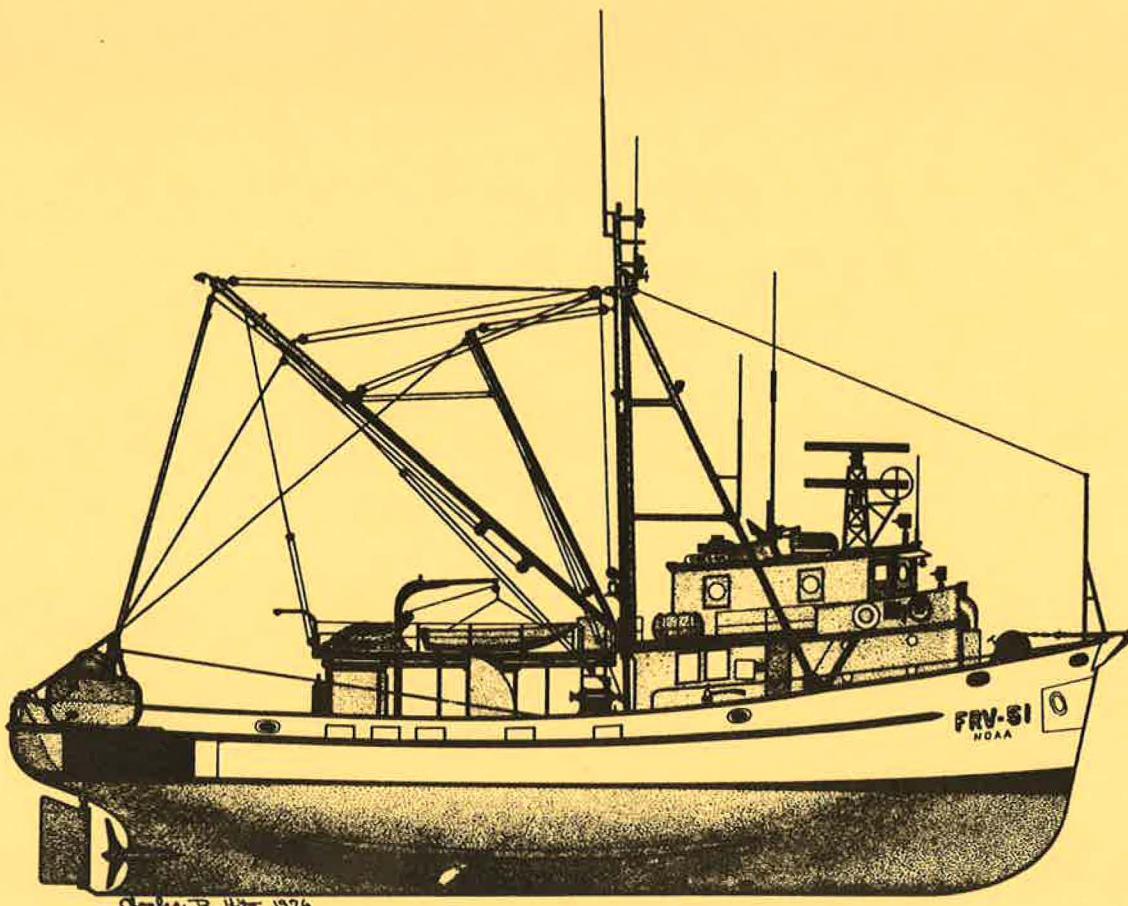


**NORTHWEST and ALASKA FISHERIES CENTER  
PROCESSED REPORT 79-14  
SEPTEMBER 1979  
REPORT TO INDUSTRY ON 1979**

**EASTERN BERING SEA SURVEY  
KING and TANNER CRAB**



**SURVEY VESSELS      R/V OREGON  
                          F/V PARAGON II  
                          F/V DISCOVERY BAY**

**Northwest and Alaska Fisheries Center  
Kodiak Facility  
Kodiak, Alaska**

**Northwest and Alaska Fisheries Center Processed Report**

**Report to Industry on**

**1979**

**Eastern Bering Sea Survey**

**King and Tanner Crab**

**by**

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**September 1979**

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## The 1979 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 distribution and abundance of red king crab (Paralithodes camtschatica), blue king crab (P. platypus) and two species of Tanner crab (Chionoecetes bairdi and C. opilio). Hybrid Tanner crabs are also discussed. Data on the distribution and abundance of groundfish are also collected as part of the survey and are available from the National Marine Fisheries Service Seattle Laboratory.

In the past, separate reports on king and Tanner crab were issued. In the interest of providing information as soon as possible, we decided to publish a combined report this year. This decision resulted in reduction of detail, however, no essential information has been omitted.

A special survey of the Norton Sound area was also conducted and will be the subject of a separate report.

### Survey Area and Methods

The area covered by the survey was enlarged in 1978 and further enlarged in 1979 (Figure 1). Additionally, the number of stations taken south of Cape Newenham during 1979 was doubled. This southern area encompasses almost all U. S. crab fisheries and a majority of the resource. The enlarged survey area and increased station density required the use of two chartered vessels in addition to the NOAA R/V OREGON. The

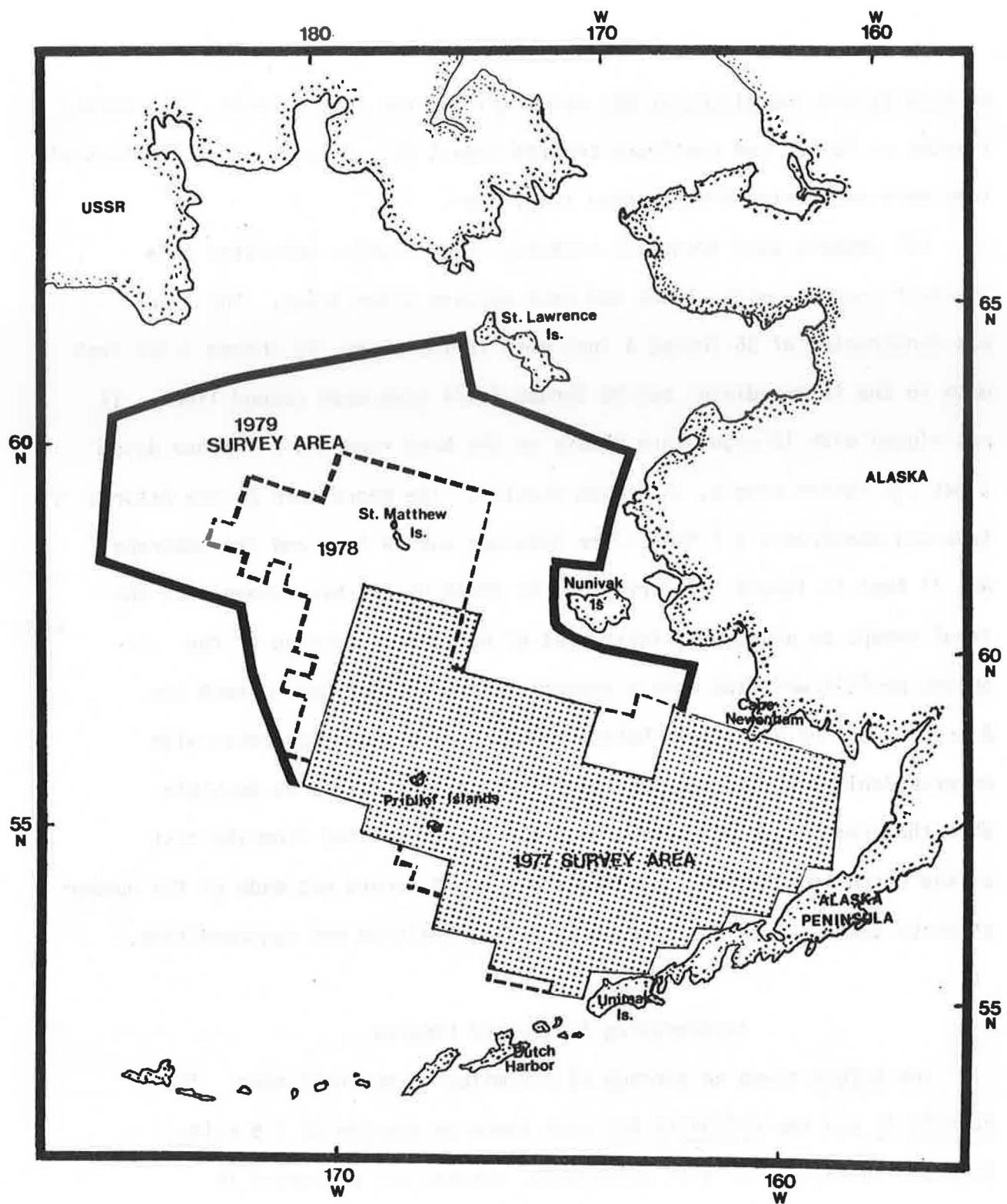


Figure 1. -- NMFS eastern Bering Sea crab survey areas in 1977 (shaded), 1978 and 1979.

PARAGON II and the DISCOVERY BAY were employed for this purpose. The survey started on May 22 and continued through August 27. A total of 522 successful tows were made using the standard trawl gear.

All vessels used identical methods. Each station 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 5 x 7 feet. The footrope was 94 feet and the headrope was 71 feet in length. Observations by SCUBA divers have shown that the trawl sweeps an average of forty feet of bottom. 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 as many stations as possible. 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.

#### Interpreting Tables and Figures

The OREGON towed an average of 1.2 miles in one-half hour. The PARAGON II and the DISCOVERY BAY each towed an average of 1.5 miles. In order to adjust for this difference, catches are presented in accompanying tables as the number of crab caught per mile towed (rounded to the nearest whole number). The charts are based on 20 by 20 mile squares. In cases where more than one tow was made in a square the

average number of crabs per mile towed is presented. It is advisable to cross-reference the charts with the tables to obtain more exact positions. Also, because of rounding, numbers of male and female crabs in the tables will not necessarily add to the total. This should not be a matter of concern. Charts and tables showing the percentage of legal crab should be carefully cross referenced since high percentages of legal crab are often found in areas of low abundance.

### Results

Only preliminary analyses of population abundance have been conducted and no population estimates are ready to be released. A general idea of crab abundance trends is given below. Population estimates will be presented at the October meeting of the North Pacific Fishery Management Council.

Position and catch information is contained in Tables 3-6 and Charts 1-12. Average bottom temperatures are given in Chart 13. Although the survey extended north to St. Lawrence Island, significant populations of fishable crab were not encountered north of 61 degrees and the charts only extend to this limit.

#### Red King Crab:

The distribution of legal-sized crab in 1979 (Table 3, Chart 1) is remarkably similar to that of 1978. For example, the five highest "squares" in 1979 (E05, F05, F06, G07, G08) and 1978 (E06, F05, F07, G07, G09) are almost identical. The distribution of pre-recruit

(Chart 2) crabs is also extremely similar in the two years. The percentages of legal crab in each square (Chart 3) are also similar to those of 1978. Note that the highest percentages of legal crab were taken along the seaward edge of the population's distribution in areas where the number of legal crab was small.

The abundance of red king crab may well be at an all time high. It follows that the availability of legal crab is probably as high or higher than it was in 1978 (Table 1). The abundance of pre-recruits seem to be similar to that of last year.

In conversations with fishermen, we have frequently been asked if there was a relationship between bottom temperature and the abundance of king crabs. Figure 2 shows temperatures and the average numbers of legal male red king crab taken per square mile in surveys since 1976. 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 five years (1975-1979) indicates only that temperatures less than 5.0° C (about 41 degrees F.) seem to be favored. The shift in the range of temperatures at which red king crab were encountered is indicative of the warming trend over recent years. Although temperature does not appear to exert strong control over the summer distribution of red king crab, it is possible that temperature is more important at other times of the year.

Figure 3 shows the relationship between catch rates in the fishery and estimates of abundance derived from annual trawl surveys. Up until 1976, plotted points fell very nearly on a straight line. Since that

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

RED KING CRABS

Year	Prerecruits*	Legals*
1969	19.5	9.8
1970	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

PRIBILOF BLUE KING CRABS

Year	Prerecruits*	Legals*
1974	3.1	1.9
1975	8.0	7.5
1976	2.1	3.9
1977	2.2	9.4
1978	5.8	4.3

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

\*\* No survey in 1971.

