AGENDA D-3
SEPTEMBER 1982

M E M O R A N D U M

TO: Council, SSC, and AP members

FROM: Jim H. Branson
Executive Director

DATE: September 13, 1982

SUBJECT: Bering Sea/Aleutian Islands King Crab Fishery Management Plan

ACTION REQUIRED

None. For information only.

BACKGROUND

The BS/AI King Crab FMP, the Regulatory Impact Review, and draft implementing regulations were submitted for Secretarial review on June 1, 1982. The Secretarial review period began on June 10 and while scheduled to end on August 9, it is continuing due to revisions being made to the RIR, draft regulations, and Final Environmental Impact Statement. These documents are nearing completion and it is anticipated that Secretarial action on the king crab FMP will occur prior to the next Council meeting.

The Northwest and Alaska Fisheries Center Bering Sea Survey is now complete and is currently undergoing analysis. A report on the status of the king crab stocks will be available.

A preliminary report on the Bristol Bay king crab fishery and the crab observer program will also be available.

RESULTS OF THE 1982 EASTERN BERING SEA CRAB SURVEY

Report To: North Pacific Fishery Management Council and U.S. Section of the International North Pacific Fisheries Commission

Sitka, Alaska
September 21 - 24, 1982

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INTRODUCTION

The 1982 survey was conducted between May 27 and August 6 by the NOAA R/V Chapman and the chartered F/V Pat San Marie. The survey covered the habitats of all commercial crab stocks in the Bering Sea except for Norton Sound red king crab. Abundance estimates are given in Tables 1 - 3. Distribution charts are provided in Figures 1 - 5. Size frequency distributions for each stock are given in Figures 6 and 7 to provide an assessment of future stock trends.

Methodology was similar to that of previous surveys in that stations were made at the centers of squares defined by a 20 x 20 nautical mile grid. A larger trawl was used in the 1982 survey than has been used in previous years. Population estimates have been adjusted for this fact. Bottom tending characteristics of the larger trawl appear to be similar to those of trawls used in previous years so the necessary adjustment was simply to allow for a greater area swept in 1982. Procedures for estimating abundance were identical to those of previous years.

STATUS OF STOCKS

Red King Crab. The abundance of legal crab is the lowest on record (Table 1). The contribution of Pribilof Islands red king crab is insignificant and the figures given reflect trends in Bristol Bay. The downward trend in legal crab abundance began in 1980, became severe in 1981, and continues to be severe in 1982. The distribution of crab in 1982 (Fig. 1) was similar to that of 1981. Size frequency information indicates improvement over the next several years although little improvement is expected for 1983. A catch of 10 - 20 million pounds is anticipated for 1982 as compared to 130 million in 1980 and 33 million in 1981. To date, no deliveries have been made in Bristol Bay although 55 vessels are registered for the area.

Pribilof Island Blue King Crab. Abundance of legal crab in 1982 is about half of what it was from 1978 to 1981. The distribution of blue king crab (Fig. 2) is similar to that of previous years. Trends in abundance of pre-recruits and size frequency information (Fig. 6) indicate declining abundance in the future. The fishery is now in progress and a catch of 6 million pounds is projected. A closure has been announced by ADF&G for noon on September 25. The projected catch is 60 - 70% of the 9 million pounds taken in 1981 but will be near the average for the past 7 - 8 years. To date, about 2 million pounds have been delivered by 118 registered vessels and the catch rate is currently 7 crab per pot. This catch rate is identical to the season average for last year but participation has increased relative to 1981 by 24 vessels.

St. Matthew Blue King Crab. Abundance of legal crab in 1982 was more than twice that of 1981. The distribution of legal crab (Fig. 2) was similar to that of 1981 except that somewhat higher relative abundances were encountered to the south and west of the island. Size frequency information (Fig. 6) indicates declining recruitment although abundance is expected to be above average in 1983. The fishery occurred during August and a record catch of 9 million pounds was taken compared to 4.6 million pounds in 1981. This fishery attracted 96 vessels in 1982 as compared to 31 in 1981. Catch rates for 1981 and 1982 were 18 and 11 crab per pot respectively. In this case, declining catch rates are indicative of increased competition between vessels as opposed to declining abundance.

Tanner Crab (C. bairdi). Abundance of legal Chionoecetes bairdi in 1982 is down about 30% from 1981 (Table 2). There has been a downward trend in abundance since 1975. The distribution of legal crab in 1982 (Fig. 3) is similar to that of 1981; showing highest relative abundances in eastern Bristol Bay and in the vicinity of the Pribilof Islands. Abundance of pre-recruits as well as size frequency data (Fig. 7) indicate increasing recruitment that should be reflected in the 1983 fishery. The 1982 fishery produced 11 million pounds as compared to 30 million pounds in 1981. Vessels participating in the fishery declined from 165 in 1981 to 125 in 1982 while catch rates declined from 21 to 10 crab per pot. Both declines reflect diminished stock abundance.

