

**NORTHWEST AND ALASKA FISHERIES CENTER
PROCESSED REPORT**

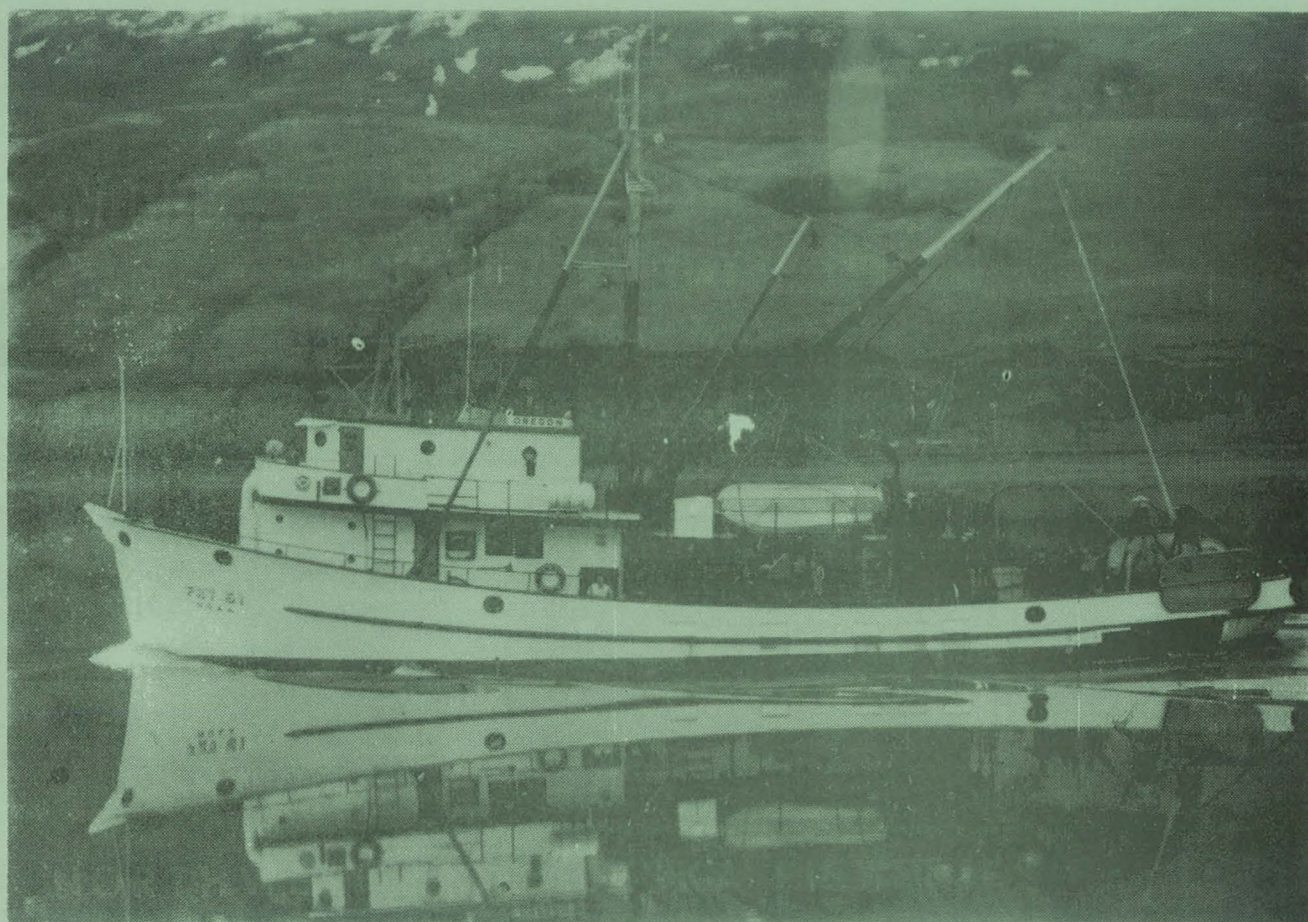
SEPTEMBER 1978

Report to industry on

1978

EASTERN BERING SEA SURVEY

KING CRAB



SURVEY VESSELS

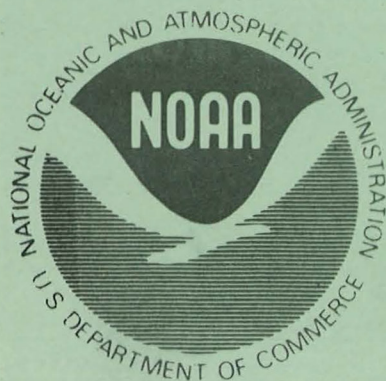
R/V OREGON

F/V PARAGON II

Northwest and Alaska Fisheries Center

Kodiak Facility

Kodiak, Alaska



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Northwest and Alaska Fisheries Center Processed Report
Report to Industry on
1978
Eastern Bering Sea Survey
King Crab

by

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The 1978 Eastern Bering Sea Crab Survey

An annual trawl survey is conducted in the eastern Bering Sea to provide information on the distribution and abundance of four species of crabs. This information is provided to fishermen and processors as an aid in locating productive areas and judging the overall availability of crabs. Survey derived information is also used as part of the basis for management decisions. This report deals with the results of the 1978 survey with respect to red (Paralithodes camtschatica) and blue (P. platypus) king crabs. An additional report, dealing with survey results for two species of Tanner (snow) crabs, will be provided later in the year.

Survey Area and Methods

The area covered by the 1978 crab survey was considerably larger than that covered in previous years (Fig. 1). Covering this enlarged area required the use of a chartered vessel. The PARAGON II surveyed from June 8 to August 16 in addition to the annual NOAA RV OREGON survey that extended from May 20 to July 7.

Both vessels used identical methods. Each station was at the center of a twenty-mile square, and consisted of a one-half hour tow made with a 400 mesh eastern otter trawl. The trawl was constructed of 36 thread 4-inch mesh in the wings, 60 thread 3-1/2 inch mesh in the intermediate, and 96 thread 1-1/4 inch mesh codend liner. It was rigged with 18 eight-inch floats on the head rope and 25 fathom dandy lines (10 fathom single, 15 fathom double). The doors were of the Astoria "V" type and measured 5x7 feet. A tracing of the bottom profile was made with a recording echo sounder during each tow. A tracing of the surface to bottom temperature profile was taken with an expendable bathythermograph (XBT) at selected stations. When the trawl was brought aboard, crabs were separated from the rest of the catch and sorted by species and sex. A record was made of the number of crabs taken as well as size, sex, shell condition and egg condition.

In spite of standardized methods, comparative trawling at a series of stations showed that the two vessels differed slightly in their ability to catch crab. For this reason, it was necessary to convert the PARAGON II's catch rates to "standard" (OREGON) units. This adjustment was minor. "Standardized" values are those given in the accompanying charts and tables.

Survey information was processed to provide estimates of stock size and descriptions of crab distribution in the area. Estimates of the number of crabs per square were obtained by calculating the number of crabs caught per square nautical mile and expanding this figure to account for the entire 20x20 mile area. Estimated stock size was obtained by summing estimates of the number of crab from all 20x20 mile squares within the survey area. This method is far less complicated and faster than the techniques used to generate "final" estimates used in management planning and International North Pacific Fishery Commission documentation. Differences in methodology simply reflect the fact that complete, well edited computer files will not be ready for some time. We feel that the simplified estimate is a useful indicator of stock abundance even though it will probably differ somewhat from the final version.

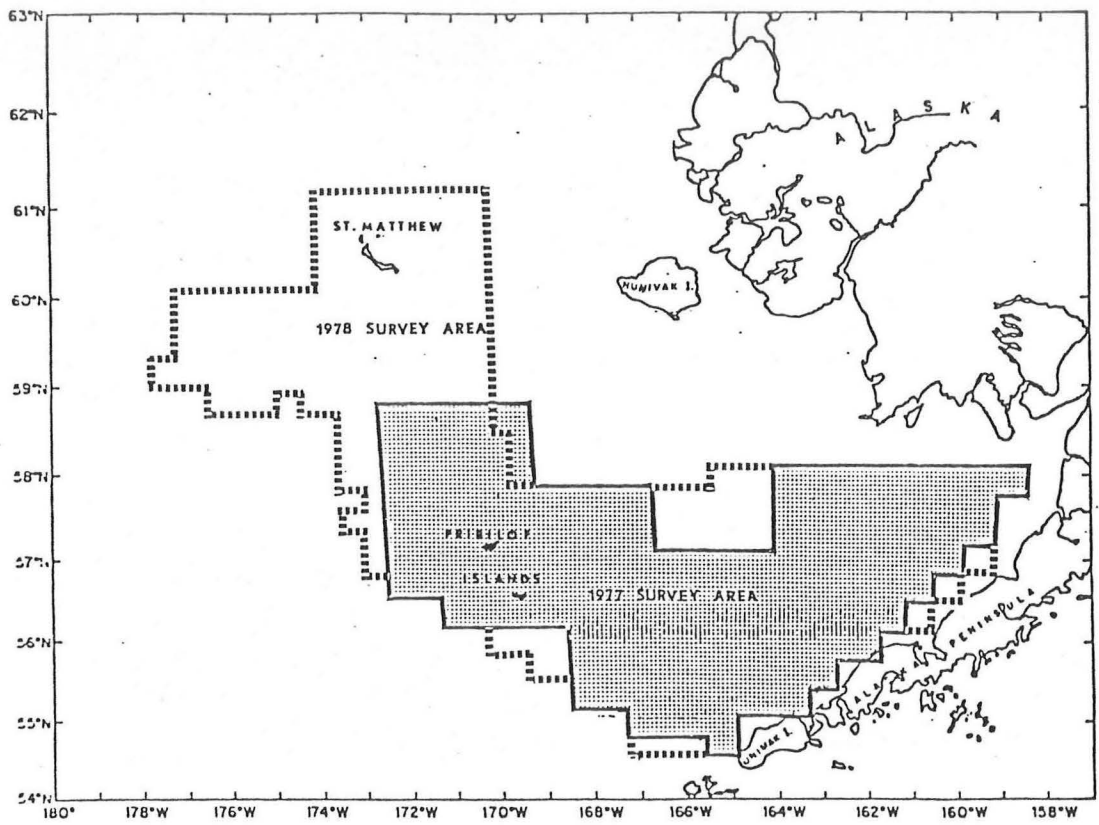


Figure 1.--NMFS eastern Bering Sea crab survey areas in 1977 (shaded) and 1978.