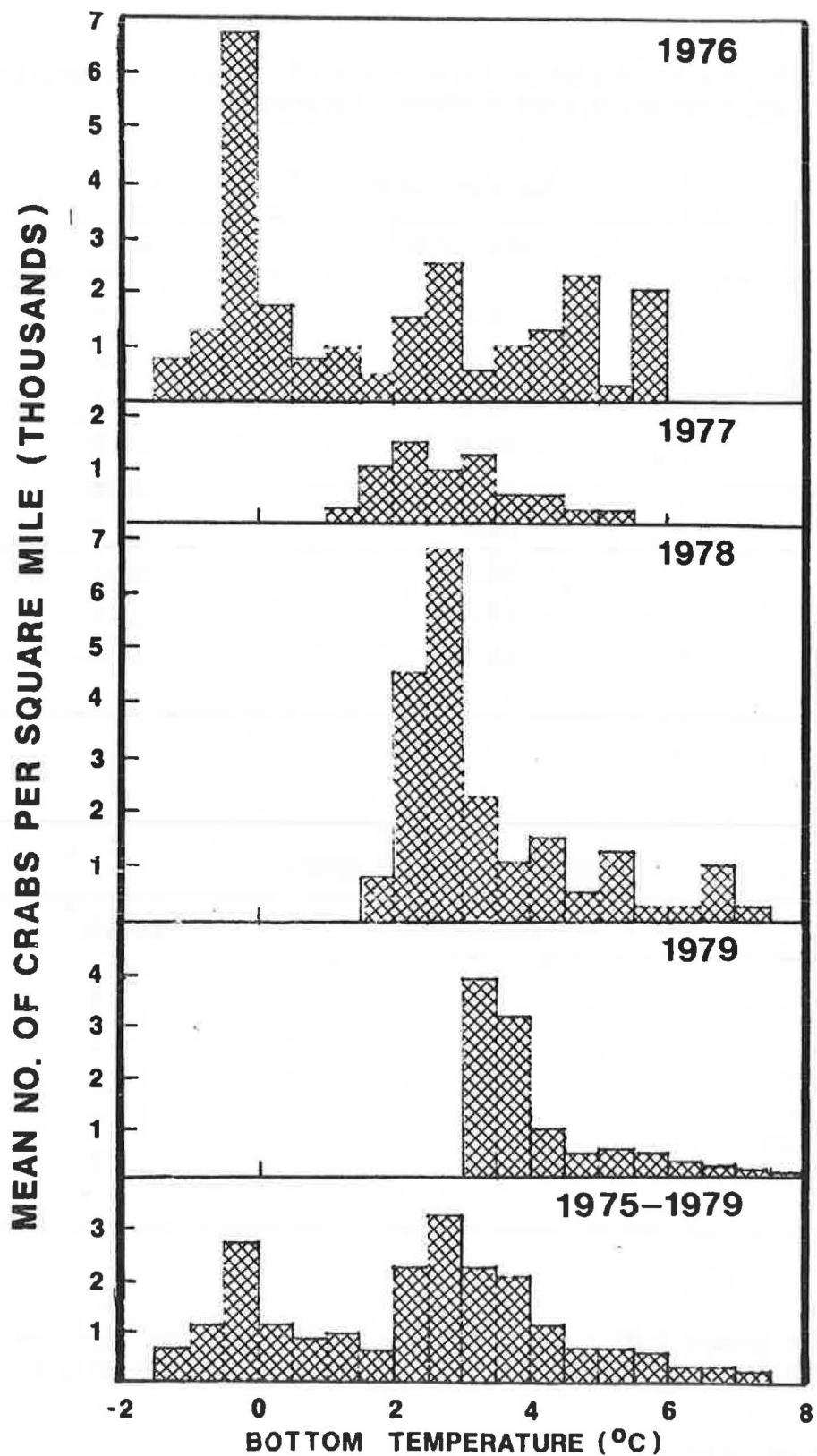


Figure 2. -- Average number of legal-sized male red king crab (Paralithodes camtschatica) per square mile found at various bottom temperatures in the 1975-1979 NMFS Bering Sea surveys. Data are summarized in 0.5 degree intervals.

## RED KING CRAB LEGAL MALES

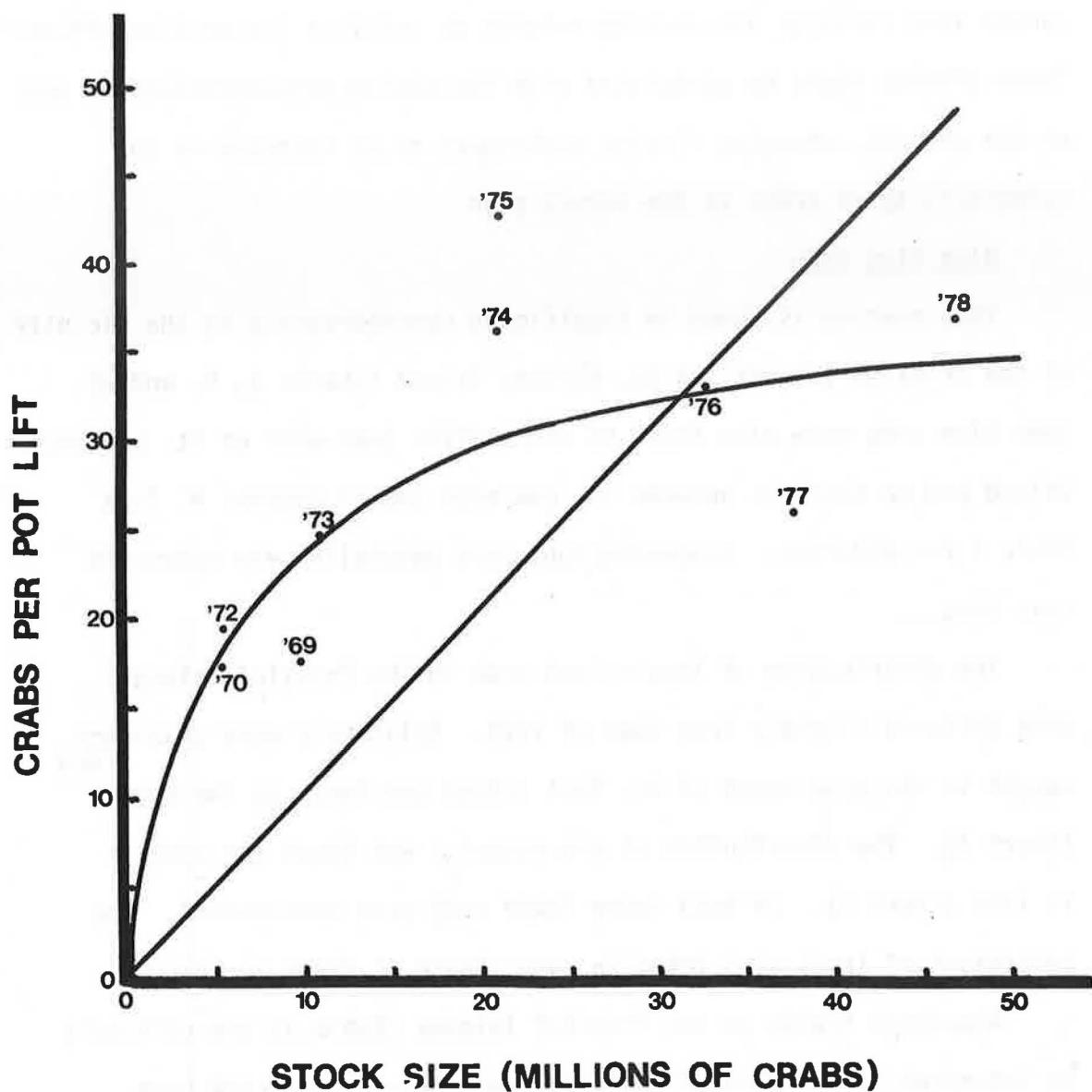


Figure 3. -- Relationship between the season average number of Red King Crab (*Paralithodes camtschatica*) taken per pot in the U.S. Fishery and estimates of stock size from NMFS trawl surveys in the preceding summer.

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, changing fishing techniques or an increase in the vulnerability of crabs to the survey gear.

Blue King Crab:

This species is found in significant concentrations in the vicinity of the Pribilof Islands and St. Matthew Island (Charts 4, 5, and 6). Some blue crab were also found on one station just west of St. Lawrence Island and on stations between St. Lawrence and 61 degrees N. (see Table 4 for U29-Y26). Concentrations were generally very sparse in this area.

The distribution of legal-sized crab in the Pribilof Islands area differed slightly from that of 1978. Relatively more crab were caught in the area north of St. Paul Island and fewer to the south (Chart 4). The distribution of pre-recruits was about the same as in 1978 (Chart 5). In both cases fewer crab were encountered. The percentage of legal crab taken in each square is shown in Chart 6.

Abundance trends in the Pribilof Islands (Table 1) are difficult to interpret. Estimates of both legal and pre-recruit crab 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 20 survey squares in any given year. Alaska Department of Fish and Game statistics do, however, indicate a declining trend in catch per unit effort over the past five years.

The distribution of legal crab in the St. Matthew Island area shows that legal-sized crab were caught at fewer stations in 1979 and closer to shore than in 1978. In both years most legal crab were taken south and west of the Island. The distribution of pre-recruit crab was similar in this respect. The percentage of legal crab in each square is given in Chart 6.

The abundance of legal-sized crab in the St. Matthew Island area appears to be roughly similar to that of 1978. It is noted that very poor commercial fishing was reported during the summer of 1979. Estimation of St. Matthew Island blue king crab abundance is extremely difficult because much of the area is untrawlable.

Bairdi Tanner Crab:

The distribution of legal-sized Bairdi Tanner crab (Chart 7, Table 5) shows areas of concentration north of False Pass (C07, C08, D07, D09), in outer Bristol Bay (from F11 northeast to H12-13), in the vicinity of G07, and east of the Pribilof Islands (F20, F01, E01). The heaviest concentrations in 1978 occurred north of False Pass (B08, D06, D09) and in outer Bristol Bay (F12, G13, G14). The area near H07 was an area of high pre-recruit abundance in 1978 and perhaps explains the high legal abundance near there in 1979. The concentration of legal crab east of the Pribilofs is not readily explainable. While there appear to be more legal crab in the Pribilof area in 1979 than in 1978, relative abundance in both years is still considerably lower than in 1977. The distribution of pre-recruit crab (Chart 8) was similar in 1978 and 1979, except that high concentrations

were found during the 1979 survey at I18 and I26. Percentages of legal crab taken in each square are given on Chart 9.

The overall abundance of legal and pre-recruit Tanner crab (Table 2) shows a decline over the past several years with a sharp decline in 1978. The abundance of legal and pre-recruit crab in 1979 appears to be similar to that of 1978.

The relationship between the average number of legal Bairdi Tanner crab per square mile and bottom temperature during the past five years is shown in Fig. 4. The temperatures at which Bairdi crab have been encountered have gradually increased, reflecting the trend toward milder weather during the same period. Differences between 1977 and 1978 do not, however, seem to be sufficient to account for the observed change in abundance of legal animals between those years. Differences in bottom temperatures from 1978 to 1979 were even smaller. The bottom panel of Fig. 4 shows that the highest catches of Bairdi Tanner crabs have occurred in the 0-5° C range. There does not appear to be a narrower range of temperatures in which the highest catch rates consistently have occurred. These data are limited and apply only to the summer distribution. It is possible that temperature is a more important factor at other times of the year.

Figure 5 shows the relationship between catch rates in the fishery and estimates of abundance from the survey. The curved line shown in the Figure seems to fit the data better than the straight line, however, there are very few data points and no strong conclusion can be drawn. Note that the 1973 data point was not included in deriving either the straight or the curved line. Catch rates during that year may

Table 2. -- Population estimates of Tanner crab in the standard survey area of the eastern Bering Sea by species and size from NMFS annual surveys, 1973-1978 (sizes are carapace widths).