Tanner Crab (C. opilio). Abundance of large (no legal size established) crab is down by about one third in the area south of 58° and up by about a half to the north (Table 2). Overall abundance remained constant from 1981 to 1982. Consistent with above abundance trends, the distribution of large crab (Fig. 4) showed higher relative abundances north of 58° than were present in 1981. This shift in distribution is attributed to localized recruitment. Tentatively, pre-recruit abundances as well as size frequency information (Fig. 7) indicate increasing recruitment. Recruitment patterns in this species are poorly known due to localized differences in growth rates. Currently, the size at recruitment is about 110 mm (4.3 inches) while a legal size limit of 78 mm is proposed. Future fishery trends are more contingent upon changes in the size at recruitment than on the abundance of recruits at this point in time. For example, decreasing the minimum size of crab in the catch from 110 mm (4.3 inches) to 95 mm (3.7 inches) would increase the number of crab available to the fishery from 10.8 million crab to 74.6 million crab for the area south of 58°. The 1982 fishery produced 30 million pounds as compared to 50 million pounds in 1981. Some U.S. effort was reported north of 58° for the first time. Vessel participation decreased from 153 vessels in 1981 to 122 vessels in 1982 while catch rates decreased from 76 to 51 crab per pot. These declines reflect diminished stock abundance although C. opilio stock abundance has been more stable than that of C. bairdi. The same vessels are used simultaneously in fishing for the two species of tanner crab and trends in participation can not be entirely attributed to the stock abundance of either species.

Korean Hair Crab. Abundance of large crab (no legal size established) declined by more than 50% from 1981 to 1982 (Table 3). The distribution of hair crab (Fig. 5) is similar to that of previous years and shows that the vast majority of the stock is located near the Pribilof Islands. This is a developing fishery and catches were inconsequential prior to 1981 when 2.4 million pounds were taken. The 1982 catch is currently about 0.4 million pounds. This fishery is still in progress but production in 1982 is not expected to reach 50% of that in 1981. The decline in catch from 1981 to 1982 primarily reflects poor market conditions rather than changes in abundance. Participation in the fishery was 67 vessels in 1981 and the catch rate was 7 crab per pot. Participation and catch rate data for 1982 are not yet available. The vast majority of hair crab are landed incidentally to tanner crab fisheries.

Table 1. -- Population estimates for eastern Bering Sea king crabs from NMFS surveys (millions of crabs).

Bristol Bay and Pribilof Red King Crabs

Year	Pre-recruits 1/	Legals 1/
1969	19.5	9.8
1970 2/	8.4	5.3
1972	8.3	5.4
1973	25.9	10.9
1974	31.2	20.8
1975	29.6	21.2
1976	49.3	32.7
1977	63.9	37.6
1978	52.5	46.6
1979	38.8	45.5
1980	23.9	36.1
1981	18.9	10.8
1982 3/	17.1	4.4

Table 1. -- (CONTINUED)

Pribilof Blue King Crabs

Year	Pre-recruits 1/	Legals 1/
1974	3.1	1.9
1975	8.0	7.5
1976	2.1	3.9
1977	2.2	9.4
1978	5.6	4.3
1979	1.5	4.6
1980	1.4	4.2
1981	1.4	4.1
1982 3/	0.7	2.2

Saint Matthew Blue King Crabs

Year	Pre-recruits 4/	Legals 4/
1978	3.3	1.9
1979	3.0	2.1
1980	3.0	2.5
1981	2.2	3.1
1982 3/	3.3	6.8

1/ The size groups 5.2" - 6.4" and $\geq$ 6.5 have been used for pre-recruits and legals.

2/ Limited survey in 1971, not used for population estimates.

3/ Preliminary estimate subject to change upon further analysis.

4/ The size groups 4.3" - 5.4" and $\geq$ 5.5" have been used for pre-recruits and legals respectively.

Table 2. -- Population estimate for eastern Bering Sea tanner crabs from NMFS surveys (millions of crabs).

Bristol Bay and Pribilof C. bairdi

Year	Pre-recruits 1/	Legals 1/
1973	140.5	66.9
1974	255.0	130.5
1975	207.0	209.6
1976	136.6	109.5
1977	116.3	92.1
1978	81.2	45.6
1979	47.7	31.5
1980	65.0	31.0
1981	24.0	14.0
1982 2/	46.9	10.1

Bristol Bay and Pribilof C. opilio

Year	Pre-recruits 3/	Large 3/
1973	38.7	84.7
1974	169.2	246.7
1975	247.4	274.8
1976	190.4	181.6
1977	196.6	137.3
1978	171.6	78.4
1979	146.3	106.3
1980	99.1	53.6
1981	62.7	15.7
1982 2/	63.8	10.8

Table 2. -- (CONTINUED)

Bristol Bay and Pribilof Hybrid Tanner Crab

Year	Pre-recruits 3/	Large 3/
1975	13.2	33.8
1976	4.0	16.5
1977	9.6	15.4
1978	2.0	5.6
1979	3.0	5.1
1980	0.8	1.7
1981	0.5	0.8
1982 2/	0.6	0.5

Northern District C. opilio

Year	Pre-recruits 3/	Large 3/
1978	8.2	10.5
1979	20.8	6.6
1980	30.4	4.2
1981	17.1	6.5
1982 2/	70.4	10.9

1/ A legal size limit of 5.5 inches carapace width was imposed in 1976, prior to this greater than 5.0 inches was used in the "Legal" column. In parallel, pre-recruit was 3.3 - 5.0 inches prior to 1976 and 4.3 to 5.5 since.

2/ Preliminary estimate subject to change upon further analysis.

3/ Large is greater than 4.3 inches as this has been the size of interest to U.S. industry; pre-recruit is 3.7 to 4.3 inches.

Table 3. -- Population estimates for eastern Bering Sea Korean hair crabs from NOAA/NMFS surveys (millions of crabs).