Survey Results

Four charts of station data are included for southeastern Bering Sea red king crab and for Pribilof Islands blue king crab. These charts show the geographic distribution and relative abundance of legal males (Charts 1, 5), sub-legal males (Charts 2, 6) and females (Charts 3, 7). Two additional charts (4, 8) show the percentage of all king crab taken that were of legal size. Charts showing the number of legal sized males (Chart 9) and the percentage of legal males (Chart 10) in the portion of the survey area near St. Matthew Island are also given. This portion of the survey is new this year. A final chart (11) shows the distribution of bottom temperatures encountered during the survey. Charts 1 to 10 use the standard catch rate of numbers caught per half hour tow. Population estimates are shown in Table 1 as derived from the data in Table 2. In addition to the above data, position (including LORAN C), depth and catch per square mile are given in Table 2.

Red King Crab. Population estimates for legal and pre-recruit crabs (Table 1) show an increase in abundance for legal males and a decrease in abundance for pre-recruits. The estimated legal crab population for 1978 (42.5 million) is regarded as being the same as that for 1977 (37.6 million), since the precision of these estimates is plus or minus 15 to 20 percent. The number of pre-recruits available in the next one to two years appears to be only slightly lower than a comparable estimate made a year ago. Tentatively, we conclude that stock conditions will be stable for the next year or two.

The distribution of legal male, sub-legal male and female red king crabs is shown in Charts 1-3. As has been true in previous years, both legal and sub-legal males are concentrated in deeper waters farther from shore while females tend to be found in slightly shallower, nearshore areas. In keeping with this pattern, concentrations of females are found farther to the east in Bristol Bay than are concentrations of males. In comparison with 1976 and 1977, the highest concentrations of legal crab were found slightly to the north and west. However this difference is small and a band formed by two diagonal lines connecting sampling stations B-4 to J-12 and D-4 to J-10 contain or touch upon most of the highest concentrations in all three years. Sub-legal males appear to be more concentrated in F-8 and F-9 areas than in previous years. Despite very high concentrations of females in the F-8 and F-9 squares, the overall distribution of females is remarkably similar to that of previous years. The percentages of legal males in the catch at various stations indicate that legal males tend to be congregated farther from shore than other groups.

Figure 2 shows the relationship between catch rates in the fishery and estimates of abundance derived from annual trawl surveys. Up until 1975, plotted points fell very nearly on a straight line. Since that time catch rates have decreased in spite of increases in the estimated population. As a result, a straight line drawn through the data points no longer provides a very good prediction of catch rates. The curved line reflects diminishing returns or possible "saturation effects". These effects could be associated with increasing concentrations of gear on the grounds, increased dispersal of crabs due to higher than average water temperatures, changing fishing techniques or an increase in the vulnerability of crabs to the survey gear.

RED KING CRAB

LEGAL MALES

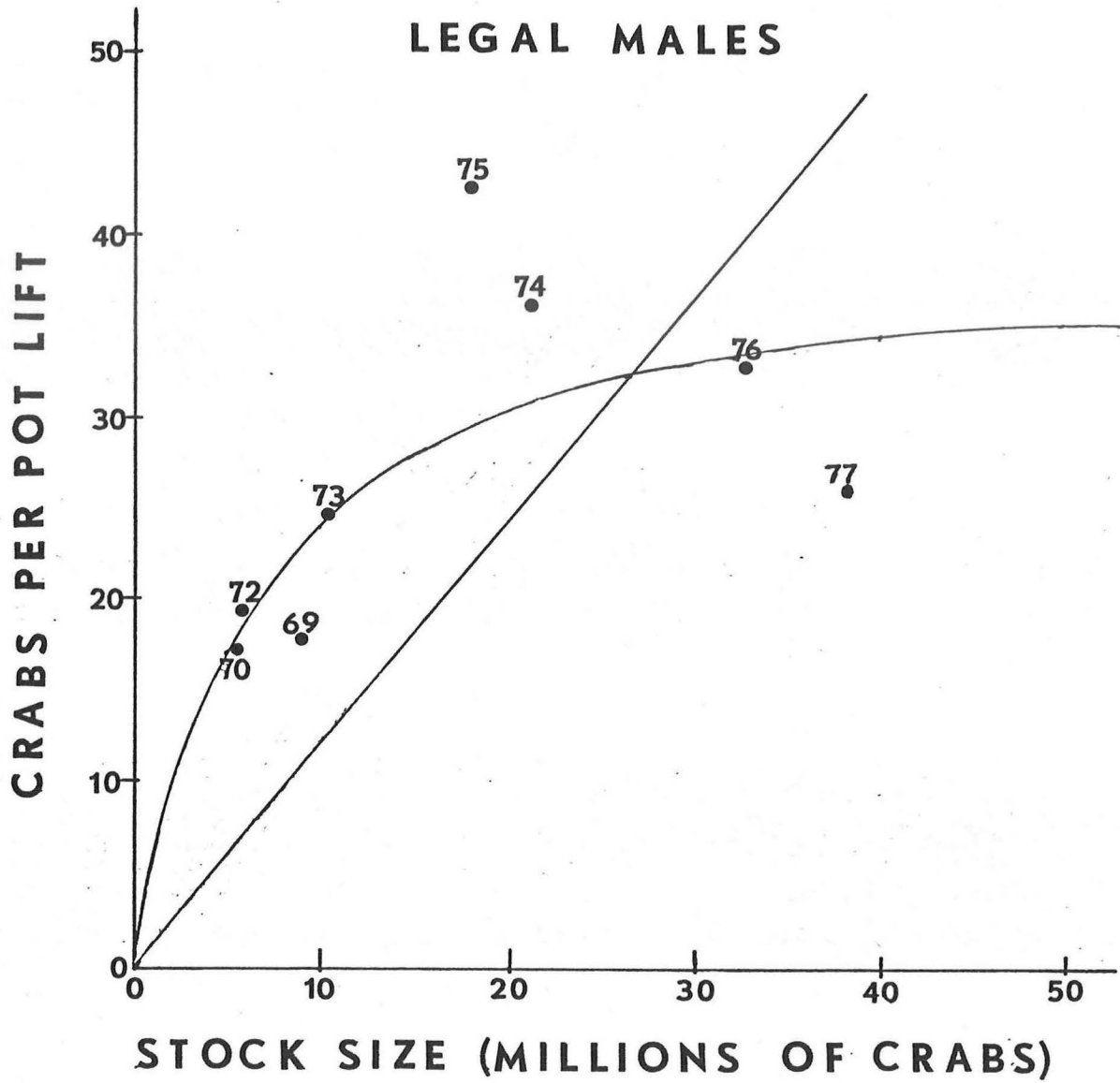


FIGURE 2. RELATIONSHIP BETWEEN THE AVERAGE NUMBER OF CRABS TAKEN PER POT IN THE U.S. FISHERY AND ESTIMATES OF STOCK SIZE FROM NMFS TRAWL SURVEYS

Table 1.--Population estimates in millions of crabs for eastern Bering Sea king crabs from NOAA/NMFS surveys.

RED KING CRABS

Year	Pre-recruits*	Legals*
1969	19.5	8.9
1970	8.4	5.3
1972**	8.3	5.6
1973	25.9	10.9
1974	31.2	20.8
1975	29.6	17.6
1976	49.3	32.7
1977	63.9	37.6
1978***	52.5	42.5

PRIBILOF BLUE KING CRABS

1974	3.1	1.9
1975	8.0	7.5
1976	2.1	3.9
1977	2.2	9.4
1978***	5.2	2.9

*The size groups 5.0"-6.25" and over 6.25" have been used for pre-recruits and legals, respectively, for purposes of comparison with previous years.

**No survey in 1971.

***Preliminary estimates. Methods of computation not identical to other estimates in table (see text).

In conversations with fishermen, we have frequently been asked if there was a relationship between bottom temperature and the abundance of king crabs. Figure 3 shows temperatures and the average numbers of legal male red king crab taken in surveys since 1975. Although there are peaks in catch rates associated with some narrow temperature range in each year, there is no narrow range of temperatures that is consistently associated with high catch rates. Averaging over the four years (1975-1978) indicates only that temperatures less than 5.0 degrees C. (about 41 degrees F.) seem to be favored. The 2.0-3.0 degree range appears to produce high catches but is not consistent in this respect. Obviously these data are very limited and only apply to the summer distribution. It is possible that temperature is an important factor at other times of the year.

Pribilof Islands Blue King Crab. Abundance trends (Table 1) are difficult to interpret. The estimated abundance of legal crabs is considerably lower than that of 1977, while that of pre-recruits is considerably higher. Considering both groups, abundance estimates have been quite variable over the years. Further, there is no readily apparent relationship between the estimated number of pre-recruits in one year and the estimated number of legals in the years immediately following. We suspect that much of the fluctuation in abundance estimates reflects the fact that blue crab occur at only 10 to 14 survey squares in any given year.

The distribution of legal male, sub-legal male and female blue king crab is shown in Charts 5, 6 and 7. Legal males were found in about the same places as last year although their abundance was lower. Pre-recruits were also found in the same areas as in the 1977 survey. The distribution of females shows a slight southward shift in spite of similar abundance. As was true with red king crabs, the percentage of legal crabs by station (Chart 8) indicates that large males tend to occur in higher percentages at the edges of the population's overall distribution. Temperature data is given in Chart 11 and in Table 3, but no analysis has been carried out due to the small amount of data.

St. Matthew Island Blue King Crab. The first records of northern populations of blue king crabs resulted from Bureau of Commercial Fisheries surveys conducted in 1941. These surveys showed that blue king crabs were distributed as far north as St. Lawrence Island. There was little interest in these populations, however, until 1975 when NMFS surveys were conducted as part of the energy related Outer Continental Shelf Environmental Assessment Program. Surveys in 1975 and 1976 showed that both red and blue king crabs are found as far north as the Chukchi Sea and indicated that there were concentrations of red king crabs in Norton Sound and blue king crabs near St. Matthew and St. Lawrence Islands. Unfortunately, a large area between St. Lawrence and St. Matthew Islands remains unsurveyed.

The blue king crab fishery in the St. Matthew Island area started in 1977 when six vessels landed about 1.2 million pounds. According to ADF&G statistics, catch per unit effort was 15 legal, 5.0 inch, crabs per pot lift and the average size was 4.3 pounds per crab. In 1978 the fishery continued and by August 29, 15 vessels had taken 1.8 million pounds with a catch rate of 9 crabs per pot.

