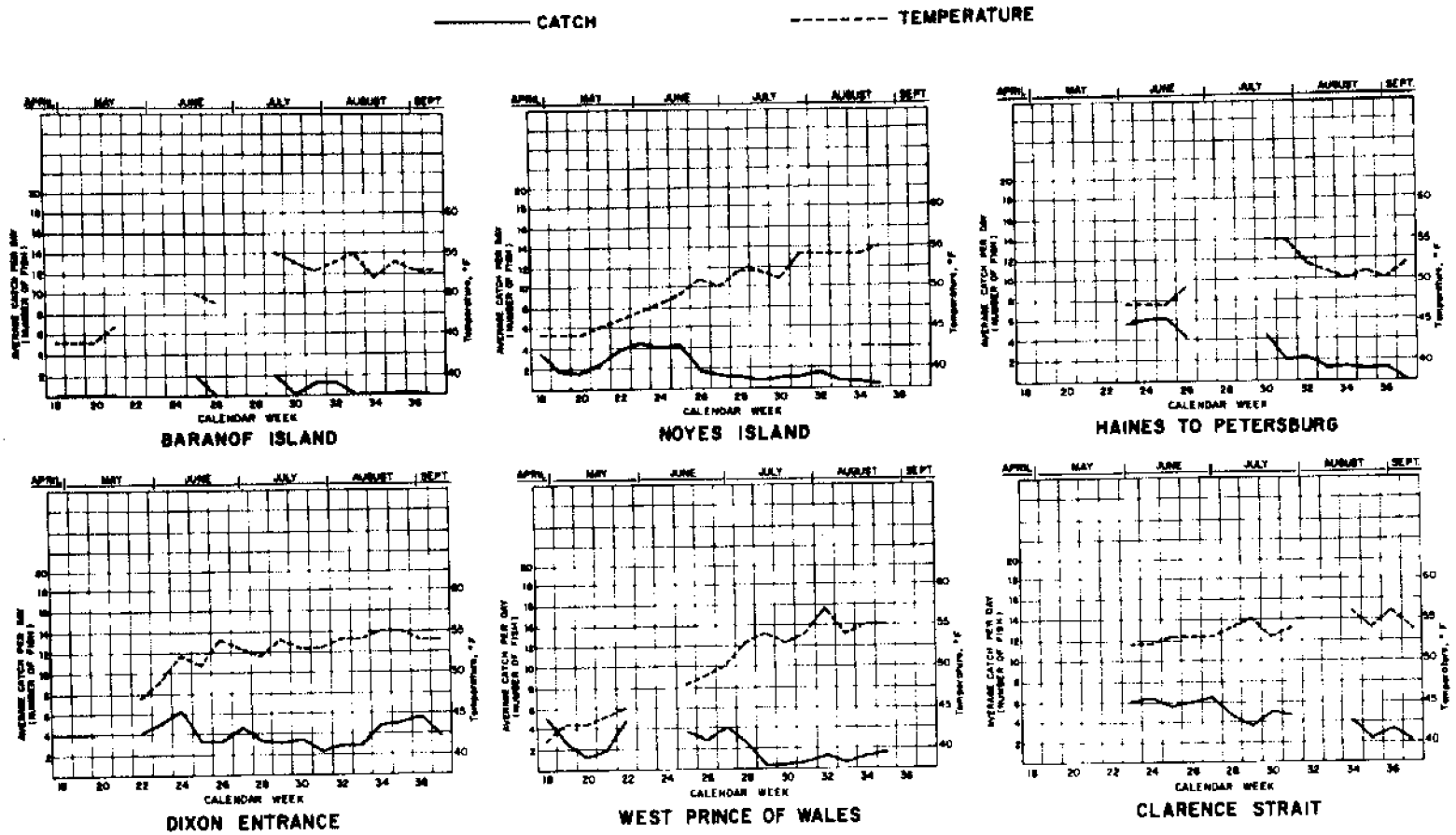

FIGURE 4. Weekly average medium Chinook catch per boat per day for nine statistical areas and for Southeast in total.

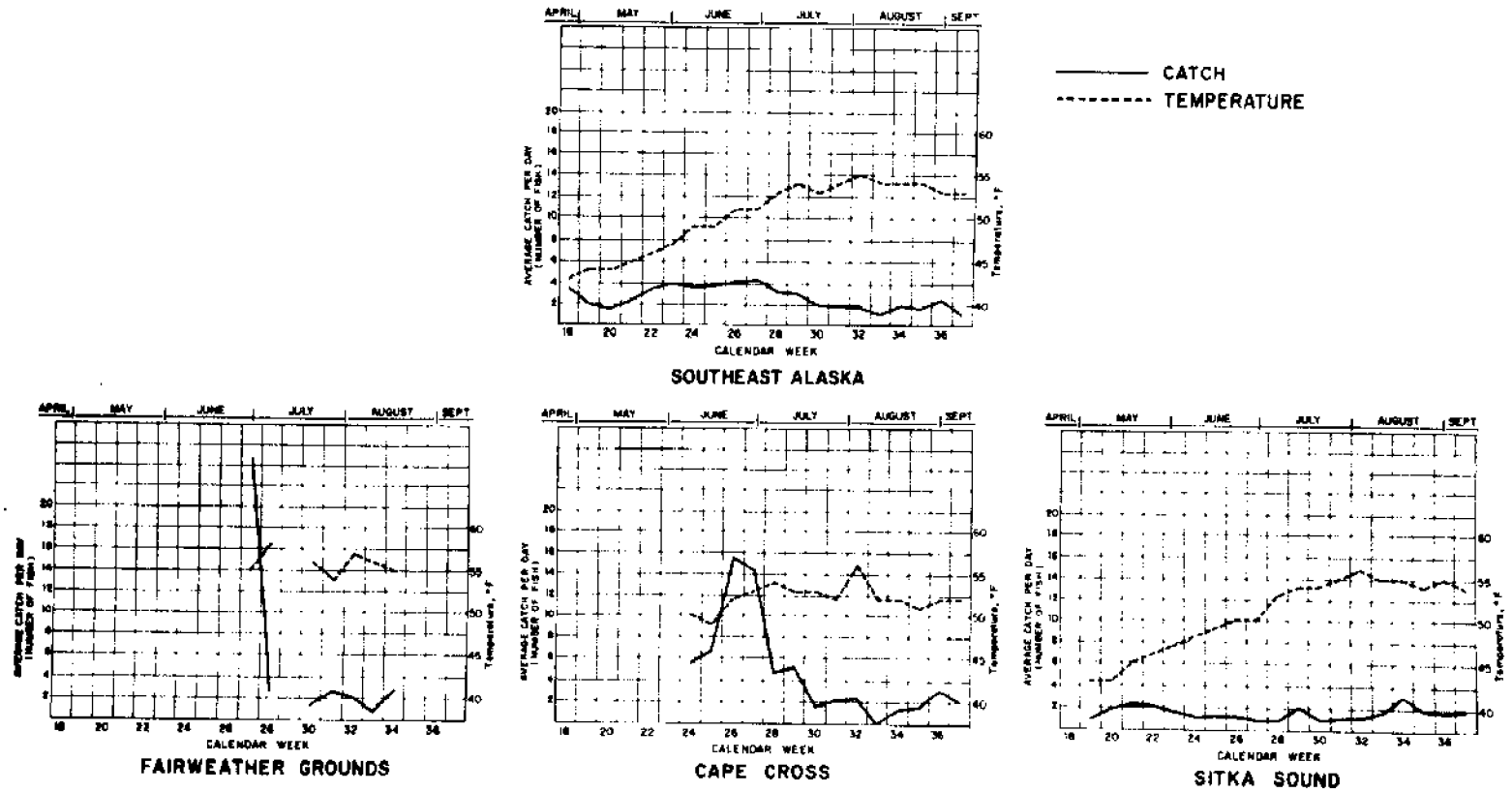

FIGURE 4 (cont.) Weekly average medium Chinook catch per boat per day for nine statistical areas and for Southeast in total.

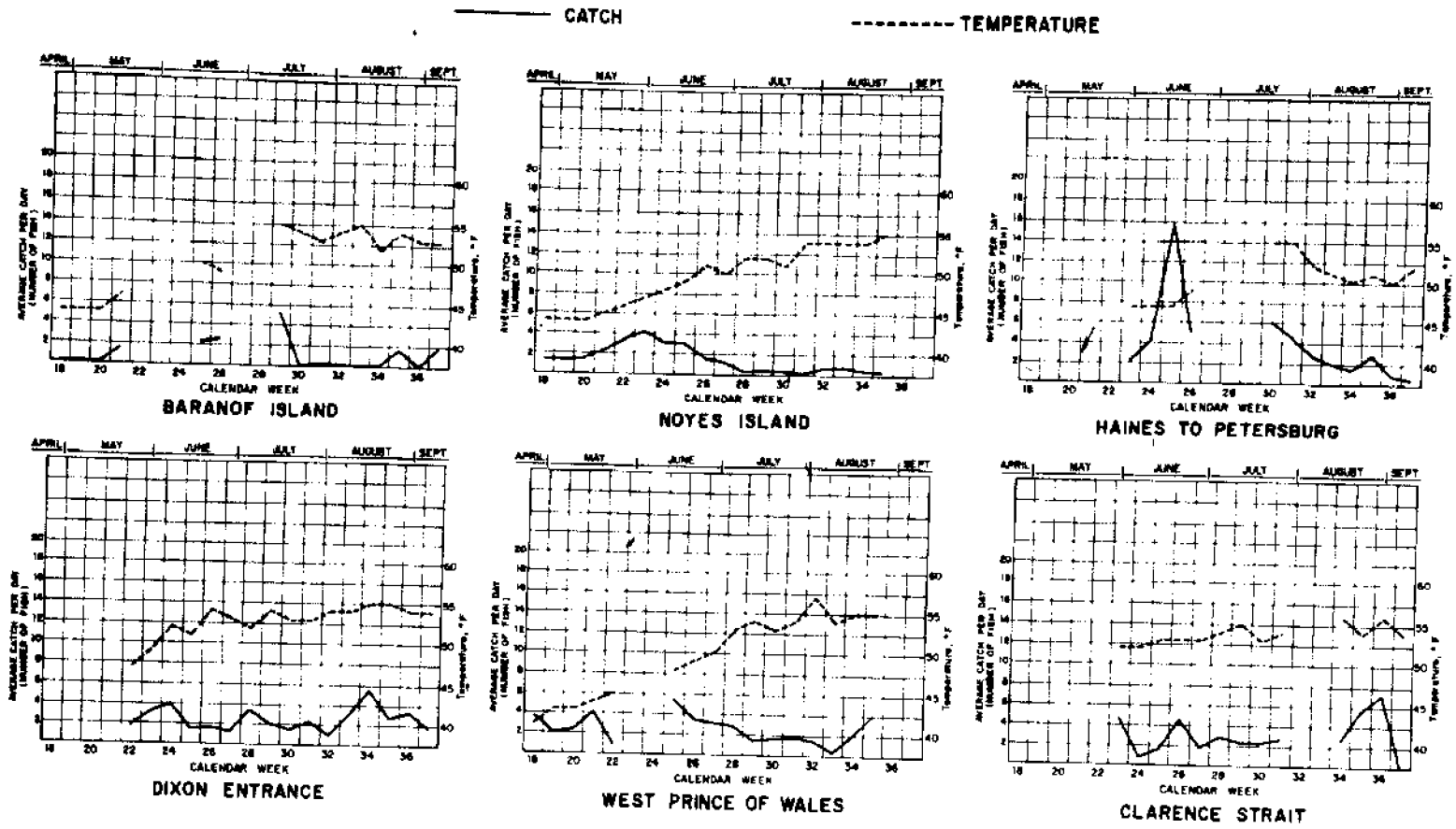

FIGURE 5. Weekly average released Chinook per boat per day for nine statistical areas and for Southeast in total. Note these values should not be compared to catch data as all fishermen did not report shakers.

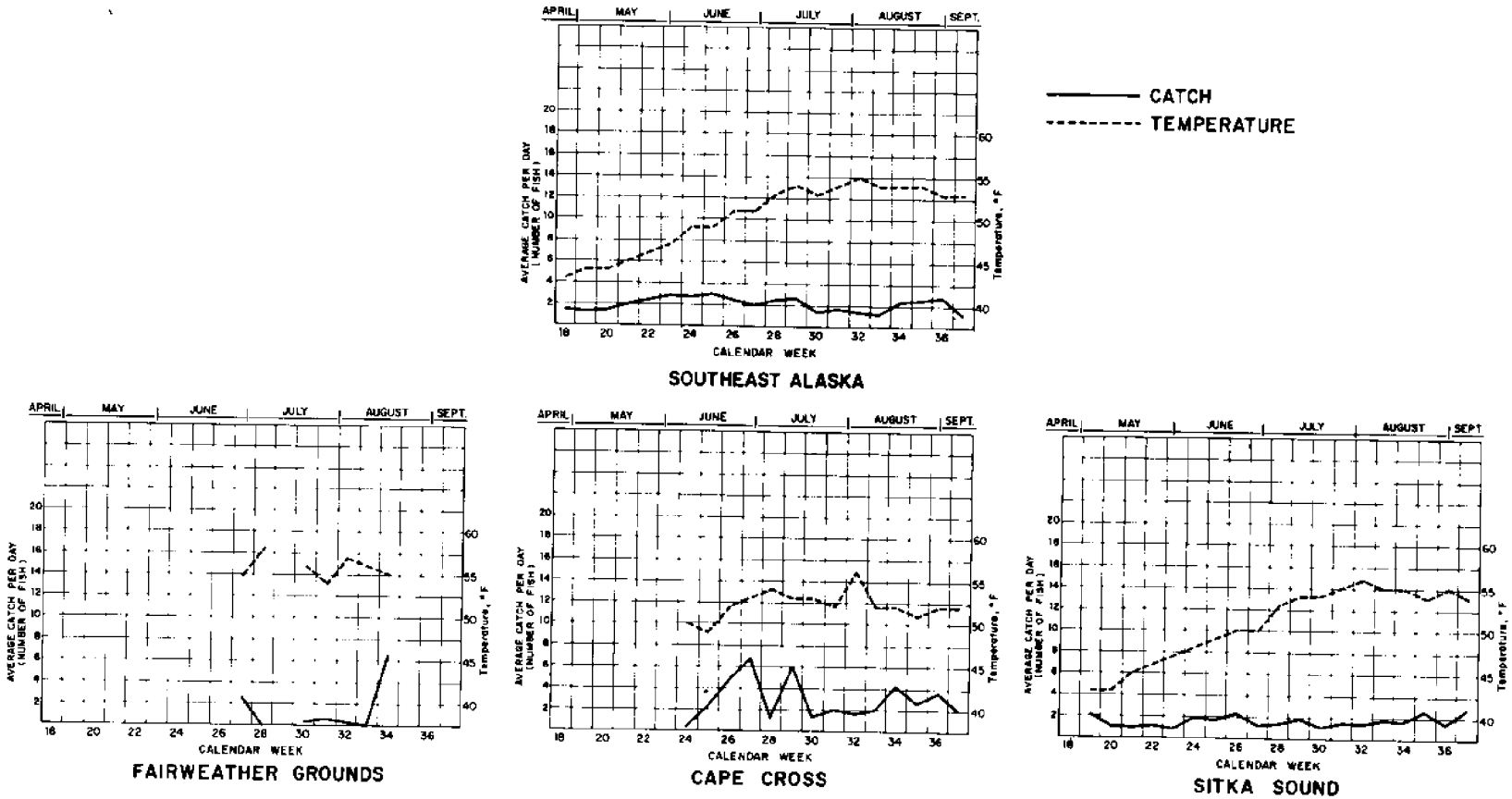

FIGURE 5 (cont.) Weekly average released Chinook per boat per day for nine statistical areas and for Southeast in total. Note these values should not be compared to catch data as all fishermen did not report shakers.

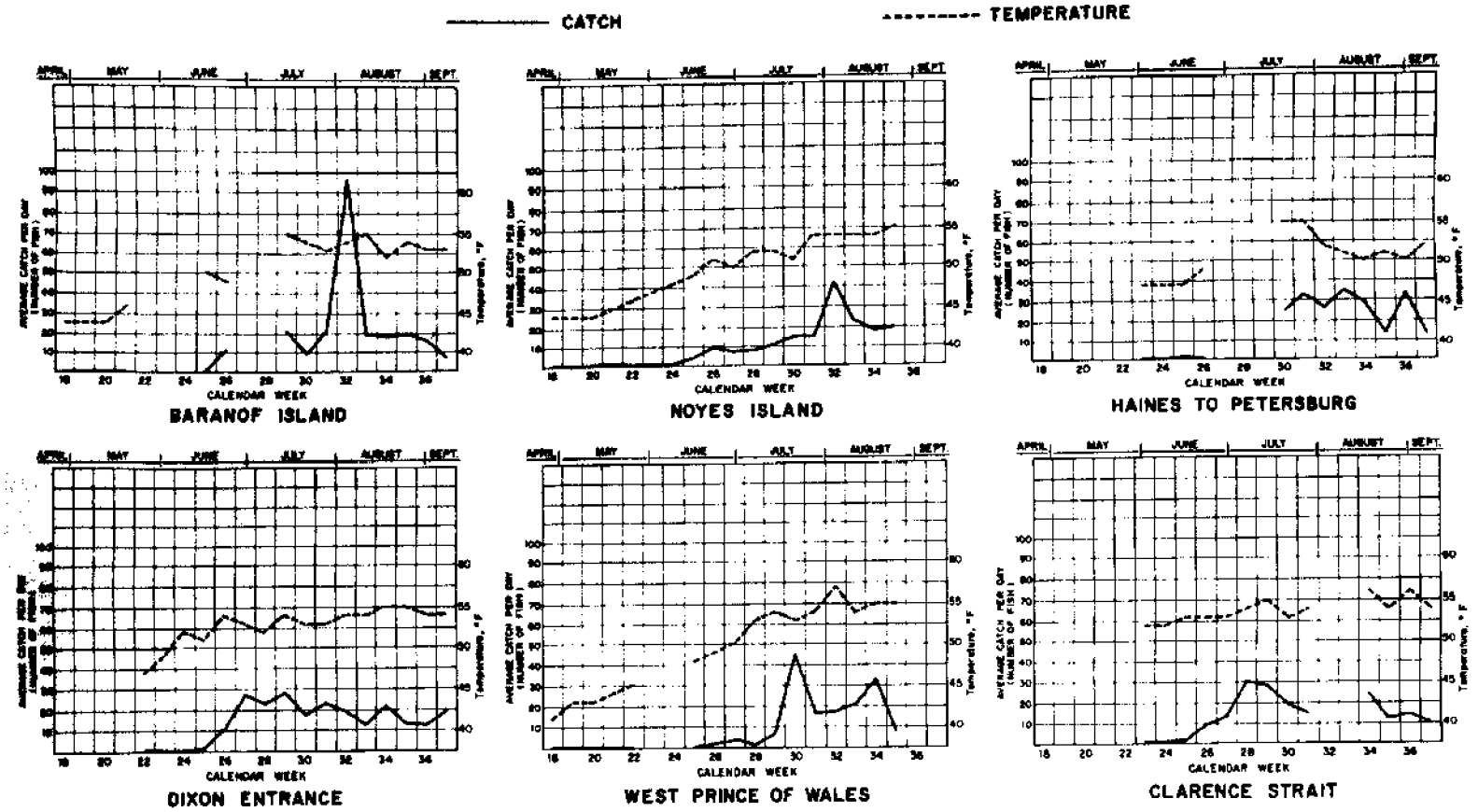

FIGURE 6. Weekly average Coho catch per boat per day for nine statistical areas and for Southeast in total.