	MILLIONS OF CRAB BY YEAR					
	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
<b><u>BAIRDI MALES</u></b>						
Large (over 5.0") <sup>1</sup>	66.9	130.5	209.6	157.8	111.1	57.1
Legal (over 5.5")				109.5	92.1	45.6
Prerecruit (3.3"-5.0")	140.5	255.0	207.5	131.7	159.6	85.7
Prerecruit (3.9"-5.5")				136.6	116.3	81.2
<b><u>OPILIO MALES</u></b>						
Large (over 4.2")	84.7	246.7	274.8	181.6	137.3	89.0
Small (under 4.3")	115.2	1480.3	1916.7	2221.1	1850.9	2174.5
<b><u>HYBRID MALES</u></b>						
Large (over 4.2")			33.8	16.5	15.4	5.6
Small (under 4.3")			47.5	27.8	141.2	11.7

<sup>1</sup> Legal size for calendar year 1977 (>140 mm)

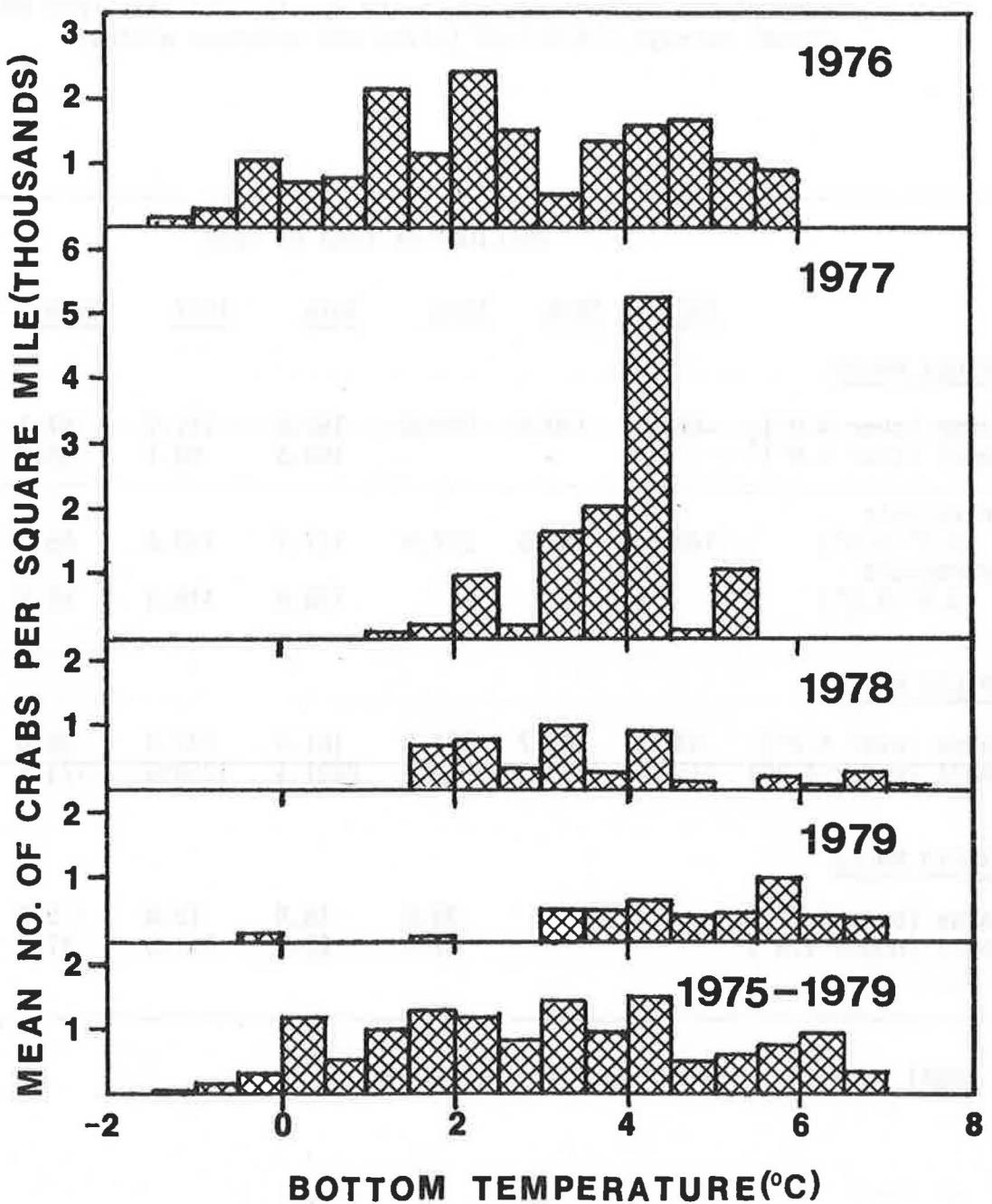


Figure 4. -- Average number of legal-sized male Tanner crab (Chionocetes bairdi) per square mile found at various bottom temperatures in the 1975-1979 NMFS Bering Sea surveys. Data are summarized in 0.5 degree intervals.

### BAIRDI TANNER CRAB LEGAL MALES

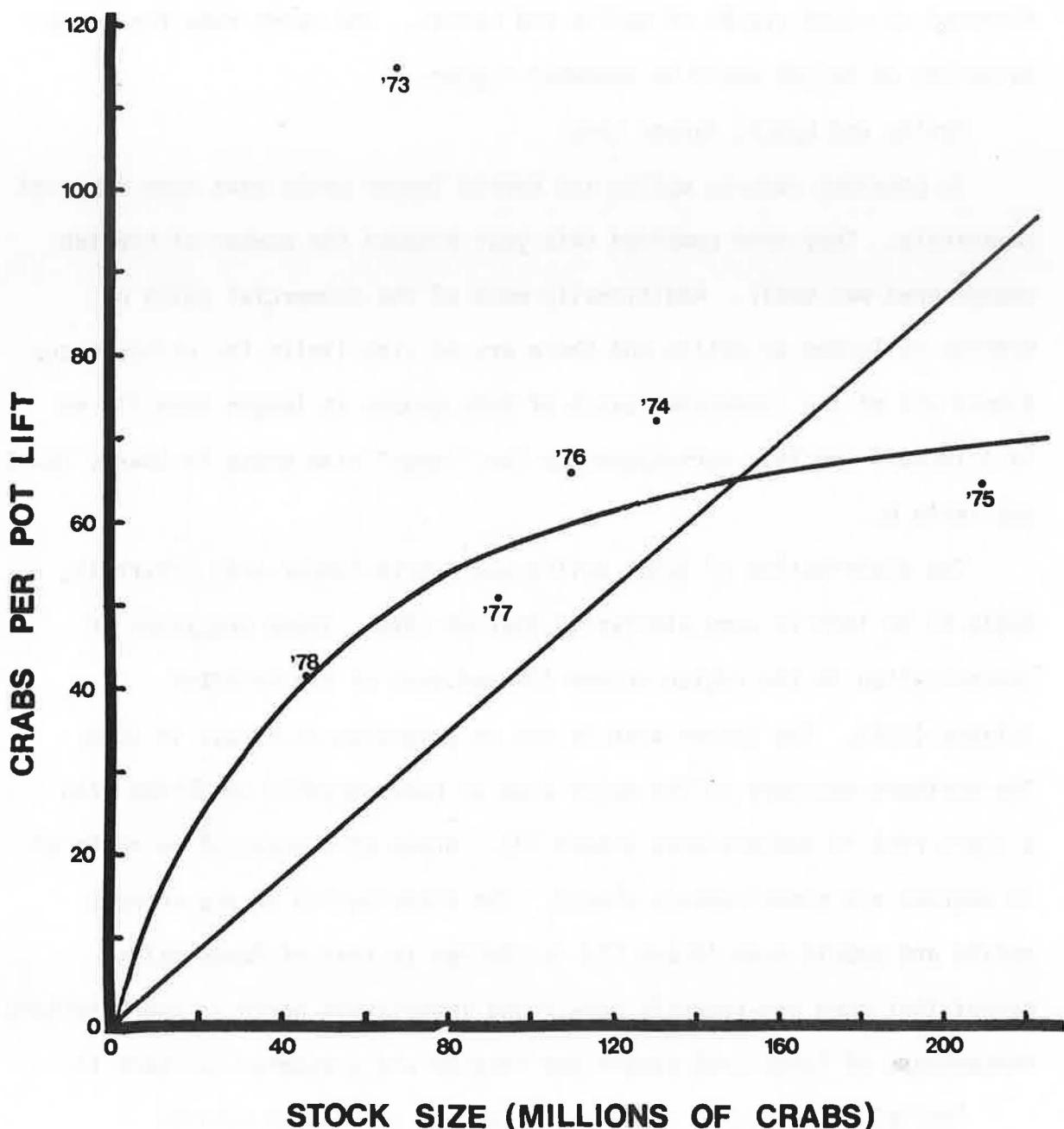


Figure 5. -- Relationship between the season average number of Tanner crab (*Chionoecetes bairdi*) taken per pot in the U.S. Fishery and estimates of stock size from NMFS trawl surveys in the preceding summer (1973 was not included in calculating equations for either line).

not be reflective of the general situation because 1973 was the first year of a Tanner crab directed U. S. fishery. The catch per unit effort shown for 1978 is for the entire fleet. Some of the 1978 effort was directed at mixed stocks of opilio and bairdi. The catch rate for boats targeting on bairdi would be somewhat higher.

Opilio and Hybrid Tanner Crab:

In previous reports opilio and hybrid Tanner crabs have been reported separately. They were combined this year because the number of hybrids encountered was small. Additionally most of the commercial catch of hybrids is landed as opilio and there are no size limits for either group. Almost all of the commercial catch of both groups is larger than 110 mm (4.3 inches) and this corresponds to the "large" size group in Charts 10-12 and Table 6.

The distribution of large opilio and hybrid Tanner crab (Chart 10, Table 6) in 1979 is very similar to that of 1978. There are areas of concentration in the region around I04 and west of the Pribilof Islands (H24). The latter area is not as extensive as it was in 1978. The northern boundary of the major area of concentration coincides with a sharp rise in temperatures (Chart 13). Areas of concentration north of 58 degrees are conspicuously absent. The distribution of pre-recruit opilio and hybrid crab (Chart 11) is similar to that of large males except that more pre-recruits were found immediately north of the Pribilofs. Percentages of large crab caught per station are presented in Chart 12.

Preliminary analysis of the abundance of opilio and hybrids indicates that large males are approximately as abundant as last year. Analysis of the abundance of opilio and hybrid Tanner crab is

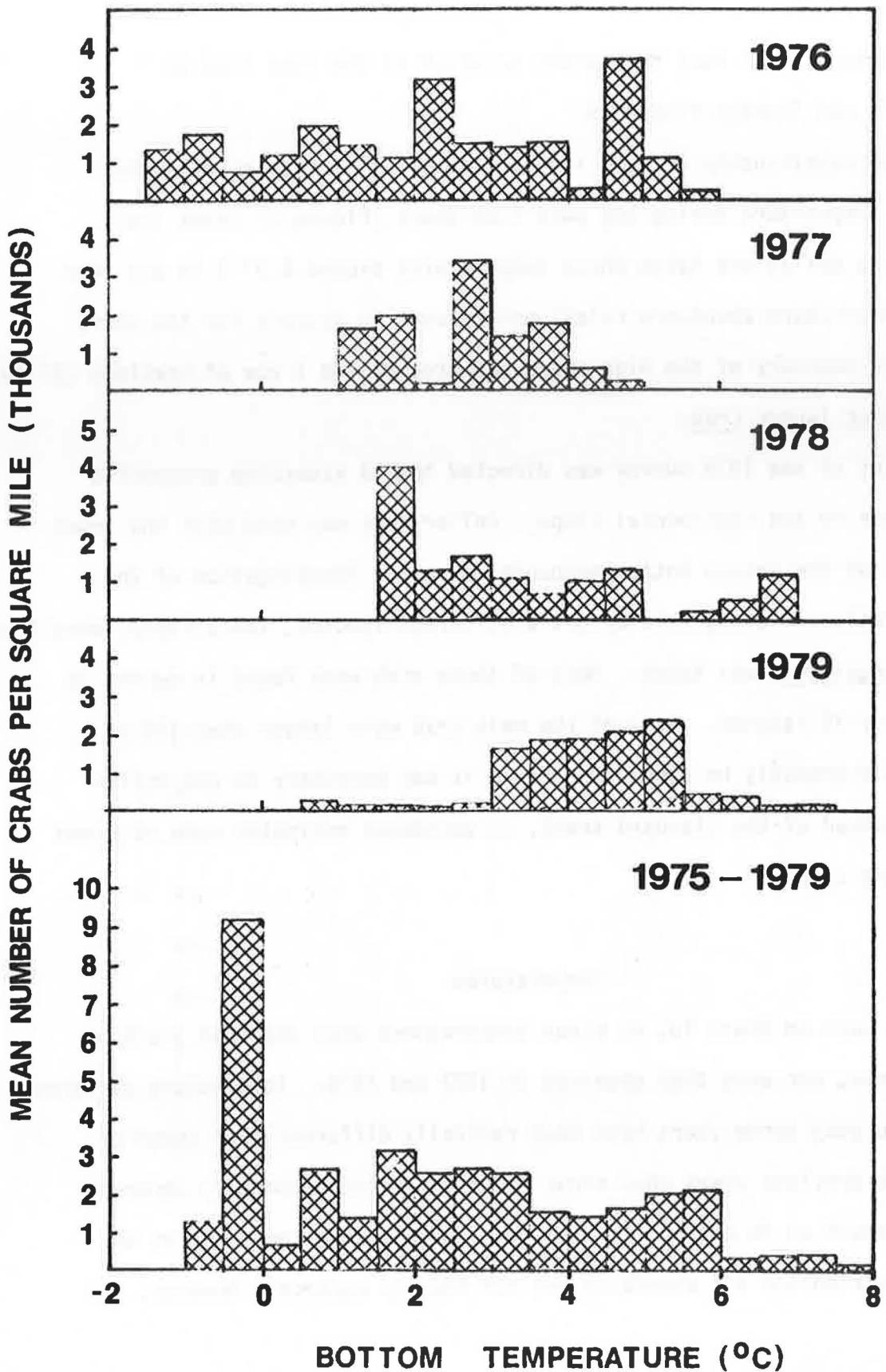


Figure 6. -- Average number of large-sized male Tanner crab (*Chionocetes opilio*) per square mile found at various bottom temperatures in the 1975-1979 NMFS Bering Sea surveys. Data are summarized in 0.5 degree intervals.

complicated by the fact the survey occurred at the same time as domestic and foreign fisheries.