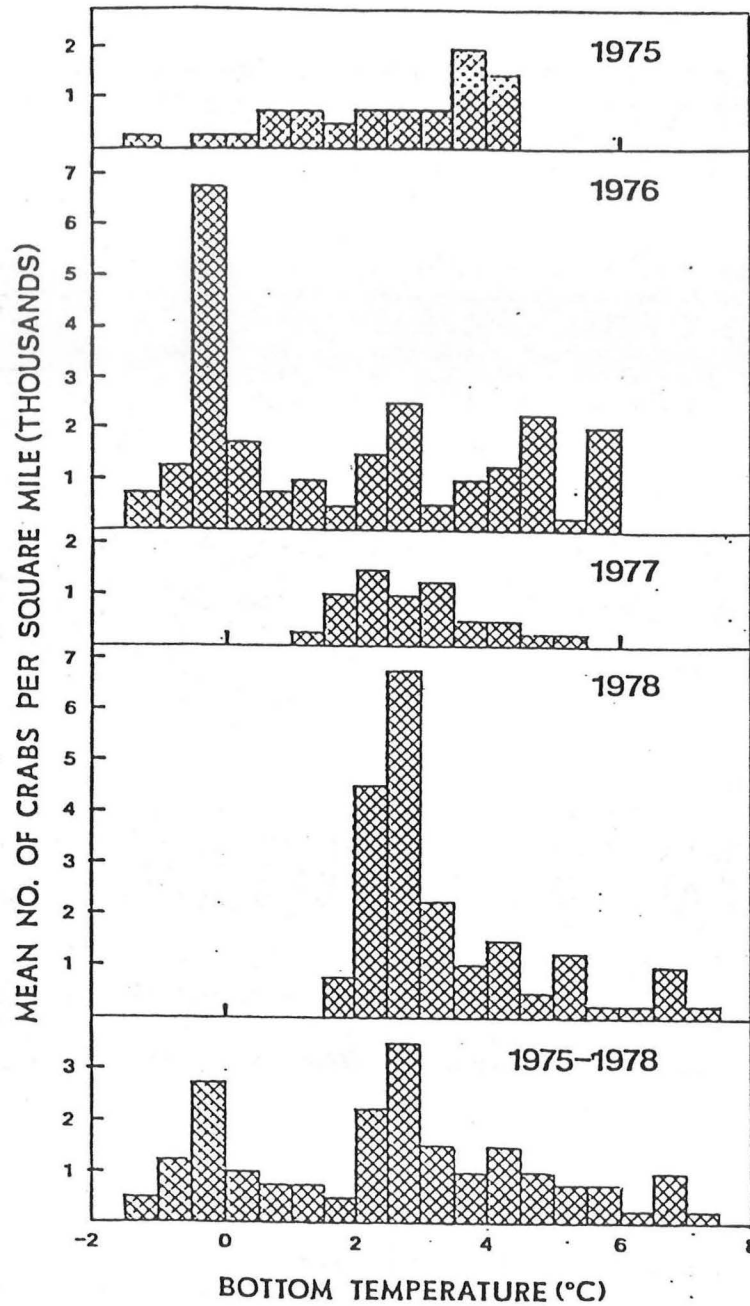


Figure 3.--The mean number of legal male red king crab (per square mile) found at various bottom temperatures during the 1975-1978 NMFS Bering Sea surveys.

The Bering Sea crab survey area was extended to St. Matthew Island in 1978. The number and percentage of legal males are shown on Charts 9 and 10. Population abundance estimates were made only for legal males. The abundance of legal males was estimated as 2.1 million crab. The estimate applies only to the stations shown. This point is worth noting since much of the bottom in the area is untrawlable and it is doubtful that the whole range of this population was surveyed.

Questionnaires. A questionnaire is not included in this year's report since very few returns have been received. We would, however, appreciate any commentary volunteered by our readers.

Table 2.--Data from eastern Bering Sea trawl survey stations where red king crab were encountered.

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm)*		Legal (\geq 136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 hr.tow	No.per sq.mi.	
Z-5	5/20	54-40	165-09	Y34608 Z48028	44	4.4	47	6495	12	1658	11.0
B-5	5/20	55-20	165-10	Y34517 Z48084	58	3.6	3	415	7	967	63.6
C-5	5/20	55-40	165-11	Y34462 Z48110	57	3.3	6	829	5	691	45.5
E-5	5/22	56-19	165-12	Y34326 Z48154	46	2.4	146	18494	70	8867	30.3
F-5	5/22	56-39	165-13	Y34239 Z48166	40	2.2	36	4975	90	12437	70.9
G-6	5/23	56-59	164-36	Y34022 Z47915	37	2.2	-	-	1	127	100.0
F-6	5/23	56-40	164-36	Y34122 Z47916	39	2.4	1	138	4	553	80.0
E-6	5/23	56-20	164-35	Y34214 Z47912	46	2.4	41	5194	8	1013	8.9
D-6	5/23	56-01	164-35	Y34293 Z47902	49	3.2	1	127	1	127	50.0
D-7	5/24	56-01	164-00	Y34196 Z47671	49	3.5	-	-	3	415	100.0
E-7	5/24	56-19	164-00	Y34116 Z47677	46	2.5	5	691	5	691	7.8
F-7	5/24	56-39	164-00	Y34019 Z47679	39	2.5	98	13542	90	12437	47.4
G-7	5/24	56-59	164-00	Y33918 Z47676	35	4.1	19	2407	46	5827	69.7
H-7	5/25	57-20	164-00	Y33797 Z47667	33	1.8	4	507	4	507	50.0
H-8	5/25	57-20	163-24	Y33695 Z47416	28	2.0	6	829	4	553	40.0
H-9	5/25	57-21	162-47	Y33593 Z47173	26	1.8	16	2027	8	1013	28.6
H-10	5/25	57-20	162-09	Y33497 Z46924	26	2.4	13	1647	4	507	8.2
H-11	5/26	57-20	161-33	Y33405 Z46673	30	3.7	22	3040	4	553	2.8
H-12	5/26	57-20	160-57	Y33319 Z46432	35	4.7	23	2913	3	380	1.4
H-13	5/26	57-20	160-18	Y33232 Z46178	32	4.5	8	1013	8	1013	17.8
H-14	5/26	57-20	159-40	Y33142 Z45922	29	4.4	3	380	10	1267	41.7
H-15	5/27	57-21	159-04	Y33063 Z45681	25	4.1	-	-	-	-	-
G-15	5/27	57-00	159-08	Y33187 Z45717	15	4.8	-	-	-	-	-
F-15	5/27	56-49	159-09	Y33244 Z45730	10	5.2	-	-	1	138	33.3
F-14	5/27	56-40	159-45	Y33367 Z45970	15	5.1	7	887	4	507	26.7
G-14	5/28	57-00	159-42	Y33258 Z45938	29	4.3	13	1796	7	967	16.7
G-13	5/28	56-59	160-20	Y33345 Z46199	34	3.6	6	760	4	507	13.3
G-12	5/28	57-00	160-56	Y33431 Z46439	34	3.7	14	1935	9	1244	6.2
G-11	5/28	57-00	161-33	Y33522 Z46691	36	4.4	16	2027	6	760	2.5

Table. 2.--(Continued)

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm)*		Legal (>136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 hr.tow	No.per sq.mi.	
G-10	5/29	57-00	162-09	Y33615 Z46932	32	4.7	32	4422	5	691	2.9
G-9	5/29	57-00	162-47	Y33712 Z47180	31	4.4	96	12160	72	9120	30.8
G-8	5/29	57-00	163-23	Y33809 Z47420	34	5.4	34	4307	39	4940	50.6
F-8	5/29	56-40	163-23	Y33916 Z47428	39	6.9	59	7474	10	1267	1.9
F-9	5/30	56-40	162-47	Y33817 Z47190	37	5.6	28	3869	1	138	0.2
F-10	5/30	56-41	162-11	Y33714 Z46952	38	5.0	5	633	3	380	4.3
F-11	5/30	56-40	161-35	Y33628 Z46709	46	5.5	-	-	2	507	8.0
F-12	5/30	56-41	160-59	Y33536 Z46467	38	5.8	6	760	3	380	3.6
F-13	5/31	56-40	160-22	Y33452 Z46220	30	5.7	4	553	2	276	6.3
E-13	5/31	56-22	160-30	Y33554 Z46280	15	6.0	-	-	1	190	33.3
D-12	6/1	56-06	160-59	Y33701 Z46485	14	4.8	-	-	-	-	-
E-12	6/1	56-20	160-59	Y33635 Z46476	27	5.5	-	-	-	-	-
E-11	6/1	56-20	161-37	Y33729 Z46730	32	6.0	7	887	3	380	6.7
D-10	6/1	55-59	162-14	Y33916 Z46978	33	6.9	18	2280	5	633	1.8
E-10	6/2	56-20	162-13	Y33824 Z46968	42	5.9	10	1267	3	380	5.3
E-9	6/2	56-20	162-47	Y33915 Z47197	41	5.7	4	507	4	507	16.7
E-8	6/2	56-20	163-24	Y34011 Z47438	44	6.0	6	760	1	127	7.7
D-8	6/2	56-00	163-24	Y34096 Z47434	46	5.6	2	253	-	-	-
A-6	6/7	55-00	164-35	Y34480 Z47852	35	4.6	2	234	4	468	11.1
B-7	6/7	55-20	164-01	Y34336 Z47655	41	3.5	3	415	4	553	1.8
B-8	6/7	55-20	163-25	Y34243 Z47427	27	4.5	8	1218	2	304	0.8
C-9	6/7	55-40	162-50	Y34087 Z47216	28	3.5	8	1013	4	507	6.0
D-9	6/8	56-00	162-49	Y34004 Z47202	41	3.4	12	1520	6	760	6.7
C-8	6/8	55-41	163-24	Y34168 Z47431	44	3.3	7	887	6	760	2.9
C-7	6/8	55-40	163-59	Y34271 Z47662	49	3.1	5	633	2	253	3.4
C-6	6/8	55-40	164-35	Y34366 Z47889	51	3.3	3	380	2	253	20.0
B-6	6/9	55-20	164-34	Y34426 Z47871	54	3.5	4	507	7	887	2.9
G-20	6/18	57-00	169-33	Y35018 Z49896	33	4.0	-	-	5	691	83.3
A-4	6/18	55-03	165-47	Y34655 Z48268	66	3.9	-	-	4	572	100.0

Table. 2.--(Continued)