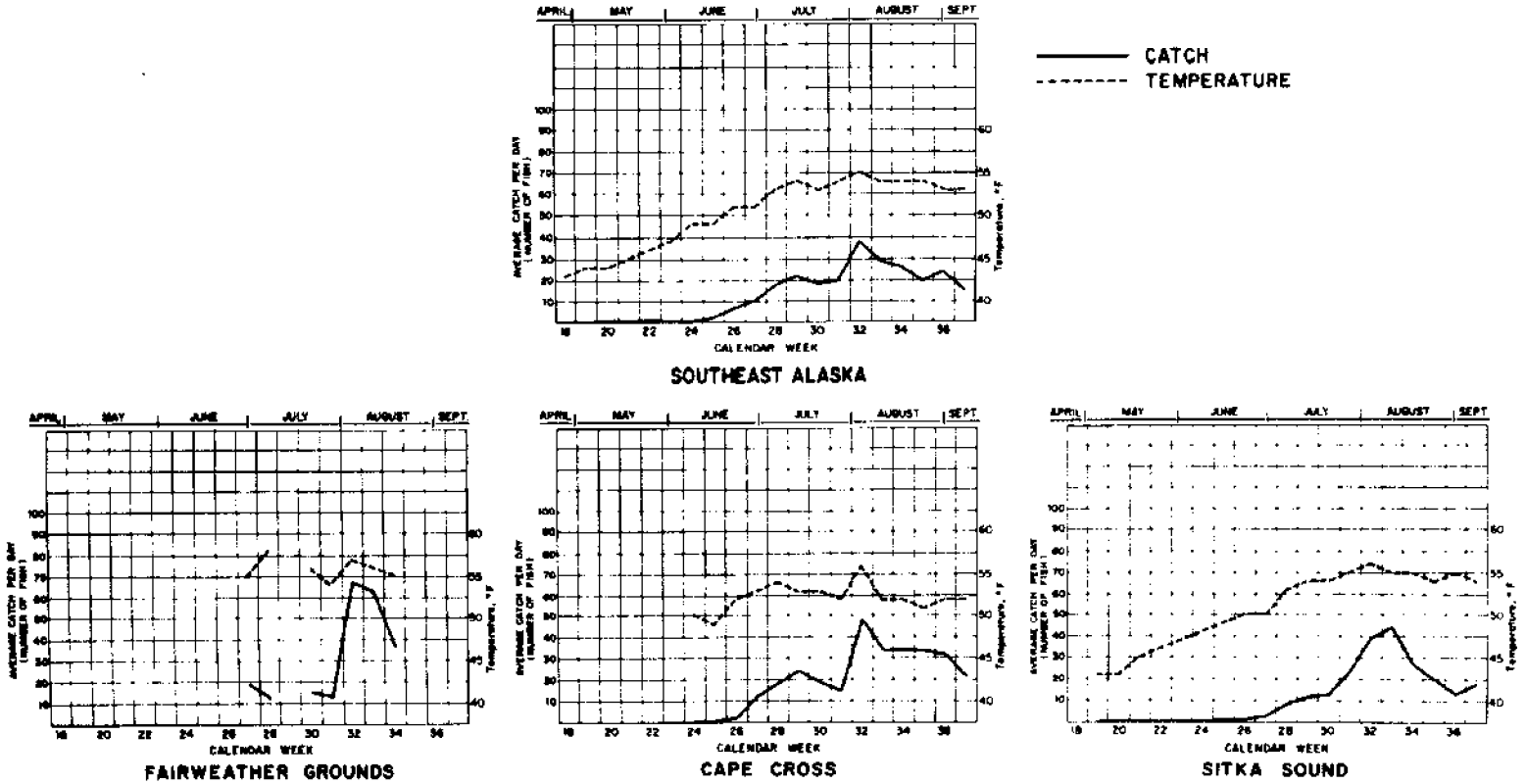

FIGURE 6 (cont.) Weekly average Coho catch per boat per day for nine statistical areas and for Southeast in total.

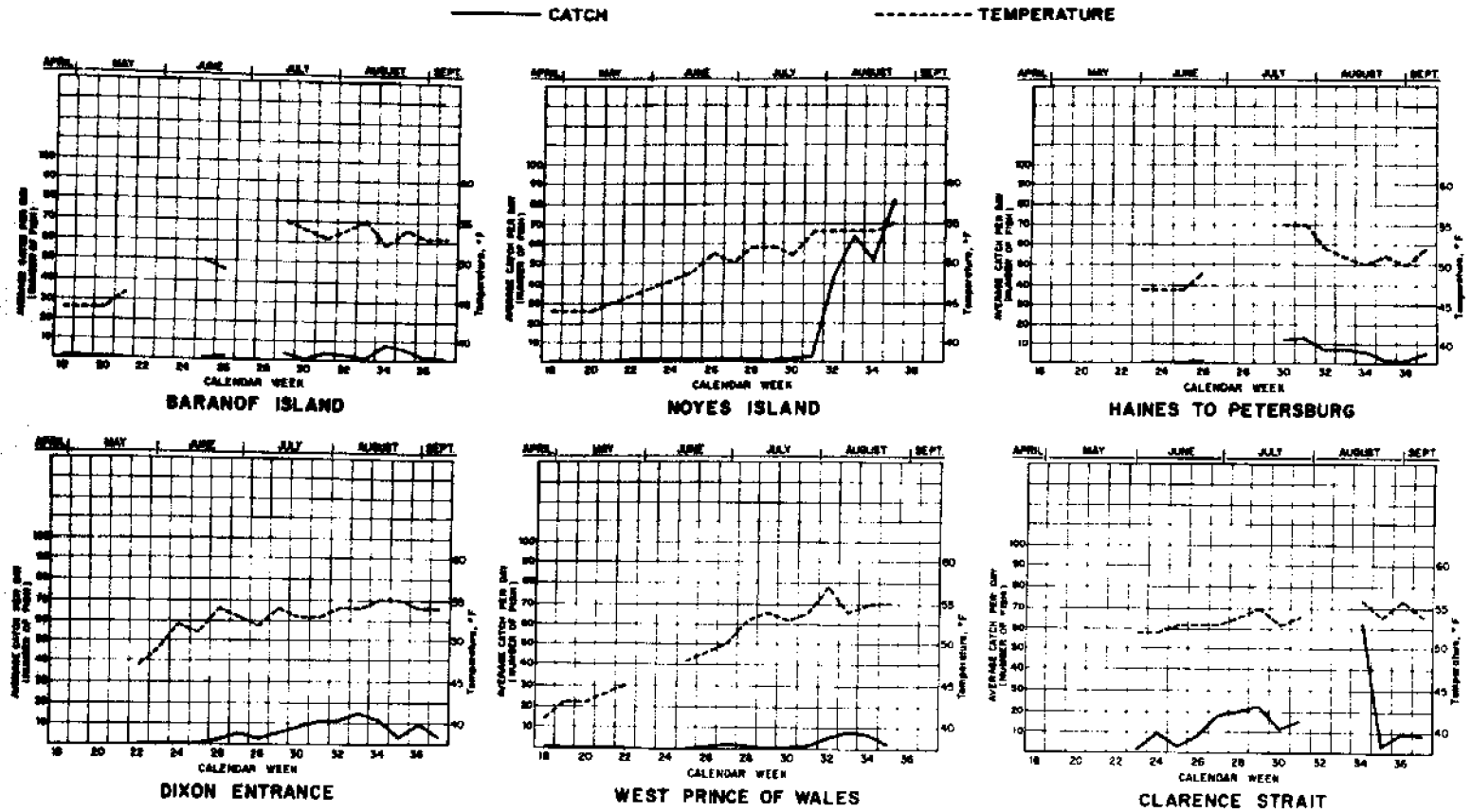

FIGURE 7. Weekly average Pink Salmon catch per boat per day for nine statistical areas and for Southeast in total.

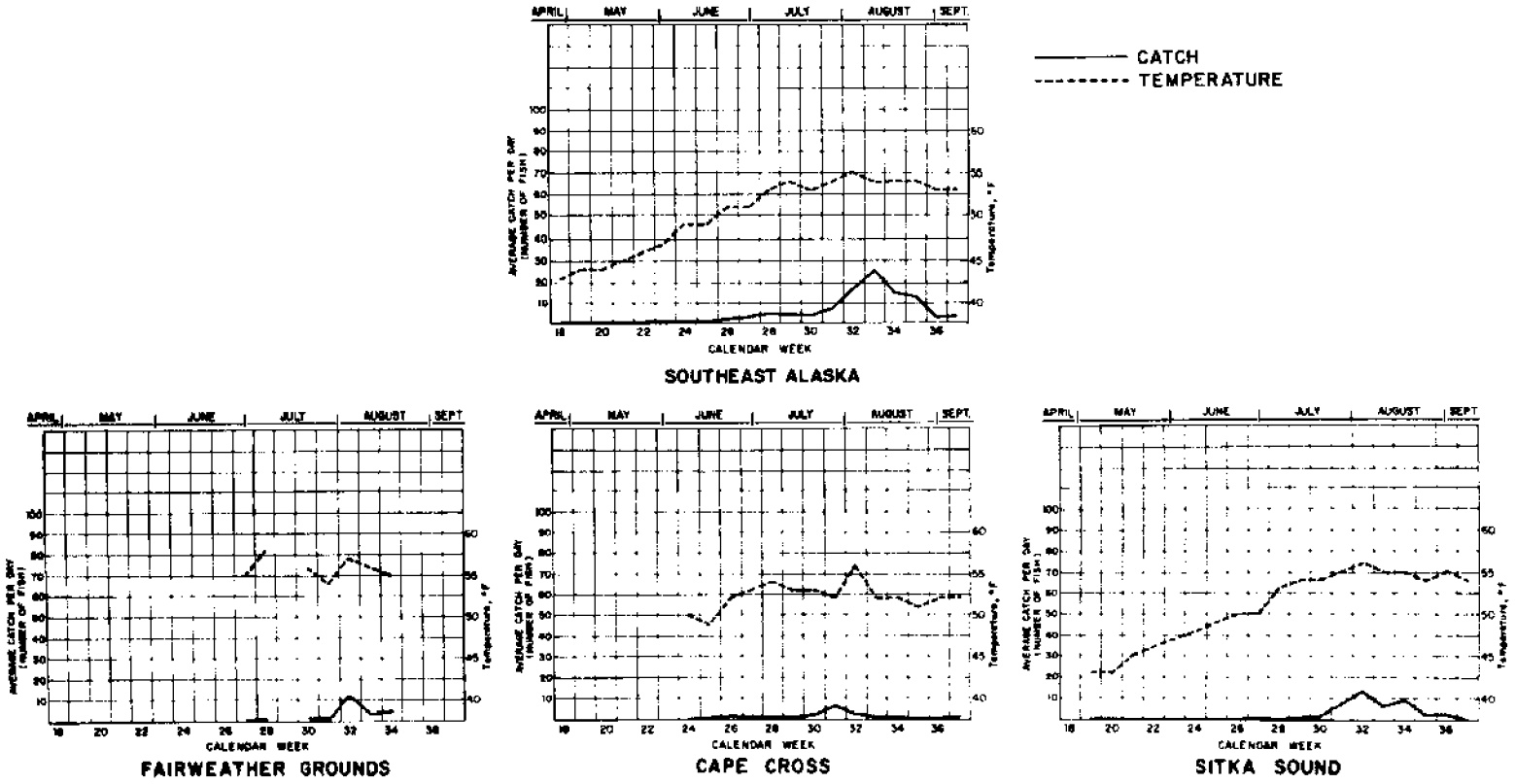

FIGURE 7 (cont.) Weekly average Pink Salmon catch per boat per day for nine statistical areas and for Southeast in total.

SECTION II

SALMON FOOD OBSERVATIONS

Dr. Bruce L. Wing
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INTRODUCTION

Which foods fish eat, how often they are eaten, and how much is eaten are important information to fishermen and to resource managers. The kinds and amounts of foods available to fish affect the choice and efficiency of lures, the growth and survival of fish, sometimes the quality of fishery products, and increasingly are important in decisions concerning the allotment of fishery resources to competing and/or cooperating fisheries. Recognizing the need for better and continuing data on food habits of commercial fish, the participants in the 1976 Alaska Troll Log Book Program reported daily observations on what king, coho, pink, and chum salmon were eating.

METHODS

The trollers recorded daily the food species which were most evident in the stomachs of troll-caught salmon, and ranked the foods--1, 2, or 3--in order of importance. During the 1976 season no separation was made between the foods of each salmon species. The foods were designated by common names or, in many cases where common names do not exist or hard to identify larval or juvenile forms eaten, by short descriptive phrases.

All observations were coded and placed in a computer file by the Alaska Department of Fish and Game Commercial Fisheries Biological Research Division. Subsequently, the data were summarized in weekly intervals and for early, middle, and late season. To summarize the data, the foods were given an arbitrarily-weighted score (S) calculated by the following formula:

$$S = \frac{n_1 + n_{2/3} + n_{3/6}}{T} \times 100$$

where n_1 is the number of troll days on which that species was ranked most abundant in the period of interest, and n_2 and n_3 have similar definitions for second and third most abundant foods. T is the total number of troll days for the area in the time period examined. When $n_1 = T$ (and n_2 and n_3 are necessarily zero), the case where a food species always ranks first, S = 100. S is zero only when $n_1 = n_2 = n_3 = 0$.

Because foods in stomach contents are often difficult to identify and because some species occurred infrequently, for this preliminary summary the salmon feed species were grouped as follows for the weekly summaries:

1. Sandlance: needlefish
2. Herring
3. Capelin
4. Pollock: young pollock, hake, whiting, tomcod, cod, and other cod-like forms
5. Crustaceans: krill (euphausiids), shrimp, sandfleas (amphipods), and other shrimp-like forms
6. Other: snails, octopus, squid, worms, unidentified small fish, items listed as unknown, salmon fingerlings, and other species which were rarely listed.

The same groupings were used for the early, middle, and late season summaries except that capelin and other smelts were combined.

RESULTS

The relative importance each week of the six food categories in stomachs of troll-caught salmon for each of the nine troll areas and for all areas combined are shown graphically in Figure 1. For those cases where the sum of the food scores ($S_1 + S_2 + S_3 \ . \ . \ . \ S_6$) was over 100, that sum was equated to 100 and S_1's shown in proper proportion. The earliest observations were in the week of February 15 in Sitka Sound, and the latest observations were in the week of September 19 in Dixon Entrance. Most observations were between May 25 and September 18. Approximately 3,000 feed observations were reported. For the total season, the Noyes Island area had the most observations and the Fairweather Grounds the least observations.

Because the numbers of observations per week are often too small to be of significance, the data are further summarized by early (February 16-June 14), middle (June 15-July 31), and late (August 1-December 15) reporting periods (Figure 2). These time periods were chosen arbitrarily to represent the early period when king salmon were the main target species of the fishery, a middle season when fishing was most intense and coho a major target species, and a late season after most boats had quit fishing.