Pribilof District

Year	Pre-recruits 1/	Large
1979	2.9	8.4
1980	3.6	10.4
1981	4.3	13.0
1982 2/	0.8	5.3

Bristol Bay

Year	Pre-recruits	Large
1979	1.2	6.3
1980	0.7	2.5
1981	0.4	2.7
1982 2/	0.3	1.9

Northern District

Year	Pre-recruits	Large
1979	0.4	1.4
1980	0.8	0.8
1981	<0.1	0.2
1982 2/	<0.1	0.5

1/ Large is greater than 3.5 inches in width which is approximately the size at entry into the U.S. fishery; pre-recruit is 3.0 to 3.4 inches.

2/ Preliminary estimate subject to change upon further analysis.

Figure 1--Distribution of legal red king crab from the 1982 NMFS crab survey (number per mile towed).

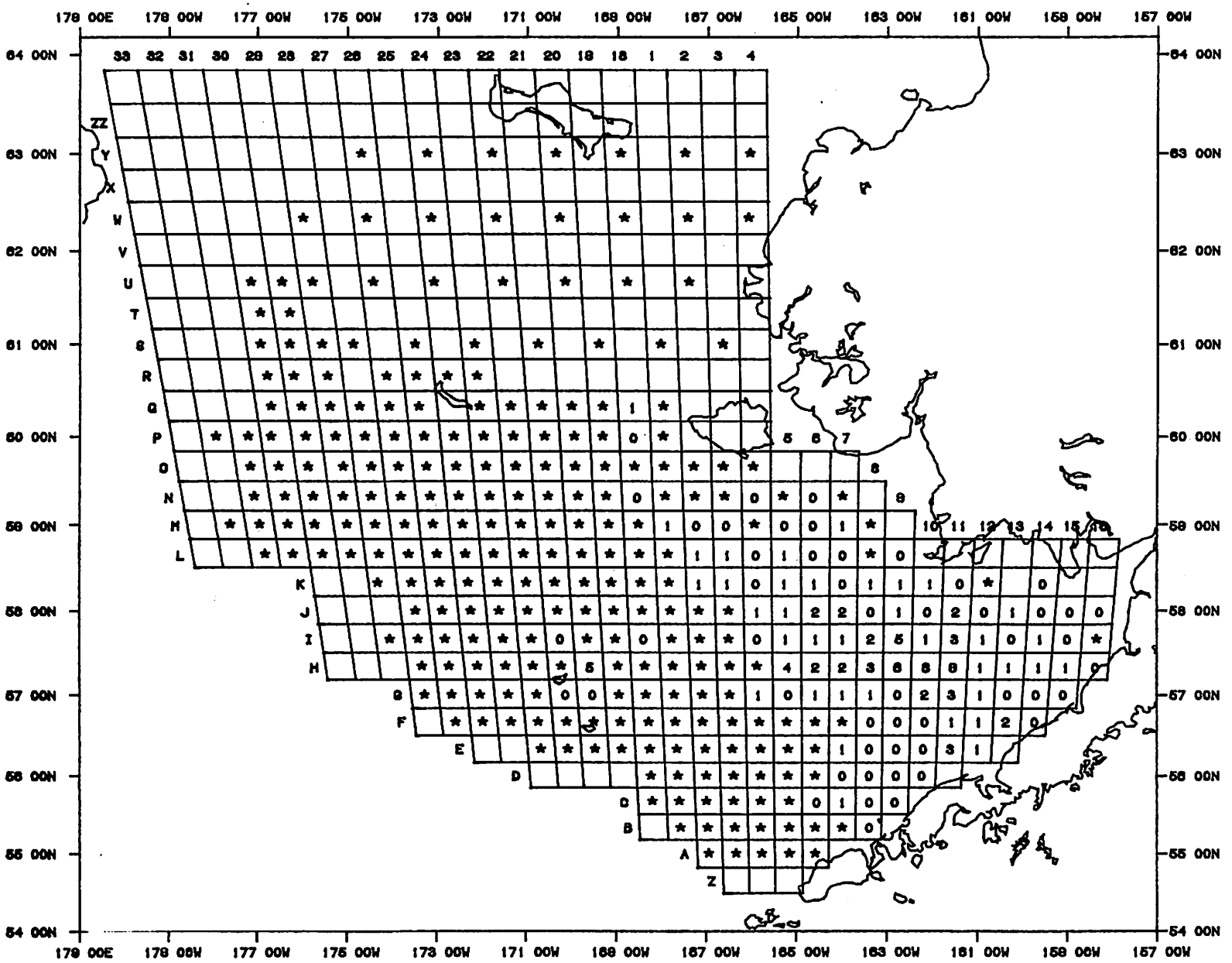


Figure 2--Distribution of legal blue king crab from the 1982 NMFS crab survey (number per mile towed).