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm)*		Legal (>136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 Hr.tow	No.per sq.mi.	
B-4	6/19	55-19	165-47	Y34618 Z48314	65	3.9	-	-	2	229	100.0
C-4	6/19	55-40	165-48	Y34568 Z48350	63	3.6	1	114	1	99	50.0
D-4	6/19	56-00	165-47	Y34582 Z48367	58	3.6	8	912	11	1288	61.9
G-20	6/24	57-00	170-47	Y35019 Z49891	32	4.8	1	114	9	1090	78.6
G-20	6/24	56-48	169-14	Y34986 Z49745	45	3.5	1	114	-	-	-
G-20	6/24	57-00	169-32	Y18718 Z35017	32	4.8	1	127	5	633	71.4
E-2	6/30	56-12	167-22	X18596 Y34664	60	3.5	1	114	3	396	80.0
A-4	7/1	55-00	165-47	X18317 Y34658	70	3.9	8	912	75	8919	90.9
A-4	7/1	55-00	165-44	X18317 Y34654	68	3.9	-	-	5	595	100.0
A-4	7/1	55-58	165-42	X18326 Y34630	66	4.2	8	912	18	2180	73.3
A-4	7/1	55-03	165-31	X18341 Y34616	65	4.3	14	2394	7	1189	33.3
A-4	7/1	55-01	165-45	Y34655 Z48276	70	3.9	3	380	15	1900	83.3
A-4	7/1	54-59	165-45	Y34659 Z48270	70	4.4	-	-	5	633	100.0
A-4	7/1	55-01	165-46	Y34652 Z48268	68	3.9	1	109	7	760	87.5
A-4	7/1	54-59	165-36	Y34631 Z48212	65	4.2	3	380	5	633	55.6
A-4	7/1	55-03	165-33	Y34617 Z48202	63	4.3	8	1013	3	380	21.4
B-7	7/3	55-20	164-01	X18461 Y34336	38	6.4	9	1026	-	-	-
B-7	7/3	55-20	164-01	X18463 Y34336	41	4.1	6	684	7	793	5.3
B-7	7/3	55-18	164-03	X18461 Y34341	42	3.4	10	1140	15	1784	11.3
B-7	7/3	55-20	164-00	Y34336 Z47652	39	-	11	1286	1	117	.3
B-7	7/3	55-20	164-60	Y34335 Z47656	41	4.1	4	507	9	1140	6.0
B-7	7/3	55-22	164-03	Y34340 Z47664	42	3.4	6	760	4	507	3.0
B-6	7/4	55-20	164-35	X18446 Y34426	50	3.9	5	1425	4	1239	13.5
B-6	7/4	55-20	164-36	X18446 Y34430	55	4.4	8	912	11	1288	24.5
B-6	7/4	55-20	164-35	Y34426 Z47872	55	3.9	3	380	3	380	9.7
B-6	7/4	55-20	164-36	Y34429 Z47882	55	4.4	3	380	2	253	6.1
B-6	7/4	55-20	164-41	Y34445 Z47911	55	4.4	9	977	7	760	10.3
B-6	7/4	55-22	164-46	Y34452 Z47933	55	3.8	7	760	3	326	5.4
B-6	7/4	55-15	164-39	X18438 Y34447	55	4.4	6	684	2	198	2.7
B-6	7/4	55-16	164-40	X18440 Y34453	56	3.7	11	1254	7	892	6.9

Table. 2.--(Continued)

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm)*		Legal (>136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 Hr.tow	No.per sq.mi.	
E-5	7/5	56-21	165-13	Y34322 Z48158	46	4.1	1	127	17	2153	77.3
E-5	7/5	56-27	165-04	Y34274 Z48109	44	2.9	8	1013	25	3167	75.8
E-6	7/5	56-22	164-35	Y34209 Z48009	41	2.8	36	4560	196	24828	84.5
E-6	7/5	56-27	164-20	Y34137 Z47804	40	3.5	352	41158	235	27478	39.4
E-5	7/5	56-21	165-12	X18624 Y34321	45	4.1	13	1482	19	2279	63.9
E-5	7/5	56-33	165-00	X18639 Y34274	44	2.9	1	114	12	1486	93.8
E-6	7/5	56-30	164-53	X18651 Y34209	44	2.8	32	3763	276	33000	91.0
E-6	7/5	56-46	164-56	X18665 Y34137	39	3.5	357	41959	166	19820	34.2
G-8	7/6	57-00	163-23	Y33811 Z47427	35	3.0	14	1773	11	1393	37.9
G-8	7/6	57-04	163-24	Y33792 Z47434	34	3.3	4	507	3	380	42.9
G-8	7/6	57-06	163-28	Y33793 Z47455	33	3.4	1	109	2	217	50.0
G-8	7/6	57-08	163-30	Y33788 Z47472	33	3.1	1	127	2	253	66.7
G-8	7/6	57-00	163-21	X18705 Y33813	35	3.0	17	1938	20	2378	53.3
G-8	7/6	57-03	163-18	X18710 Y33793	34	3.4	5	570	5	595	42.9
G-8	7/6	57-04	163-22	X18713 Y33794	34	3.4	2	228	8	991	83.3
G-8	7/6	57-04	163-18	X18715 Y33787	34	3.3	3	342	12	1486	83.3
I-8	7/7	57-40	163-22	Y33562 Z47390	25	4.8	2	253	2	253	33.3
I-9	7/7	57-40	162-43	Y33462 Z47144	22	5.0	4	507	11	1393	50.0
I-10	7/7	57-40	162-08	Y33375 Z46902	25	5.5	21	2660	7	887	8.6
I-11	7/7	57-40	161-30	Y33280 Z46653	28	5.0	7	887	1	127	1.5
H-6	7/7	57-20	164-39	X18733 Y33908	35	2.8	1	114	1	99	50.0
H-5	7/7	57-19	165-09	X18732 Y33990	36	3.2	1	114	-	-	-
E-4	7/8	56-20	166-28	Y34431 Z48396	49	2.7	8	912	8	991	55.6
E-3	7/8	56-21	166-27	Y34540 Z48639	55	3.4	1	114	2	198	66.7
I-6	7/13	57-39	164-38	Y33776 Z47891	28	3.7	-	-	1	99	100.0
I-7	7/13	57-39	164-02	Y33674 Z47652	27	4.3	4	456	9	1090	64.7
I-12	7/14	57-40	160-51	Y33187 Z46402	30	5.8	6	684	3	396	6.7
I-13	7/14	57-39	160-18	Y33119 Z46155	30	-	2	228	2	297	9.7
I-14	7/14	57-39	159-41	Y33043 Z45903	26	6.5	2	228	2	198	2.6
J-13	7/15	58-00	160-12	Y32982 Z46130	27	-	15	1710	7	892	7.4

Table. 2.--(Continued)

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm)*		Legal (\geq 136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 Hr.tow	No.per sq.mi.	
J-12	7/15	58-01	160-51	Y33059 Z46386	23	7.1	10	1140	1	99	1.0
J-11	7/15	58-00	161-26	Y33140 Z46640	27	6.3	5	570	7	793	11.4
J-10	7/15	58-01	162-06	Y33234 Z46884	21	7.2	7	798	3	396	10.3
J-9	7/16	58-00	162-46	Y33334 Z47133	21	-	1	114	3	396	80.0
J-8	7/16	58-00	163-21	Y33419 Z47372	22	-	2	228	2	297	33.3
J-7	7/16	58-00	164-01	Y33524 Z47633	24	-	1	114	-	-	-
J-6	7/16	58-01	164-35	Y33622 Z47865	24	-	-	-	1	99	100.0
G-4	7/17	57-00	165-52	Y34247 Z48416	38	-	1	114	-	-	-
F-4	7/18	56-43	165-50	Y34338 Z48414	42	-	-	-	2	198	100.0
F-3	7/18	56-41	166-28	Y34462 Z48655	45	3.0	-	-	1	74	100.0
I-21	7/21	57-40	170-16	Y34760 Z49971	38	3.9	-	-	1	99	100.0
I-19	8/1	57-40	169-02	Y34605 Z49606	37	3.0	-	-	1	99	100.0

Table 3.--Data from eastern Bering Sea trawl survey stations where blue king crab were encountered.

Station	Date	Latitude	Longitude	Loran C	Depth (fm)	Bot. Temp. (C.)	Pre-recruit (110.0 - 135.0 mm*)		Legal (>136.0 mm)		%Legal of catch
							Catch per 1/2 hr.tow	No.per sq.mi.	Catch per 1/2 hr.tow	No.per sq.mi.	
F-20	6/18	56-40	169-30	Y35056 Z49828	43	4.0	-	-	-	-	-
G-20	6/18	57-00	169-33	Y35018 Z49896	33	4.0	8	1106	39	5389	35.8
H-20	6/18	57-20	169-36	Y34904 Z49896	35	3.5	8	1013	1	127	8.3
H-22	6/19	57-20	170-51	X18516 Z50153	44	3.5	1	127	3	380	60.0
G-21	6/19	57-02	170-07	X18707 Z50111	35	4.8	-	-	1	127	5.0
G-22	6/20	57-00	170-47	X18508 Y35086	51	3.5	-	-	4	496	100.0
G-20	6/24	57-00	169-32	X18718 Y35017	32	4.8	56	7094	36	4560	3.8
G-20	6/24	56-50	169-13	X18676 Y34985	43	3.5	7	760	9	977	37.5
F-19	6/24	56-41	168-53	X18642 Y34951	52	3.8	2	217	-	-	-
G-20	6/24	57-00	170-47	X18718 Y35019	32	4.8	23	2736	27	3171	3.5
G-20	6/24	56-48	169-14	X18676 Y34986	45	3.5	7	798	15	1784	48.6
I-22	6/28	57-40	170-52	X18447 Y34745	45	3.3	32	3763	7	892	12.9
H-19	7/19	57-22	168-56	Y34763 Z49648	37	3.9	17	2052	4	496	18.5
G-19	7/19	57-05	168-55	Y34875 Z49658	43	3.3	18	2166	6	694	24.1
I-20	7/21	57-40	169-39	Y34706 Z49812	37	3.0	-	-	1	99	100.0
I-21	7/21	57-40	170-16	Y34760 Z49971	38	3.9	10	1140	2	297	20.0
J-22	7/27	58-00	170-58	Y34513 Z49942	47	2.8	1	114	-	-	-
G-18	7/31	57-00	168-20	Y34735 Z49414	44	3.8	-	-	5	595	100.0
L-22	7/22	58-40	171-05	Y34031 Z49707	44	2.2	-	-	0	0	0
Q-23	7/23	60-20	172-04	Y32861 Z49284	31	0.4	-	-	0	0	0
R-24	7/24	60-40	172-47	Y32646 Z49627	24	-	-	-	7	788	18.4
R-25	7/24	60-40	173-28	Y32658 Z49340	38	1.9	-	-	16	1915	16.0
S-26	7/25	61-00	174-12	Y32454 Z49319	44	1.7	-	-	0	0	0
Q-26	7/25	60-20	174-04	Y32871 Z49491	49	-	-	-	1	113	50.0
P-25	7/25	60-00	173-18	Y33092 Z49520	38	1.3	-	-	3	338	7.1
P-24	7/26	60-00	172-38	Y33098 Z49454	35	1.4	-	-	2	225	8.3
M-25	8/6	59-00	173-08	Y33741 Z49796	58	3.7	-	-	3	338	75.0
N-26	8/10	59-20	173-48	Y33502 Z49749	60	2.9	-	-	2	225	100.0
N-25	8/10	59-20	173-09	Y33529 Z49704	55	2.8	-	-	1	113	25.0
O-25	8/11	59-40	173-14	Y33311 Z49614	52	2.0	-	-	1	113	33.0
O-26	8/11	59-40	173-52	X17386 Z49659	56	3.0	-	-	2	225	100.0
O-27	8/11	59-40	174-27	X17229 Z49692	62	2.8	-	-	5	563	62.0
P-27	8/13	60-00	174-36	X17177 Z49618	59	2.2	-	-	1	113	33.0
P-26	8/13	60-00	173-57	X17344 Z49570	53	1.7	-	-	1	113	17.0