DISCUSSION

The preliminary summaries of data given in the figures must be interpreted with caution, recognizing that for many of the weeks and several of the areas,

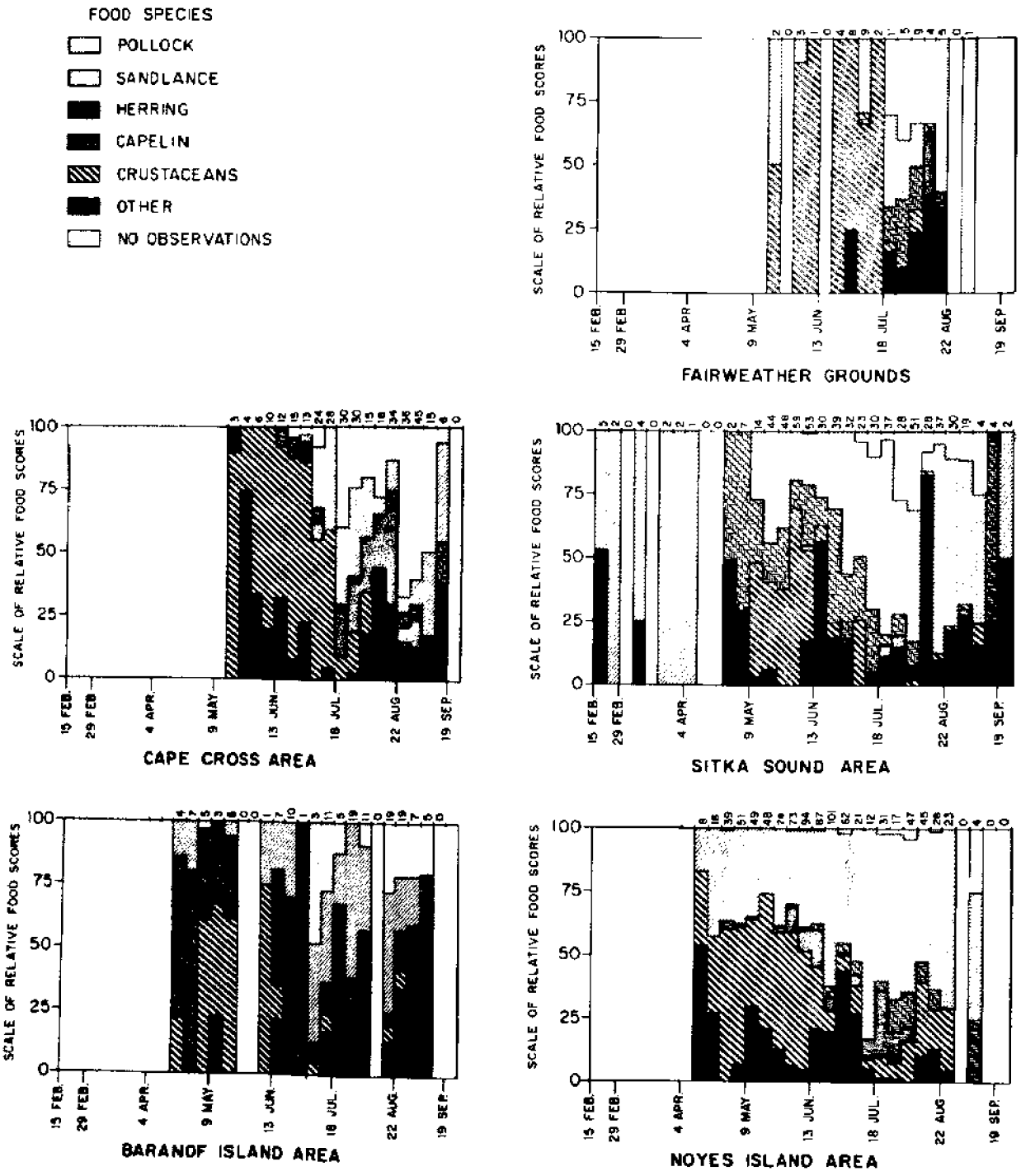

FIGURE 1. Weekly changes in importance of salmon food species for nine statistical areas. Length of vertical sections are proportional to weighted food scores. Dates are for first day (Sunday) of the statistical week. Number of food observations per week are at the top of each figure.

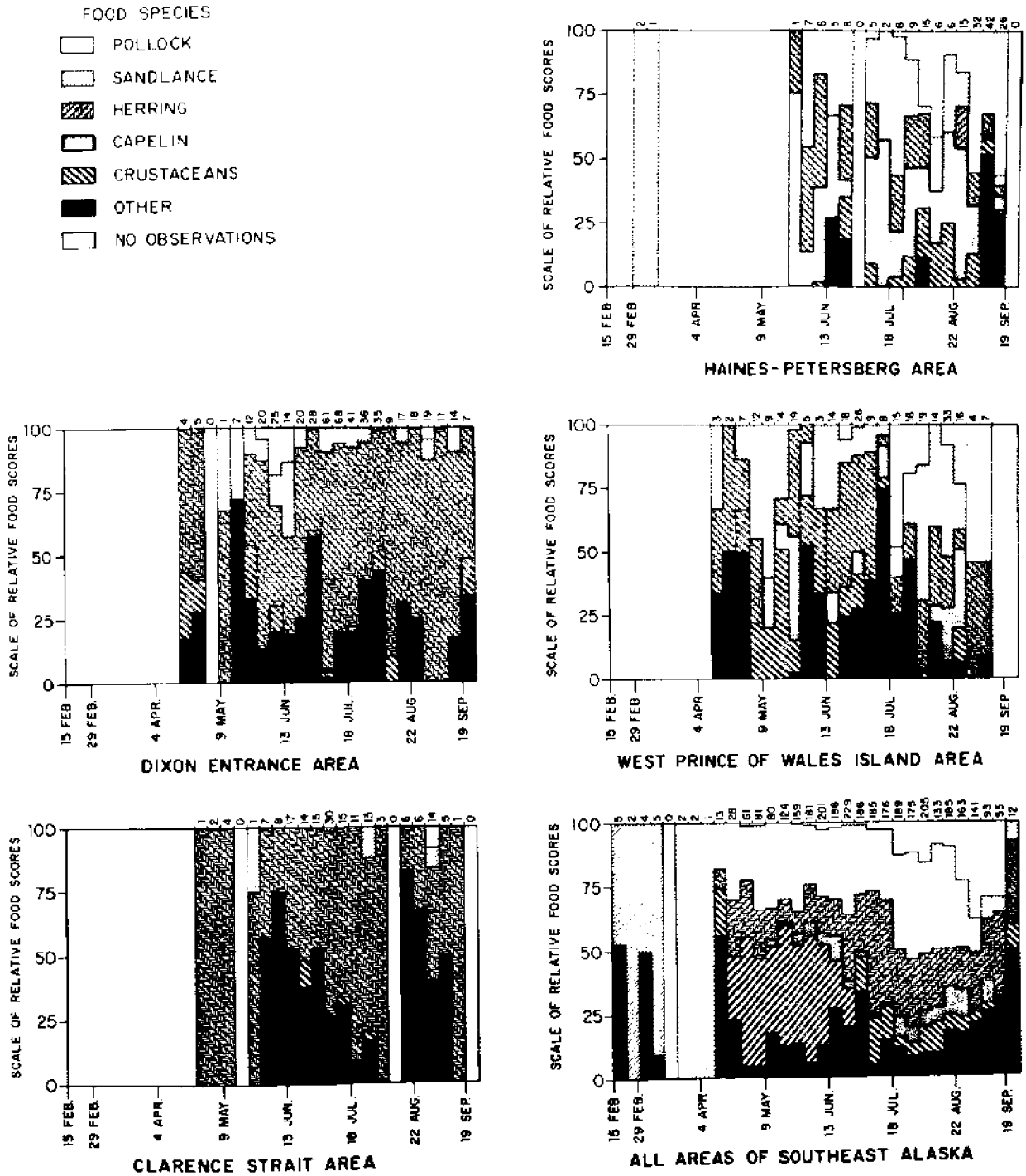

FIGURE 1. (Continued)

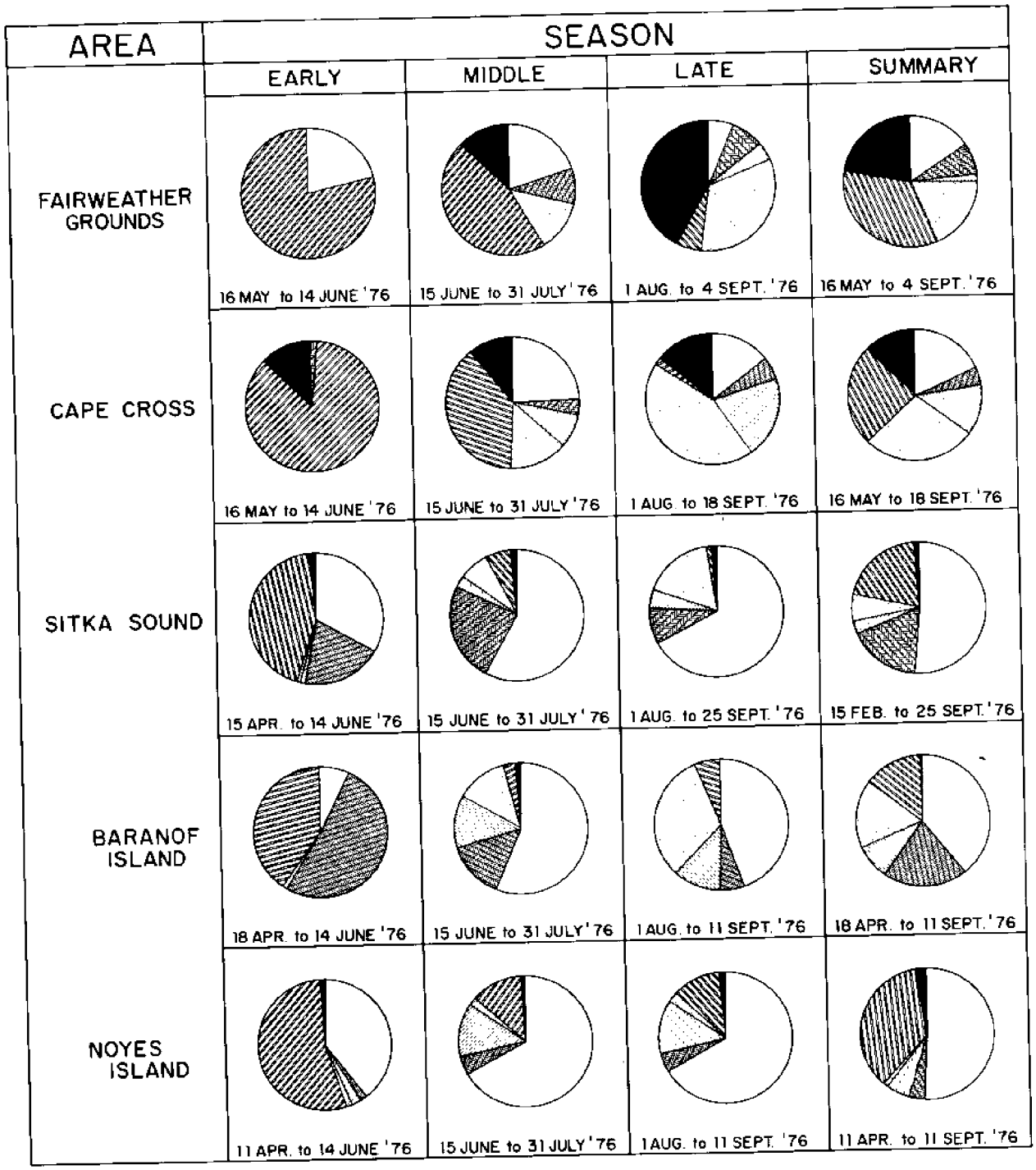

FIGURE 2. Seasonal importance of salmon food species for statistical areas of southeast Alaska. Width of the pies are proportional to the weighted food scores (S). Time periods of early and late seasons vary according to actual dates fishing began and ended.

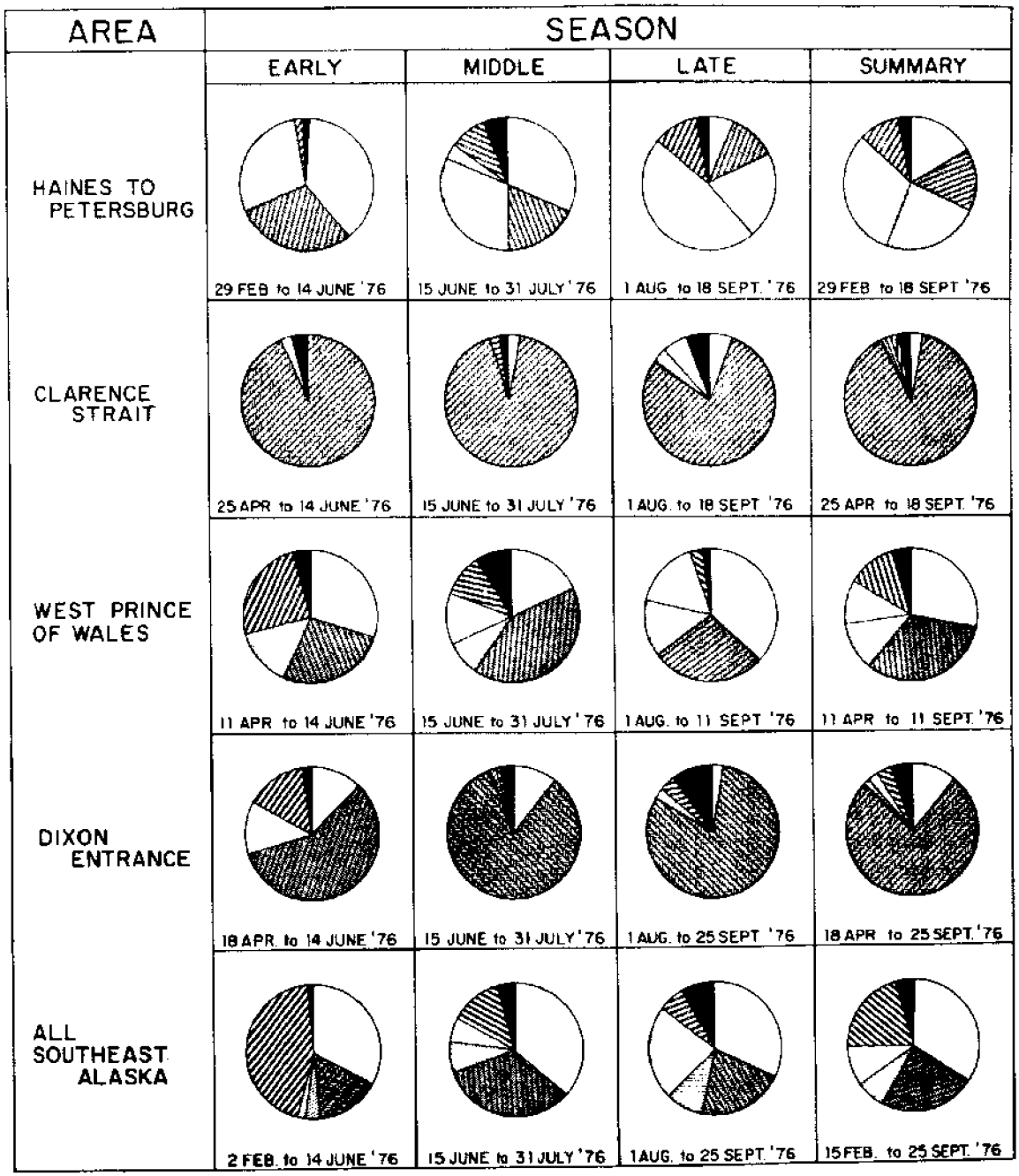

FIGURE 2. (Continued)

the number of observations are very small and that the data are frequency observations based on subjective judgments as to which foods were most abundant. Actual measurements (weight or volume) of the foods were not made. Accepting these limitations on the data, the tentative interpretations of the data are presented.

For the whole season and area, sandlance, herring, and crustaceans ranked 1, 2, and 3 respectively in importance but did not differ greatly from each other. Small pollock (and other cod-like fishes) ranked 4 in importance, somewhat more important than the capelin and other smelt. Examined on a weekly time frame, sandlance were most important in the early season, the crustaceans in April and May, and the pollock in July and August.

The overall impressions do not hold true for the individual fishery areas. Sandlance did dominate the observation all season in the Noyes Island and Sitka areas. Herring were the dominant foods all season in the Dixon Entrance and Clarence Strait areas. Crustaceans (all shrimp-like foods) were most important in the Cape Cross area and Fairweather Grounds in the middle season and appeared to be replaced by young pollock in the late part of the season (there were no early season observations). Pollock were of major importance in late July and August in all except the Clarence Strait, Dixon Entrance, and Noyes Island areas. Capelin and smelts were very important as foods in the Haines-Petersburg area where they were about equal in importance to the sandlance or pollock as salmon forage. The West Prince of Wales, Baranof Island, and Haines-Petersburg areas had the most complex feeding patterns.

The 1976 log book data demonstrate area and within season changes in the king and coho salmon diets. The data can be compared to the 1957-58 study by Reid (1961). Reid gathered stomachs from the troll fleet and gave a detailed analysis of species composition by frequency and weight. The two sets of data are not equivalent because of the differences in statistical treatment and observation. Reid did find some area differences similar to that observed this year in that the relative importance of sandlance was highest in the Fairweather and Cape Cross areas, herring highest in the Haines-Petersburg and Dixon Entrance areas, and capelin and smelt most important in the Noyes Island and West Prince of Wales Island areas. Overall in Reid's data, herring were the most frequently observed food species while in 1976 sandlance were the most frequently observed food. In Reid's 1957-58 study, the frequency of foods would rank: herring, 1; other, 2; capelin and smelt, 3; sandlance, 4; crustaceans (shrimp-like forms), 5; and squid, 6. Pollock were of minor importance in 1957 and 1958, and less important than young rockfish. In 1976 the rankings were: sandlance, 1; herring, 2; crustaceans, 3; pollock, 4; capelin and smelt, 5; and others, 6. Squid were rare in the 1976 data and young rockfish were not reported. Of potential side interest was the observation that young salmon smolts were very minor food items in both the 1957-58 and 1976 data sets, indicating that cannibalism is not a major problem during the marine phase of salmon life as it is in some other fisheries.

CONCLUSION

The 1976 Troll Log Book Program has provided useful data on the diets of king and coho salmon. Distinct area and seasonal differences were observed and, by comparison with earlier data, considerable year to year changes are evident. In 1976 the salmon relied upon a variety of foods which ranked in order of importance as sandlance, herring, crustaceans, pollock, capelin and smelts, and other items. Sandlance were most important early in the season and in the outer and northern areas. Herring were most important in the Dixon Entrance and Clarence Strait areas. Pollock were a major food item in the outer and northern areas late in the season. Pollock had not been previously reported as a major food item of salmon. Also, crustaceans were more important in 1976 than in the earlier study.

The data and interpretations presented in this report are preliminary and tentative. Subsequent intensive analyses will probably change the interpretations and conclusions somewhat. However, the data do show the importance of continuing studies on fish diets and the need for yearly observations on relationships of fish to their environment and the potential changes in fisheries.

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Reid, Gerald M. Stomach content analysis of troll-caught king and coho salmon, southeastern Alaska, 1957-58. United States Fish and Wildlife Service Special Science Representative Fishery 379, 1961, 8 p.

SECTION III

DISTRIBUTION AND FREQUENCY OF OCCURRENCE OF BOTTOMFISH AS INDICATED BY TROLL CATCHES

Dr. Richard S. Straty
Northwest and Alaska Fisheries Center Auke Bay Laboratory
National Marine Fisheries Service, NOAA

During the 1976 fishing season, trollers participating in the log book program recorded the occurrence of "large numbers" of bottomfish in their catches. This information was expected to show seasonal and area differences in the abundance of various species of bottomfish, i.e., halibut, pollock, turbot (arrowtooth flounder), hake, and bass (rockfish and others) in southeastern Alaska.