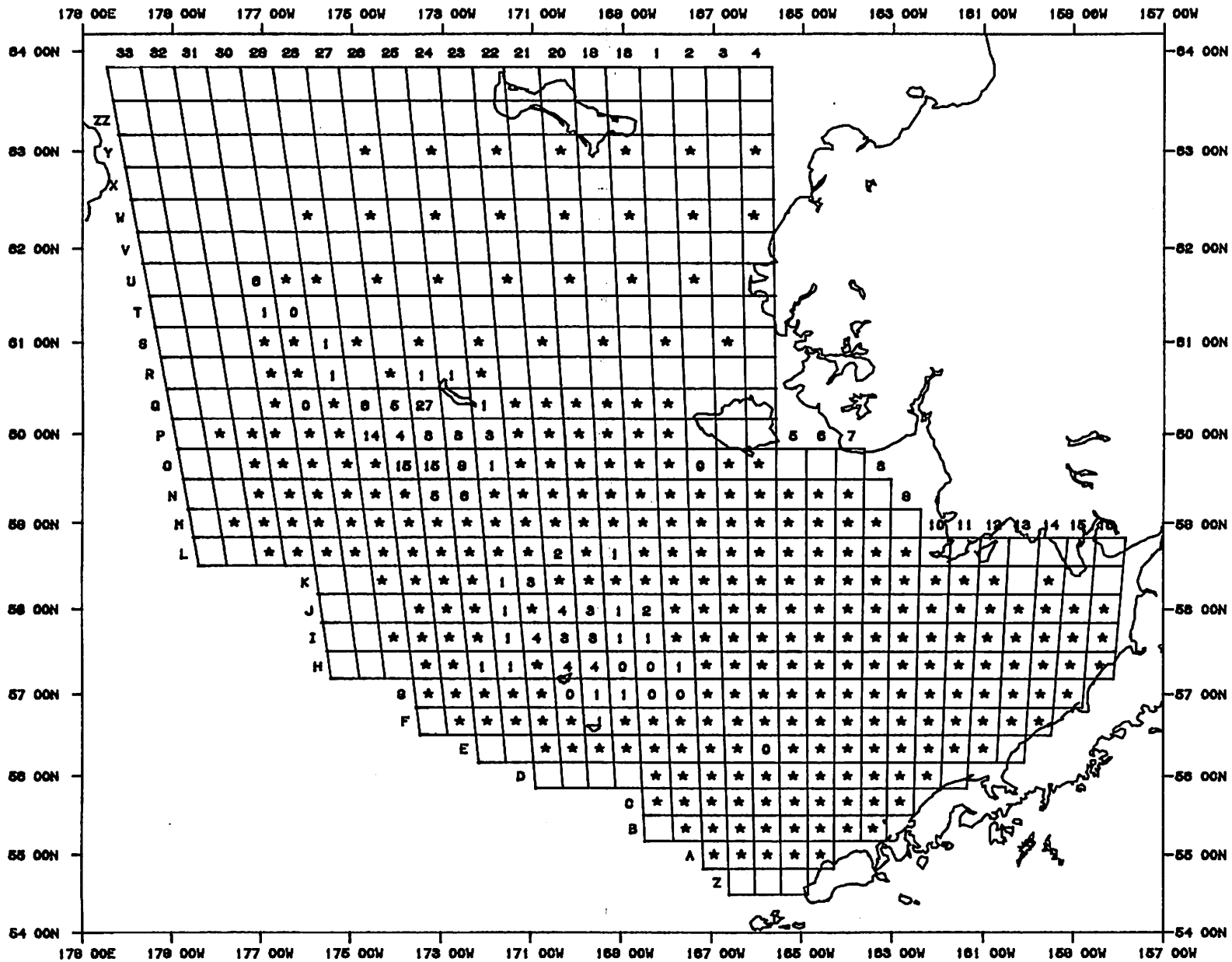


Figure 3--Distribution of legal C. bairdi from the 1982 NMFS crab survey (number per mile towed).