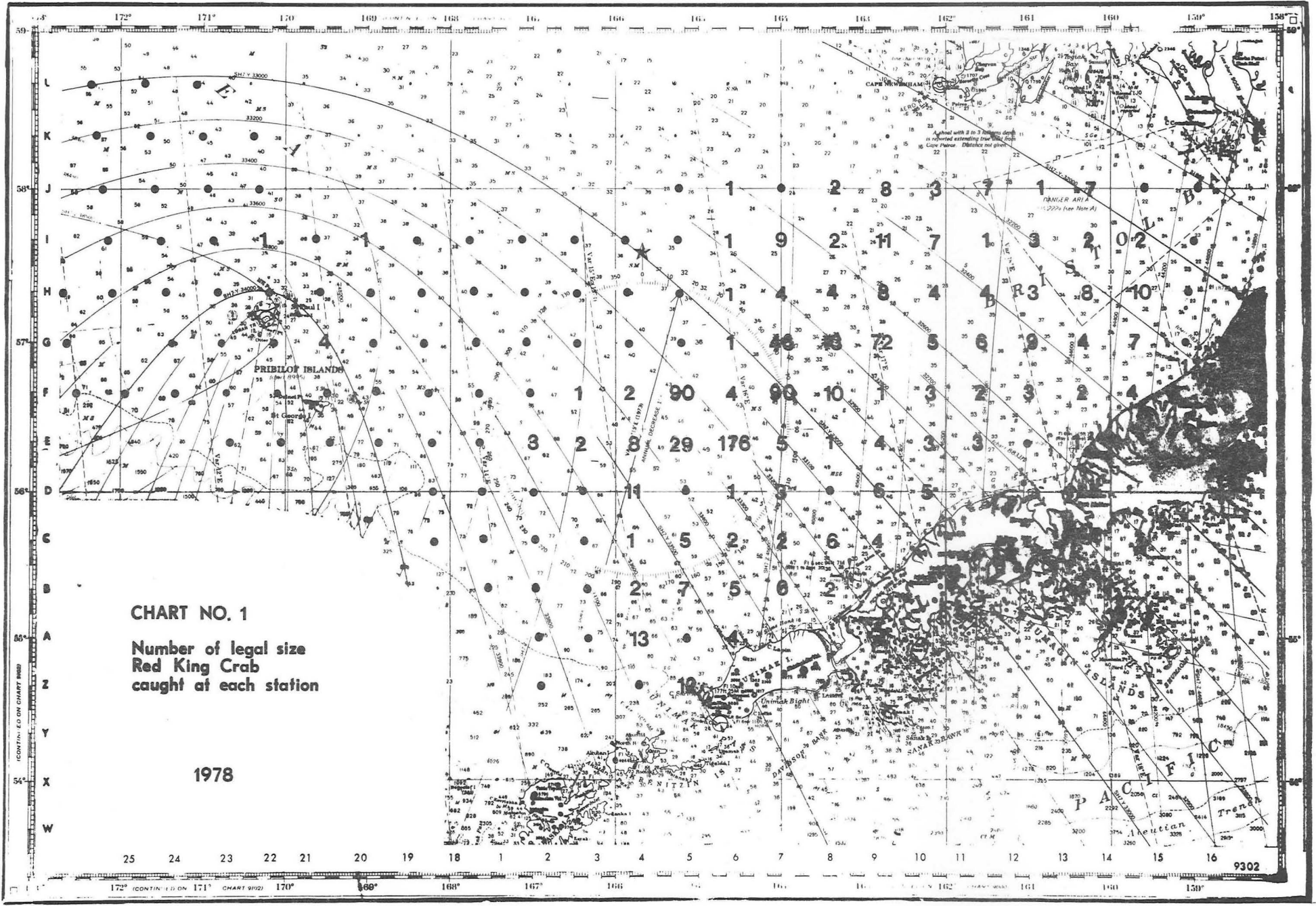


CHART NO. 1

**Number of legal size
Red King Crab
caught at each station**

1978

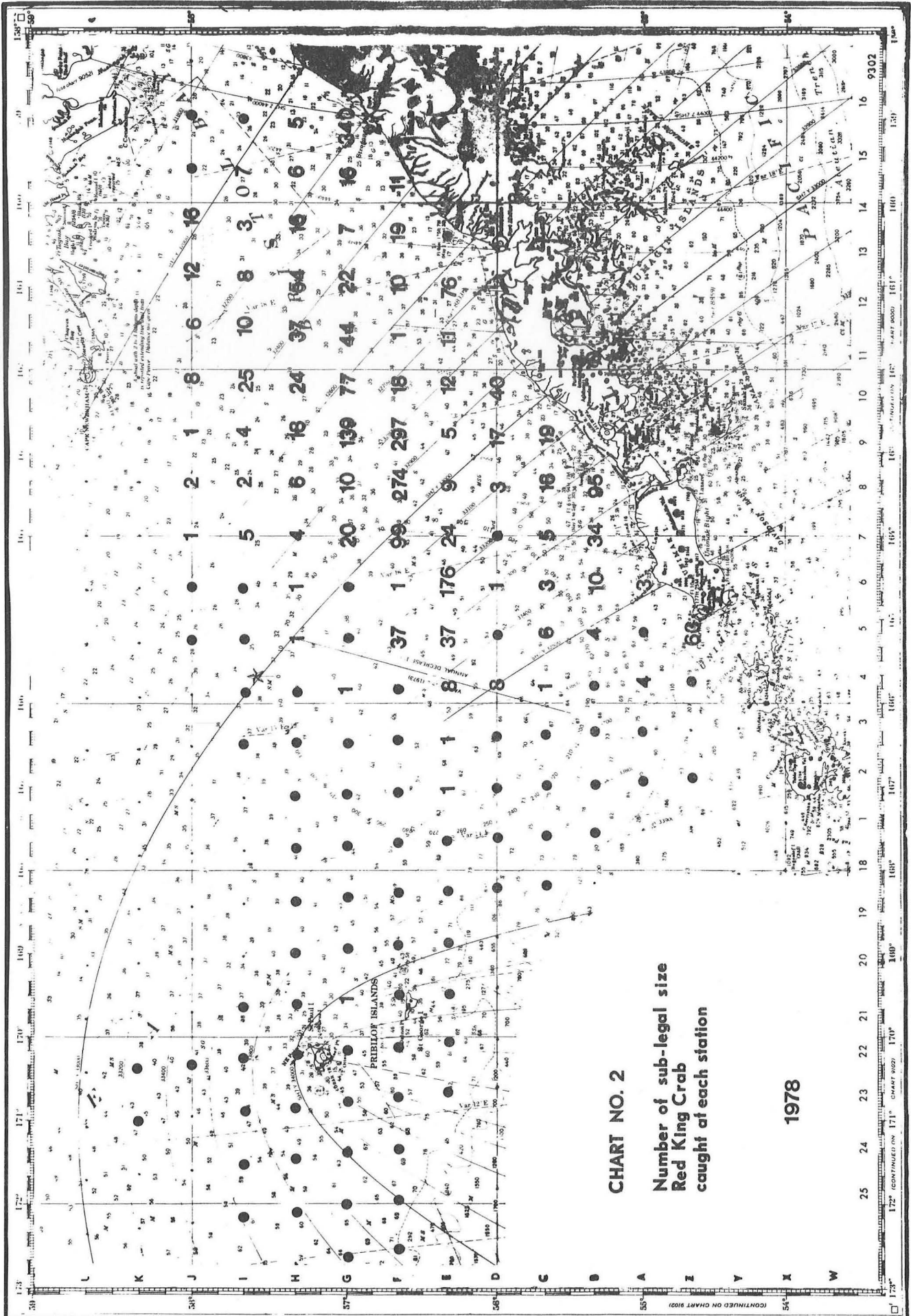


CHART NO. 2

**Number of sub-legal size
Red King Crab
caught at each station**

1978

172° 171° 170° 169° 168° 167° 166° 165° 164° 163° 162° 161° 160° 159° 158° 157° 156° 155°

58° 57° 56° 55°

(CONTINUED ON CHART 9102)