The interpretation of these data are preliminary in nature and subject to change when viewed more closely with respect to environmental data, changes in fishing depths, allotted fishing periods, and/or area or seasonal closures. Because some of these data were not available (seasonal changes in fishing depth), were not available in summary form (environmental data), or not reviewed (fishing periods and area closures), there is uncertainty in attributing seasonal and area differences in the occurrence of bottomfish to these factors and/or to real area differences and seasonal changes in fish behavior. The uncertainties in the interpretation of much of these data can be greatly reduced in the future by knowing such things as the approximate depth of fishing, when bottomfish (halibut) are the principle target species, and some indication of the numbers of bottomfish captured.

SEASONAL DIFFERENCES IN THE OCCURRENCE OF BOTTOMFISH

Bottomfish in general were more frequent in troll catches made during the early (January 1-June 14) and middle (June 15-July 31) period than during the late (August 1-December 31) period (Table 1). We are uncertain if this occurrence reflects a seasonal change in depth preference of bottomfish or is due to a change by fishermen to a shallower fishing depth for coho salmon during the late period. It is assumed that deeper fishing results in greater catches of bottomfish than shallow fishing.

HALIBUT

Salable halibut were more frequent in the catches made in most areas during the middle (June 15-July 31) period than during the early and late periods (Table 1). Undersized halibut appeared to occur more frequently in the catches made during the early period of January 1 through June 14. The apparent lower abundance of both salable and undersized halibut during the late period may be due to a switch to shallower fishing for coho salmon at this time.

TABLE 1. FREQUENCY OF OCCURRENCE OF BOTTOMFISH CAPTURED BY AREA

Area	Total boat days	Percent of Total Boat Day Species Captured						
		Salable halibut	Under-sized halibut	Pollock hake	Turbot (arrowtooth flounder)	Cod	Bass (rockfish) and other bottomfish	Unknown or none
January 1 - June 14, 1976								
Dixon Entrance	85	12	5	3	4	1	21	64
Noyes Island	484	10	21	33	1	1	15	48
Baranof Island	28	14	7	46	0	0	71	21
Sitka Sound	253	5	5	31	0	0	41	46
Cape Cross	27	7	0	0	0	0	26	70
Fairweather Grounds	6	17	17	0	0	0	33	50
Haines to Petersburg	20	0	0	0	0	0	15	85
West Prince of Wales	81	0	1	6	0	1	9	86
Clarence Strait	35	6	0	0	0	0	0	94
Southeast Alaska	1,016	8	12	26	1	1	23	54
June 15 - July 31, 1976								
Dixon Entrance	273	23	8	1	4	3	13	61
Noyes Island	317	17	15	14	6	2	31	44
Baranof Island	60	0	3	23	0	0	12	72
Sitka Sound	218	8	2	3	0	1	26	66
Cape Cross	157	6	5	21	0	0	12	75
Fairweather Grounds	39	15	21	0	0	0	3	64
Haines to Petersburg	38	18	0	37	0	0	3	55
West Prince of Wales	117	12	3	6	0	0	8	77
Clarence Strait	122	16	1	1	2	0	3	79
Southeast Alaska	1,337	14	7	8	2	1	17	63
August 1 - December 31, 1976								
Dixon Entrance	138	13	7	2	2	3	6	78
Noyes Island	149	11	18	4	0	0	12	65
Baranof Island	77	1	0	11	0	0	9	84
Sitka Sound	178	2	7	8	0	5	27	61
Cape Cross	173	1	3	7	0	0	2	90
Fairweather Grounds	19	11	5	11	0	0	0	95
Haines to Petersburg	156	1	0	32	0	1	3	65
West Prince of Wales	106	8	1	4	3	1	15	75
Clarence Strait	43	9	0	2	0	0	0	88
Southeast Alaska	1,037	5	5	9	1	1	10	74

Although salable halibut occurred frequently in the catches made during the early period in fishing districts encompassing the outer coasts, they were virtually absent from catches made in the inside waters of the Haines to Petersburg, West Prince of Wales, and Clarence Strait areas (Table 1). This suggests that halibut may move from more coastal waters to the inside waters during the summer and out again during the late fall and winter.

POLLOCK/HAKE

In these analyses pollock and hake have been treated as a group because of the uncertainty among fishermen in making positive identification of each species.

For all fishing areas in general, pollock/hake were most frequent in the catches made during the early period of January 1 through June 14 (Table 1). With the exception of Cape Cross and Haines to Petersburg areas, pollock/hake were more frequent in the catches made after late July (Figures 1-9). When reviewing Figures 1 through 9, the reader should note that it is the proportion of boat days a species was observed in the catch to the total number of boat days trolled which is indicative of a species relative abundance rather than only the height of the individual bars representing the numbers of boat days of species observation.

Several reasons are offered for the apparent difference between the time of seasonal occurrence of pollock/hake in the Haines to Petersburg and Cape Cross areas and that occurring in the other areas. Unfortunately we do not know to what extent the depth of fishing varied between areas for a given fishing period. If changes were made to shallower fishing in one area before that in another area this could account for seasonal differences in the catch of pollock/hake between areas.

During the winter months, pollock remain deep or very near the bottom. With the warming of water temperatures in spring and summer, pollock become more active throughout the water column and therefore more vulnerable to troll gear. Sea temperatures warmed more slowly and were generally lower by several degrees throughout most of the season in the Haines to Petersburg area than in the other fishing areas. This may have resulted in pollock becoming more active throughout the water column later in this area than in the outer coastal areas. This line of reasoning, however, does not explain the later occurrence of pollock in the troll catches made in the Cape Cross area (Figure 2) which includes the outer coast.

The late occurrence of pollock in the Haines to Petersburg catches could also be attributed to a seasonal influx of large numbers of pollock from the outside waters.

TURBOT (ARROWTOOTH FLOUNDER) AND COD

These species occurred so sporadically in catches throughout the fishing season that the data reveal little about their seasonal occurrence.

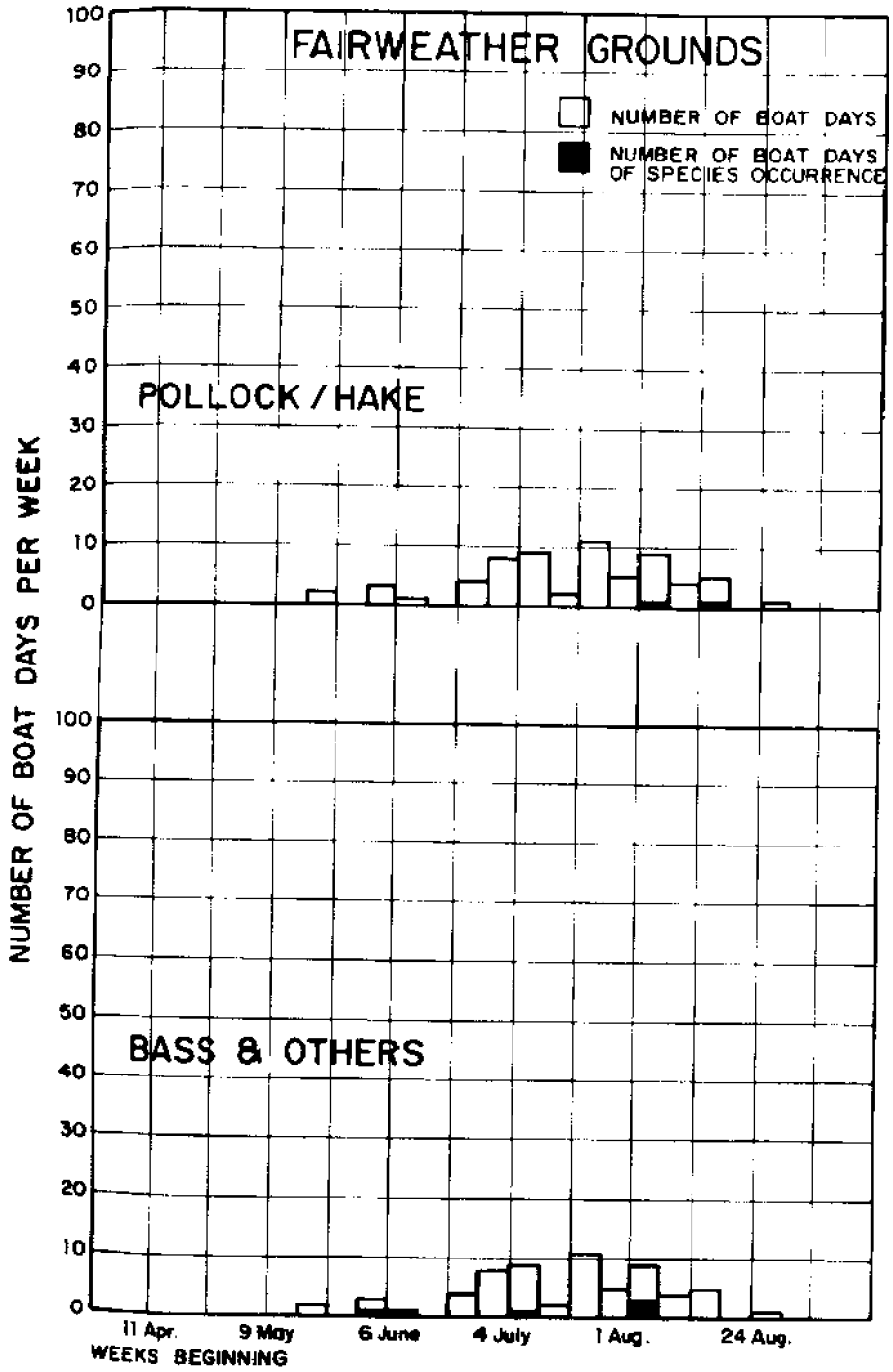

FIGURE 1. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Fairweather Ground, 1976.

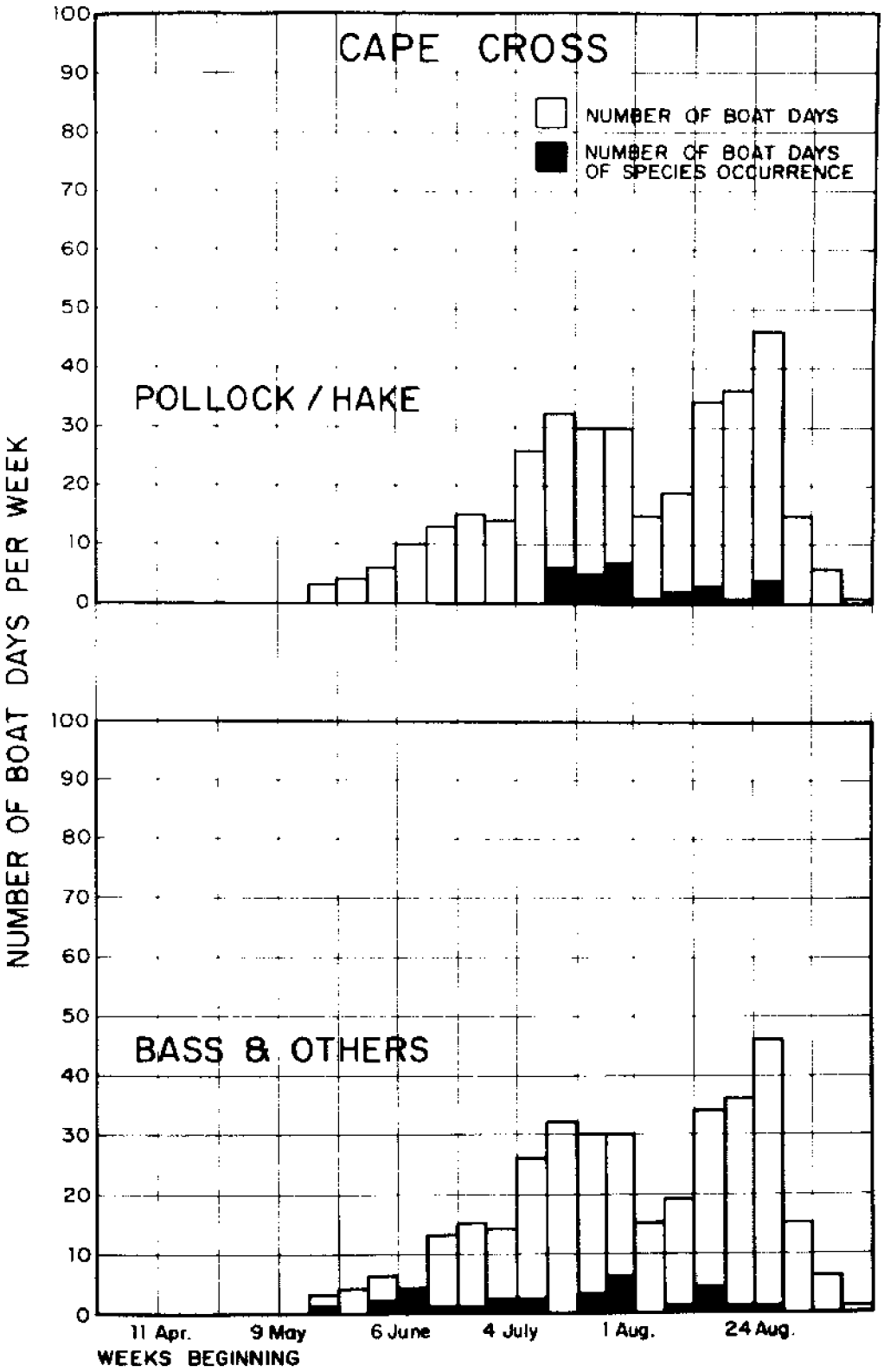

FIGURE 2. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Cape Cross, 1976.

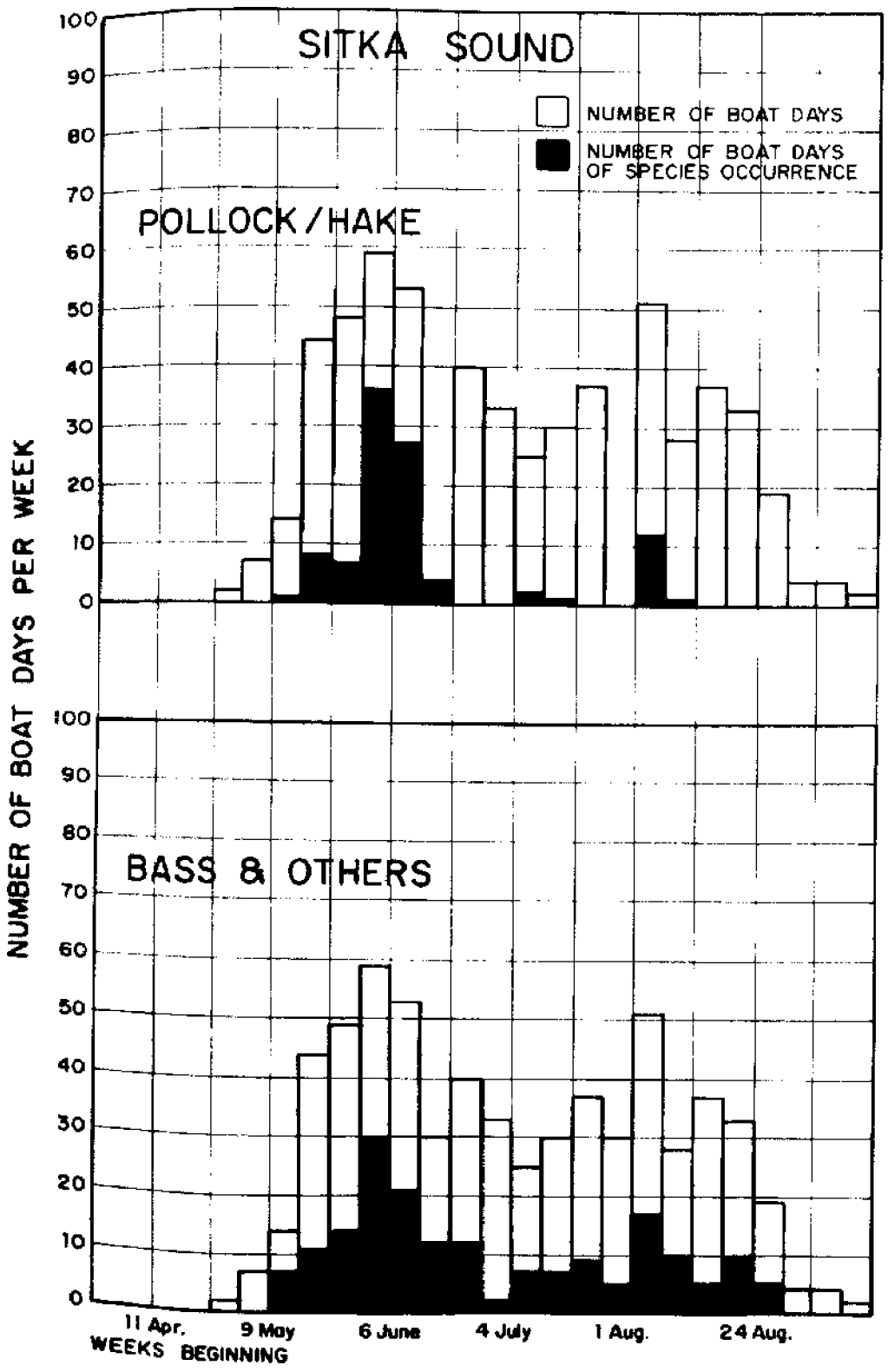

FIGURE 3. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Sitka Sound, 1976.