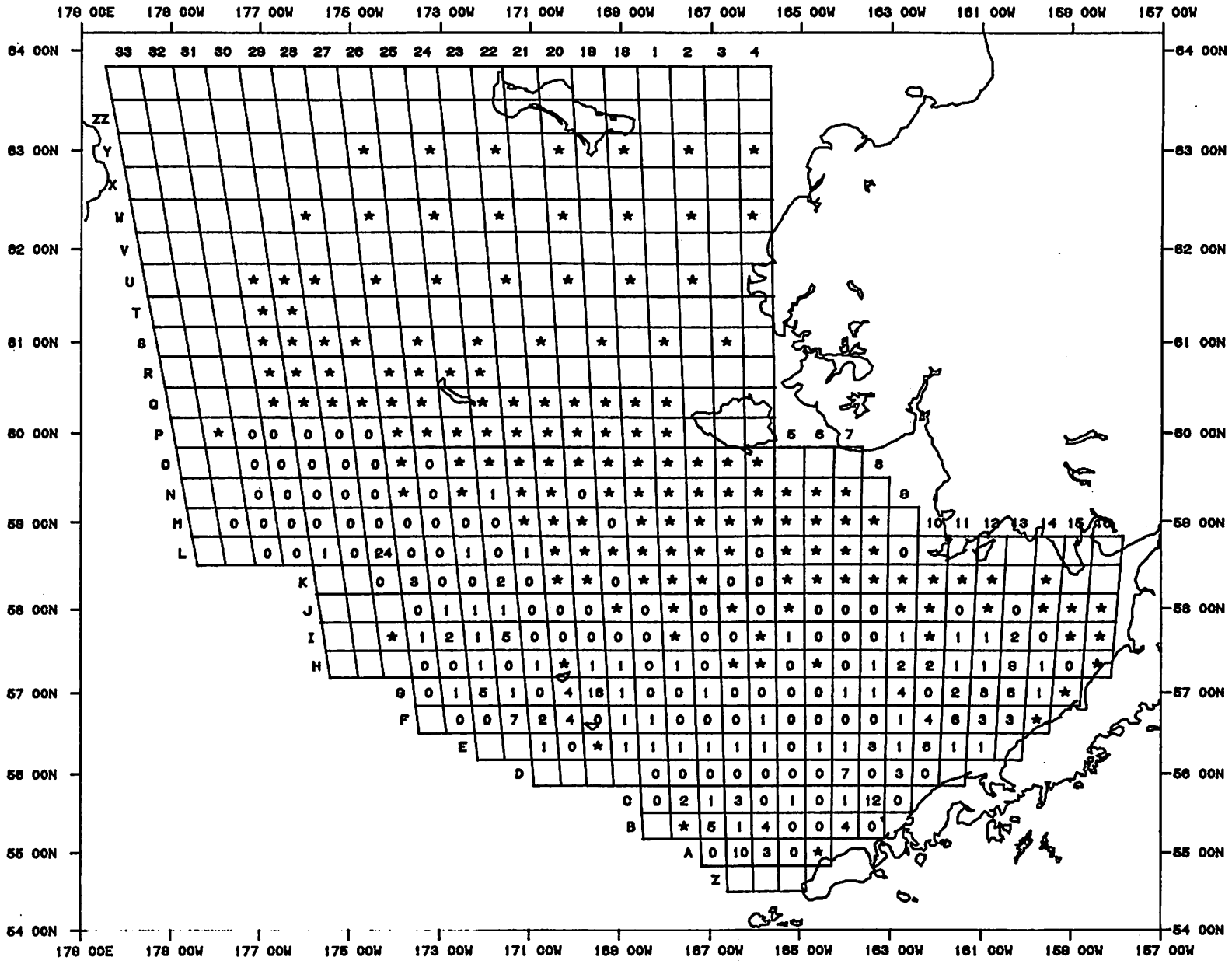


Figure 4--Distribution of large C. opilio from the 1982 NMFS crab survey (number per mile towed).