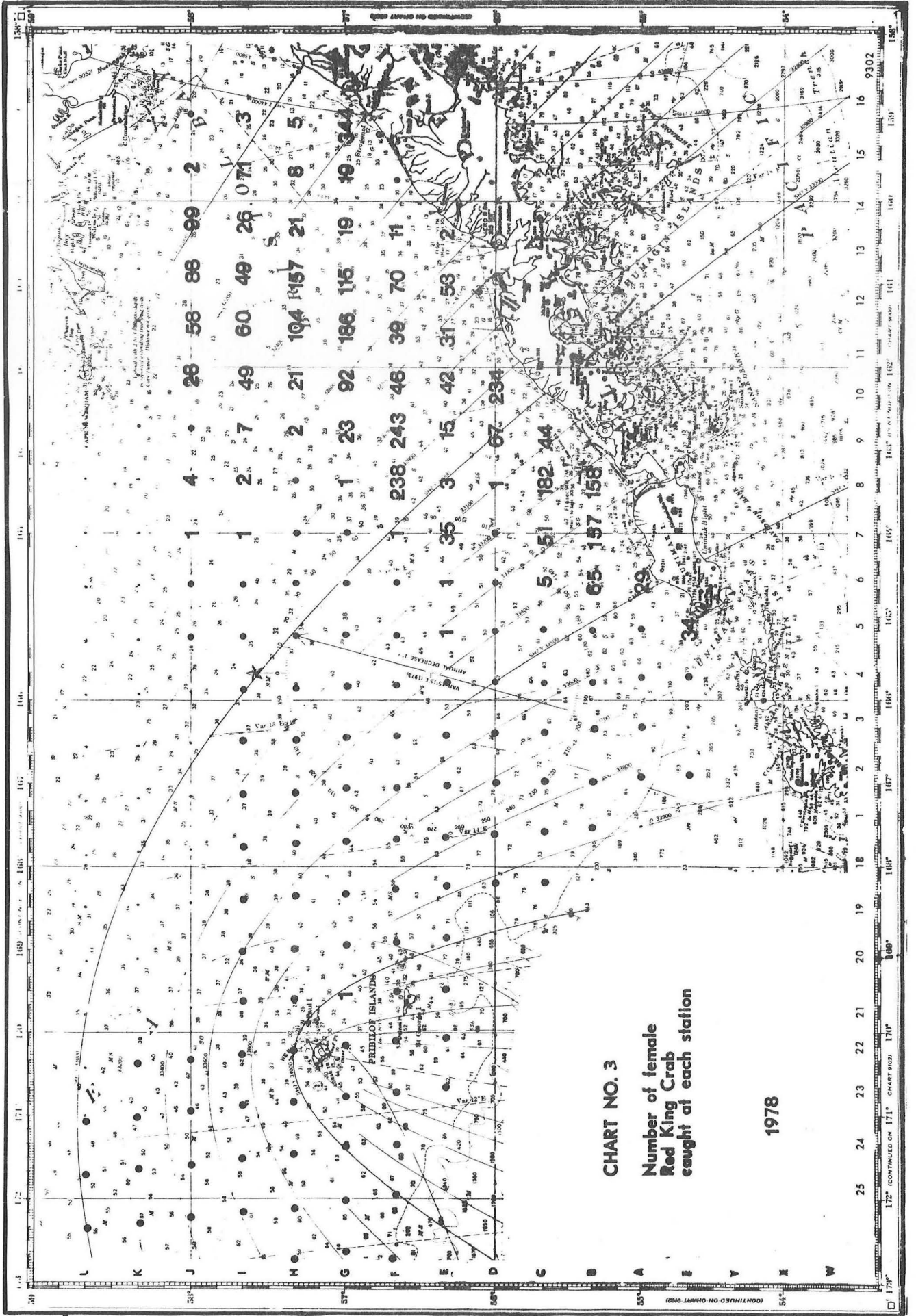


CHART NO. 3

**Number of female
Red King Crab
caught at each station**

1978

172° (CONTINUED ON 171° CHART 102) 171°

170°

169°

168°

167°

166°

165°

164°

163°

162°

161°

160°

159°

158°

157°

156°

155°

154°

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107°

106°

105°

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103°

102°

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55°

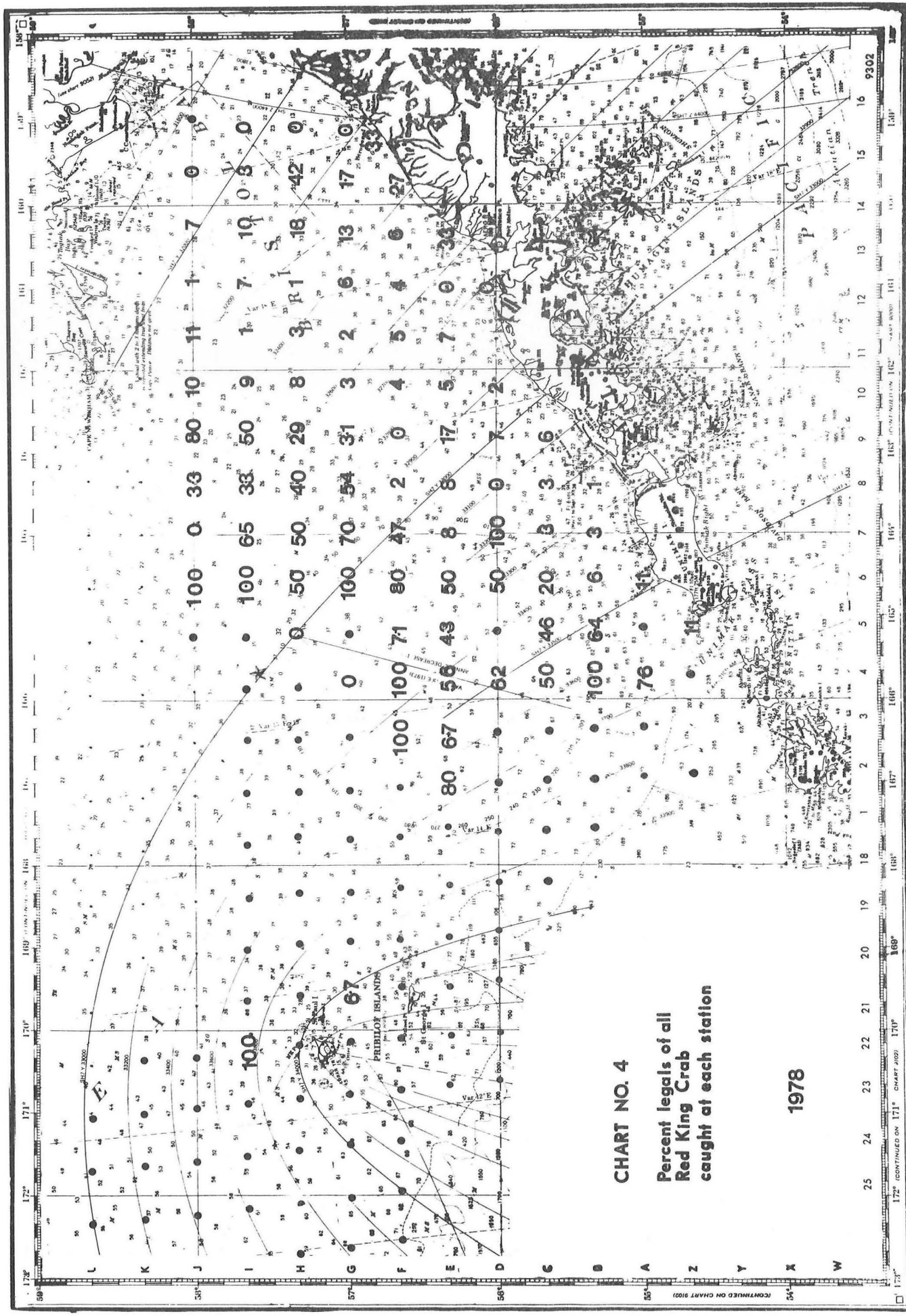


CHART NO. 4

**Percent legals of all
Red King Crab
caught at each station**

1978

172° 171° 170° 169° 168° 167° 166° 165° 164° 163° 162° 161° 160° 159° 158° 157°

5° 6° 7° 8° 9° 10° 11° 12° 13° 14° 15°

172° 171° 170° 169° 168° 167° 166° 165° 164° 163° 162° 161° 160° 159° 158° 157°

172° 171° 170° 169° 168° 167° 166° 165° 164° 163° 162° 161° 160° 159° 158° 157°

(CONTINUED ON CHART 9302)