The relationship between the average catch per square mile and bottom temperature during the past five years (Figure 6) shows that Almost no opilio are taken where temperatures exceed 6.0° C in any year. This temperature-abundance relationship seems to account for the sharp northern boundary of the high abundance area at the I row of stations (57°40'N).

Other Tanner Crab:

Part of the 1979 survey was directed toward assessing groundfish resources on the continental slope. Roller gear was used with the trawl because of the uneven bottom encountered during investigation of the slope region. During this effort a different species, tentatively identified as C. angulatus, was taken. Most of these crab were found in depths in excess of 70 fathoms. Many of the male crab were larger than 110 mm and could probably be processed. Since it was necessary to use roller gear instead of the standard trawl, no abundance estimates were obtained for these crabs.

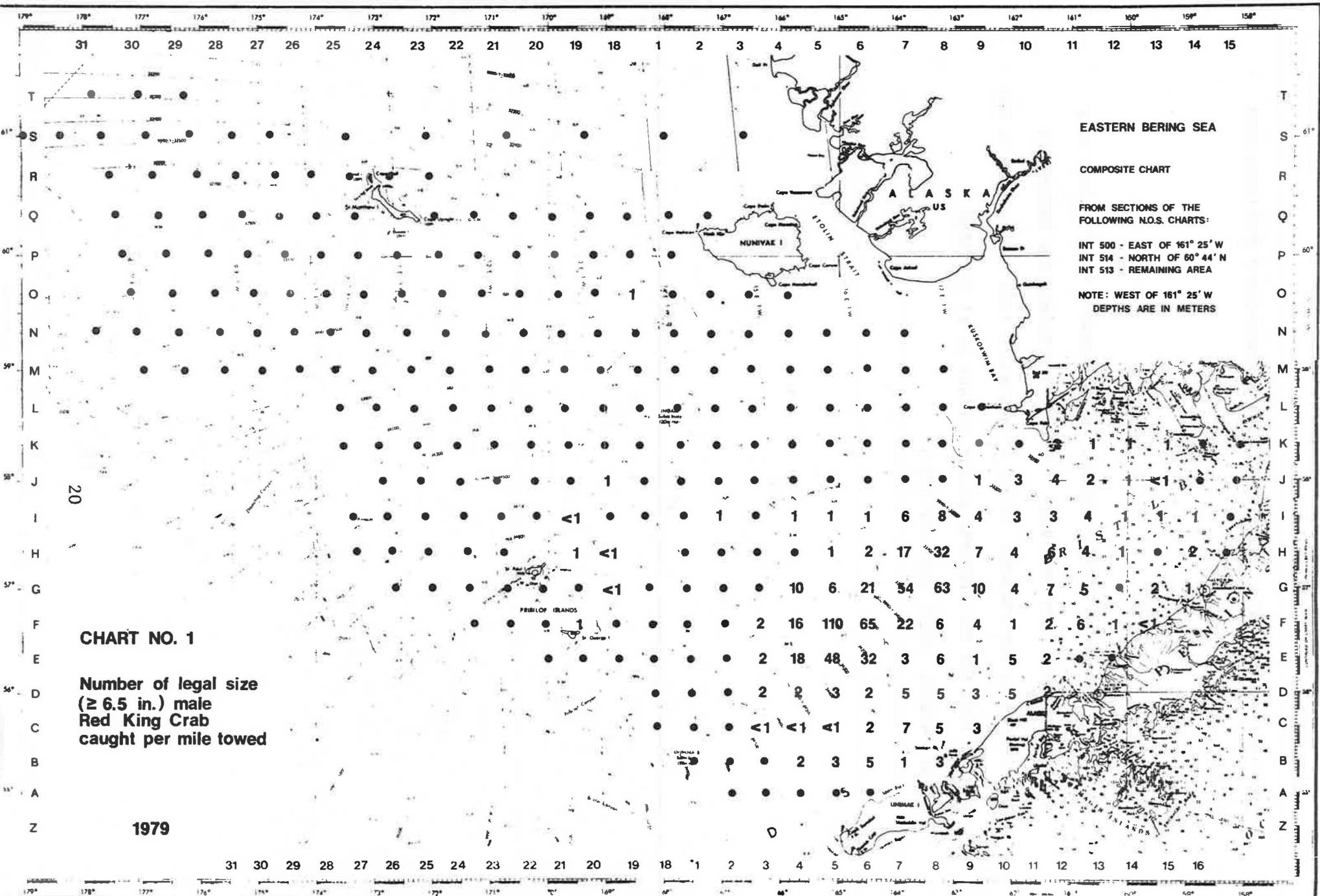
Temperatures

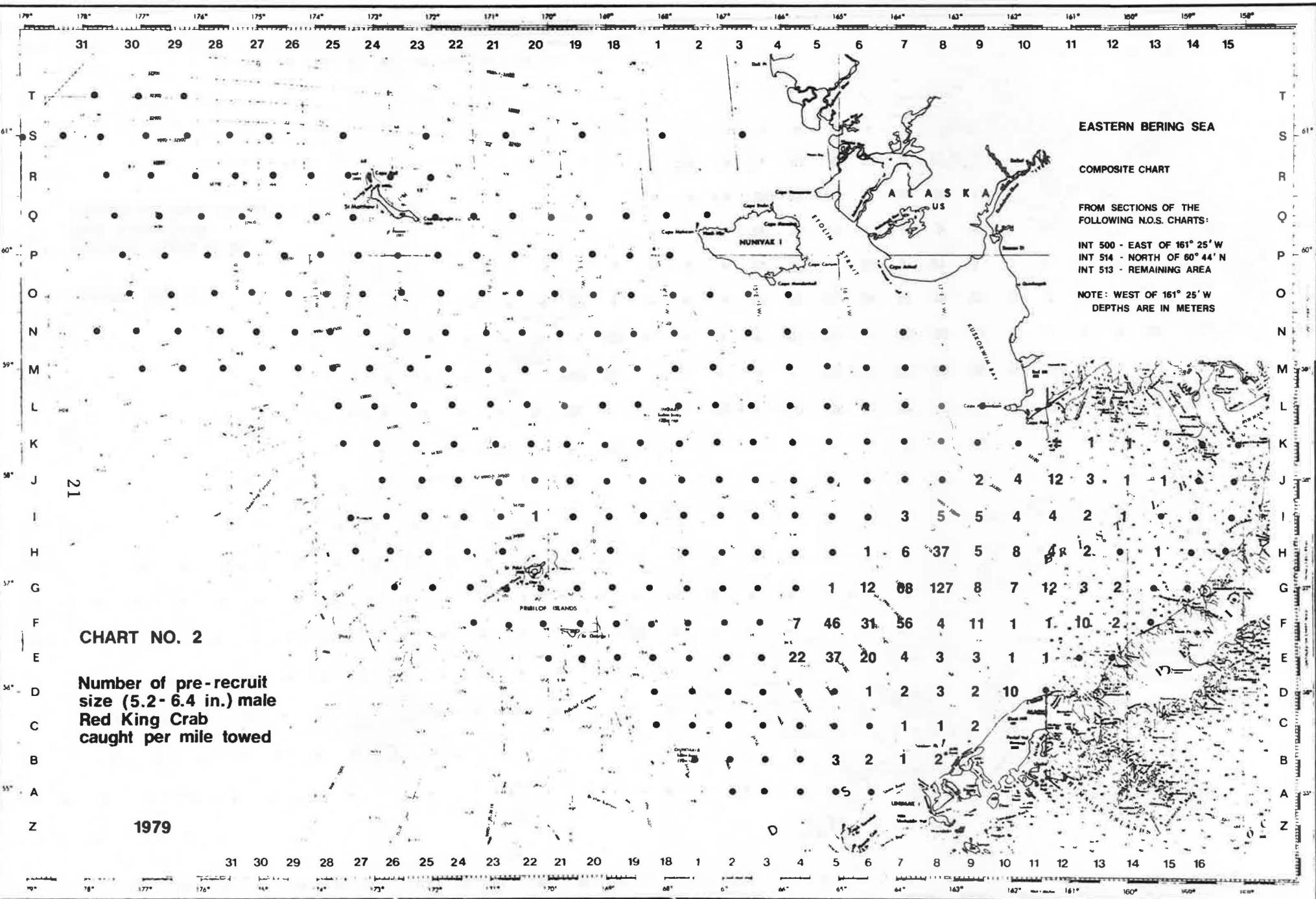
As seen on Chart 13, no minus temperatures were observed south of 61 degrees, nor were they observed in 1977 and 1978. Temperature patterns over the past three years have been radically different than those of 1976 and previous years when minus temperatures were commonly observed as far south as 56 degrees. The effects of changing temperatures on crab distribution and abundance are not readily apparent, however, the

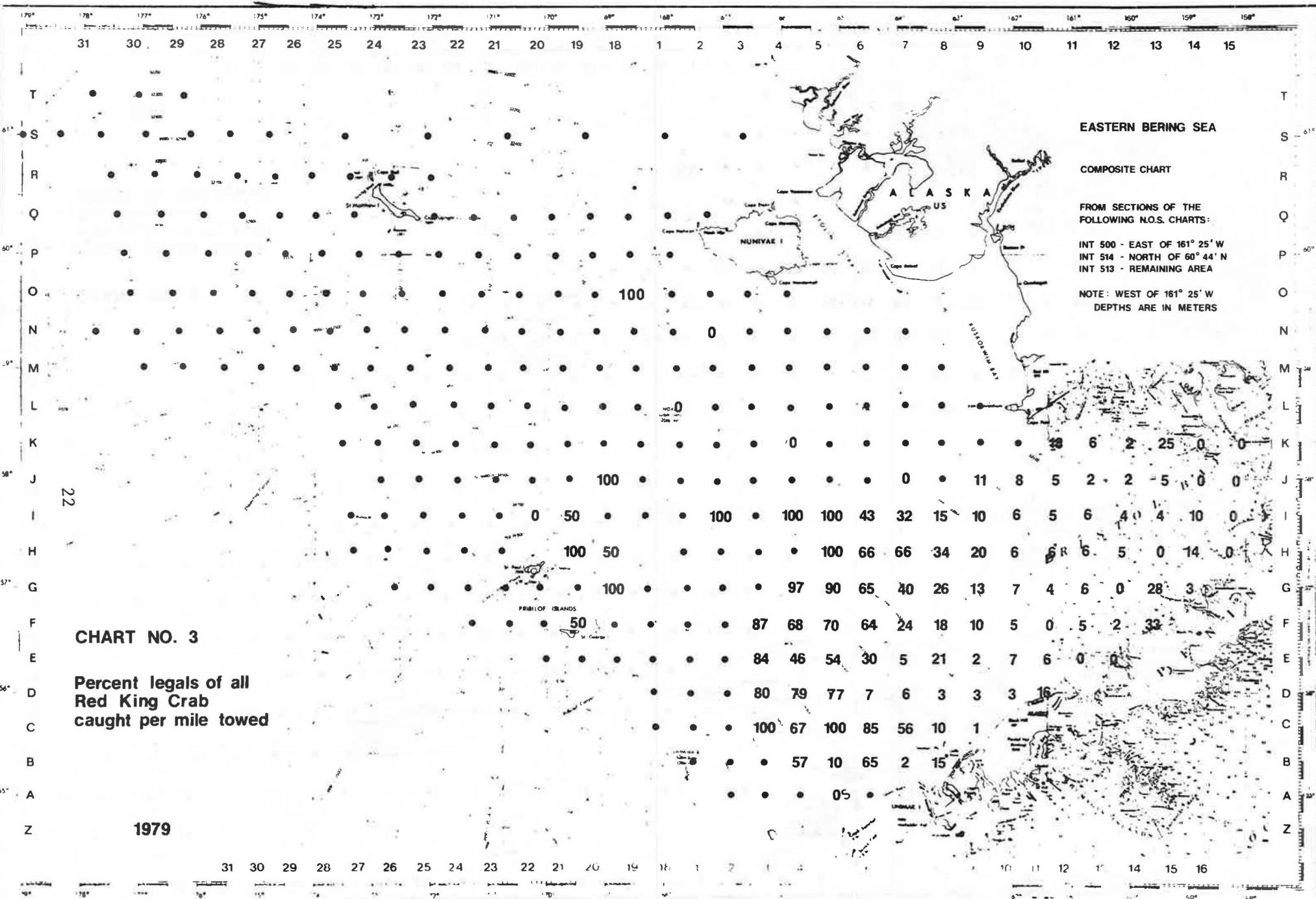
distribution of opilio suggests that sharp temperature gradients tend to concentrate crab.