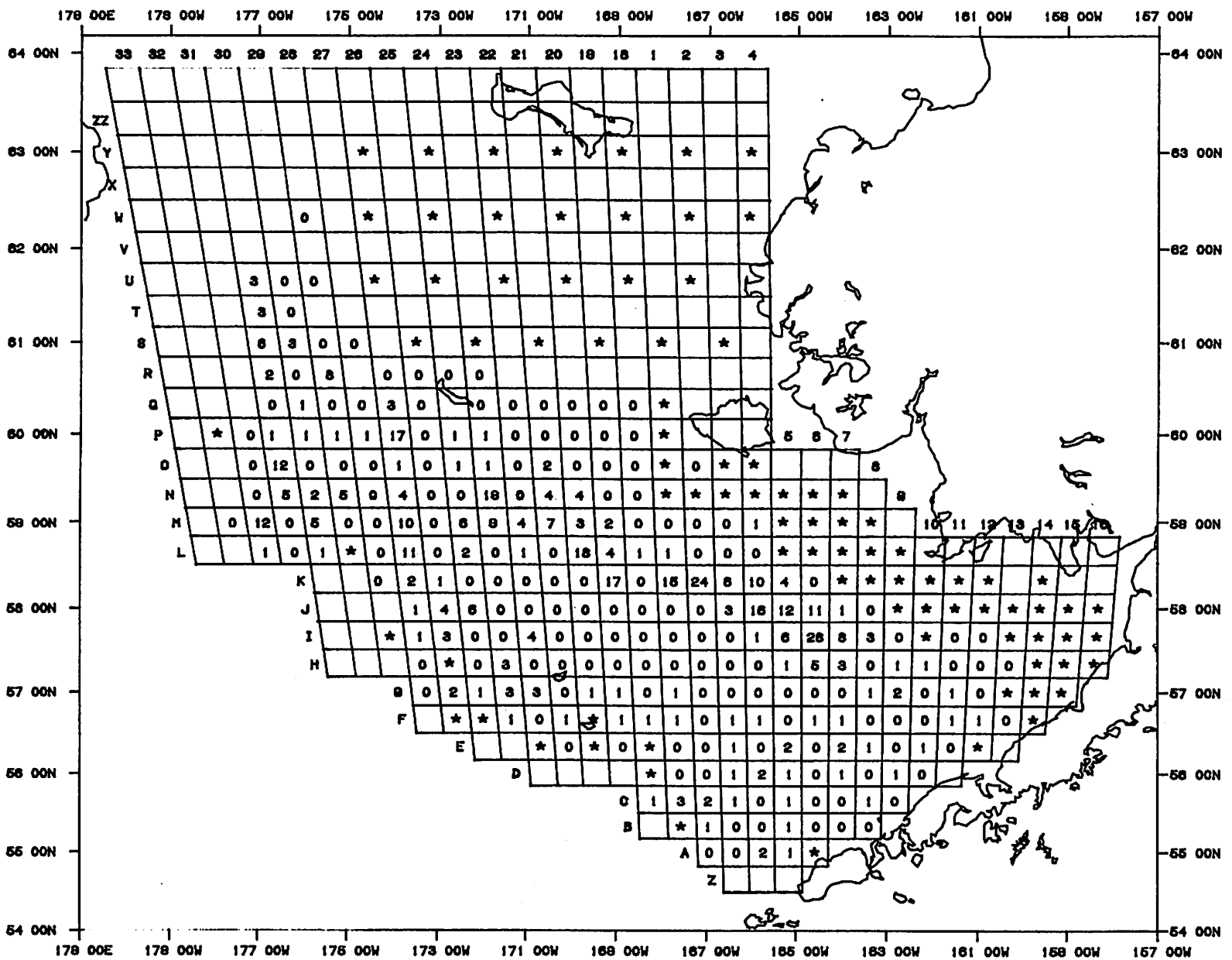
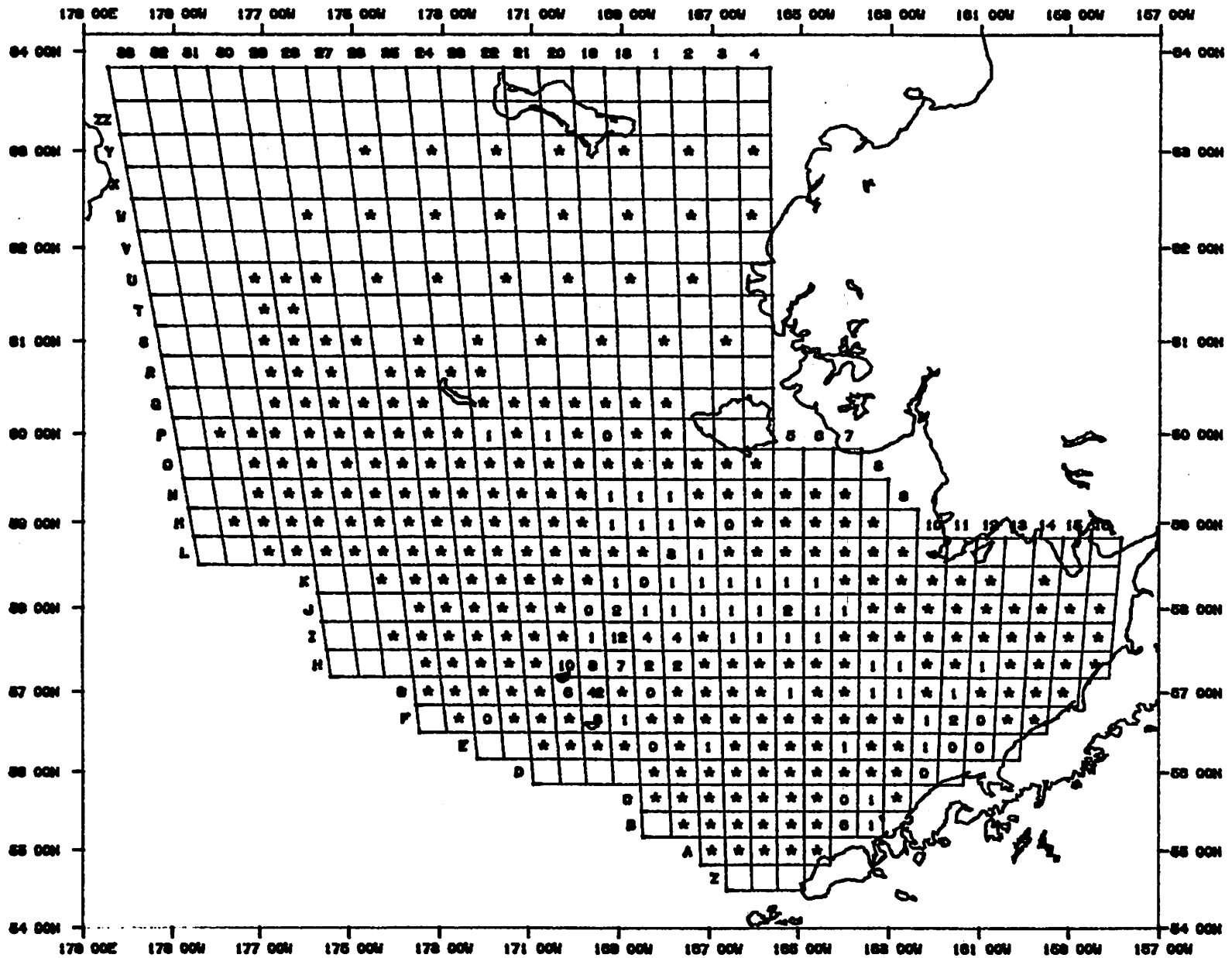
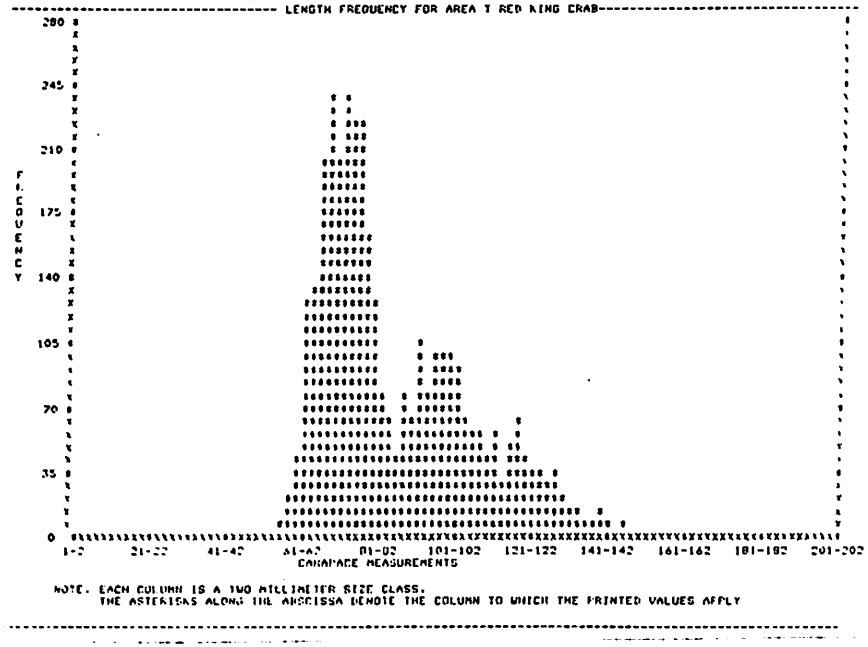
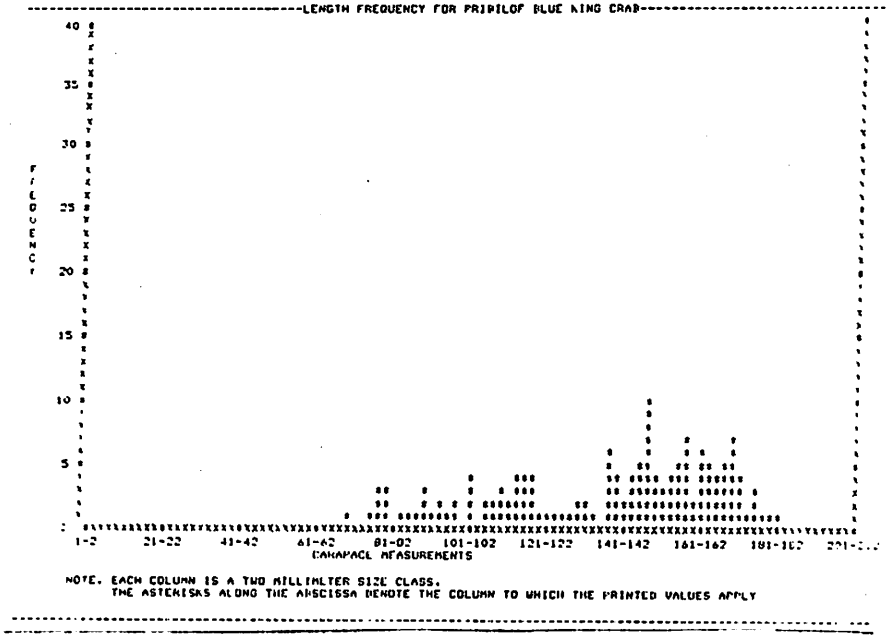


Figure 5--Distribution of large Korean hair crab from the 1982 NMFS crab survey (number per mile towed).







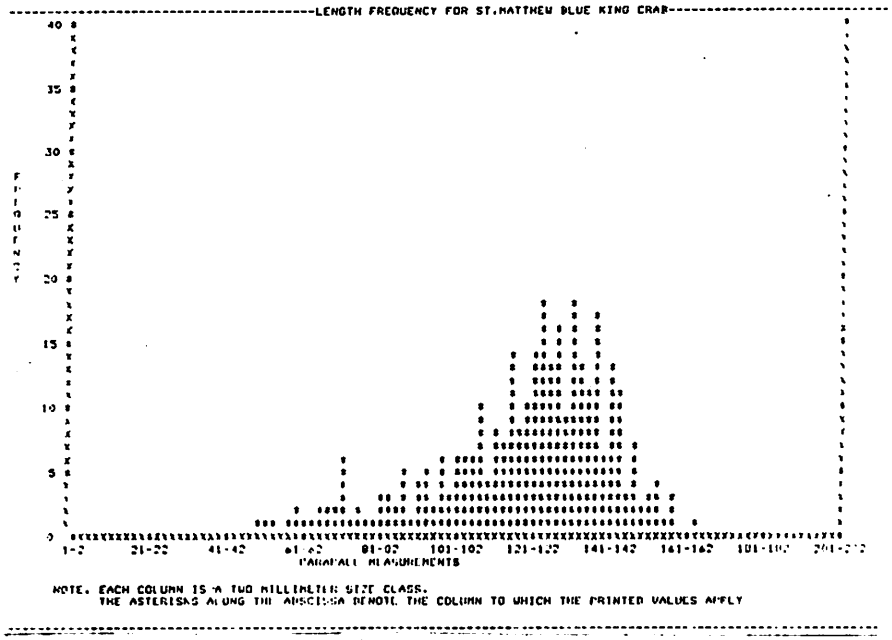
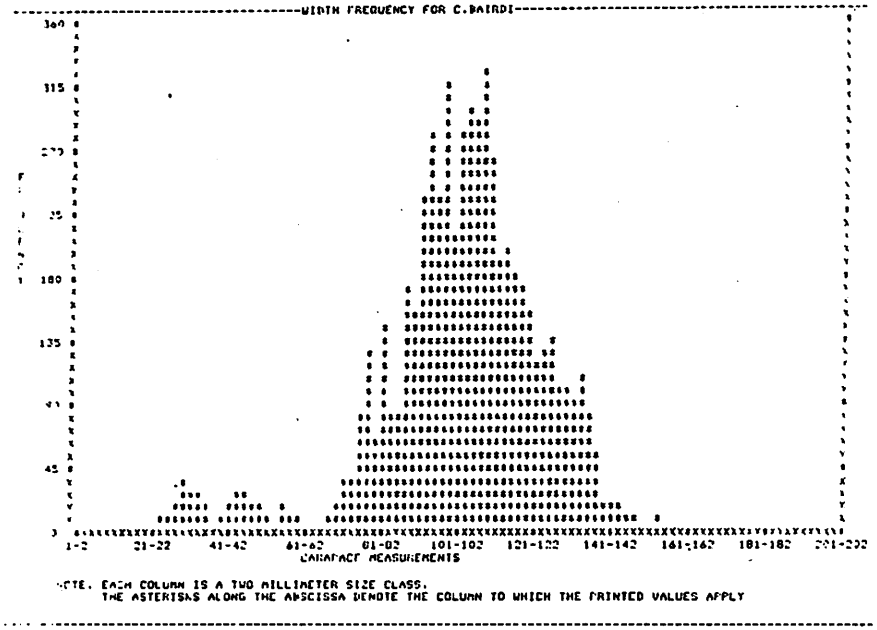
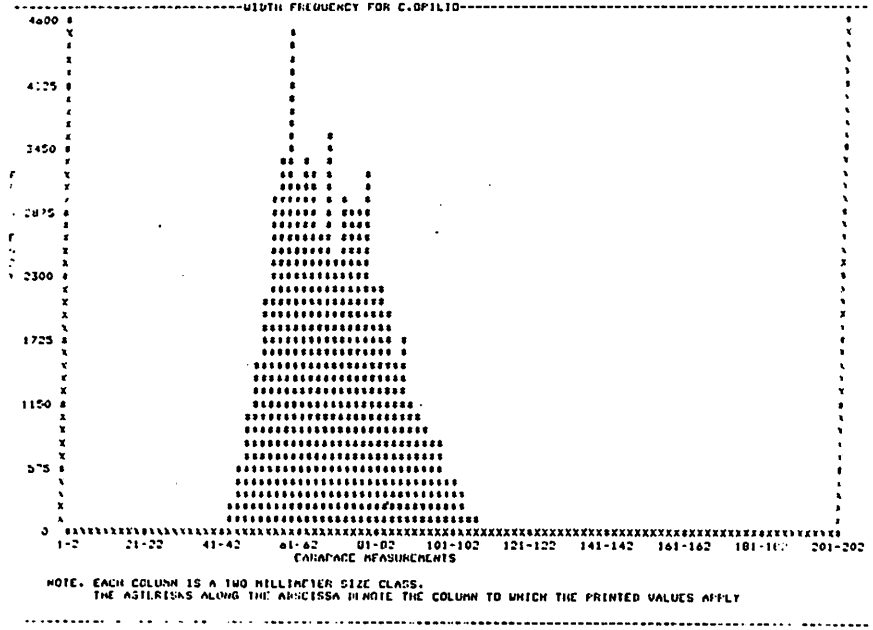


Figure 6--Size frequencies for: A) Red king crab (legal size = 135 mm); B) Pribilof Island blue king crab (legal size = 135 mm); and, C) St. Matthew Island blue king crab (legal size = 120 mm) in the 1982 survey.





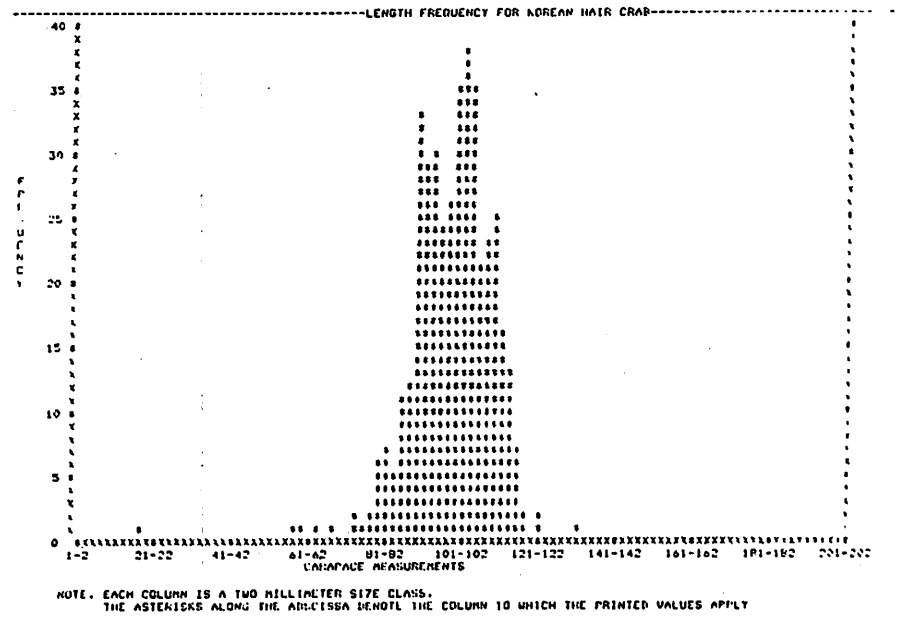


Figure 7--Size frequencies for: A) C. bairdi (legal size = 140 mm); B) C. opilio (size at recruitment about 110 mm); and, C) Korean hair crab (size at recruitment about 90 mm) in the 1982 survey.