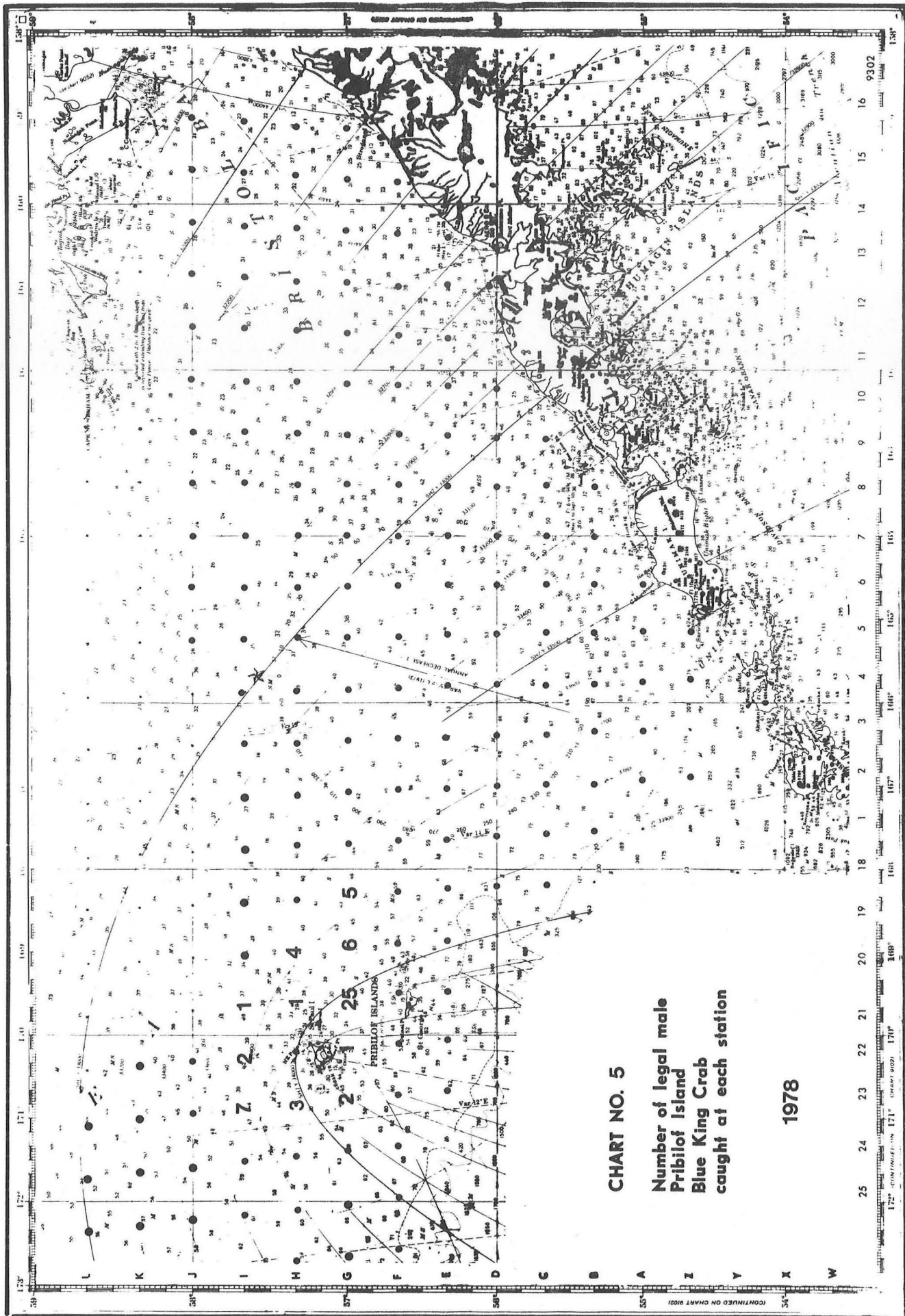


CHART NO. 5

**Number of legal male
Pribilof Island
Blue King Crab
caught at each station**

1978

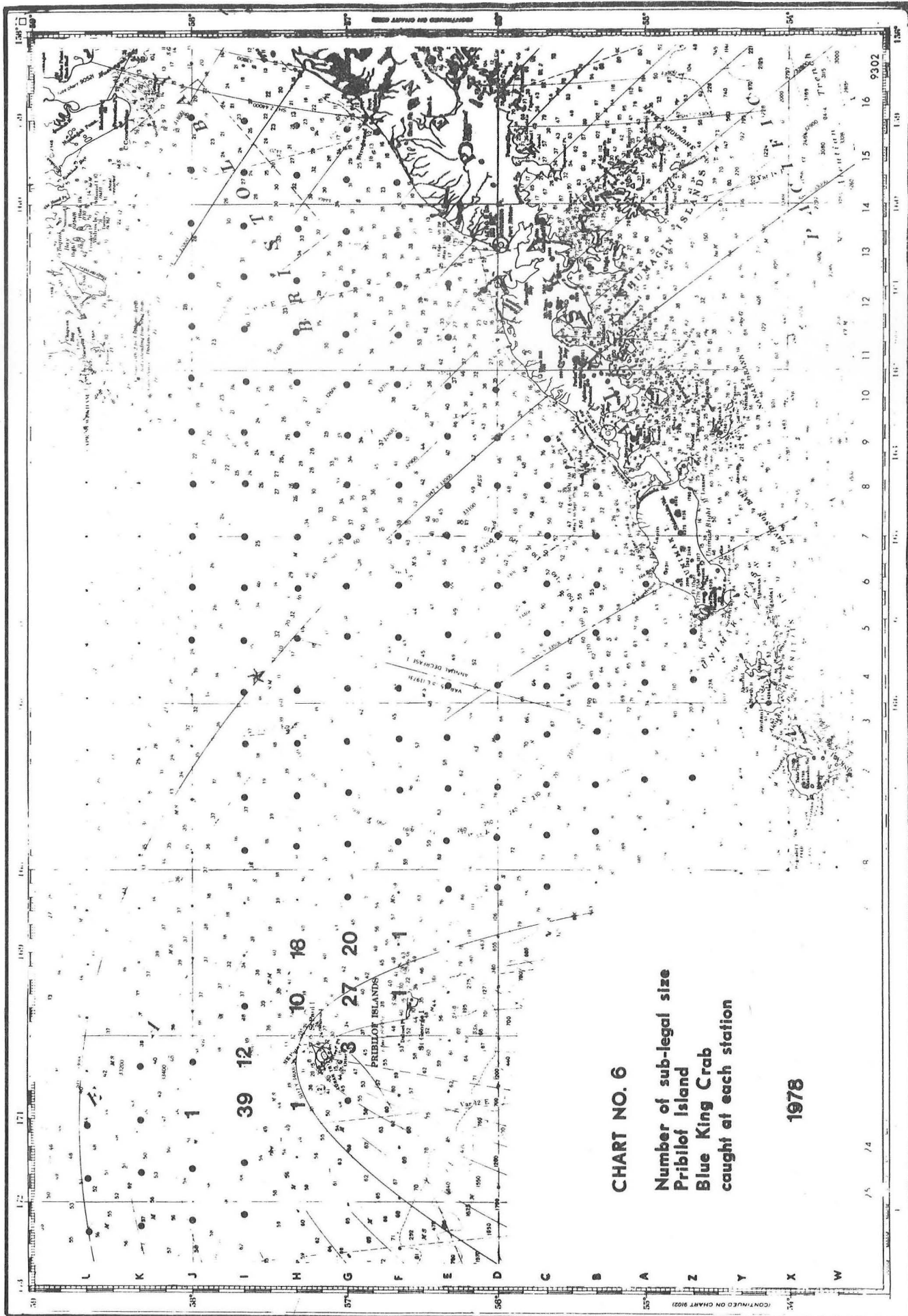


CHART NO. 6
Number of sub-legal size
Pribilof Island
Blue King Crab
caught at each station

1978

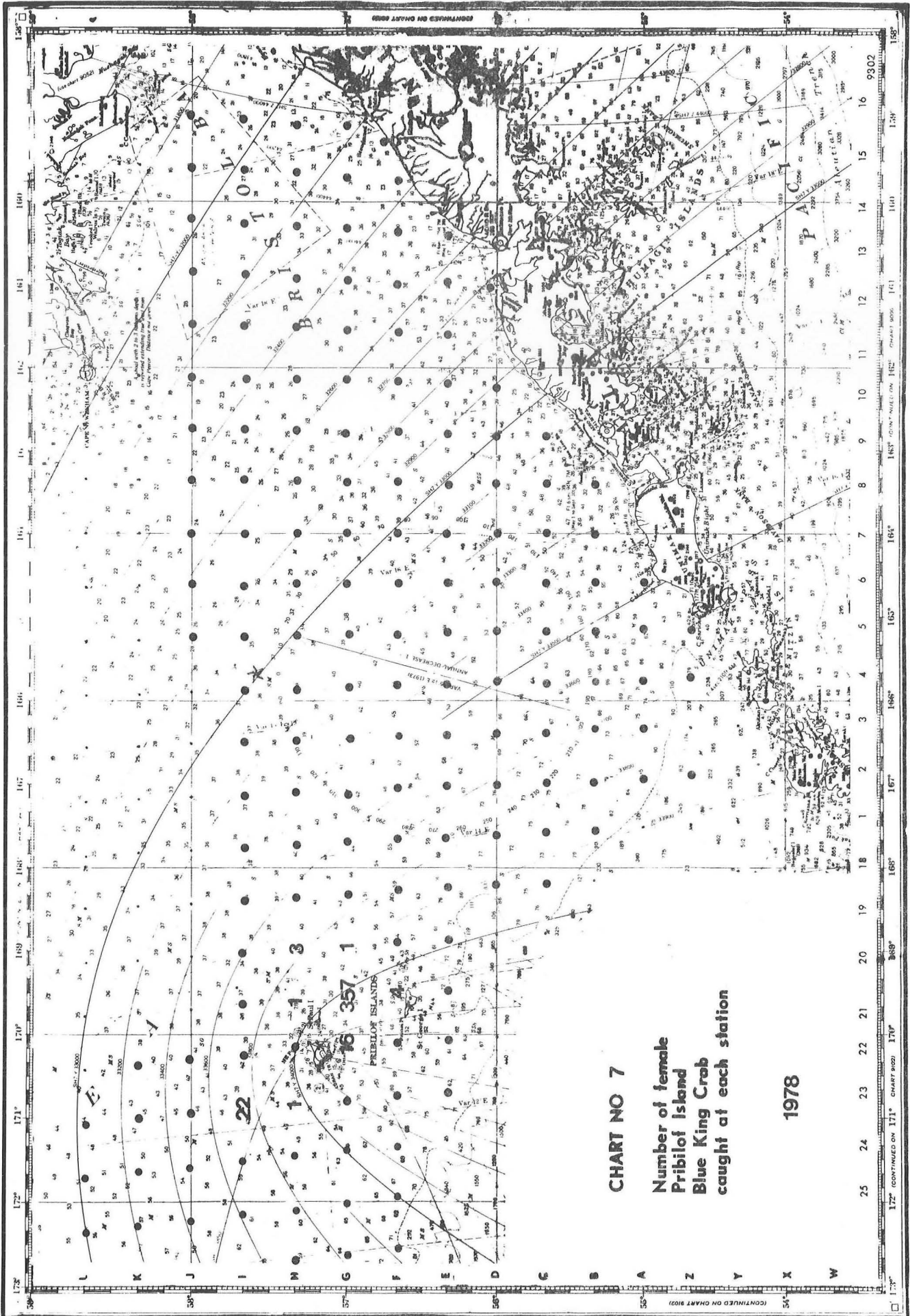


CHART NO 7

**Number of female
Pribilof Island
Blue King Crab
caught at each station**

1978

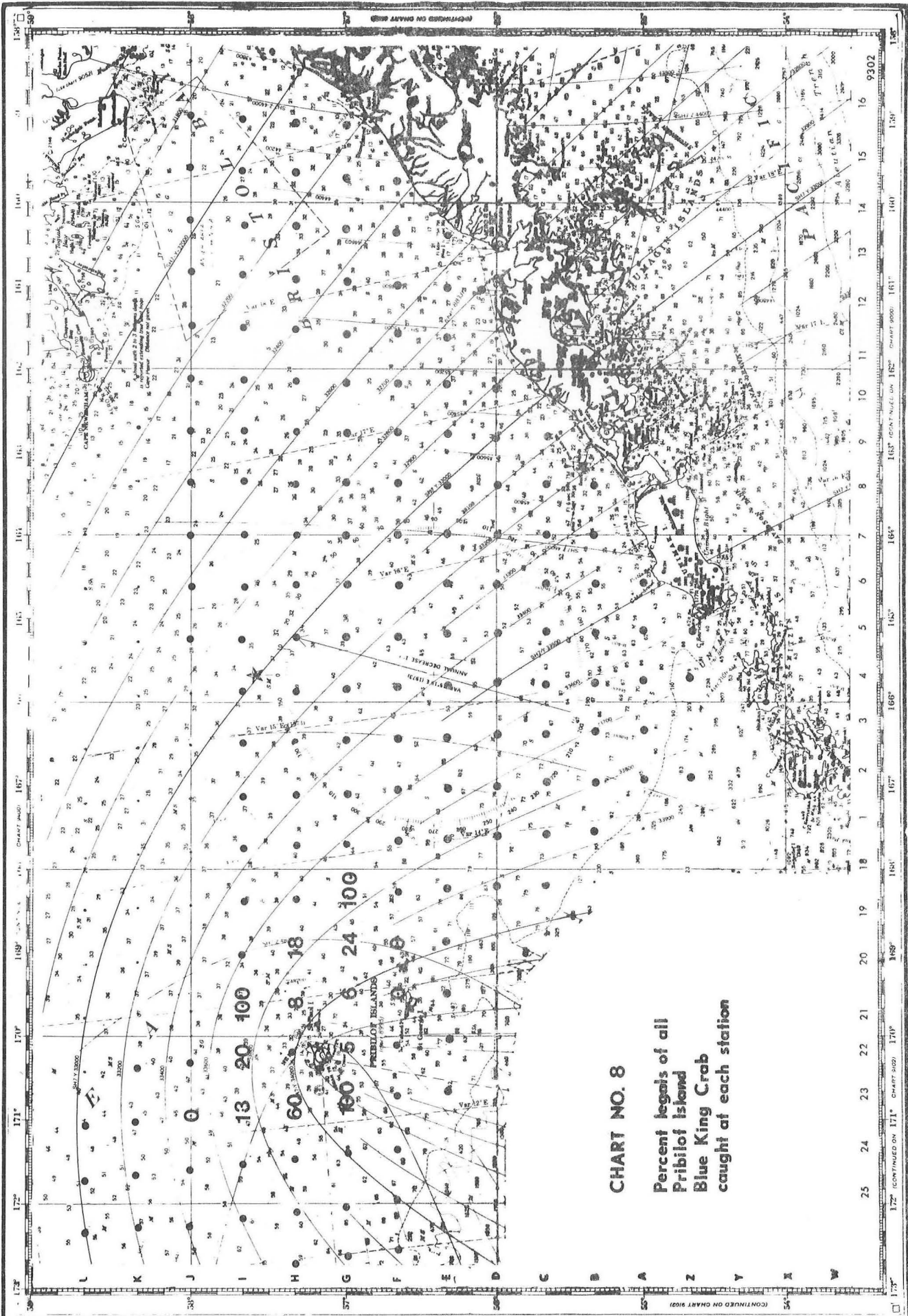


CHART NO. 8

**Percent legals of all
Pribilof Island
Blue King Crab
caught at each station**

13 20 100
60 18 8
100 15 6 24 100

PRILOF ISLANDS

(CONTINUED ON CHART 9101)

172° 171° 170° 169° 168° 167° 166° 165° 164° 163° 162° 161° 160° 159° 158° 157° 156° 155° 154° 153° 152°

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

9302

172°

172°

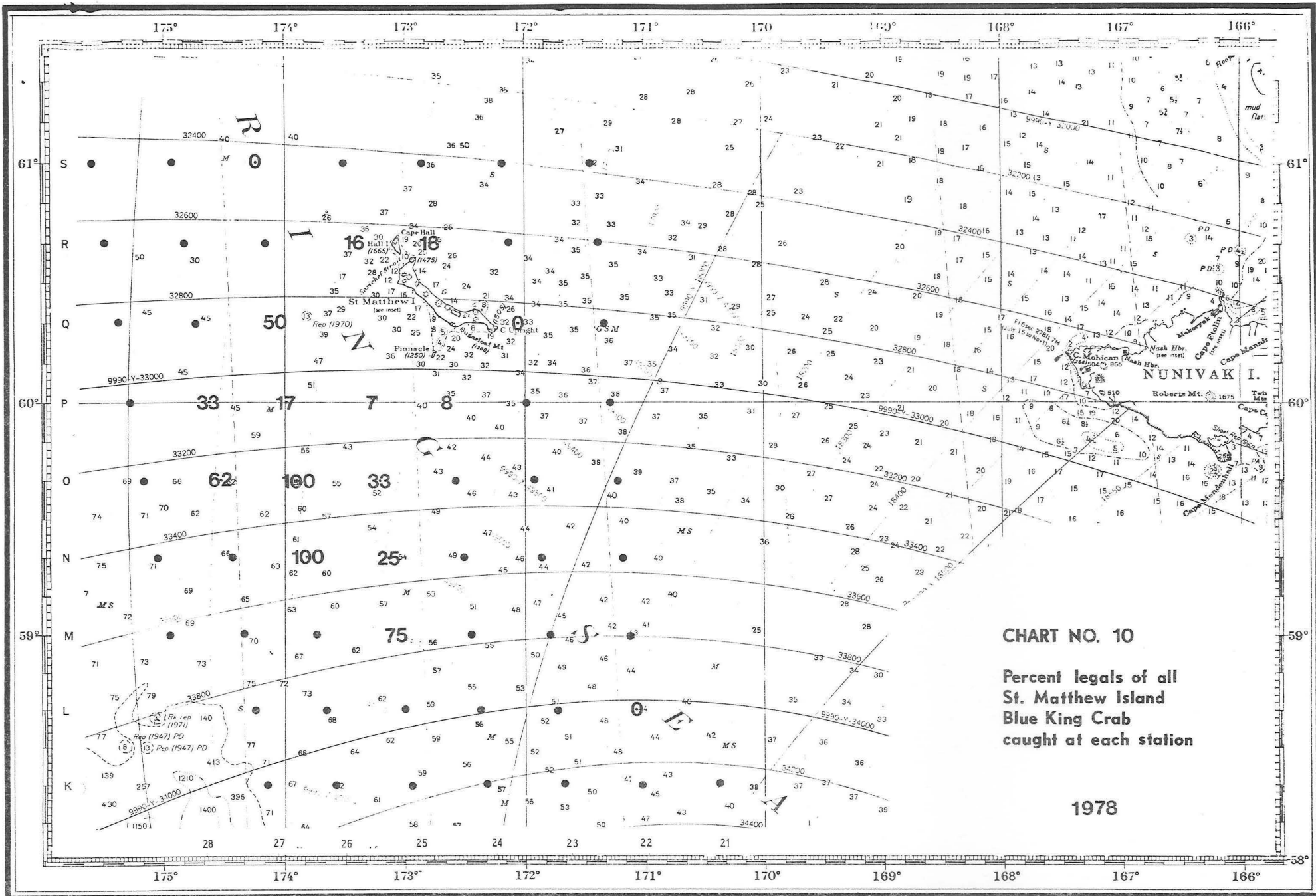


CHART NO. 10

Percent legals of all
St. Matthew Island
Blue King Crab
caught at each station

1978

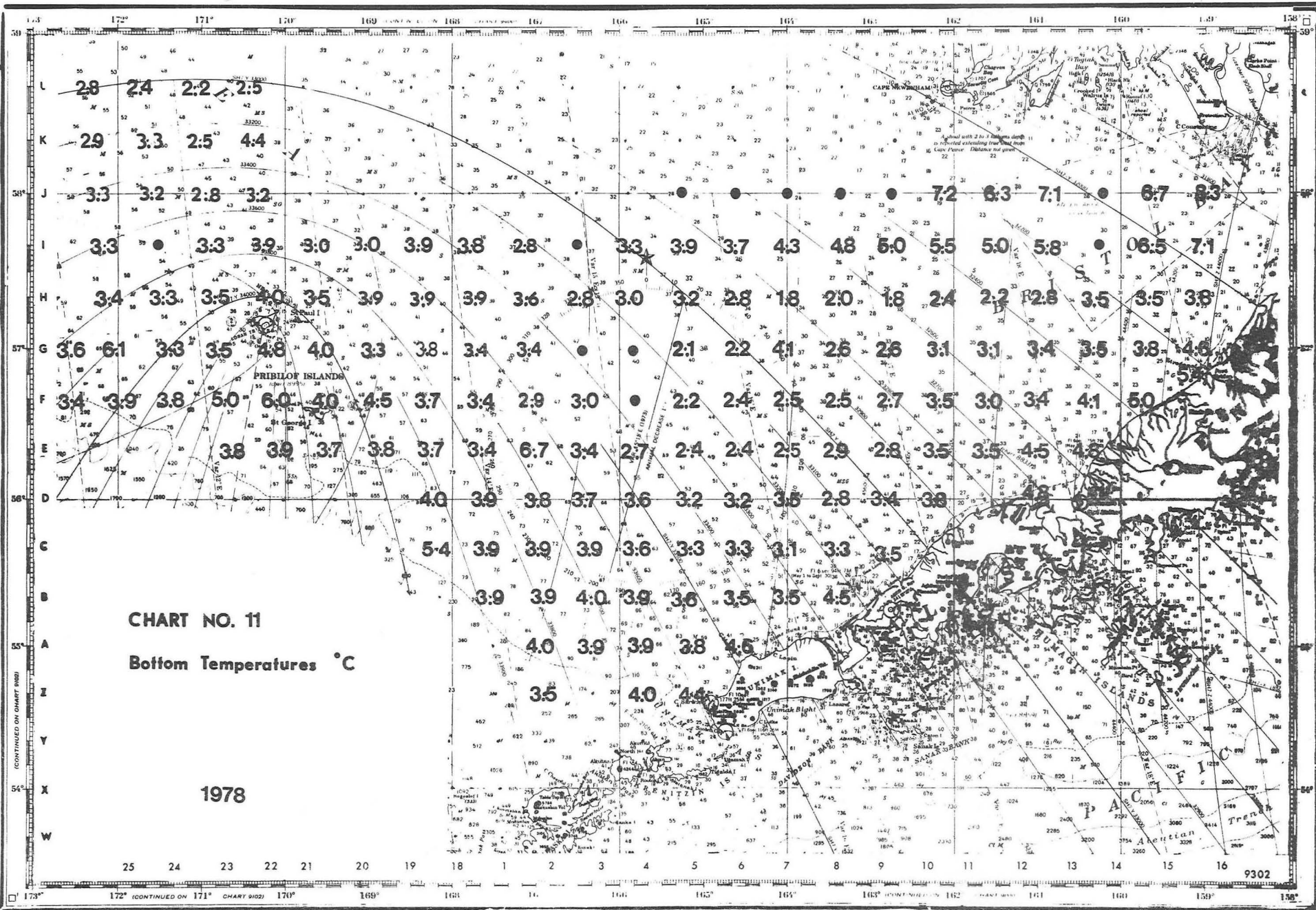


CHART NO. 11
Bottom Temperatures °C

1978