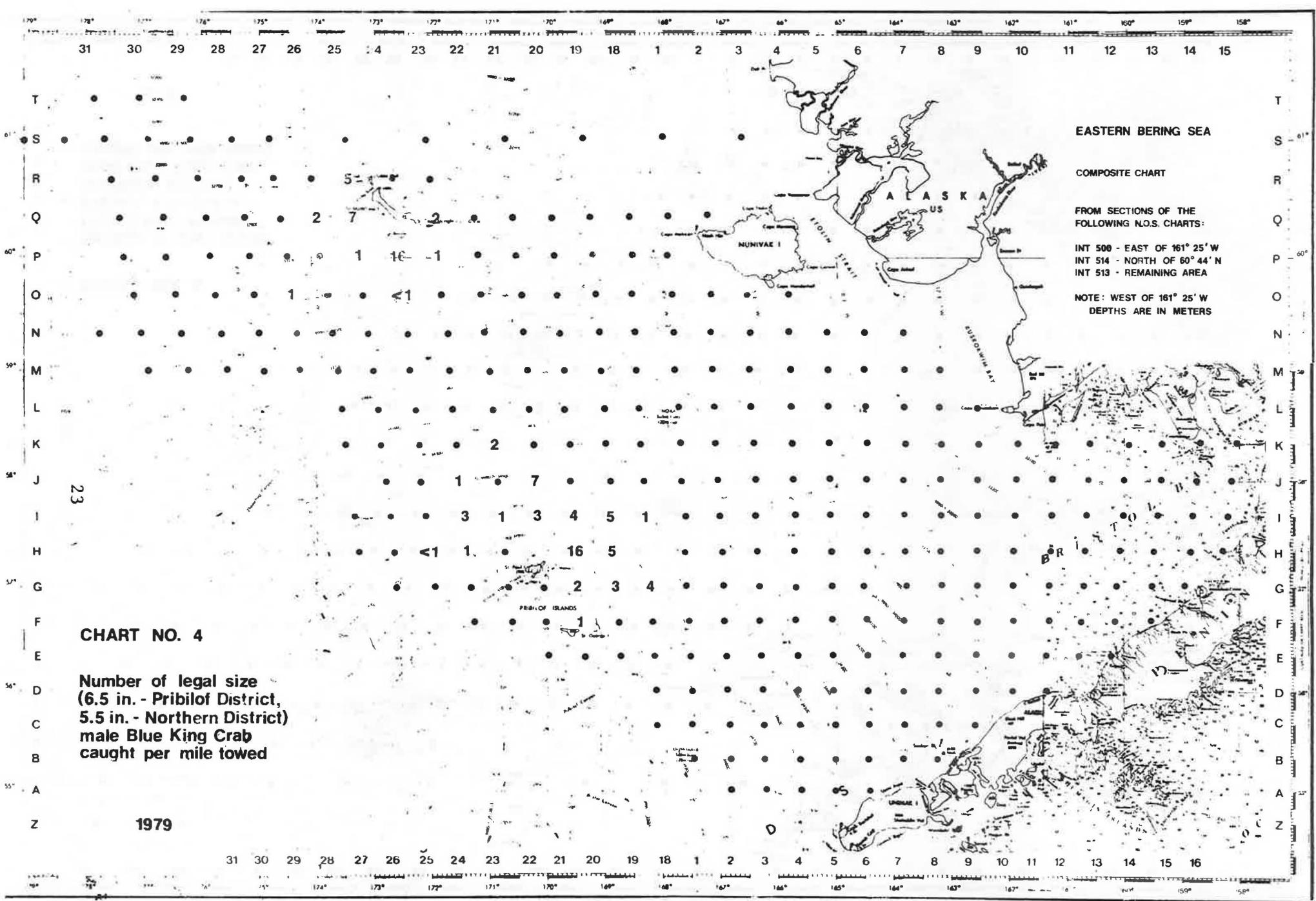
#### Questionnaires

A questionnaire is not included in this year's report since very few returns have been received. We would appreciate any commentary volunteered by our readers. Also, if you would like to be added to the mailing list for this report, please contact us at Box 1638, Kodiak, Alaska 99615 (907-487-4961).









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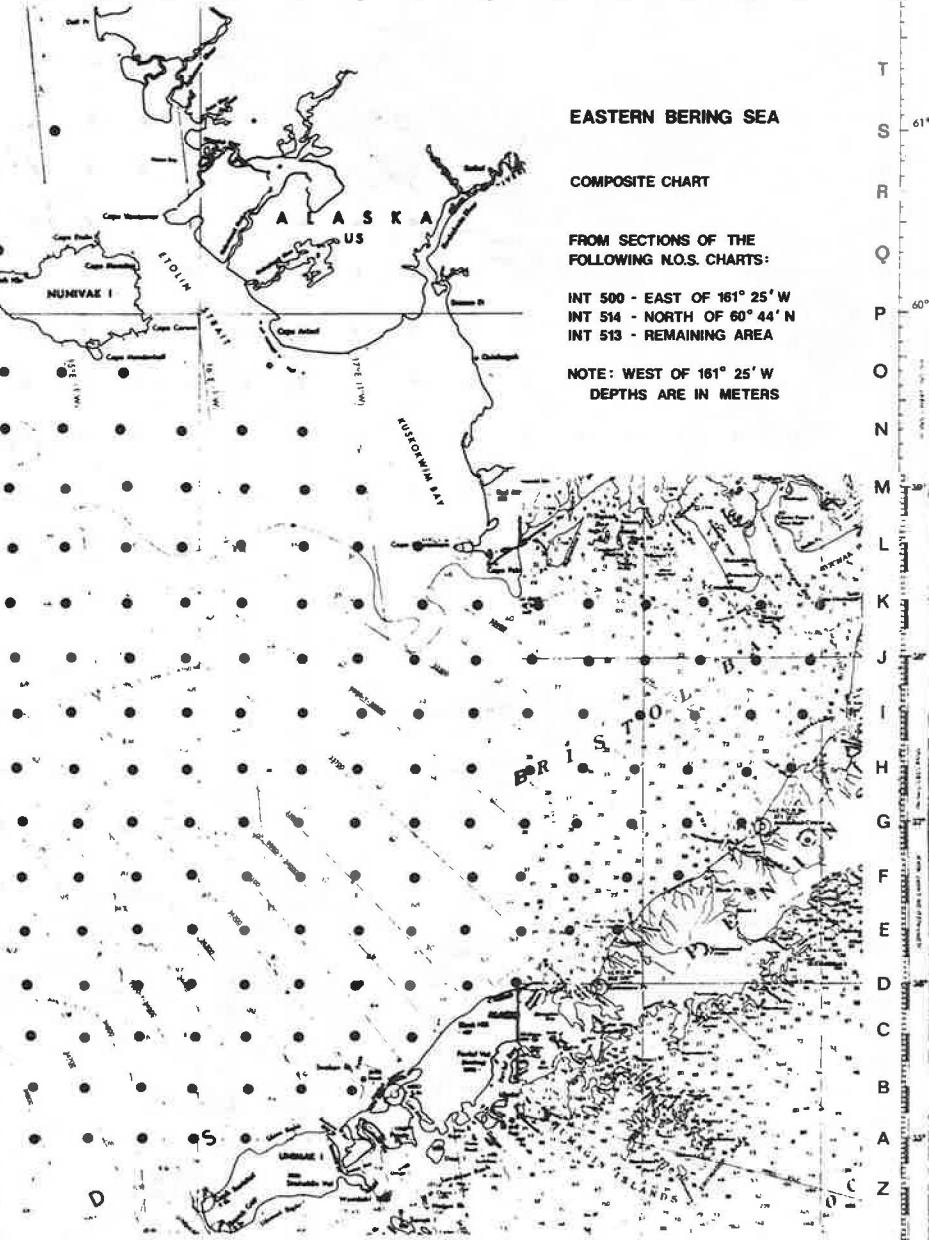
## CHART NO. 5

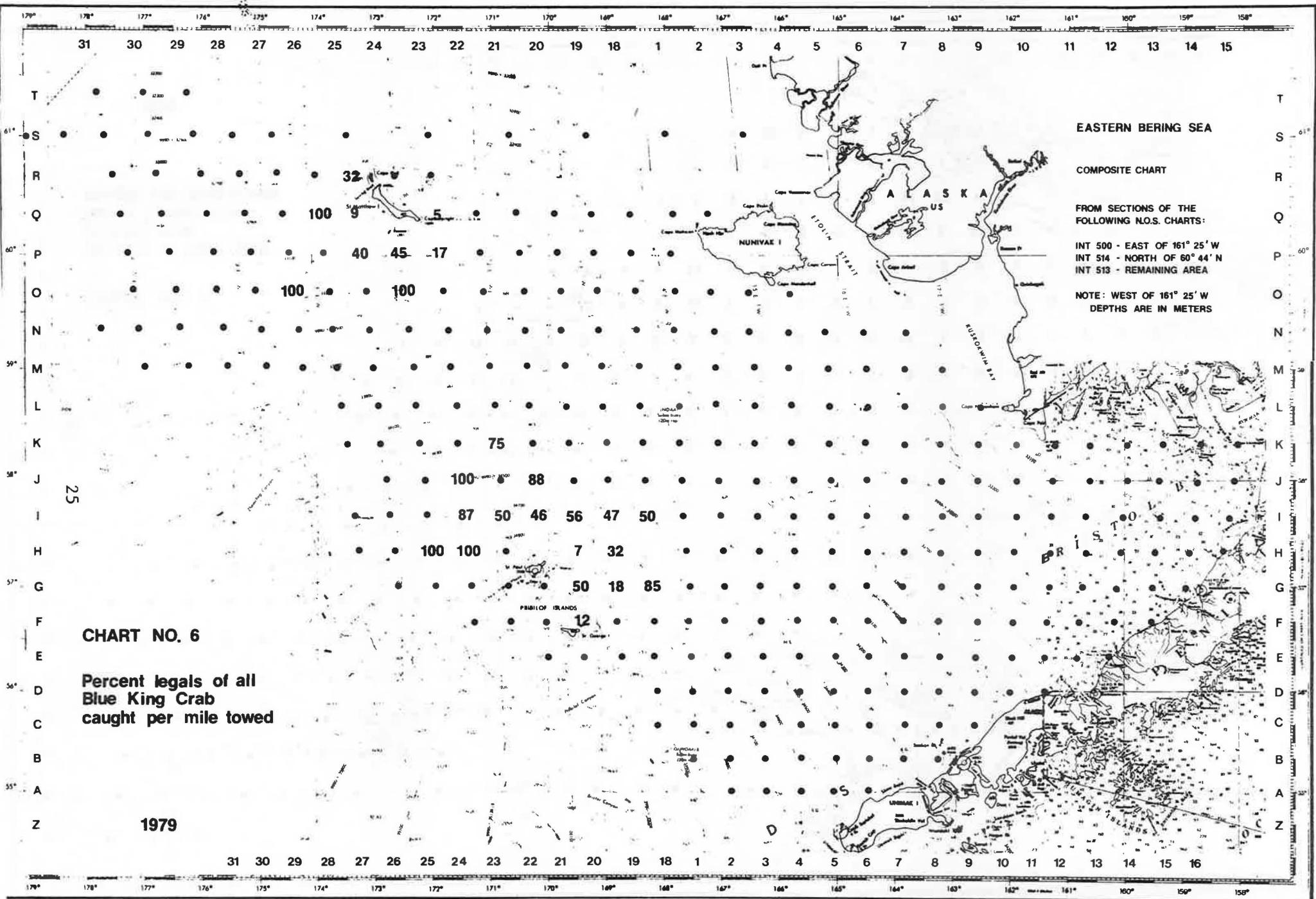
Number of pre-recruit  
(5.2 - 6.4 in. - Pribilof  
District, 4.3 - 5.4 in. -  
Northern District)  
male Blue King Crab  
caught per mile towed