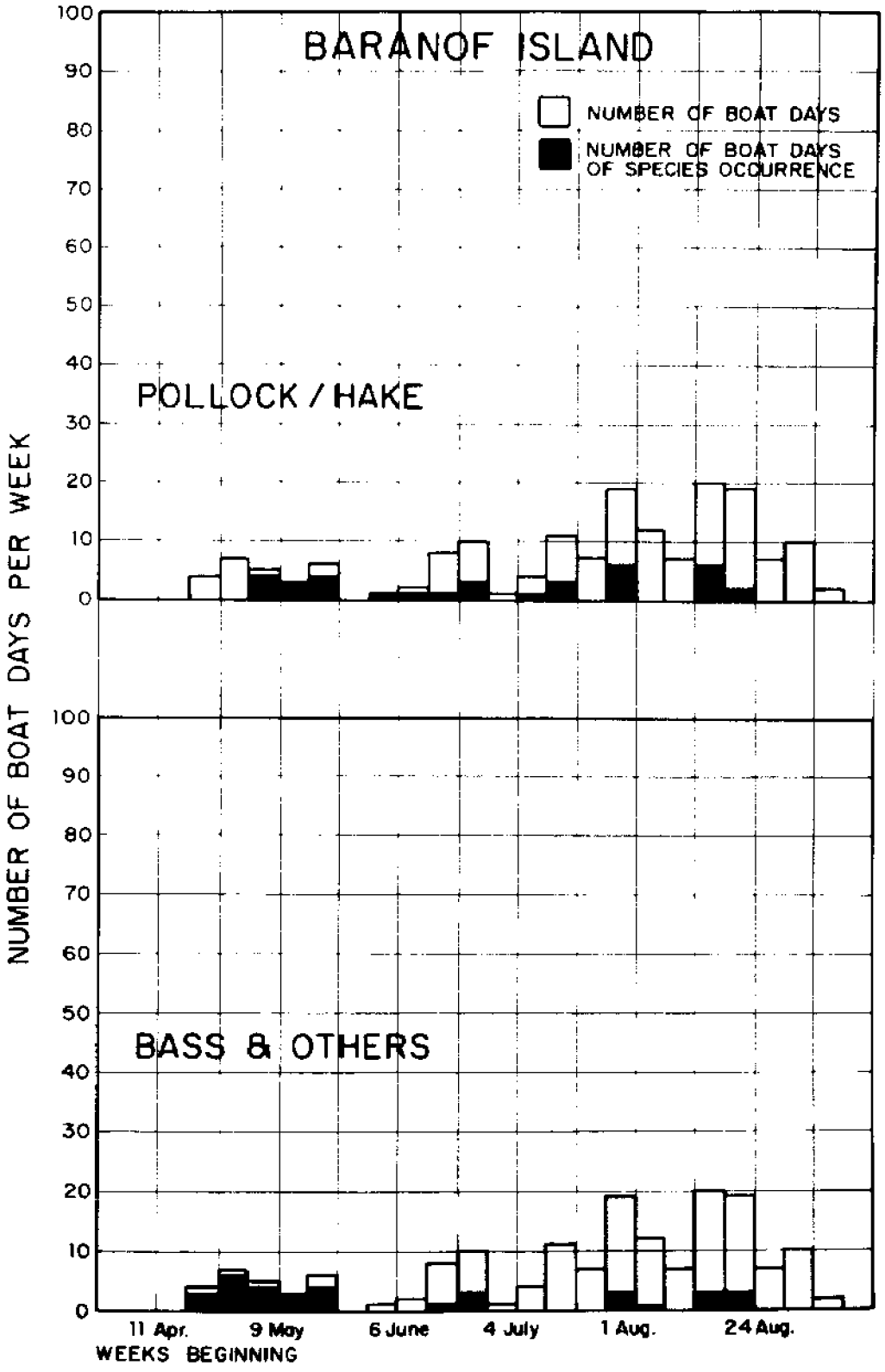

FIGURE 4. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Baranof Island, 1976.

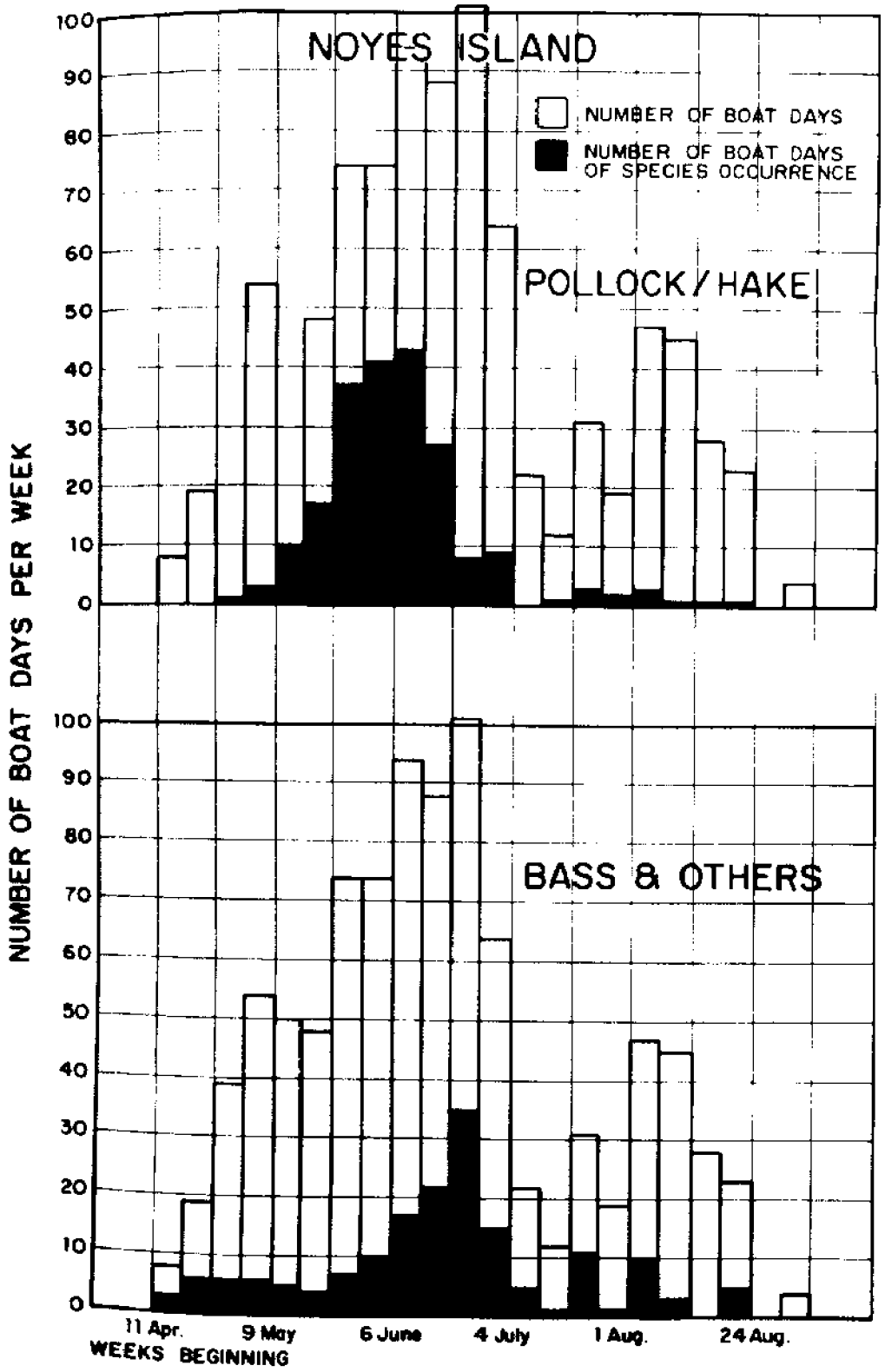

FIGURE 5. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottom fish species in troll catches from Noyes Island, 1976.

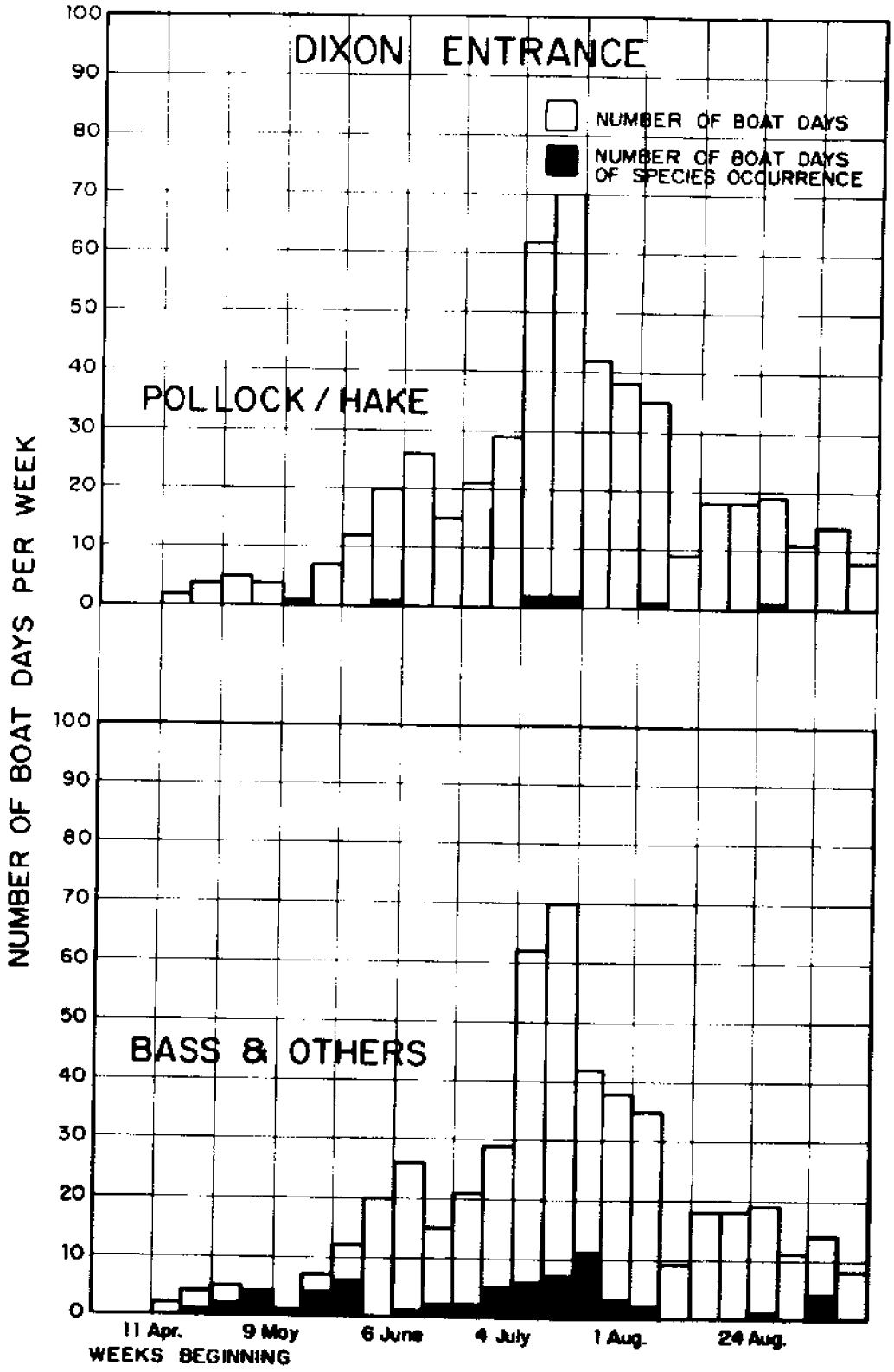

FIGURE 6. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Dixon Entrance, 1976.

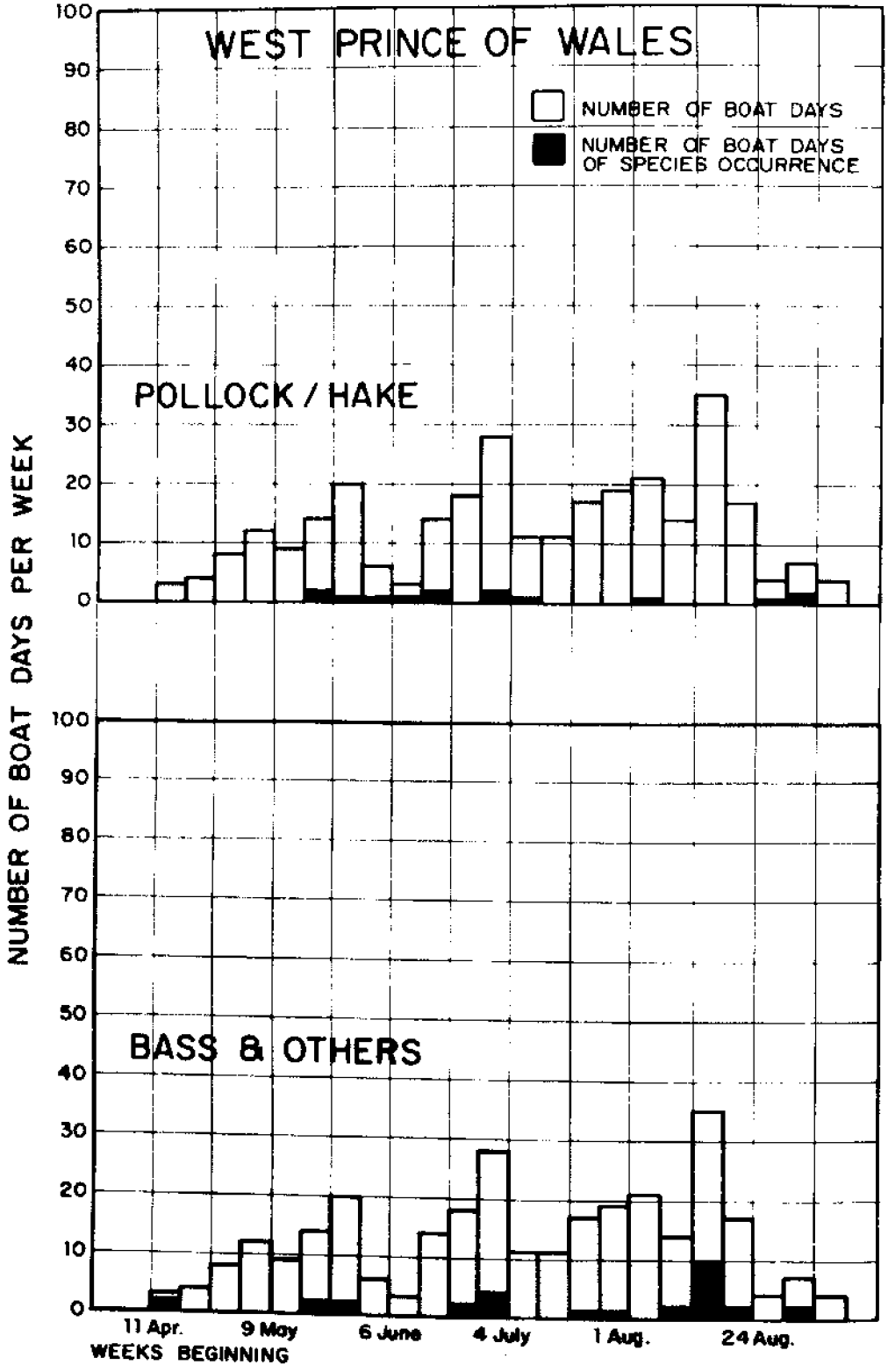

FIGURE 7. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from West Prince of Wales, 1976.

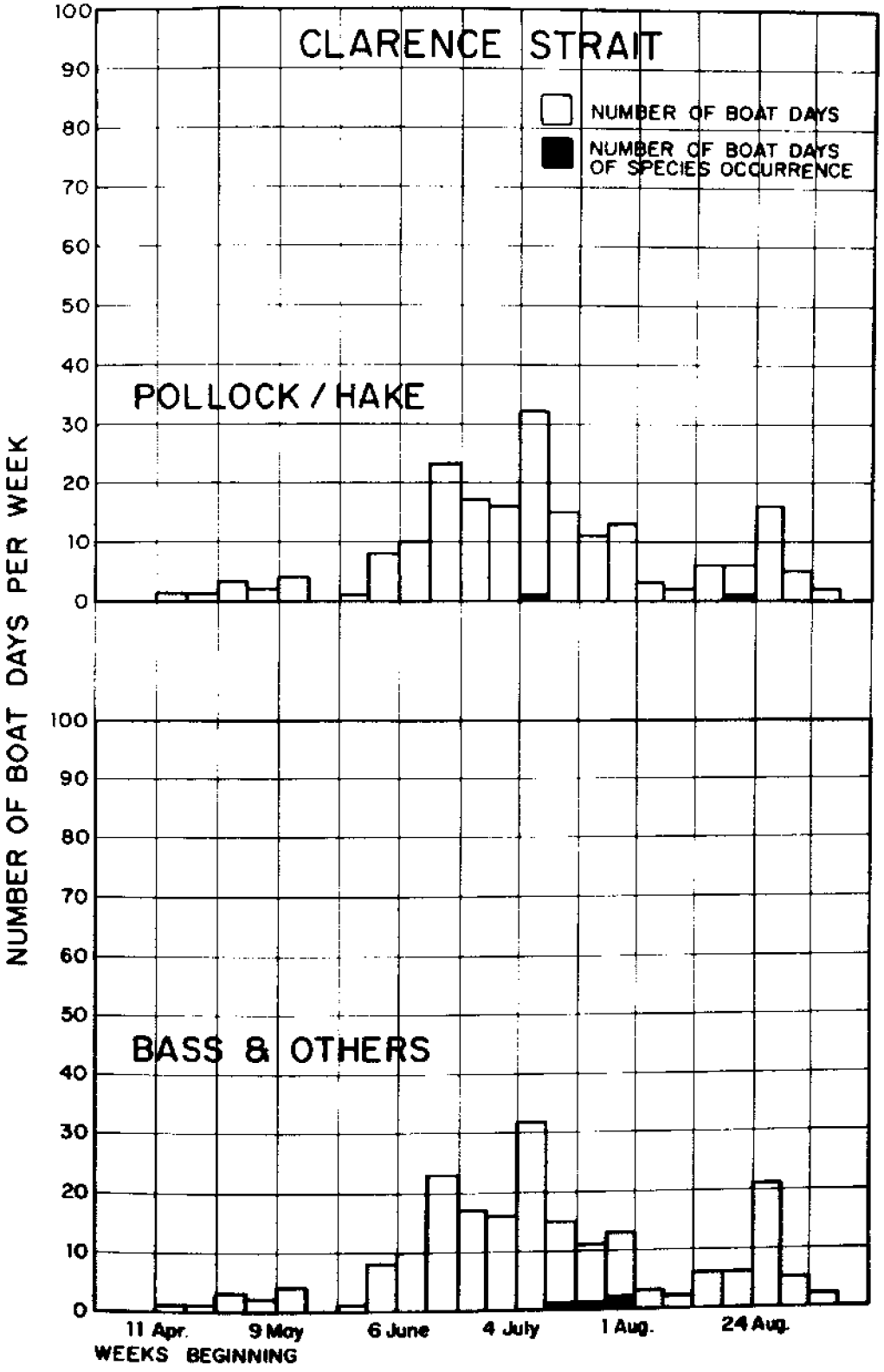

FIGURE 8. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Clarence Strait, 1976.

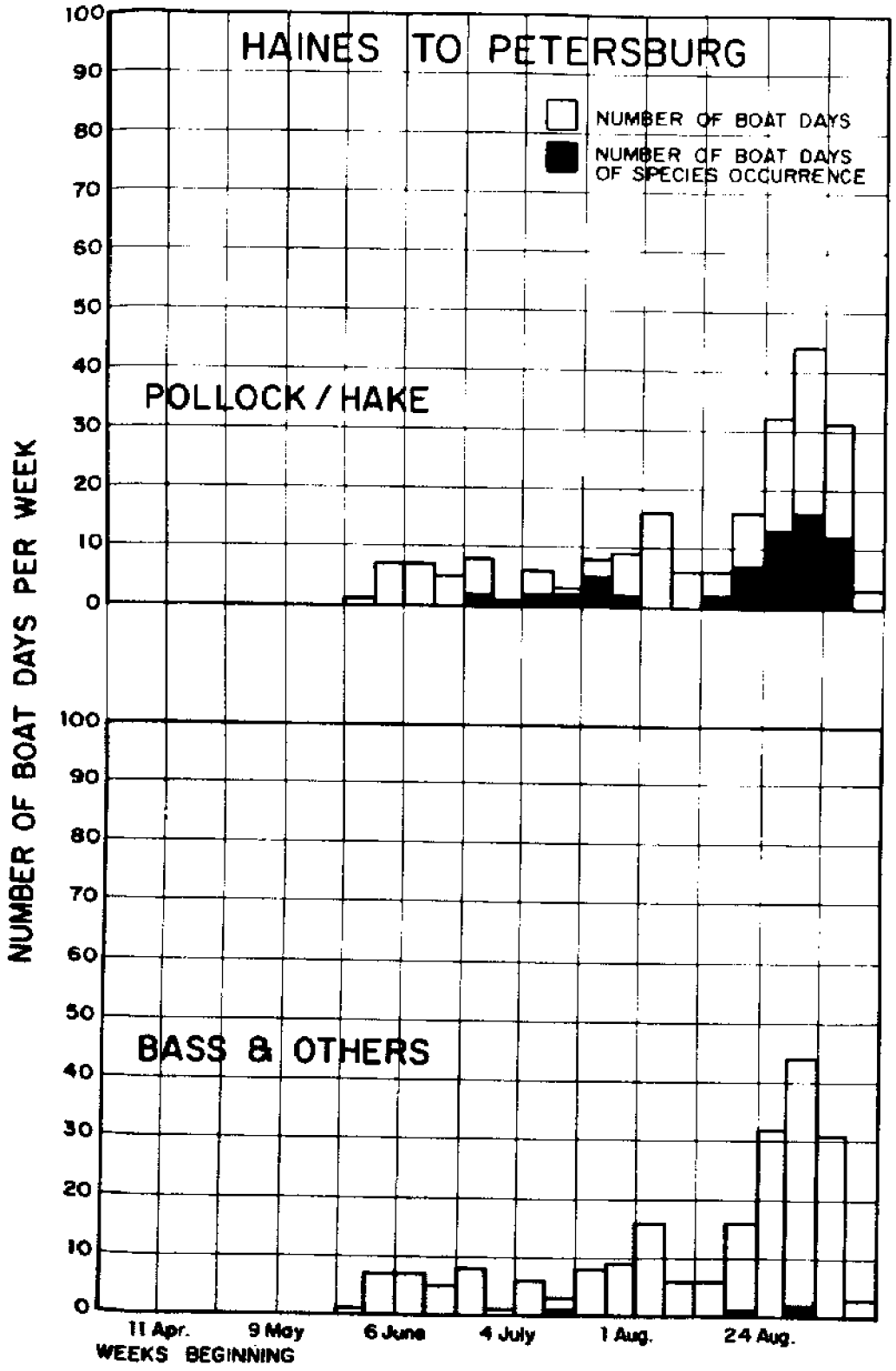

FIGURE 9. Weekly frequency of occurrence of pollock/hake, bass (rockfish) and other bottomfish species in troll catches from Haines to Petersburg, 1976.

BASS (ROCKFISH) AND OTHER BOTTOMFISH

For most areas rockfish and other bottomfish generally were most abundant during the early January 1 through June 14 fishing period (Table 1 and Figures 1-9) This may be the result of deeper fishing for king salmon early in the season and a switch to shallower fishing for coho and pink salmon later. Rockfish and other fish species were least frequent during the late period of August 1 through December 31 (Table 1 and Figures 1-9). For some fishing areas (Figures 1, 7, 8, and 9), rockfish and other bottomfish occurred sporadically throughout the fishing season and the catches reveal little with respect to their seasonal abundance.

FISHING AREA DIFFERENCES IN THE OCCURRENCE OF BOTTOMFISH

Figures 1 through 9 and Table 1 indicate that certain species of bottomfish are more prevalent in some fishing areas than in others. To what extent these species differences and abundance were due to area differences and/or differences in fishing depth is unknown. The interpretation of the recorded catch observations assumes that fishing depths were similar between areas during a given fishing period.

HALIBUT

Both salable and undersized halibut occurred most frequently in the Noyes Island, Fairweather Grounds, and Dixon Entrance fishing areas (Table 1). This was consistent throughout the fishing season and would seem to indicate that halibut are more abundant in these three areas than in the other six areas. To what extent the area differences indicated in Table 1 are due to selective fishing for halibut in these three areas or perhaps fishing for salmon at greater depth than in other areas is unknown.

POLLOCK/HAKE

Of the nine areas fished, pollock/hake appear to have been most abundant in the Noyes Island and Sitka Sound areas (Figure 3 and 5) and least abundant in the Clarence Strait (Figure 8), Dixon Entrance (Figure 6), and West Prince of Wales (Figure 7) areas. The other fishing areas appeared to be intermediate in pollock/hake abundance (Figures 2, 4, and 9).

BASS AND OTHERS (Pacific ocean perch, "red snapper," "bombers," other rockfish, "buckethead," and other bottomfish)

Bass and other bottomfish also occurred most frequently in the troll catches made in Sitka Sound and Noyes Island areas (Figures 3 and 5). The Noyes Island area appears to be richer in bottomfish including halibut (Table 1). Whether the apparent abundance of bottomfish in the Noyes Island area reflects a difference in fishing depth between this and other areas or is due to such factors as more suitable food conditions or bottom habitat is unknown. Information on the similarities and extent of bottom habitat types in the various fishing areas might be a subject worthy of investigation in the future. This information might be available from those vessels equipped with recording fathometers.

The fishing areas which appeared to contain the least abundance of bottomfish were Clarence Strait and the Haines to Petersburg areas (Figures 8 and 9). The remaining areas were intermediate in the abundance of bottomfish species. Both the Haines to Petersburg and Clarence Strait areas included the inside waters of southeast Alaska were food abundance and bottom habitat types may be less conducive to supporting as large a population of bottom fish as the more coastal fishing areas.

UNUSUAL PELAGIC FISHES

Pomfret, pampano (butterfish), and opahs were reported in late July and early August from the Fairweather and Cape Cross areas. The pomfret were confirmed by specimens delivered to the Auke Bay Laboratory. These fish apparently moved inshore with warm waters at that time. Promfret are commonly associated with the warmer offshore waters of the North Pacific from central British Columbia to southern California.

The reports of pompano, or butterfish, were far north of their recorded ranges, and were not confirmed by specimens. These may have been small pomfret which at 8-12 inches are very similar in shape and color to pompano. Pompano are more commonly encountered off the California coast and rarely occur as far north as Vancouver Island. Specimens of pompano or suspected pompano would be appreciated by the Auke Bay Laboratory.

The report of opah from the Cape Cross area was by word of mouth. These medium to large fish are associated with the same warm water as the pomfret. In the North Pacific, the opah and pomfret have similar ranges.

SECTION IV

MARINE MAMMAL SIGHTINGS

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National Marine Fisheries Service

ABSTRACT

The Alaska Trollers Log Book Program of 1976 has yielded almost 1,000 sighting reports of marine mammals; furthermore, these sightings have come from areas previously unmonitored by our other Platforms of Opportunity observers. Sighting records of humpback (*Megaptera novaeangliae*) whales from Sitka Sound and the Fairweather Grounds indicate that these animals may feed along the coast in large congregations (April-May) after arriving from their winter calving range and before dispersing throughout southeastern Alaska later in the season. Killer whale (*Orcinus orca*) sightings do not reveal any similar patterns of seasonal distribution. Brief examination of other sighting records yield no conclusive results at this time.

METHODS

During the 1976 season, aside from Northwest and Alaska Fisheries Center (NWAFC) identification briefings, the Trollers were not supplied with adequate marine mammal identification materials. Radio communication between fishermen helped to fill this gap, and resulted in a higher proportion of reliable identifications than might have been otherwise possible.

Troll log books for 1977 include several pages of marine mammal identification material and should help trollers to make positive identifications. Marine mammals that cannot be positively identified are reported as unknown whales, porpoises or seals, and an attendant description of the animal is given.

Data from the log books were coded for computer processing by Ivan Frohne and Julie Carson, Alaska Department of Fish and Game (ADF&G), Juneau. Computer tapes of the data were not available for Northwest and Alaska Fisheries Center (NWAFC) analysis at the time this preliminary report was prepared, and, consequently, this review of the data is based upon tabulations produced by Mr. Frohne.

These tabulations employ the statistical areas described in the Introduction of this report and a breakdown of the year into early (1 January - 14 June), middle (15 June - 31 July), and late (1 August - 31 December) periods. When computerized data become available, plots and analyses of troller data can be integrated with other information into a more comprehensive report.

Trollers whale sighting reports have been reviewed using the areal and temporal sectoring scheme employed in the ADF&G tables. For this presentation, numbers of animals reported for each area and period have been divided by a standard boat day coefficient as shown below:

$$Ns = N \times \frac{\overline{BD}}{BD}$$

Ns = Standardized number of animals in each area and time period.

$\overline{BD}$ = Reported number of boat days meaned over all areas and periods.

BD = Actual number of reported boat days for each area and time period.

N = Reported number of animals for each area and time period.

By this method, the numbers reported from each area and time period can be more directly compared to determine relative reported abundance of each species. Figures 1 and 2 employ these standardized numbers in presentation of the data.

Reported sightings of humpback whales were plotted by hand for each period in an effort to determine more precisely the movements of these animals. General areas of reported abundance of humpback whales have been indicated (Figures 3-5) by crosshatching those areas on a chartlet of southeast Alaska. NWAFC computer (Figures 6-8) plots of MM sighting reports from all nontroller observers were prepared to permit comparison with troller data.

RESULTS

It is difficult to discern any major patterns of marine mammal distribution and relative abundance from a single type source (such as the trollers) and year class of data. Trollers data will be of more value when compared with data from other observers in southeastern Alaska. Some correlation of humpback whale sightings with those from other sources (Figures 6-8) has been attempted for this writing but information on other species will not be analyzed until a computerized version of the data is available.

HUMPBACK WHALES

Concentrations of humpback whales were reported in the Sitka Sound area during all three periods with the greatest reported abundance of animals occurring in late May and early June. Humpbacks were reported from the Noyes Island area during the early (Jan. 1-June 14) and middle (June 15-July 31) periods but not after August 1. There was a shift of reported humpback sightings in the Cape Cross area from the central portion during the early period to the northern portion for the middle period; this could, however, be the result of a shift in fishing activity area rather than a pattern of humpback distribution. Sighting reports of numbers of humpbacks per standard boat day (Figure 1 and Table 1) by area seem to indicate that they disperse inland as the season progresses. Because trollers also may move inland in pursuit of salmon, this trend may be an artifact of the sampling system; however, plots of humpback reports from other observers (Figures 6-8) also indicate that such dispersal may occur.

Humpback whales (*Megaptera novaeangliae*). Killer whales (*Orcinus orca*).

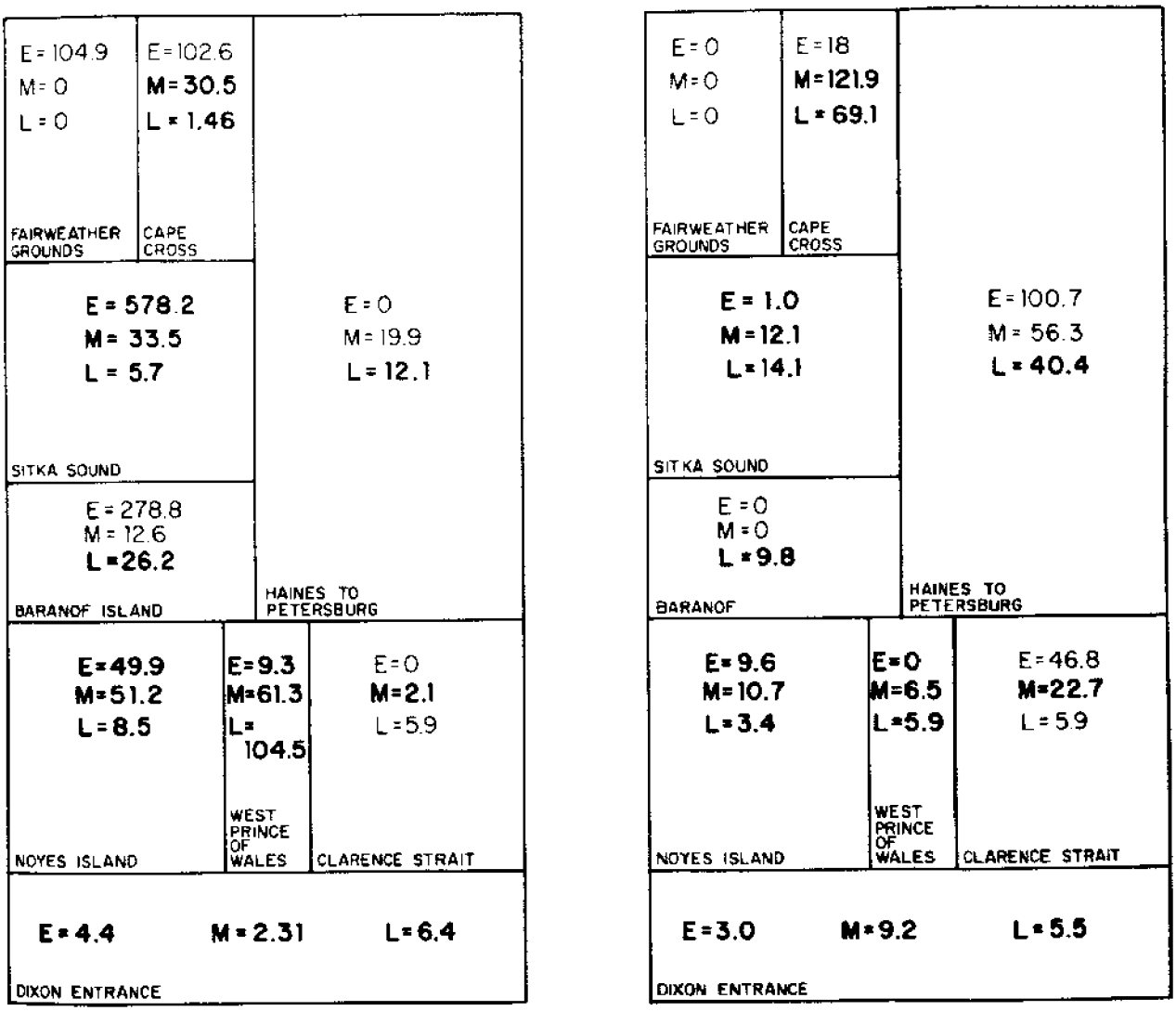
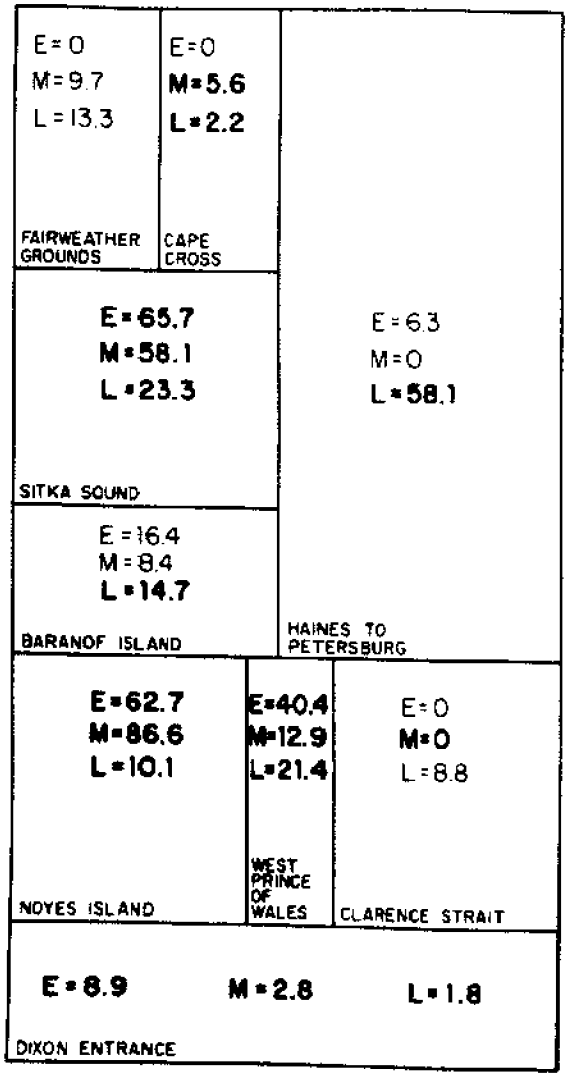


FIGURE 1. Standardized numbers of humpback and killer whales reported for each statistical area and time period. Light numbers indicate fewer than 60 for 6 days reported. E = early period (Jan. 1-June 14); M = middle period June 12-July 31); and L = late period Aug. 1-Dec. 31).