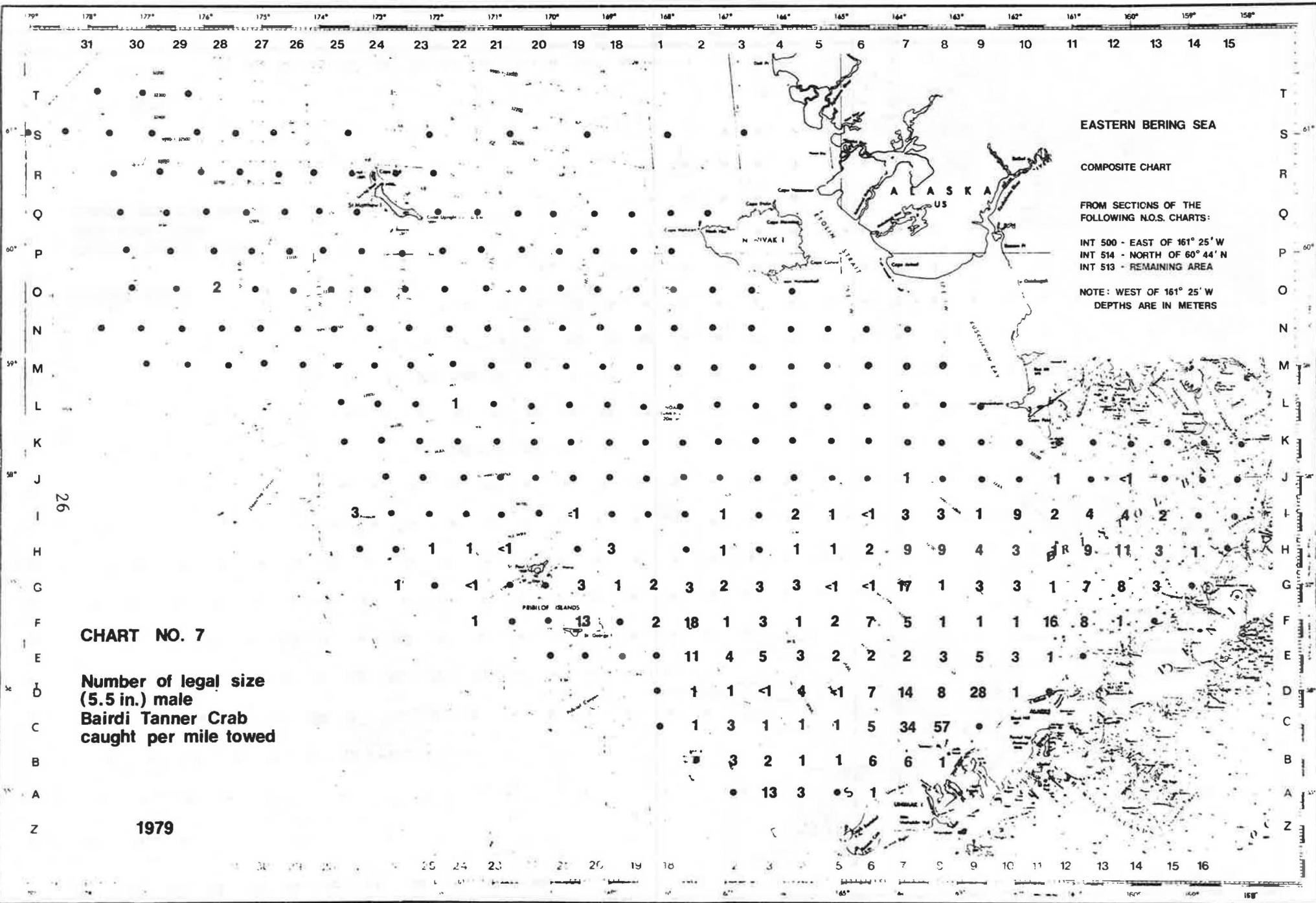
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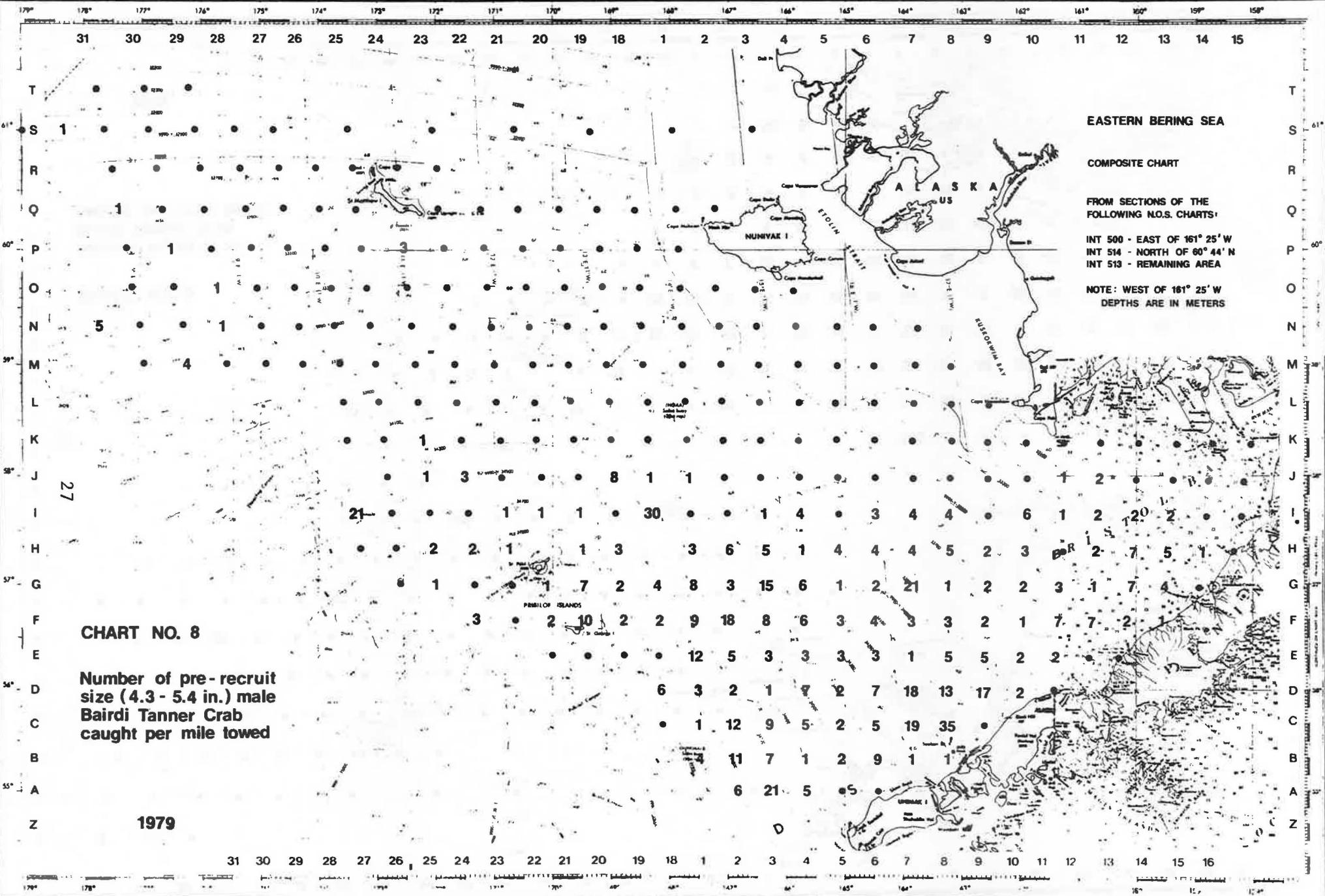
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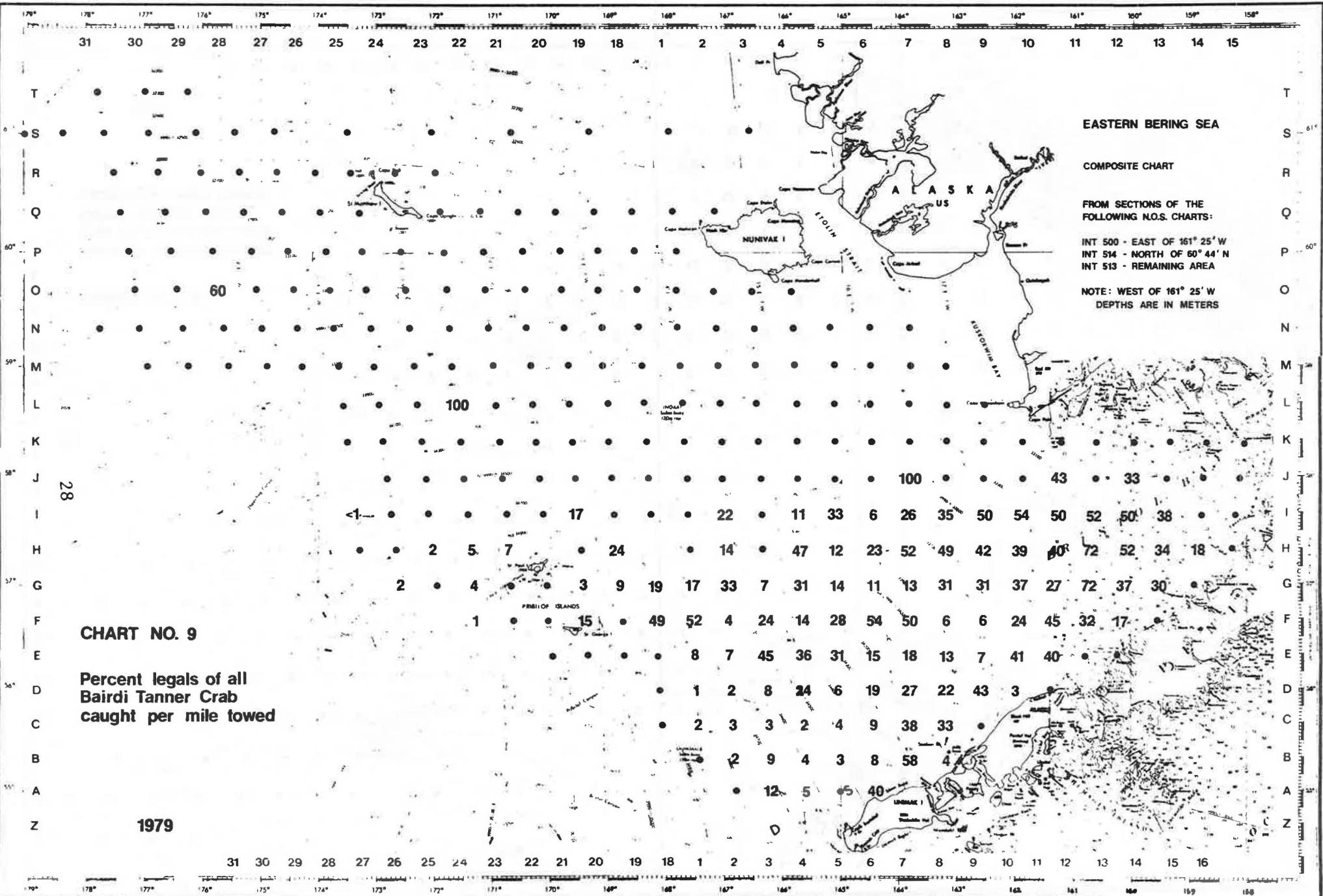
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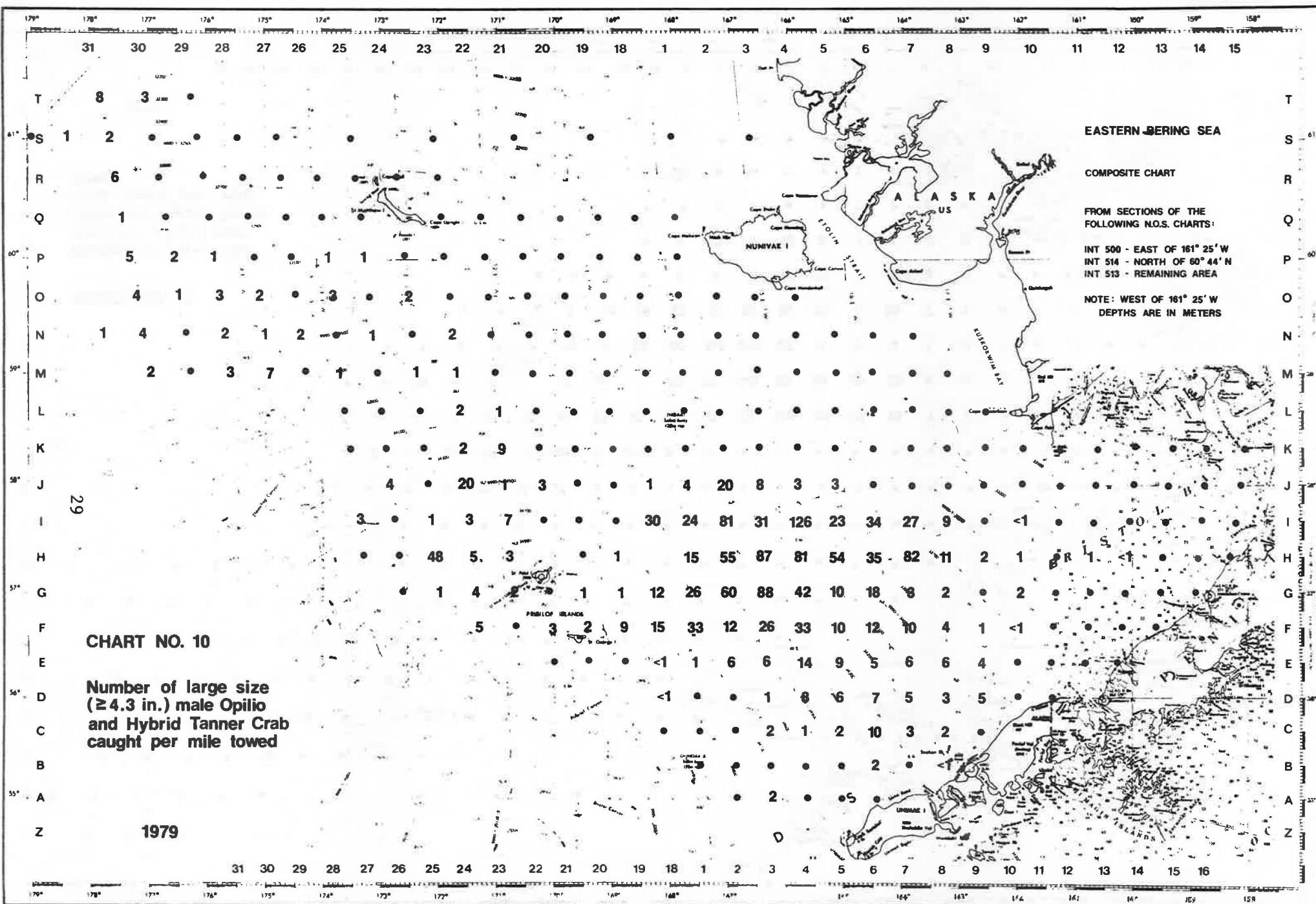