Unknown large (Fin, Sei, Sperm, Gray, Right)



Unknown small (Minke, Pilot)

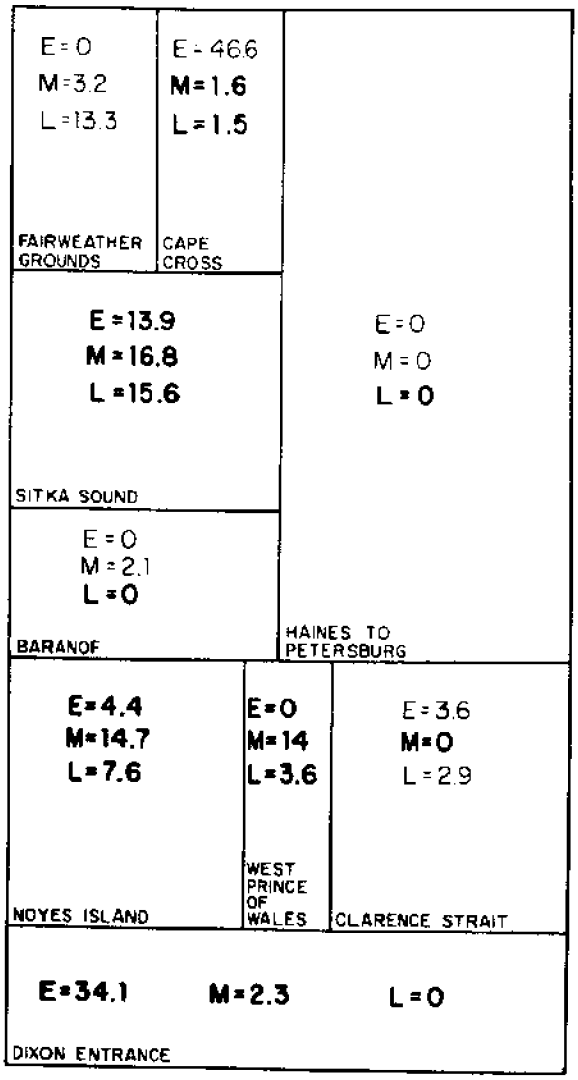


FIGURE 2. Standardized number of unknown large and unknown small whales reported for each statistical area and time period. Light numbers indicate fewer than 60 for 6 days reported. E = early period (Jan. 1–June 14); M = middle period (June 15–July 31); and L = late period (Aug 1–Dec. 31).

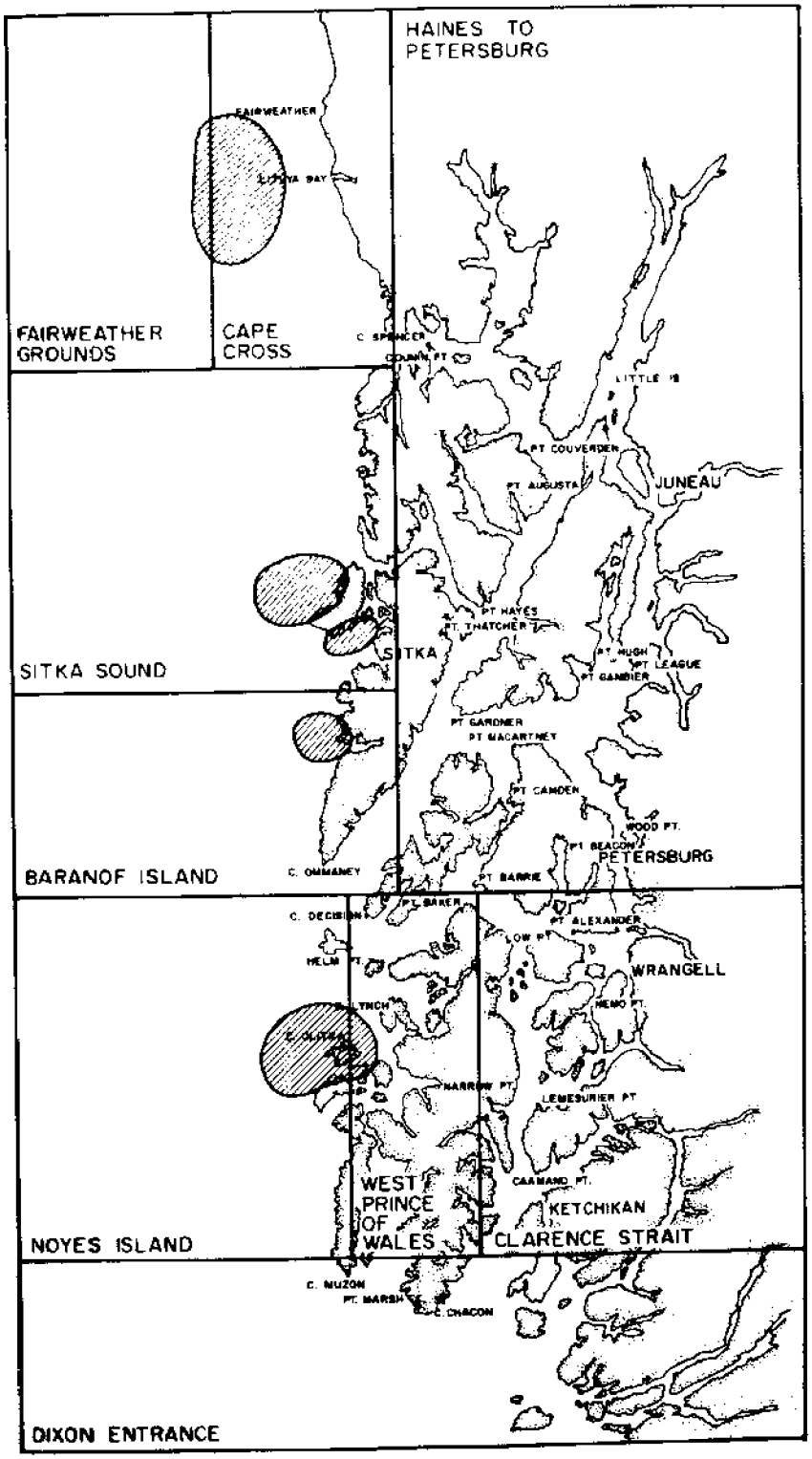


FIGURE 3. Areas where concentrations of humpback whales (*Megaptera novaengliae*) were reported by trollers during the early period (Jan. 1-June 14) of 1976.

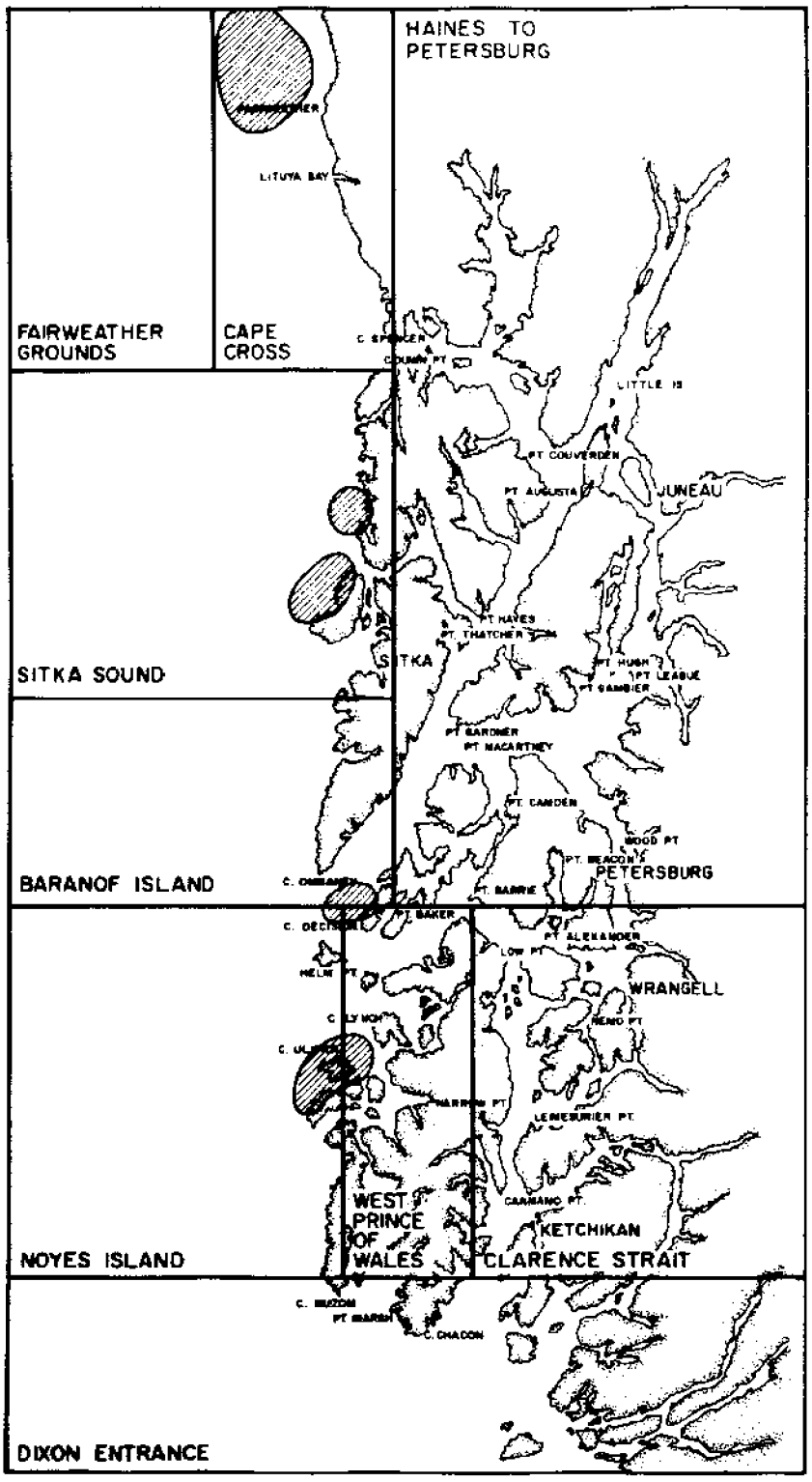


FIGURE 4. Areas where concentrations of humpback whales (*Megaptera novaengliae*) were reported by trollers during the middle period (June 15-July 31) of 1976.

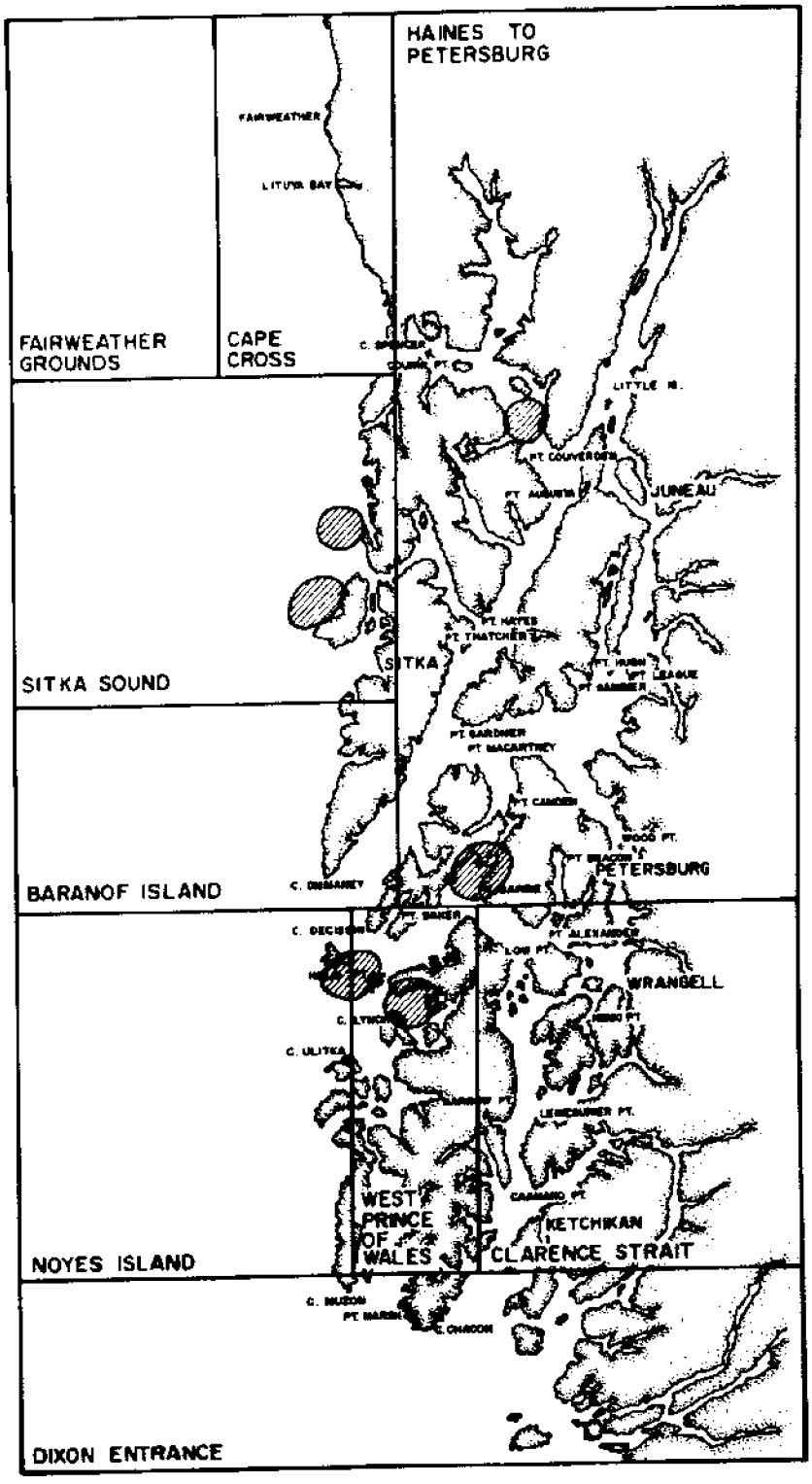


FIGURE 5. Areas where concentrations of humpback whales (*Megaptera novaengliae*) were reported by trollers during the late period (Aug. 1-Dec. 31) of 1976.

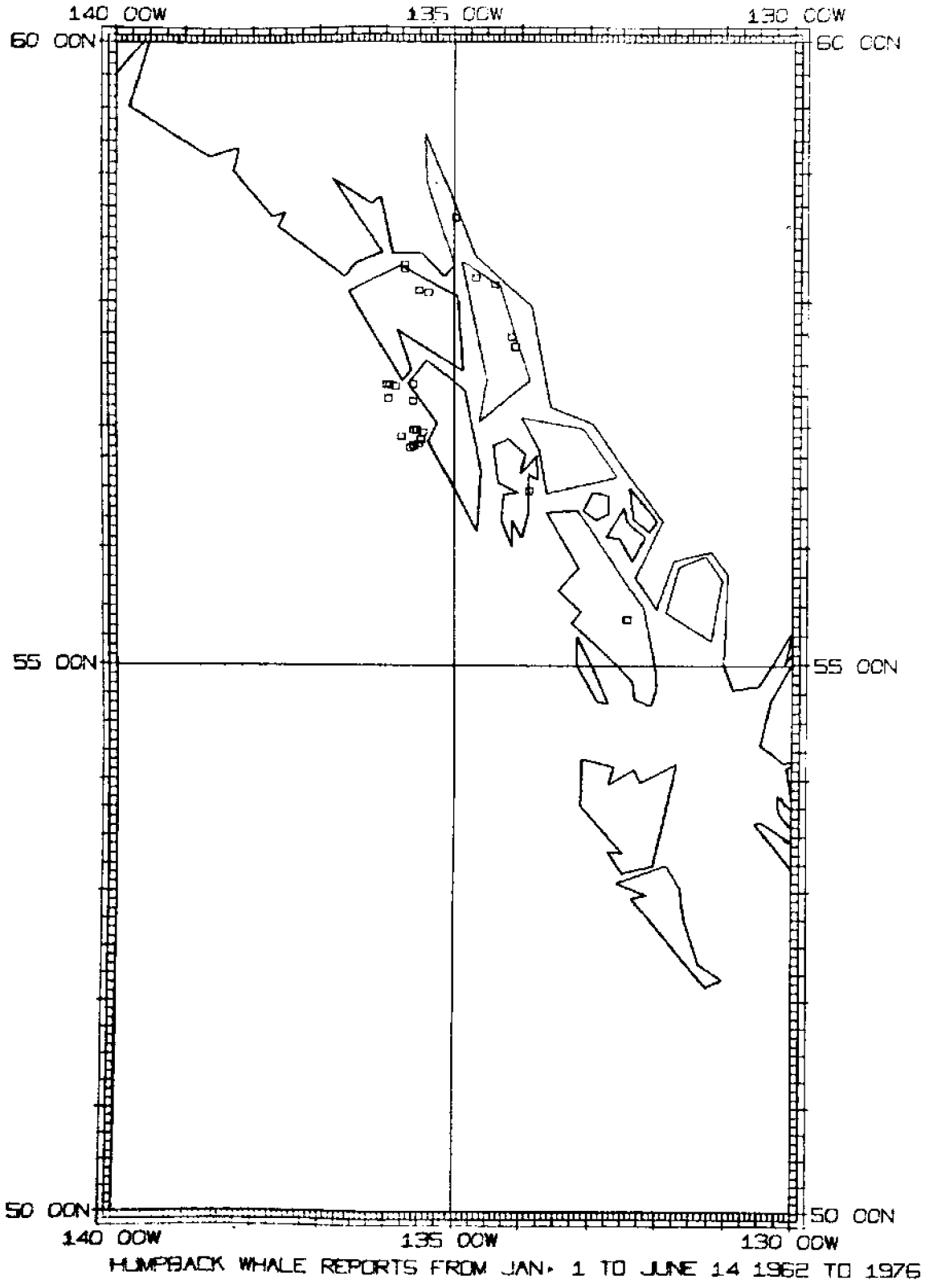


FIGURE 6. Sightings of humpback whales (*Megaptera novaengliae*) reported by observers other than trollers for the early period (Jan. 1-June 14) since 1971.