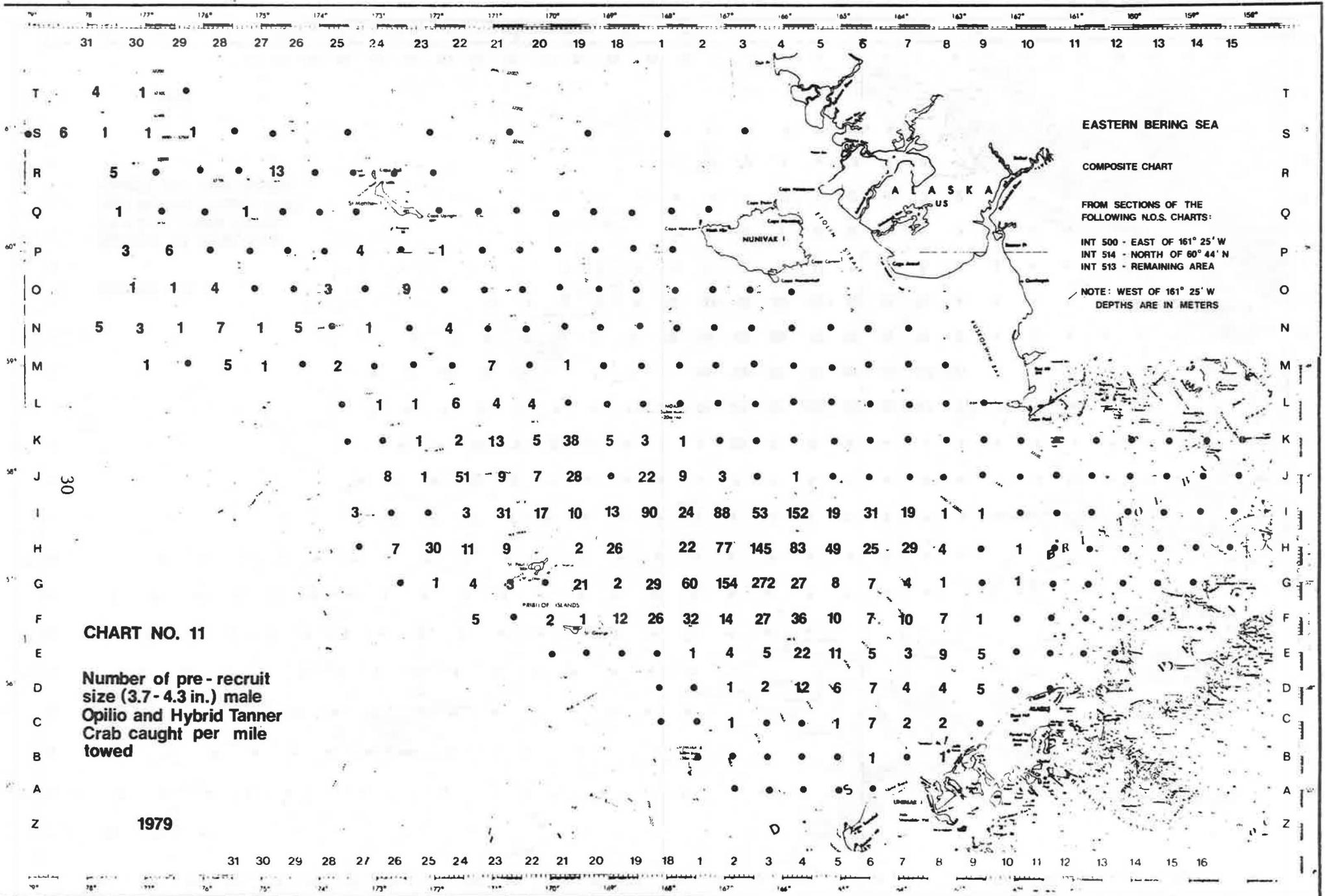


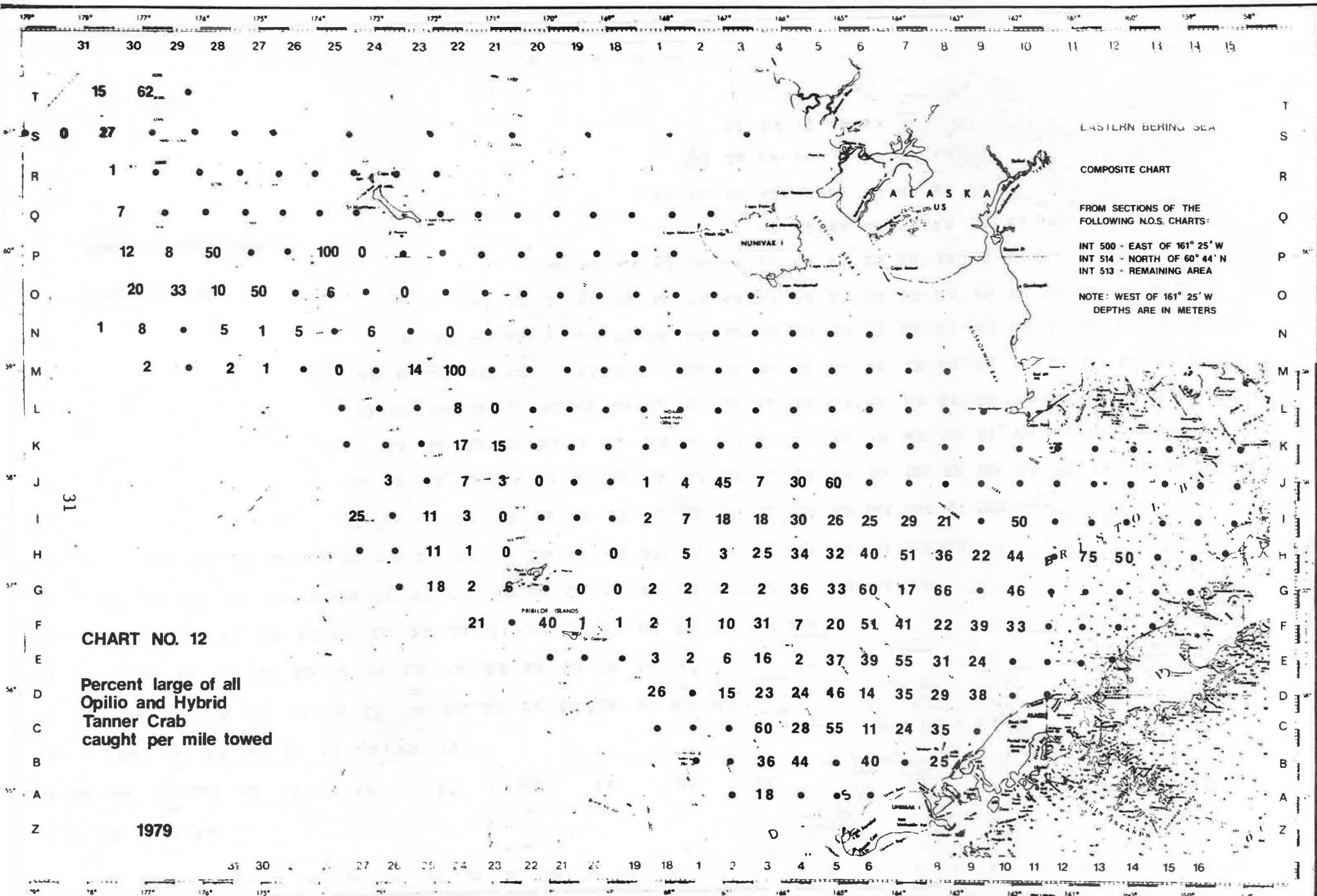












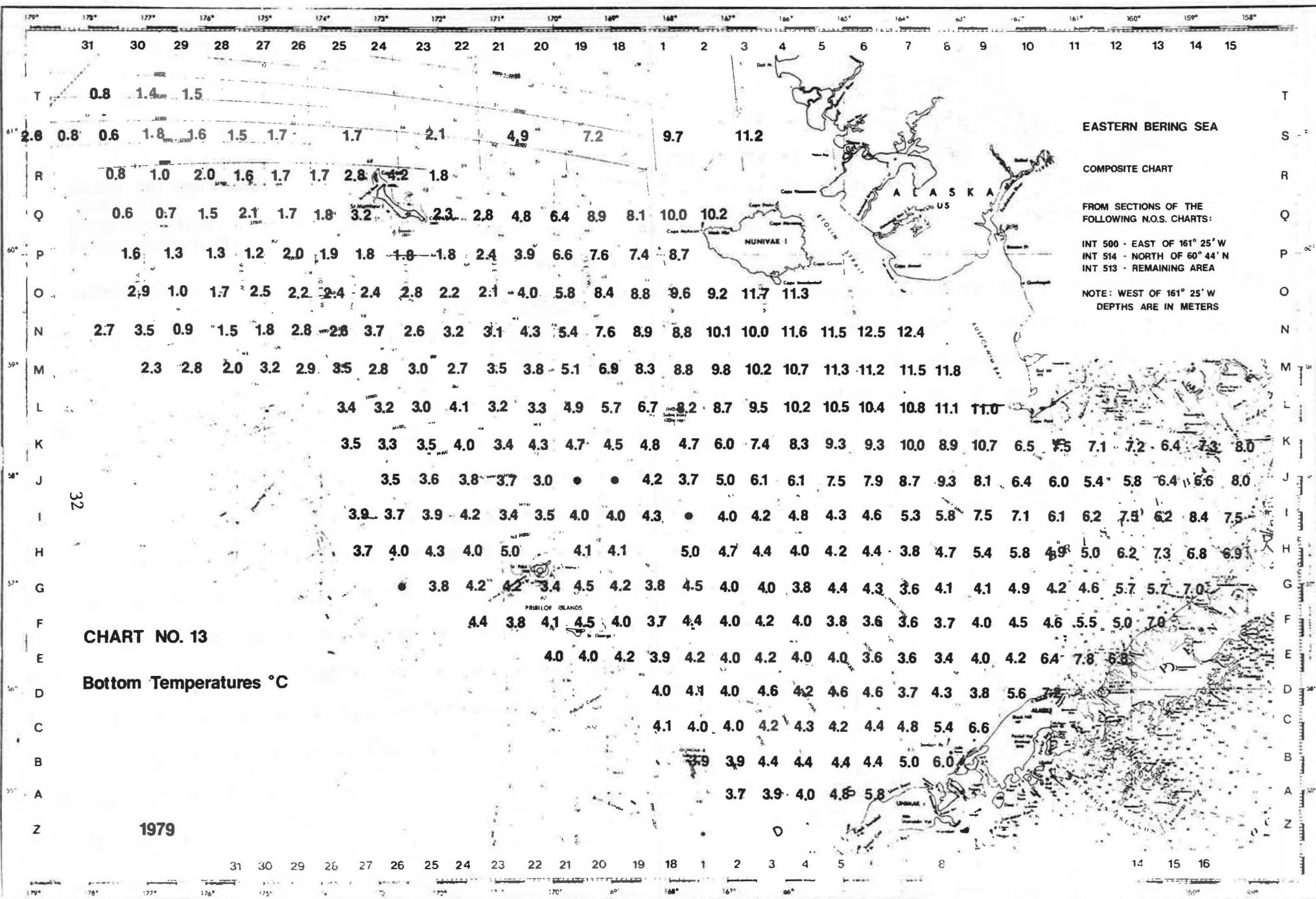










Table 3. - Continued

NUMBER PER MILE TOWED

STATION	DATE	LATITUDE	LONGITUDE	LORAN C	DEPTH FTMS	BOTTOM TEMP	FEMALES	MALES			TOTAL	PERCENT LEGAL
								SMALL	PRERECRUIT*	LEGAL*		
J09	6/24	57.50	162.56	Y33429 Z47217	22	6.6	17.	0.	5.	3.	25.	10.8
J10	6/23	58.00	162.04	Y33231 Z46868	16	6.3	31.	0.	1.	1.	33.	2.0
J10	6/23	57.51	162.20	Y33329 Z46975	24	6.5	39.	1.	8.	6.	54.	11.1
J11	6/21	57.58	161.29	Y33157 Z46637	27	6.0	36.	2.	3.	1.	42.	1.6
J11	6/23	57.50	161.48	Y33259 Z46766	25	6.0	79.	12.	20.	7.	118.	6.2
J12	6/22	58.00	160.51	Y33064 Z46390	24	5.4	66.	19.	3.	2.	89.	2.2
J13	6/20	58.01	160.14	Y32979 Z46142	27	5.8	79.	6.	1.	1.	87.	1.5
J13	6/20	57.50	160.32	Y33084 Z46260	28	5.7	33.	1.	0.	1.	35.	1.9
J14	6/19	57.50	159.51	Y32995 Z45995	25	6.4	12.	0.	1.	1.	14.	4.8
J15	6/18	57.51	159.18	Y32920 Z45774	21	6.6	1.	2.	1.	0.	4.	0.
J16	6/17	57.49	158.03	Y32788 Z45281	12	9.0	1.	1.	0.	0.	1.	0.
J16	6/17	57.50	158.79	Y32852 Z45519	17	7.2	15.	12.	0.	0.	27.	0.
J16	6/18	57.00	158.19	Y32756 Z45391	18	7.7	60.	54.	0.	0.	114.	0.
J19	7/ 9	58.00	169.02	Y34391 Z49507	37		0.	0.	0.	1.	1.	100.0
K04	8/20	58.20	165.53	X18736 Z48312	22	8.3	1.	0.	0.	0.	1.	0.
K11	6/22	58.20	161.31	Y32996 Z46579	16	8.0	0.	0.	0.	1.	1.	100.0
K11	6/23	58.10	161.48	Y33123 Z46753	20	7.0	13.	0.	2.	3.	18.	14.8
K12	6/22	58.08	161.07	Y33040 Z46488	24	5.8	18.	2.	2.	1.	23.	5.7
K13	6/20	58.10	160.32	Y32957 Z46262	22	5.5	46.	5.	2.	1.	54.	2.5
K14	6/19	58.09	159.50	Y32865 Z45994	22	6.0	5.	1.	1.	2.	8.	25.0
K15	6/18	57.10	159.10	Y32792 Z45729	10	7.3	1.	0.	0.	0.	1.	0.
K16	6/18	57.09	157.59	Y32664 Z45266	14	7.9	57.	58.	0.	0.	115.	0.
K16	6/18	57.09	158.34	Y32724 Z45492	16	8.2	2.	1.	0.	0.	3.	0.
L01	8/19	58.40	167.51	X18647 Z49930	22	8.2	1.	0.	0.	0.	1.	0.
N02	8/18	59.19	167.16	X18582 Y33276	16	10.1	1.	0.	0.	0.	1.	0.
O18	8/14	59.39	168.40	X18408 Y33190	20	8.8	0.	0.	0.	1.	1.	100.0
U20	8/ 7	61.40	170.09	X17876 Y31826	24	4.1	0.	0.	0.	1.	1.	100.0
W02	8/ 2	62.21	167.29	X18080 Y31155	13	6.1	0.	0.	1.	0.	1.	0.

\* Prerecruit = 5.2 - 6.4 in. width; legal =  $\geq$  6.5 in. width







Table 5. - Continued

NUMBER PER MILE TOWED

STATION	DATE	LATITUDE	LONGITUDE	LORAN C	DEPTH FTMS	BOTTOM TEMP	FEMALES	MALES			PERCENT LEGAL	
								SMALL	PRERECRUIT*	LEGAL*		
E08	6/ 7	56.10	163.41	X18611 Y34104	47	3.2	15.	10.	9.	5.	39.	11.9
E09	7/14	56.20	162.41	X18641 Y33913	45	4.9	3.	1.	0.	0.	4.	0.
E09	6/ 6	56.10	163.00	X18617 Y33990	45	3.2	77.	46.	10.	11.	143.	7.4
E10	7/14	56.19	162.12	X18642 Y33822	40	4.6	3.	0.	1.	0.	4.	0.
E10	6/ 6	56.10	162.22	X18623 Y33889	41	3.8	3.	0.	3.	7.	12.	55.6
E11	6/12	56.10	161.51	X18626 Y33811	32	4.5	0.	1.	3.	3.	7.	40.0
E12	8/12	56.20	161.00	Y33638 Z46482	27	9.3	2.	1.	0.	0.	3.	0.
E18	5/24	56.11	168.27	X18507 Y34937	106	3.8	27.	11.	0.	0.	38.	0.
E18	6/ 1	56.20	168.14	X18567 Y34885	82	4.0	44.	60.	0.	0.	104.	0.
E19	5/24	56.12	165.59	X18479 Y35016	92	4.2	0.	1.	0.	0.	1.	0.
E20	5/24	56.11	169.43	X18388 Y35102	136	4.0	9.	20.	0.	0.	29.	0.
E20	6/ 1	56.20	169.28	X18484 Y35074	91	4.1	6.	3.	0.	0.	9.	0.
E21	5/25	56.09	169.22	X18258 Y35137	67	3.8	11.	12.	0.	0.	23.	0.
E21	6/ 2	56.19	170.35	X18395 Y35126	56	4.1	35.	59.	1.	0.	95.	0.
F01	6/12	56.40	167.40	X18661 Y34707	53	3.7	13.	0.	8.	14.	35.	40.5
F01	5/30	56.30	168.70	X18618 Y34810	62	5.2	0.	1.	11.	21.	33.	64.0
F02	6/14	56.39	167.04	X18664 Y34589	50	4.0	1.	3.	18.	1.	22.	3.8
F03	7/ 9	56.39	166.66	X18666 Y34468	43	4.0	1.	3.	3.	1.	8.	11.1
F03	7/ 1	56.31	166.41	Y34551 Z48756	55	4.3	0.	2.	13.	6.	21.	29.0
F04	7/ 9	56.40	165.50	X18670 Y34349	40	4.0	0.	2.	12.	2.	15.	11.1
F04	6/28	56.30	166.03	Y34437 Z48506	47	4.0	0.	0.	1.	1.	2.	33.3
F05	7/ 9	56.40	165.12	X18671 Y34235	37		1.	0.	3.	3.	7.	37.5
F05	6/28	56.31	165.30	Y34330 Z48289	45	3.8	0.	1.	3.	1.	5.	14.3
F06	6/ 1	56.29	165.02	X18646 Y34255	42	3.5	1.	6.	4.	2.	13.	15.8
F06	7/10	56.40	164.36	X18673 Y34123	31	3.9	0.	0.	1.	3.	4.	80.0
F06	7/30	56.47	164.31	Y34071 Z47883	38	3.5	0.	0.	7.	16.	23.	70.4
F07	6/ 3	56.29	164.13	X18652 Y34108	42	3.2	1.	1.	3.	3.	8.	33.3
F07	7/11	56.40	164.00	X18674 Y34019	38	4.0	0.	3.	3.	8.	14.	58.8
F08	7/11	56.40	163.23	X18676 Y33913	38	4.2	0.	3.	1.	0.	3.	0.
F08	6/ 4	56.31	163.36	X18657 Y33997	43	3.2	10.	4.	5.	1.	20.	6.7
F09	6/ 4	56.30	163.02	X18658 Y33906	42	3.5	13.	17.	2.	1.	33.	4.0
F09	7/12	56.40	162.47	X18677 Y33815	37	4.5	0.	0.	2.	1.	3.	33.3
F10	7/12	56.40	162.11	X18678 Y33720	35	5.1	1.	2.	0.	0.	3.	0.
F10	6/ 6	56.30	162.23	X18660 Y33802	40	3.9	3.	1.	2.	3.	9.	30.8
F11	7/13	56.40	161.35	X18680 Y33627	35	5.4	1.	0.	4.	6.	11.	53.8
F11	6/ 6	56.30	161.47	X18667 Y33708	47	3.9	23.	1.	10.	26.	59.	43.8
F12	6/ 6	56.31	161.16	X18665 Y33626	37	4.1	11.	6.	13.	16.	47.	34.3
F12	8/13	57.00	160.20	Y33344 Z46200	33	6.9	2.	2.	0.	0.	3.	0.
F13	6/13	56.30	160.36	X18667 Y33532	28	4.7	0.	1.	3.	0.	4.	0.
F13	6/13	56.30	160.22	X18668 Y33500	17	5.7	0.	1.	0.	0.	1.	0.
F13	6/13	56.40	160.22	X18681 Y33453	30	4.5	1.	2.	3.	2.	7.	27.3
F14	6/14	56.41	160.02	X18684 Y33395	25	6.0	0.	1.	3.	0.	3.	0.
F14	6/14	56.40	159.45	X18684	17	7.5	0.	0.	1.	0.	1.	0.
F18	6/12	56.40	168.15	X18655 Y34824	55	3.6	0.	0.	3.	2.	4.	40.0
F18	5/30	56.30	168.35	X18599 Y34922	57	3.8	0.	0.	1.	2.	3.	60.0

\* Prerecruit = 4.3 - 5.4 in. width; legal =  $\geq$  5.5 in. width

























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