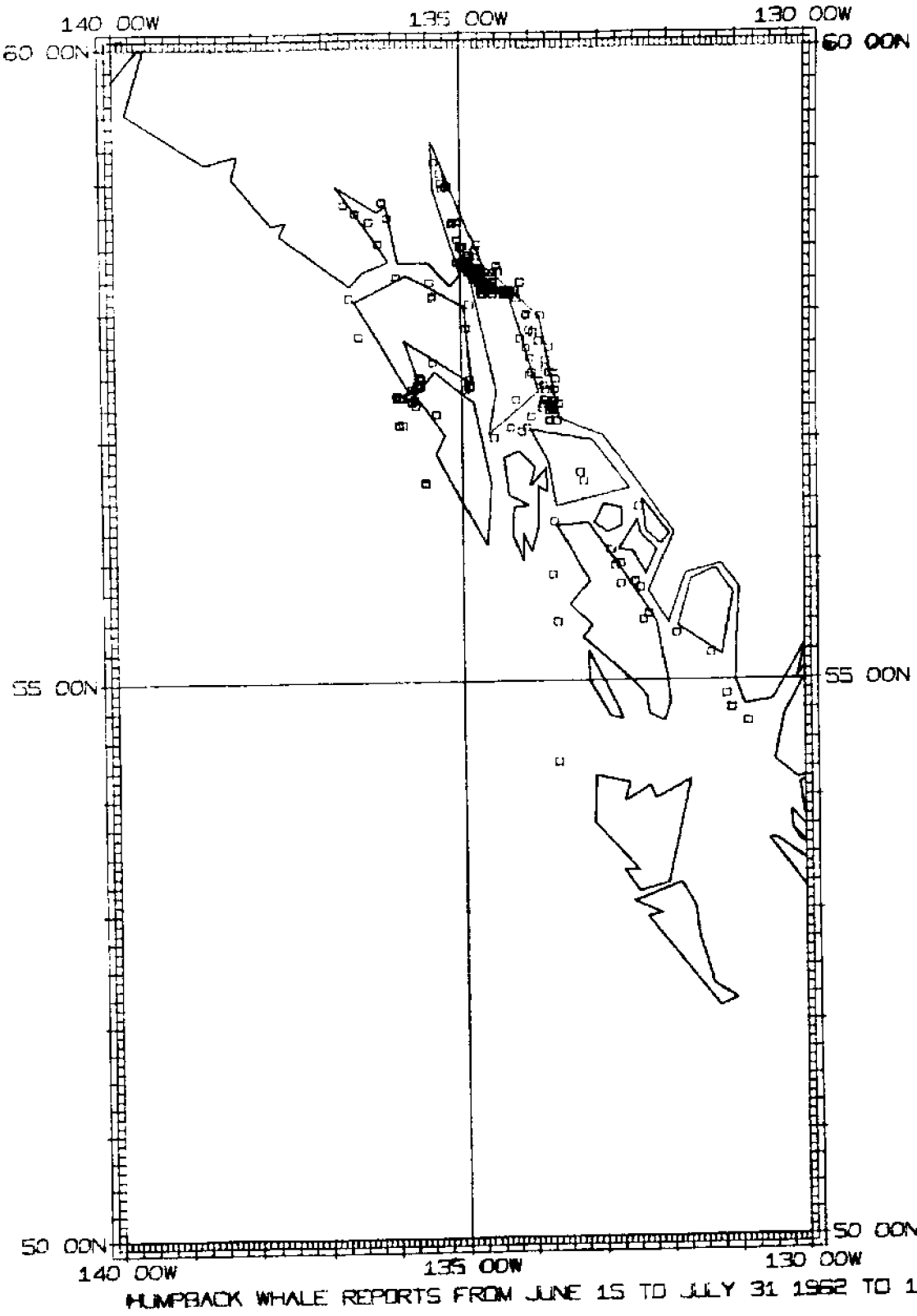


FIGURE 7. Sightings of humpback whales (*Metaptera novaengliae*) reported by observers other than trollers during the middle period (June 15-July 31) since 1971

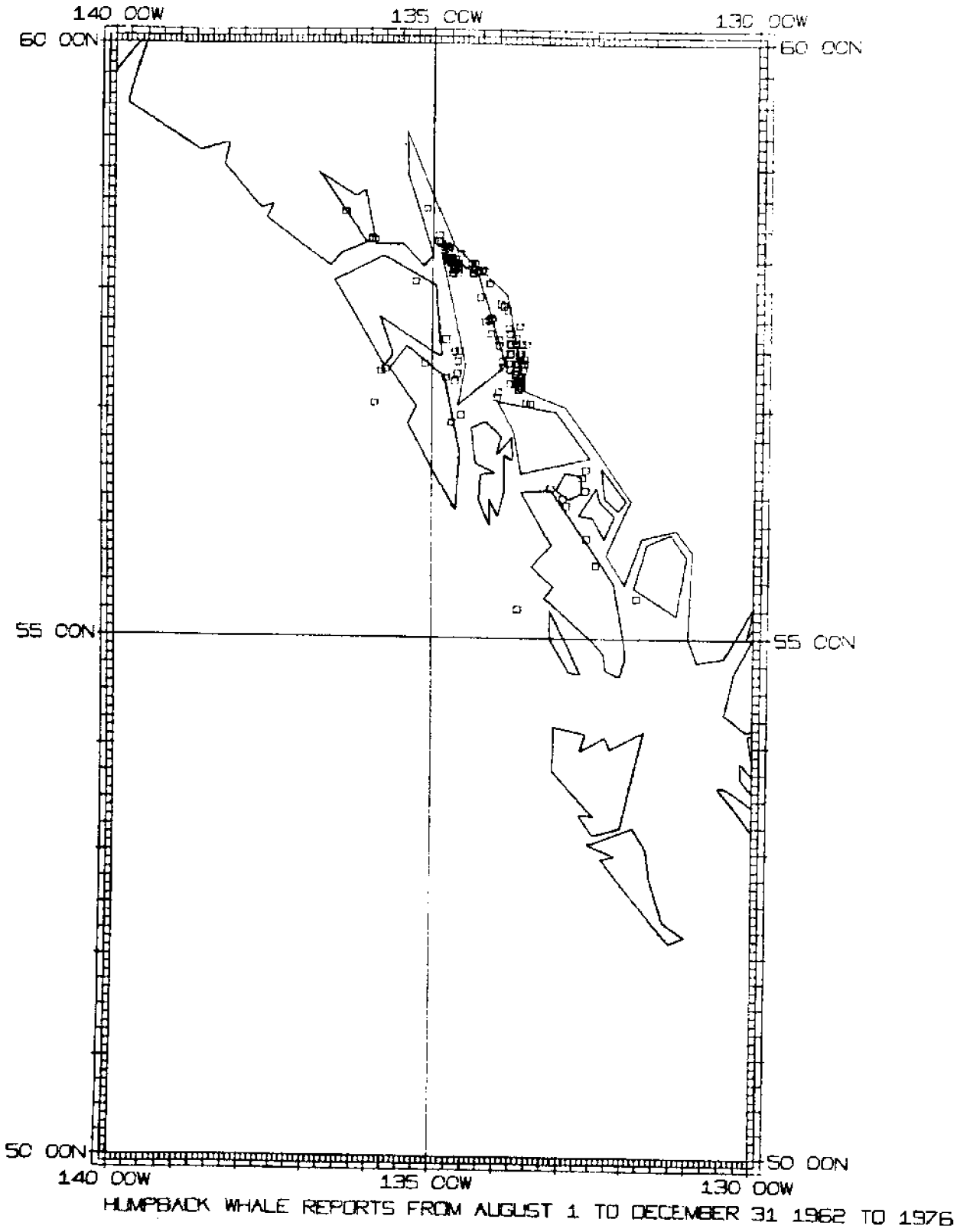


FIGURE 8. Sightings of humpback whales (*Megaptera novaengliae*) reported by observers other than trollers during the late period (Aug. 1-Dec. 31) since 1971.

	1/1 - 6/14	6/15 - 7/31	8/1 - 12/31	1/1 - 12/31
DIXON ENT.	3 / 85	5 / 273	7 / 138	15 / 496
NOYES IS.	192 / 484	129 / 317	10 / 149	335 / 950
BARANOF	62 / 28	6 / 60	16 / 77	84 / 165
SITKA	1162 / 253	58 / 218	8 / 178	1228 / 649
CAPE CROSS	22 / 27	38 / 157	2 / 173	62 / 357
FAIRWEATHER	5 / 6	0 / 39	0 / 19	5 / 64
HAINES TO PETERSBURG	0 / 20	6 / 38	15 / 156	21 / 214
WEST PRINCE OF WALES	6 / 81	57 / 117	88 / 106	151 / 304
CLARENCE ST.	0 / 35	2 / 122	2 / 43	4 / 200
SUM	1452 / 1019	301 / 1341	148 / 1039	1901 / 3399

NUMBER REPORTED / BOAT DAYS

TABLE 1. Number of humpback whales and boat days reported for each sector and time period.

KILLER WHALES

Although there is a shift in the number of reported killer whales per standard boat day from inland areas (Haines-Petersburg, Clarence Strait) to some offshore areas (Cross Sound, Sitka Sound, Baranof Island), the actual numbers of boat days (less than 60 days) involved in some of the more obvious trends are not large enough to support such a conclusion (Figure 1 and Table 2). In addition, some of the areas show a contradictory trend (Noyes Island, West Prince of Wales). The 1976 trollers data do not reveal any clear temporal distribution patterns for killer whales. Perhaps further analysis and correlation will reveal some.

OTHER WHALES

All whales (Figure 2 and Tables 3 and 4) other than humpback and killer whales have been grouped under the classification of unknown whales and unknown small whales to expedite a cursory analysis of the data. Most species in these classifications are migrant animals which feed in Gulf of Alaska waters during the summer months; thus, a peak in reported abundance of these animals might be expected during the middle (June 15-July 31) period. No such peak is consistently evident from last season's data. This is probably due to the variation between the grouped species and to non-migratory movements within the feeding range of some of these species. Further breakdown of this data after species reports are verified with microfiche copies of the 1976 log books might reveal patterns that are not now discernible.

DISCUSSION

Marine mammal sighting reports from the 1976 Trollers Log Book Program are an important contribution to the southeastern Alaska data base. Taken alone, this data is but a brief glance at the overall situation; correlated with data from other sources and, if the program continues, with trollers data from other seasons, significant gains can be made in our understanding of the distribution and relative abundance of marine mammals in southeastern Alaska.

During the upcoming 1977 season, provided with identification materials in the log books, the trollers might be able to improve the reliability of their identifications. Although positive species identification is desired for all sightings reported, we realize that this is an impossible request and that a larger proportion of unidentified animals often reflects a higher degree of reliability for those animals that are identified.

	1/1 - 6/14	6/15 - 7/31	8/1 - 12/31	1/1 - 12/31
DIXON ENT.	2 / 85	20 / 273	6 / 138	28 / 496
NOYES IS.	37 / 484	27 / 317	4 / 149	68 / 950
BARANOF	0 / 28	0 / 60	6 / 77	6 / 165
SITKA	2 / 253	21 / 218	20 / 178	43 / 649
CAPE CROSS	4 / 27	152 / 157	95 / 173	251 / 357
FAIRWEATHER	0 / 6	0 / 39	0 / 19	0 / 64
HAINES TO PETERSBURG	16 / 20	17 / 38	50 / 156	83 / 214
WEST PRINCE OF WALES	0 / 81	6 / 117	5 / 106	11 / 304
CLARENCE ST.	13 / 35	22 / 122	2 / 43	37 / 200
SUM	74 / 1019	265 / 1341	188 / 1039	527 / 3399

NUMBER REPORTED / BOAT DAYS

TABLE 2. Number of killer whales and boat days reported for each sector and time period.

	1/1 - 6/14	6/15 - 7/31	8/1 - 12/31	1/1 - 12/31
DIXON ENT.	6 / 85	6 / 273	2 / 138	14 / 496
NOYES IS.	241 / 484	218 / 317	12 / 149	471 / 950
BARANOF	17 / 28	4 / 60	9 / 77	30 / 165
SITKA	132 / 253	365 / 218	33 / 178	530 / 649
CAPE CROSS	0 / 27	7 / 157	3 / 173	10 / 357
FAIRWEATHER	0 / 6	3 / 39	2 / 19	5 / 64
HAINES TO PETERSBURG	1 / 20	18 / 38	72 / 156	91 / 214
WEST PRINCE OF WALES	26 / 81	12 / 117	18 / 106	56 / 304
CLARENCE ST.	0 / 35	0 / 122	3 / 43	3 / 200
SUM	423 / 1019	633 / 1341	154 / 1039	1210 / 3399

NUMBER REPORTED / BOAT DAYS

TABLE 3. Sum of sei, fin, sperm, gray, right and unknown whales and boat days for each sector and time period.

	1/1 - 6/14	6/15 - 7/31	8/1 - 12/31	1/1 - 12/31
DIXON ENT.	23 / 85	5 / 273	0 / 138	28 / 496
NOYES IS.	17 / 484	37 / 317	9 / 149	63 / 950
BARANOF	0 / 28	1 / 60	0 / 77	1 / 165
SITKA	28 / 253	29 / 218	22 / 178	79 / 649
CAPE CROSS	10 / 27	2 / 157	2 / 173	14 / 357
FAIRWEATHER	0 / 6	1 / 39	2 / 19	3 / 64
HAINES TO PETERSBURG	0 / 20	0 / 38	0 / 156	0 / 214
WEST PRINCE OF WALES	0 / 81	13 / 117	3 / 106	16 / 304
CLARENCE ST.	1 / 35	0 / 122	1 / 43	2 / 200
SUM	79 / 1019	88 / 1341	39 / 1039	206 / 3399

NUMBER REPORTED / BOAT DAYS

TABLE 4. Sum of minke, pilot and unknown small whales and boat days reported for each sector and time period.

APPENDIX

SAMPLE LOG BOOK PAGE AND INSTRUCTIONS PROVIDED FISHERMEN

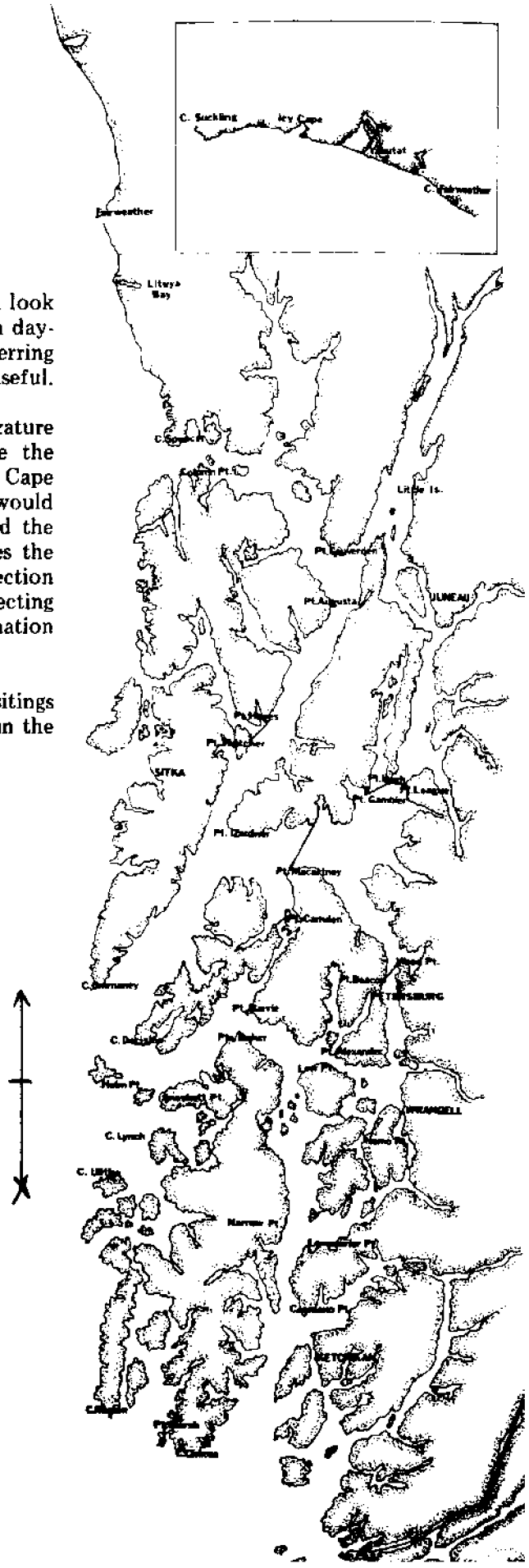
Date _____

Water Temperature 50 54 48

One of the objectives of this logbook is to get a look at the overall current situation along the coast on a day-to-day basis. If you are travelling a record of differring water temperatures along the way would be very useful.

A boat leaving Noyes Island, where the temperature was 50 degrees, passing Coronation Island where the temperature was 54 degrees, and arriving at Cape Ommaney where the temperature was 48 degrees would line his route on the chart as indicated and record the readings (X-50, — -54, ▲ -48). The "X" indicates the point of origin, the arrow indicates both the direction of travel and the destination, and the small intersecting line indicates where 54 degrees was recorded (Coronation Island).

Temperature, unusual water color, and whale sitings should be recorded even if you don't get the gear in the water.



Date _____

Indicate vessel's position with an "X"

Water temperature _____ _____ _____

Water color (if unusual)

_____

Kings

Mild cure _ _____ Small and Med. _____

Shakers 0 1-5 6-20 20+
(circle one)

Coho _____ Pink _____

Sockeye _____ Chum _____

Stomach Contents (in order of predominance)

1. _____

2. _____

3. _____

Bottomfish (check only if large numbers are encountered)

Salable halibut	_____
Undersize halibut	_____
Pollock	_____
Bombers	_____
Other _____	_____

Whales

Species	Number
_____	_____
_____	_____
_____	_____
_____	_____

Other Observations or comments: