Alaska Fisheries
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U.S. DEPARTMENT OF COMMERCE

AFSC PROCESSED REPORT 2000-01

Report to Industry on the 1999 Eastern Bering Sea Crab Survey

January 2000

This report does not constitute a publication and is for information only. All data herein are to be considered provisional.

Alaska Fisheries Science Center
Processed Report 2000-01

REPORT TO INDUSTRY ON THE 1999 EASTERN BERING SEA CRAB SURVEY

by
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RESULTS OF THE 1999 NMFS BERING SEA CRAB SURVEY
EXECUTIVE SUMMARY

This section summarizes data presented in the Report to Industry on the 1999 Eastern Bering Sea Trawl Survey. Numbers presented are trawl survey indices of population level and do not necessarily represent absolute abundance. For further information, contact Dr. Bradley G. Stevens at (907)481-1726 or Dr. Robert S. Otto at (907)481-1711, NMFS, 301 Research Court, Kodiak, AK 99615-7400. (GHL = Guideline Harvest Level.)

Red king crab (*Paralithodes camtschaticus*) Bristol Bay.

Legal males:	11.0 million crabs; 49% increase.
Pre-recruits:	7.1 million crabs; 57% decrease.
Large Females:	14.5 million crabs; 59% decrease.
Outlook:	Abundance of legal males has increased due to growth of a recruiting cohort. However, decreased abundance of mature females requires use of a 10% exploitation rate.
GHL:	10.66 million lbs (4,853 metric tons, t). Fishery opens October 15.

Red king crab (*P. camtschaticus*) Pribilof District.

Legal males:	1.2 million crabs; 176% increase.
Pre-recruits:	0.6 million crabs; no change.
Large Females:	3.2 million crabs; 214% increase.
Outlook:	Crabs were highly concentrated, and index has very low precision. Despite an increase this year, survey and fishery data indicate a long-term decline.
GHL:	Combined red and blue king crab fishery will not open in 1999.

Pribilof Islands blue king crab (*P. platypus*) Pribilof District.

Legal males:	0.45 million crabs; 46% decrease.
Pre-recruits:	0.22 million crabs; 46% decrease.
Large Females:	2.5 million crabs; 24% increase.
Outlook:	Population is low and long-term trend is declining.
GHL:	Combined red and blue king crab fishery will not open in 1999.

St. Matthew blue king crab (*P. platypus*) Northern District.

Legal males:	0.6 million crabs; 80% decrease.
Pre-recruits:	0.2 million crabs; 88% decrease.
Large Females:	Not well estimated.
Outlook:	Dramatic population decline requires this stock to be defined as overfished.
GHL:	Fishery will not be opened in 1999.

Tanner crab (*Chionoecetes bairdi*) Eastern District.

Legal males:	2.0 million crabs; no change.
Pre-recruits:	14.5 million crabs; 20% increase.
Large Females:	16.1 million crabs; 148% increase.
Outlook:	Legal males are at an historic low, but some recruitment is occurring.
GHL:	Fishery was closed in 1997 and 1998, and will not open in 1999.

Snow crab (*C. opilio*) All districts combined.

Large males:	94 million crabs; 63% decrease.
Small males:	517 million crabs; 49% decrease.
Large Females:	474 million crabs; 59% decrease.
Outlook:	Abundance has declined precipitously to below threshold and is now defined as over fished. Exploitation rate has been reduced to 22%. Little recruitment is apparent, and fishery may be closed next year.
GHL:	28.5 million lbs (12,928 t). Fishery opens January 15, 2000.

Hair crab (*Erimacrus isenbeckii*)

Large males:	2.3 million crabs; no change.
Large Females:	Not well estimated.
Outlook:	Population is declining and recruitment is not apparent.
GHL:	283,000 lbs (128 t) Pribilof District only. Fishery opens November 1.

THE 1999 EASTERN BERING SEA SURVEY

The National Marine Fisheries Service (NMFS) conducts an annual trawl survey in the eastern Bering Sea (EBS) to determine the distribution and abundance of crab and groundfish resources. This report summarizes survey results for commercially important crabs. It is intended to aid the fishing industry in locating productive grounds and judging overall availability of various species. Survey-derived data are also used as part of the basis for management decisions. Results are presented for red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), hair crab (*Erimacrus isenbeckii*), Tanner crab (*Chionoecetes bairdi*) and snow crab (*C. opilio*). Information on groundfish resources is available from the Alaska Fisheries Science Center, 7600 Sand Point Way NE, BIN C15700, Seattle, Washington 98115.

Landing statistics for 1999 are preliminary data obtained from the Alaska Department of Fish and Game (Skip Gish, ADF&G, Dutch Harbor, personal communication). Those needing final statistics should contact ADF&G directly.

Survey Area and Methods

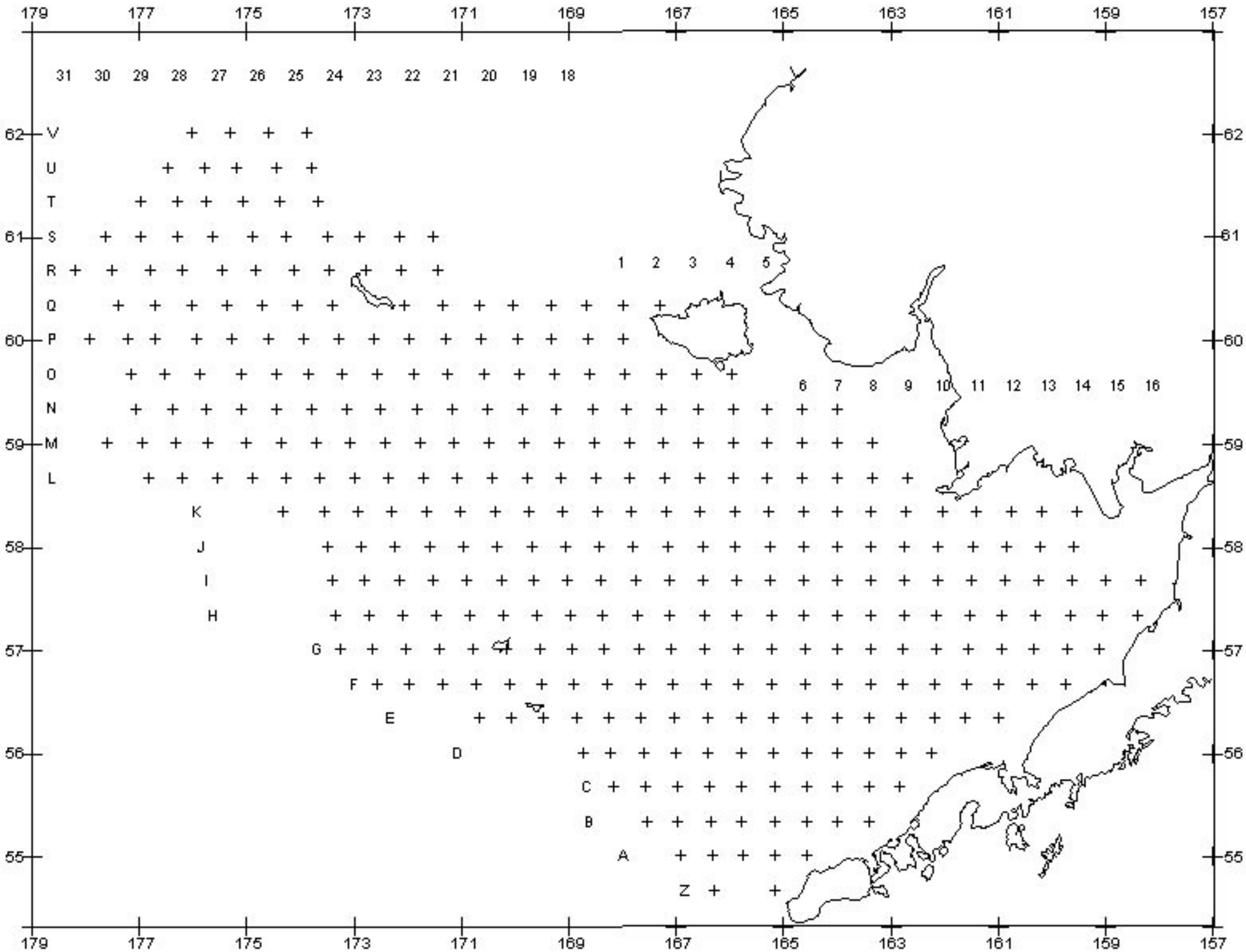
The 1999 EBS crab survey consisted of 380 bottom trawl tows and covered an area of approximately 139,200 square nautical miles (nmi). The survey area (Fig. 1) has been standardized since 1990. The survey was conducted aboard two chartered vessels, the F/V *Aldebaran* and F/V *Arcturus*, between May 23 and July 20. The same vessels have been used since 1993. Methodology was identical to that of previous surveys and most tows were made at the centers of squares defined by a 20x20 nmi (37x37 km) grid. Near St. Matthew Island and the Pribilofs, additional tows were made at the corners of squares.

Both vessels fished an eastern otter trawl with an 83 ft (25.3 m) headrope and a 112 ft. (34.1 m) footrope. This has been the standard trawl since 1982. Each tow was one-half hour in duration; average length was 1.46 nmi (2.72 km). Crabs were sorted by species and sex, and then a sample of crabs was measured (to the nearest millimeter) to provide a size-frequency distribution. Crab sizes are reported as carapace width (cw) for Tanner and snow crabs, and carapace length (cl) for all others. Procedures for estimating abundance were similar to previous years (Appendix A). Note that population estimates are indexes and are most precise for large crabs; however, they may not represent absolute abundance and are least precise for females and small crab due to variance in crab behavior and net performance. GHL refers to Guideline Harvest Levels including Community Development Quotas (CDQs).

In 1999, 34 additional tows were made in Bristol Bay at the end of the regular survey to reassess abundance and condition of female red king crabs. Those data are included in population analyses. An additional 12 tows were made on the continental slope at stations E19 and A03 (Fig. 1) to assess deepwater fauna. Those data will be analyzed separately and are not presented in this report.

Because of differences in the length of each tow, catches presented in accompanying charts and tables are standardized to the nearest whole number of crab caught per square nmi. Where more than one tow was made in a square (including corner tows), charts indicate average crab density for all tows. Tables 7-11 present data for all tows where each species was caught, without averaging. It is advisable to cross-reference charts and tables.

The following abbreviations are used in the text: (in) inches, (m) meters, (km) kilometers, (mm) millimeters, (fm) fathoms, (lbs) pounds, (°C) degrees Celsius, (nmi) nautical miles, (cl) carapace length, (cw) carapace width, (MSST) minimum stock size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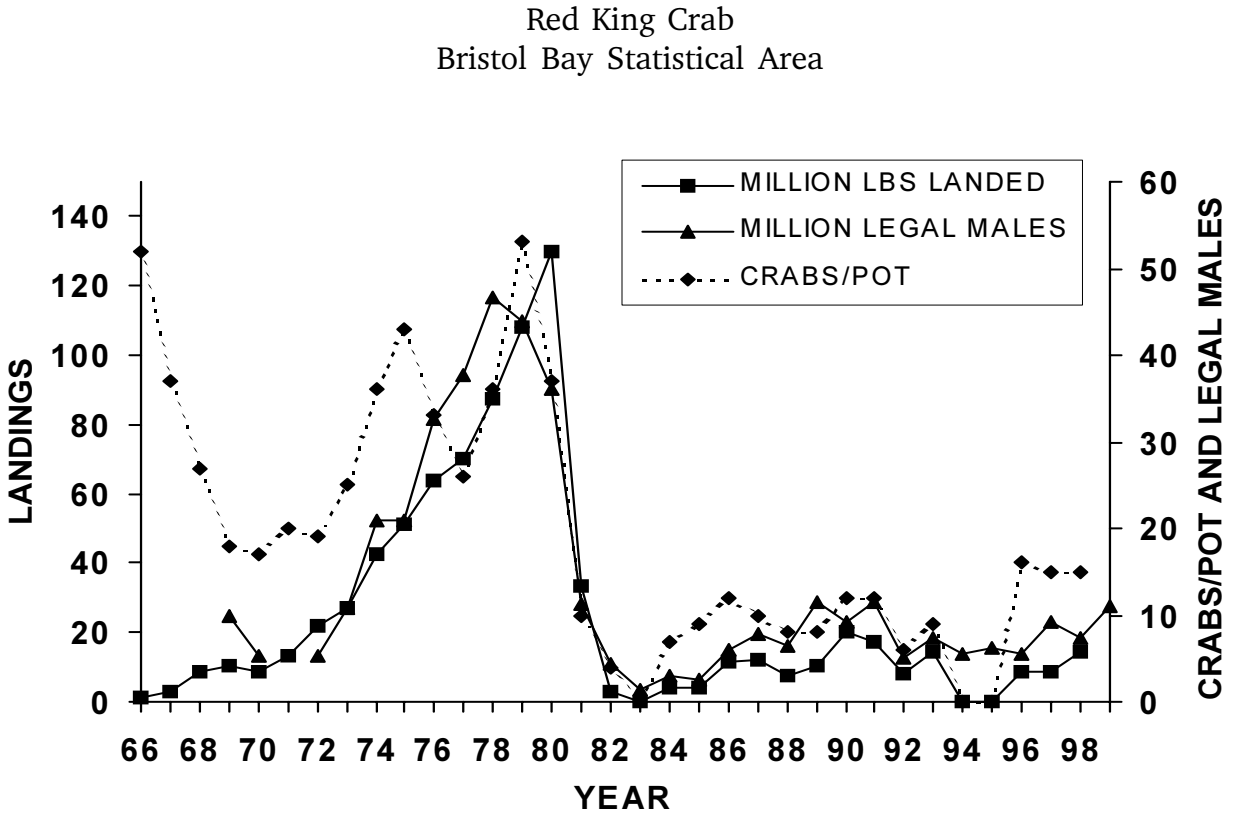

FIGURE 2. U.S. landings in millions of pounds, CPUE as crabs/pot, and abundance of legal red king crab *(P. camtschaticus)* in millions in Bristol Bay, estimated from NMFS trawl surveys (abundance data include the Pribilof District prior to 1983).

threshold, and (MSFCMA) Magnuson-Stevens Fishery Conservation and Management Act. Terminology for shell condition categories is explained in Appendix B.

Distribution and Abundance of Crab Stocks

Bristol Bay Red King Crab (*P. camtschaticus*)

Legal-sized (≥6.5 in cw or 135 mm cl) male crabs were concentrated in south central Bristol Bay (Chart 1 and Table 7). The abundance index of legal male red king crabs in the Bristol Bay District (south of 58° 39'N and east of 168°W) was 11.0 million crabs (Table 1 and Fig. 2). The estimate represents a 49% increase from last year and is near the twenty year average (9.0 million). Pre-recruit crab (110-134 mm cl) showed a decrease of 57% to 7.1 million. Abundance of small males decreased by 27%. A recruiting cohort with a modal size of 120 mm in 1998 (Fig. 3) grew to about 135 mm in 1999. The abundance of legal males has increased in 1999 as a result. Fewer than 1% of legal male crabs were in molting or softshell condition, and 65% were new-hardshell crabs.

The initial abundance index for large (≥ 90 mm cl) females in Bristol Bay made during the regular survey, was 12.2 million crabs. However, incorporation of data from 34 retowed stations raised that estimate to 14.5 million crabs, a decrease of 59% from last year. Because of the cold winter and earlier start of the survey, reproductive conditions of king crabs in May were not representative of "normal" survey conditions. The following information represents conditions of crab from the retowed stations in mid-July. Almost all females in the recruiting cohort are now mature. One percent of sampled mature females were softshell without new eggs (vs. 2% last year), whereas 97.5% had molted and extruded new, uneyed eggs. Fluctuations in the timing of

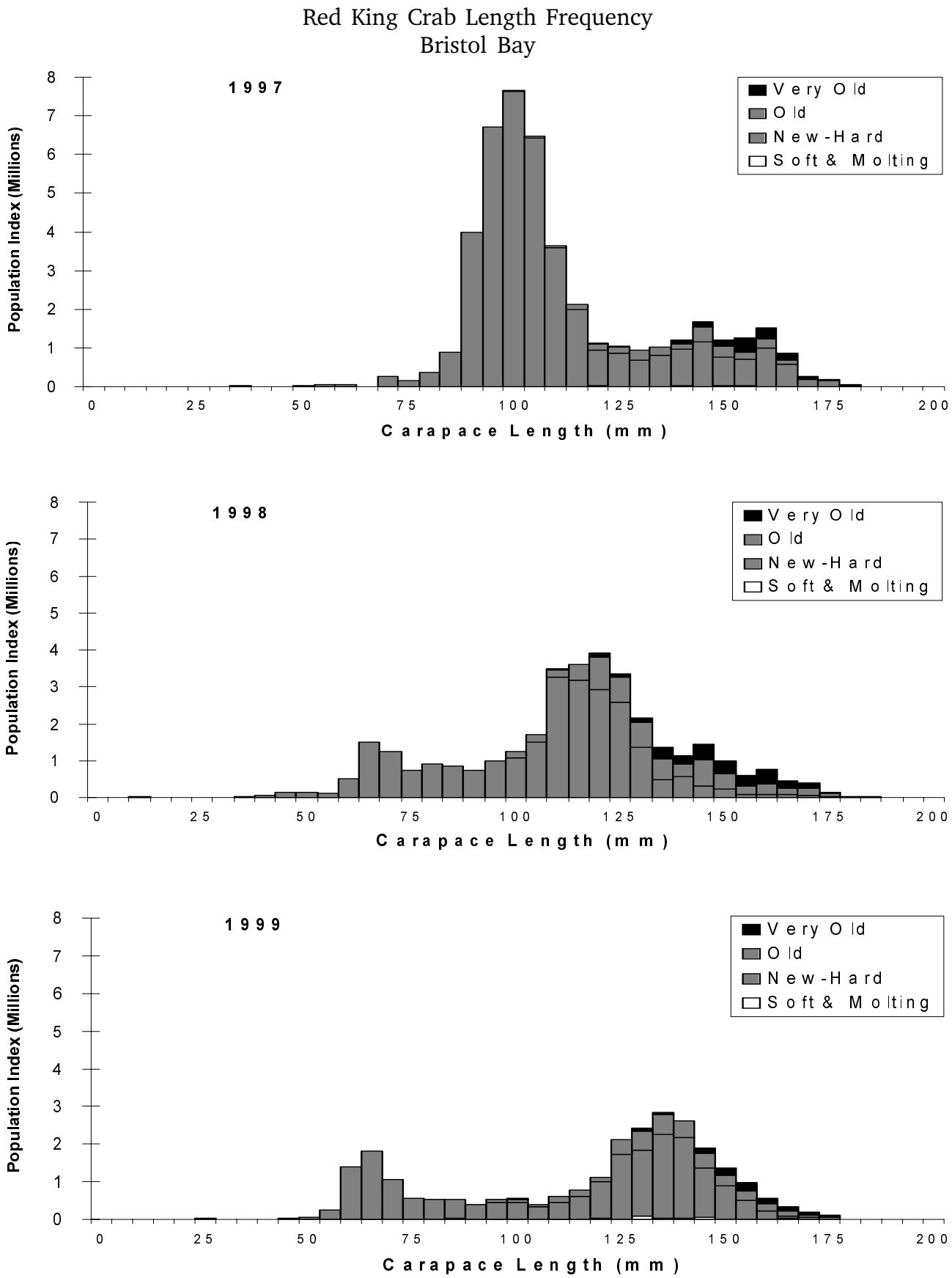

FIGURE 3. Size-frequency of male red king crab (*P. camtschaticus*) by 5 mm length classes, 1997-1999.

TABLE 1. Annual abundance estimates (millions of crabs) for red king crab (*P. camtschaticus*) from NMFS surveys. Bristol Bay and Pribilof Districts are combined except where noted.

		Males				Females			
		Small	Pre-rec	Legal		Small	Large		
Carapace Length(mm)		<110	110-134	≥135		<90	≥90		Grand
Width(in)		<5.2	5.2-6.5	≥6.5	Total	<4.3	≥4.3	Total	Total
1980		56.8	23.9	36.1	116.8	44.8	67.6	112.5	229.3
1981		56.6	18.4	11.3	86.3	36.3	67.3	103.6	189.9
1982		107.2	17.4	4.7	129.3	77.2	54.8	132.0	261.3
1983		43.3	10.4	1.5	55.2	24.3	9.7	34.0	89.2
1984		81.8	12.6	3.1	97.6	57.6	17.6	75.1	172.7
1985		13.7	10.1	2.5	26.3	6.9	6.8	13.7	40.0
1986		11.8	12.3	5.9	30.1	4.5	5.4	9.8	39.9
1987		20.1	12.6	7.9	40.6	16.8	18.3	35.1	75.7
1988		8.5	6.4	6.4	21.3	2.7	15.7	18.4	39.7
1989		8.6	9.4	11.9	29.9	4.4	16.9	21.2	51.1
1990		8.2	10.2	9.2	27.6	7.2	17.5	24.7	52.2
1991		8.1	6.4	12.0	26.5	4.7	12.6	17.4	43.9
1992		7.0	5.5	5.8	18.3	2.2	13.4	15.6	33.9
1993		5.7	10.2	9.8	25.7	2.5	19.2	21.7	47.4
1994		6.2	6.7	7.5	20.4	3.4	10.1	13.5	33.9
1995		9.7	6.0	8.9	24.6	4.9	10.4	15.3	33.9
1996		17.2	3.5	6.0	26.7	13.7	12.9	26.6	53.3
1997		27.5	9.6	10.4	47.4	1.8	25.9	27.7	75.1
1998		11.1	17.0	7.8	35.9	5.5	36.3	41.8	77.7
1999	(B[1])	8.1	7.1	11.0	26.1	6.2	14.5	20.6	46.7
	(P)	6.6	0.6	1.2	8.4	6.5	3.2	9.6	18.1
Limits[2]									
Lower		1.9	4.7	7.0	17.8	0.0	7.8	11.7	29.5
Upper		14.3	9.4	14.9	34.5	12.4	21.1	29.5	64.0
±%		77	33	36	32	101	46	43	37

[1] Separate estimates given for Bristol Bay (B) and Pribilof (P) Districts.

[2] Mean ± 2 standard errors for most recent year; Bristol Bay only.

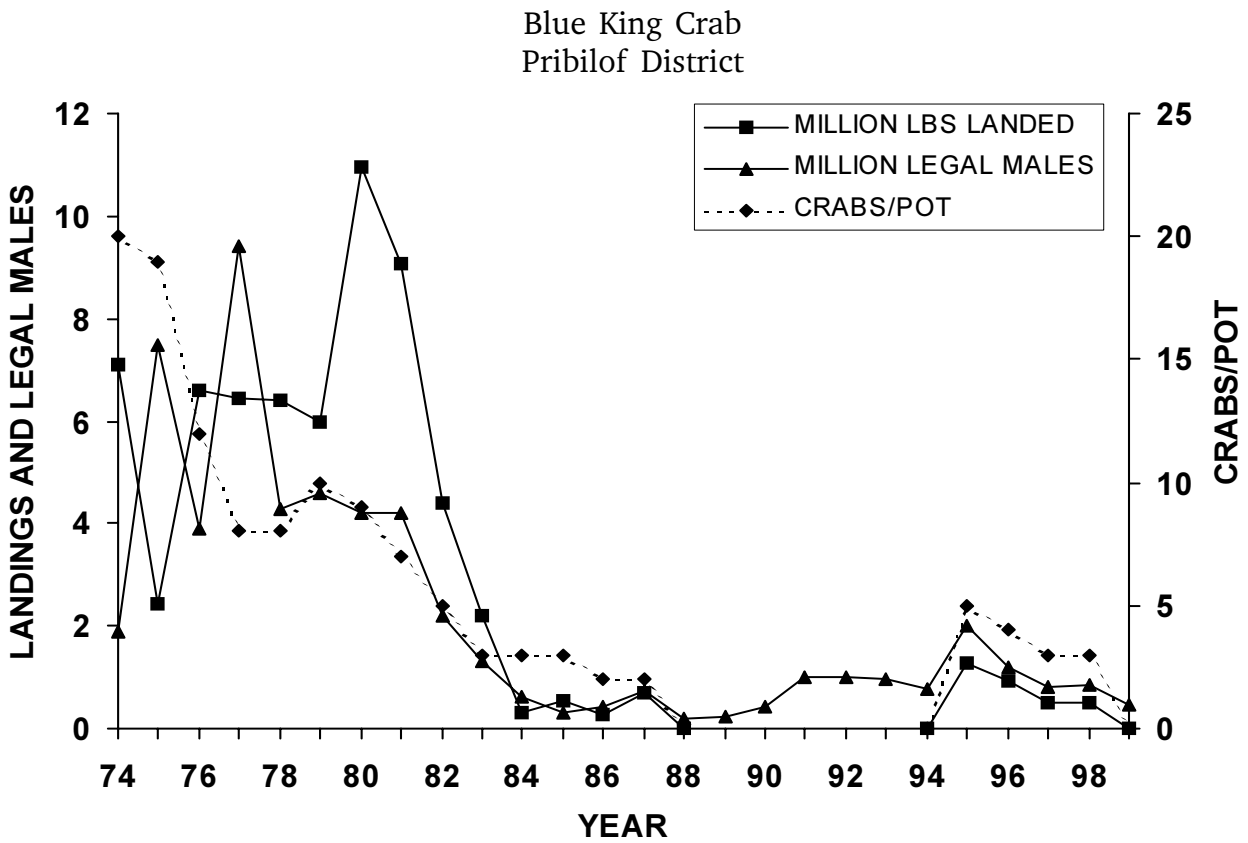

FIGURE 4. U.S. landings in millions of pounds, CPUE as crabs/pot, and abundance of legal blue king crab (*P. platypus*) in millions in the Pribilof District, estimated from NMFS trawl surveys.

molting, mating, and embryo extrusion may be related to annual variations in water temperature.

ADF&G has developed a length-based assessment (LBA) model, which was fitted to the survey time series to provide estimates of the abundance of mature males and females that are used to establish a GHL (ADF&G Regional Information Report 5J99-09). As a result of the decreased number of mature females, a harvest rate of 10% of mature males (> 119 mm cw) was selected, which resulted in a GHL of 10.7 million lbs (4,853 t), including 0.6 million lbs of CDQ. This translates into approximately 1.88 million crabs at an average weight of 5.7 lbs.

Pribilof Islands Red King Crab
(P. camtschaticus)

In the Pribilof District (south of 58° 39'N and west of 168° W), the abundance index for legal male red king crab was 1.2 million crabs (Table 1), an increase of 176% from last year's estimate. The index for large females showed a 214% increase. The majority of male and female crabs were concentrated at one station (G21). From 1996 to 1998, a combined fishery for red and blue king crab in the Pribilof District opened on September 15, however, due to low abundance of blue king crabs (see next section), the combined fishery was not open in 1999. Landings in 1998 were 0.5 million lbs of red king crab with a CPUE of 3 crab/pot-lift. Historically, red king crab have not been abundant in the Pribilof Islands and landings were taken incidentally during the blue king crab fishery. This stock is not considered overfished under provisions of the MSFCMA (see Appendix C).

Pribilof Islands Blue King Crab
(*P. platypus*)

Legal (≥6.5 in cw or 135 mm cl) males were found primarily north and east of St.

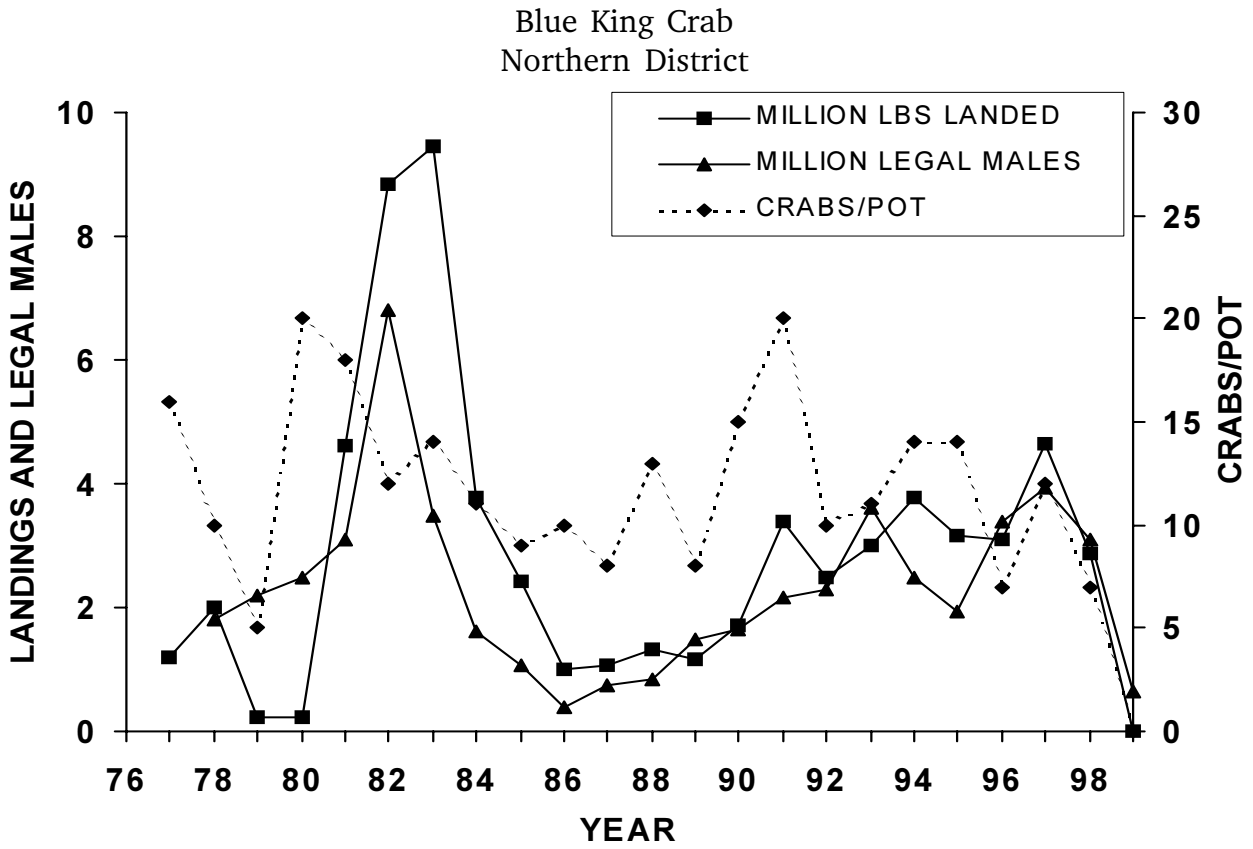

FIGURE 6. U.S. landings in millions of pounds, CPUE as crabs/pot, and the abundance of legal blue king crabs (*P. platypus*) in millions in the Northern District (St. Matthew Island), estimated from NMFS trawl surveys.

Paul Island (Chart 2 and Table 8A). The abundance index for legal males was 0.45 million crabs (Table 2 and Fig. 4), a 46% decrease from last year, and is well below the twenty year average (1.2 million). The index of pre-recruits (110-134 mm cl) decreased 46%. The abundance of small males (<110 mm cl), is very difficult to determine. Size-frequency data (Fig. 5) are very sparse and only 25 legal males were captured. Shell conditions among legal males were 0% softshell or molting, 32% new-hardshells, and 68% oldshells.

The abundance index for large (≥90 mm cl) females showed a 24% increase from last year. However, estimates of female abundance are usually very imprecise due to the preference of such crab for rocky habitat which is not sampled well by trawls. Among sampled mature females, 48% were new hardshells, of which 100% carried new eggs, and 52% were oldshells, of which 99% carried empty embryo cases. No mature females were softshell. Blue king crab are predominantly biennial spawners. Only a portion of the female population spawns in a given year, while the remainder is in the non-embryo-bearing phase.

This fishery was closed from 1988 through 1994 due to low stock abundance but was reopened in 1995 with a combined GHL for red and blue king crab. Blue king crab landings in 1998 were 0.5 million lbs and CPUE was 3 crab/potlift. Declining GHLs and landings reflect declining trends in stock abundance for both species. The fishery was not opened in 1999. This stock is not below the MSST established under MSFCMA.

St. Matthew Island Blue King Crab (*P. platypus*)

Legal (≥ 5.5 in cw or 120 mm cl) males were captured primarily southwest of St. Matthew Island (Chart 2 and Table 8B). The abundance index for legal males was 0.63 million crabs (Table 3 and Fig. 6), representing

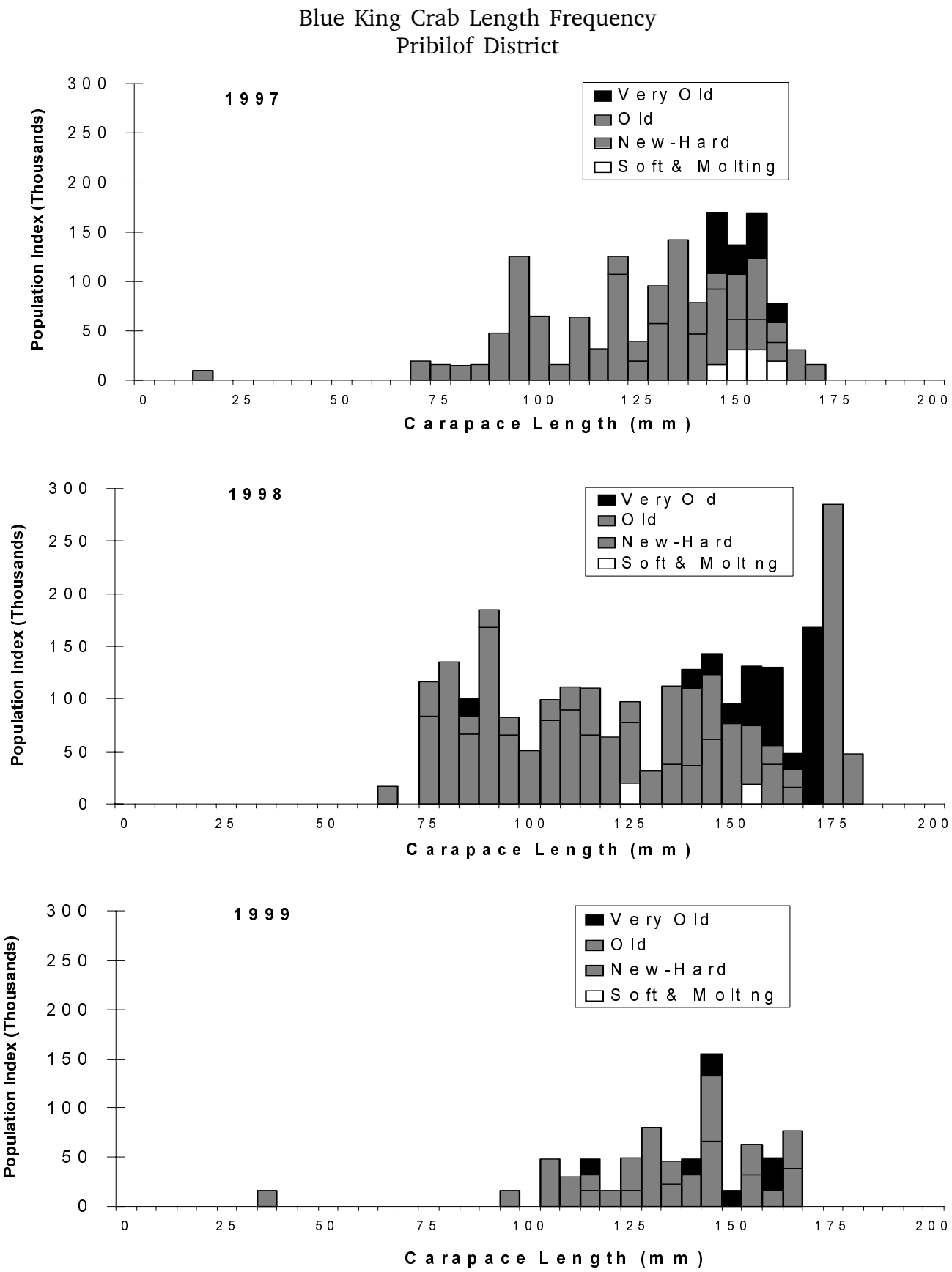

FIGURE 5. Size-frequency of Pribilof District male blue king crab (*P. platypus*), by 5 mm length classes, 1997-1999.

TABLE 2. Annual abundance estimates (millions of crabs) for blue king crab (*P. platypus*) in the Pribilof District from NMFS surveys.

	Pribilof District							
	Males				Females			
	Small	Pre-rec	Legal		Small	Large		
Carapace Length(mm)	<110	110-134	≥135		<90	≥90		Grand
Width(in)	<5.2	5.2-6.5	≥6.5	Total	<4.3	≥4.3	Total	Total
1980	1.9	1.4	4.2	7.5	0.8	101.9	102.7[1]	110.2
1981	4.8	1.4	4.2	10.4	3.4	11.6	15.0	25.4
1982	1.2	0.7	2.2	4.1	0.7	8.6	9.3	13.4
1983	0.6	0.8	1.3	2.8	0.2	9.2	9.4	12.2
1984	0.5	0.3	0.6	1.3	0.3	3.1	3.4	4.7
1985	0.1	0.2	0.3	0.5	0.2	0.5	0.7	1.2
1986	<0.1	<0.1	0.4	0.5	<0.1	1.9	1.9	2.4
1987	0.6	0.1	0.7	1.4	0.4	0.6	1.0	2.4
1988	1.1	0.0	0.2	1.3	0.8	0.4	1.2	2.5
1989	3.2	0.1	0.2	3.5	2.3	1.3	3.6	7.1
1990	1.8	1.2	0.4	3.5	1.8	2.7	4.5	8.0
1991	1.3	1.0	1.0	3.4	0.6	2.8	3.4	6.7
1992	1.6	1.2	1.0	3.8	1.3	2.1	3.4	7.1
1993	1.0	0.8	1.0	2.8	0.3	2.2	2.5	5.3
1994	0.3	0.5	0.8	1.6	0.1	4.3	4.3	5.9
1995	0.8	1.2	2.0	3.9	0.4	4.0	4.5	8.4
1996	0.3	0.7	1.2	2.3	0.1	4.6	4.7	7.0
1997	0.3	0.4	0.8	1.5	0.1	2.5	2.6	4.1
1998	0.8	0.4	0.8	2.0	0.3	2.0	2.3	4.3
1999	0.1	0.2	0.5	0.8	<0.1	2.5	2.5	3.2
Limits[2]								
Lower	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.3
Upper	0.2	0.4	0.8	1.3	0.0	4.9	4.9	6.2
±%	101	75	78	70	0	99	99	92

[1] Female estimates considered unreliable in 1980.

[2] Mean ± 2 standard errors for most recent year.

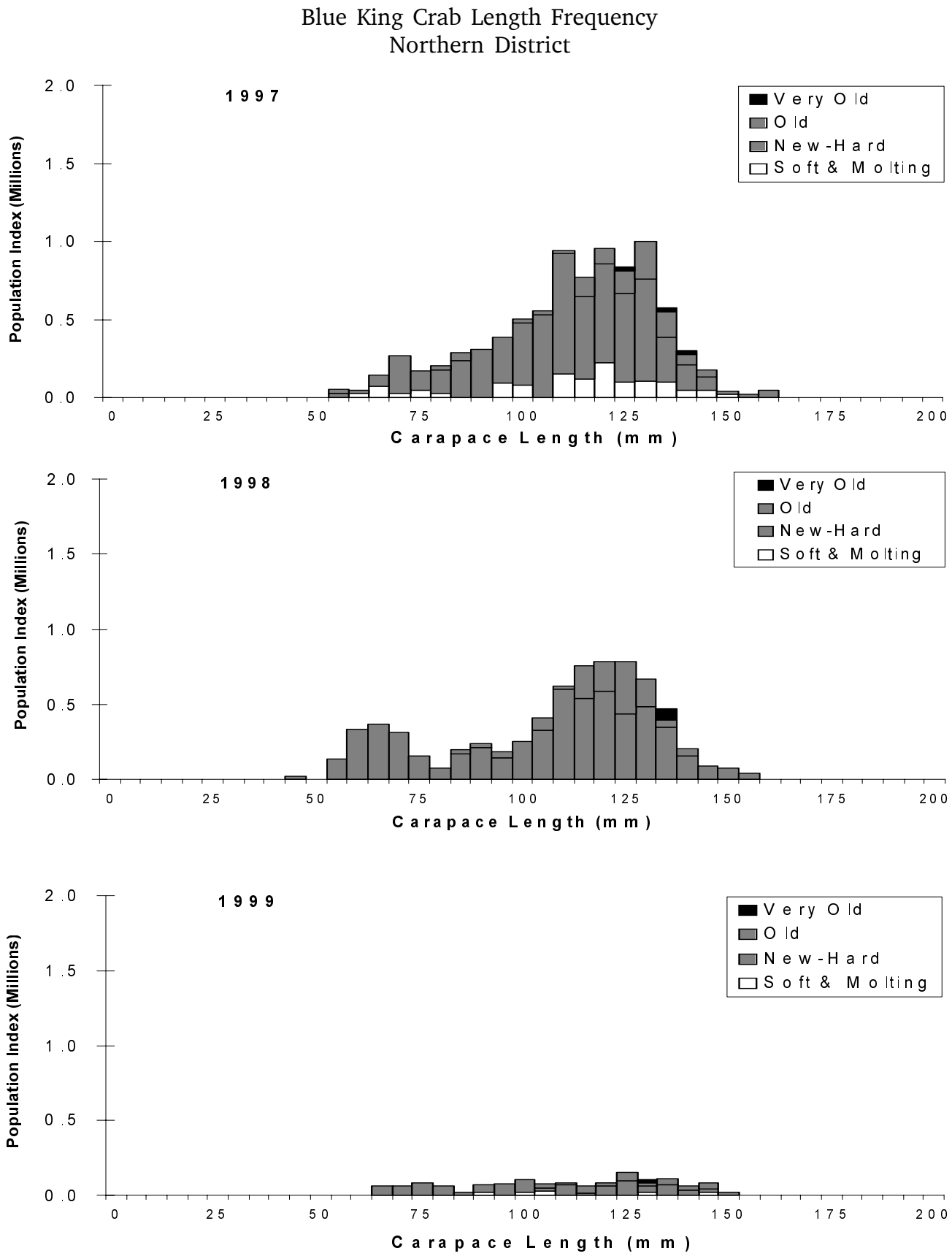

FIGURE 7. Size-frequency of Northern District (St. Matthew Island) male blue king crab (*P. platypus*), by 5 mm length classes, 1997-1999.

TABLE 3. Annual abundance estimates (millions of crabs) for blue king crab (*P. platypus*) in the Northern District (St. Matthew Island) from NMFS surveys.

	Northern District							
	Males				Females			
	Small	Pre-rec	Legal		Small	Large		
Carapace Length(mm)	<105	105-119	≥120		<80	≥80		Grand
Width(in)	<4.3	4.3-5.5	≥5.5	Total	<3.8	≥3.8	Total	Total
1980	3.4	2.2	2.5	8.1	0.8	2.2	3.0	11.1
1981	1.2	1.8	3.1	6.3	<0.1	0.5	0.5	6.8
1982	3.2	2.6	6.8	12.5	0.4	0.7	1.1	13.6
1983	1.8	1.6	3.5	6.9	0.2	2.4	2.7	9.6
1984	1.4	0.6	1.6	3.6	0.2	0.5	0.7	4.3
1985	0.5	0.4	1.1	1.9	0.1	0.1	0.2	2.1
1986	0.6	0.4	0.4	1.4	0.3	0.1	0.3	1.7
1987	1.1	0.7	0.7	2.5	0.5	0.2	0.7	3.2
1988	1.4	0.7	0.8	2.9	0.9	0.8	1.7	4.6
1989	4.8	1.0	1.5	7.3	1.6	1.7	3.3	10.5
1990	1.4	0.8	1.7	3.9	0.4	0.2	0.6	4.50
1991	2.9	1.5	2.2	6.6	0.8	0.7	1.5	8.1
1992	2.3	1.5	2.3	6.0	0.9	0.4	1.3	7.4
1993	4.6	2.0	3.6	10.2	1.4	3.0	4.4	14.6
1994	1.5	1.4	2.5	5.4	0.1	0.4	0.5	5.9
1995	1.9	1.1	1.9	4.9	0.6	0.1[1]	0.7	5.6
1996	2.6	2.0	3.4	8.0	1.1	0.9	2.0	10.0
1997	2.4	2.3	3.9	8.6	0.6	0.8	1.4	10.0
1998	2.3	1.8	3.1	7.2	0.6	0.5	1.1	8.4
1999	0.5	0.2	0.6	1.4	0.3	<0.1[1]	0.3	1.7
Limits[2]								
Lower	0.0	0.1	0.4	0.7	0.0	0.0	0.0	0.5
Upper	1.1	0.4	0.9	2.1	0.7	0.1	0.8	2.9
±%	108	61	42	51	152	200	141	68

[1] These estimates considered unreliable because few crabs caught.

[2] Mean ± 2 standard errors for most recent year.

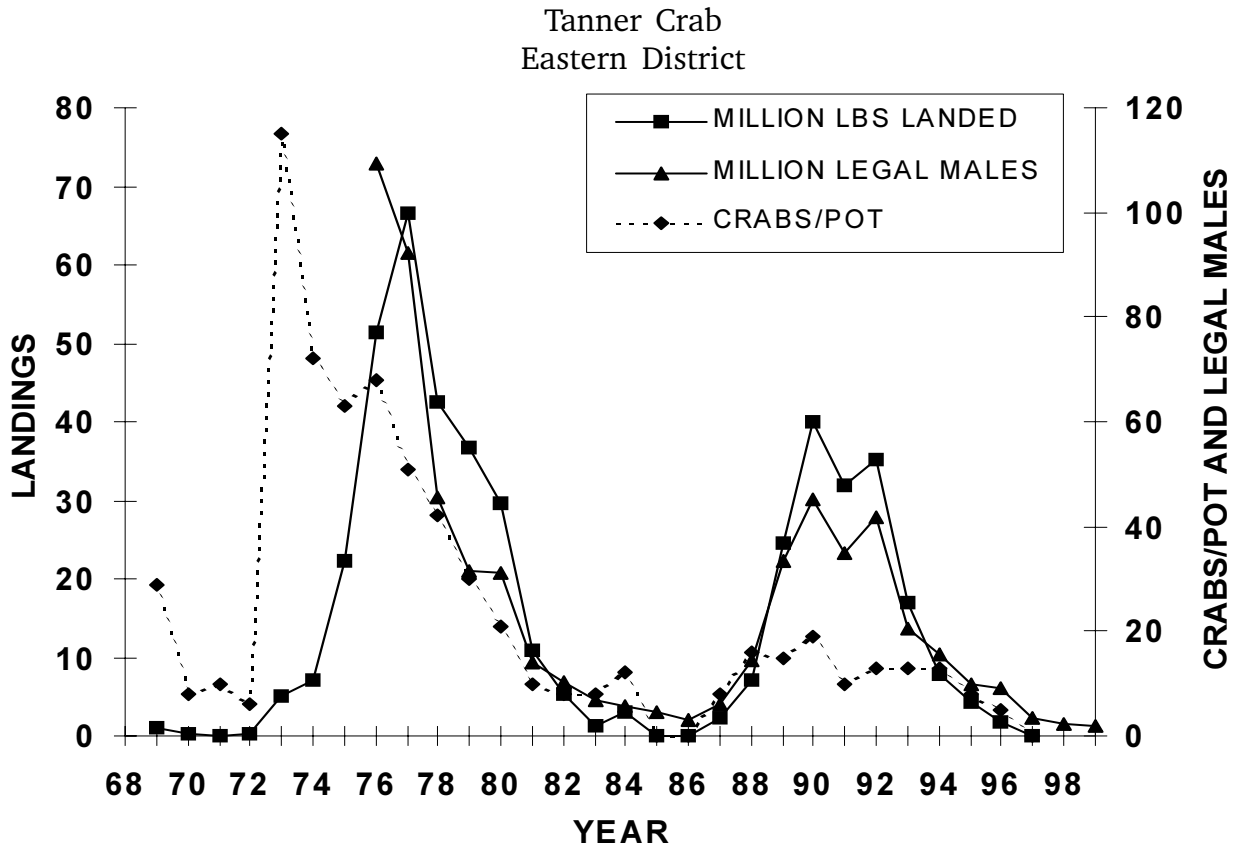

FIGURE 8. U.S. landings in millions of pounds, CPUE as crabs/pot, and the abundance of legal male Tanner crab (*C. bairdi*) in millions in the Bristol Bay and Pribilof Districts (prior to 1989) or the Eastern District (since 1989), estimated from NMFS trawl surveys.

an 80% decrease from last year. The abundance of pre-recruits (105-119 mm cl) showed an 88% decrease. The distribution of size-frequencies was similar to last year (Fig. 7). Only 14 legal males were captured.

The index of legal males (0.63 million) is well below the twenty year average of 2.4 million. Among legal males, 7% were softshell, 50% were new-hardshells, and 43% oldshells. The index for large females ($\geq$ 80 mm cl) is poorly determined due to a habitat preference for inshore, rocky and untrawlable grounds. Only 17 females were captured. Due to low abundance, a fishery was not opened in 1999. Landings in 1998 were 2.9 million lbs and CPUE was 7 crab/pot-lift. This fishery is considered overfished under the provisions of the MSFCMA and a rebuilding plan is being developed (see Appendix C).

Tanner Crab (*C. bairdi*)

The legal minimum size of 5.5 in cw (spine tip to spine tip) is equivalent to 138 mm cw measured between the spines (scientific measure). Legal males were sparsely distributed with regions of highest abundance in central and southeast Bristol Bay (Chart 3 and Table 9). The abundance index for legal male *C. bairdi* in the Eastern District (east of 173° W)is 2.0 million crabs (Table 4 and Fig. 8), essentially no change from last year. This is the lowest abundance of legal Tanner crabs in the history of the survey. Virtually all the legal males occurred in the Eastern District. The abundance index for pre-recruits (110-137 mm cw) showed a 20% increase and the index for small male (<110 mm cw) showed a 158% increase. Increased abundance of males in the 25-50 mm and 75-100 mm cw range (Fig. 9) suggests improved future recruitment. Among legal males, 24% were molting or softshell, 32% were new-hardshells, and 44% were oldshells. Most oldshell crab will not molt again in their lifespans.

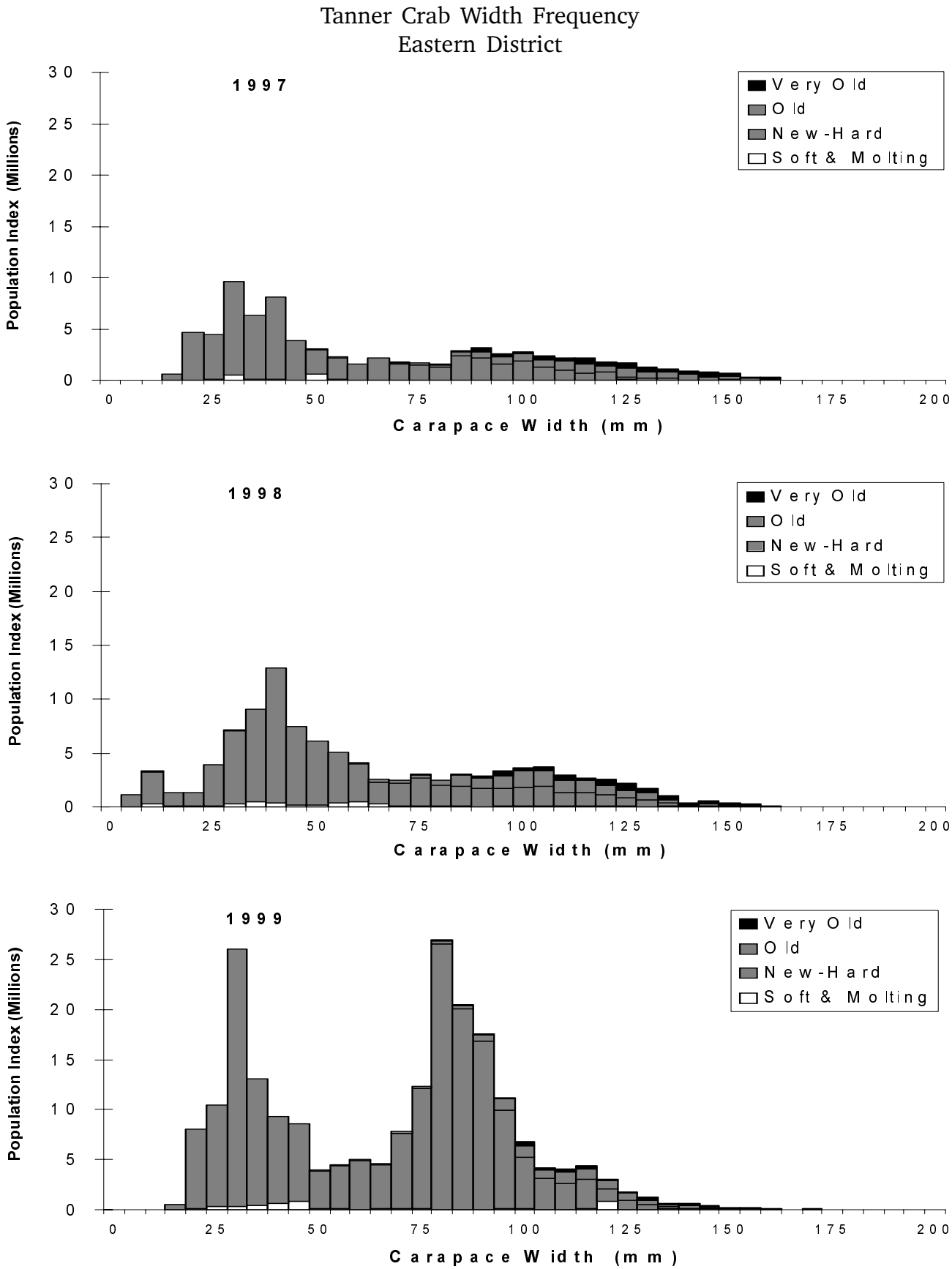

FIGURE 9. Size-frequency of male Tanner crab (*C. bairdi*) in the Eastern District, by 5 mm width classes, 1997-1999.

TABLE 4. Annual abundance estimates (millions of crabs) for Tanner crabs (*C. bairdi*) from NMFS surveys. Data since 1988 are for Eastern District; all prior data for Bristol Bay and the Pribilof Districts; both areas contain virtually all legal males.

	Males				Females			
	Small	Pre-rec	Legal		Small	Large		
Carapace Width(mm)	<110	110-137[1]	≥138[1]		<85	≥85		Grand
Width(in)	<4.3	4.3-5.5	≥5.5	Total	<3.4	≥3.4	Total	Total
1980	453.0	70.2	26.2	549.3	326.9	106.8	433.7	983.0
1981	270.3	59.6	12.0	341.8	324.2	79.1	403.3	745.1
1982	77.3	60.3	8.2	145.8	126.4	83.6	210.0	355.8
1983	141.8	38.1	5.1	185.0	180.1	45.4	225.5	410.5
1984	82.5	24.9	4.7	112.1	107.0	33.4	140.4	252.5
1985	29.8	11.4	3.9	45.0	24.2	15.6	39.8	84.8
1986	109.0	14.7	2.6	126.4	68.2	13.7	81.9	208.3
1987	229.9	22.0	5.9	257.8	192.4	35.5	227.8	485.6
1988	287.3	62.8	14.3	364.4	184.8	81.0	265.8	630.2
1989	403.0	110.9	33.6	547.5	338.6	63.8	402.4	949.9
1990	286.1	87.4	45.1	418.6	266.5	97.4	363.9	782.5
1991	267.2	115.8	35.1	418.1	232.1	116.8	348.9	767.0
1992	121.0	112.7	41.8	275.5	98.9	63.9	162.8	438.3
1993	76.6	70.5	20.6	167.7	57.6	29.6	87.2	254.9
1994	47.9	43.2	15.4	106.6	57.9	27.5	85.4	192.0
1995	40.4	35.7	10.0	86.1	66.6	37.2	103.8	189.9
1996	52.6	26.7	9.2	88.5	59.3	27.7	87.1	175.6
1997	65.6	9.9	3.4	78.9	70.1	10.0	80.1	159.0
1998	74.2	12.1	2.2	88.5	61.4	6.5	67.9	156.5
1999	191.3	14.5	2.0	207.8	125.5	16.1	141.6	349.5
Limits[2]								
Lower	63.1	10.3	1.0	76.9	80.3	5.5	89.2	167.7
Upper	319.5	18.7	2.9	338.8	170.7	26.8	194.0	532.8
±%	67	29	48	63	36	66	37	52

[1] Values prior to 1987 are interpolated from 5 mm width classes.

[2] Mean ± 2 standard errors for most recent year.

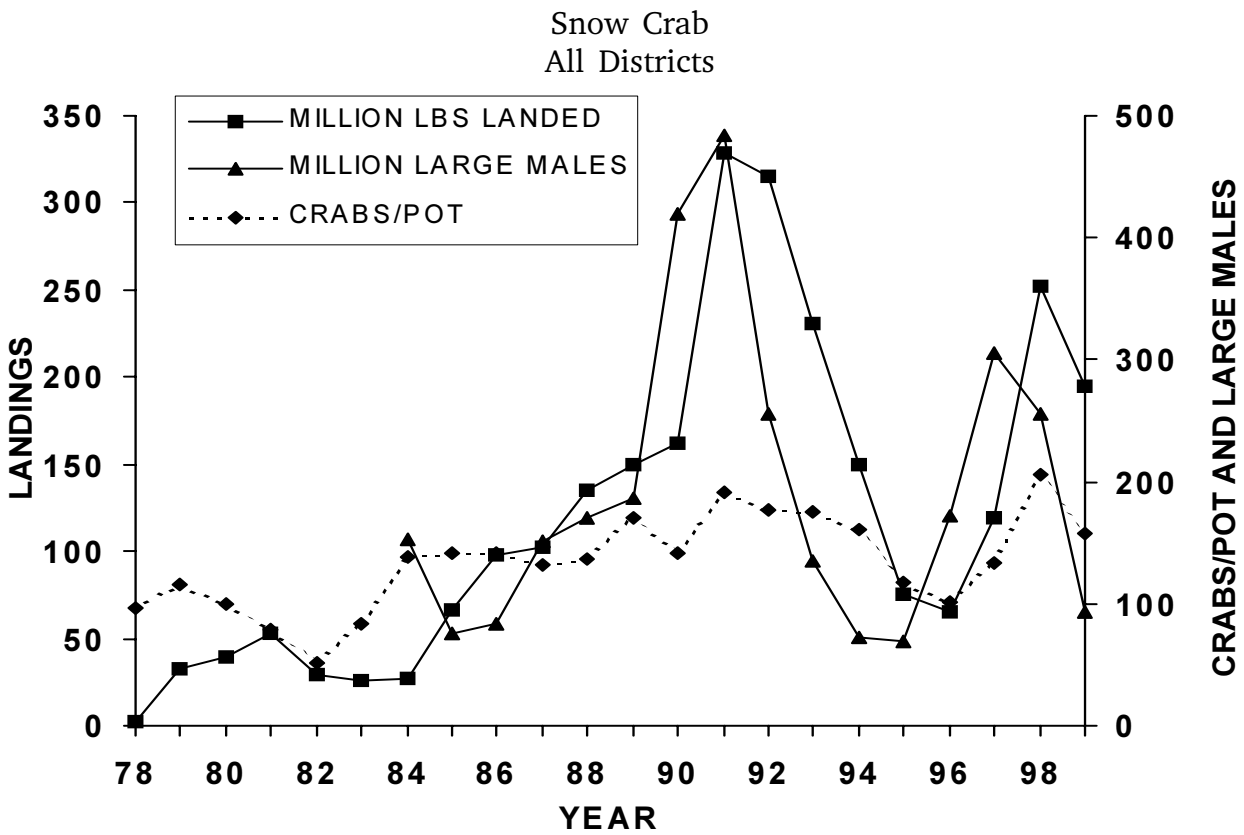

FIGURE 10. U.S. landings in million of pounds, CPUE as crabs/pot, and the abundance of large male snow crab (*C. opilio*) in millions (all districts combined), estimated from NMFS trawl surveys.

The abundance index of large (≥85 mm cw) females showed a 148% increase but is still at a relatively low level. Among sampled mature females, 4% were softshells; 48% were new-hardshells, of which 96% carried new eggs; and 48% were oldshell or older, of which 70% carried new eggs. About 7% of mature females sampled had not completed hatching by the time of the survey.

The fishery was not opened in 1997 or 1998 due to low abundance and it will remain closed in 1999. The estimated spawning biomass of this stock is below the MSST and the stock is considered overfished under the MSFCMA. A recovery plan is under public review.

Snow Crab (*C. opilio*)

Although the legal minimum size limit for *C. opilio* is 3.1 in cw (78 mm), processors currently prefer a minimum size of 4.0 in cw (102 mm). Therefore, the size ranges for male *C. opilio* used in this report are defined as follows: small, <4.0 in (102 mm); large, ≥4.0 in cw (102 mm); and very large ≥4.3 in cw (110 mm).

The distribution of large males showed several areas of high concentration, north and east of the Pribilof Islands (Chart 4 and Table 10) and south and west of St. Matthew Island. The abundance index for large (≥102 mm cw) males (Eastern and Western Districts combined) is 94 million crabs (Table 5 and Fig. 10), and represents a 63% decrease from last year. This is well below the twenty year average of 170 million. Approximately 70% of these were in the Eastern District as compared to 91% in 1997 and 83% in 1998. Small males (<102 mm cw) showed a 49% decrease due to growth, mortality and apparent lack of recruitment into the smallest size groups. The abundance index for large females (≥ 50 mm cw) showed a 59% decrease.

A large mode in the size-distribution entered the fishery in 1996, the result of a strong

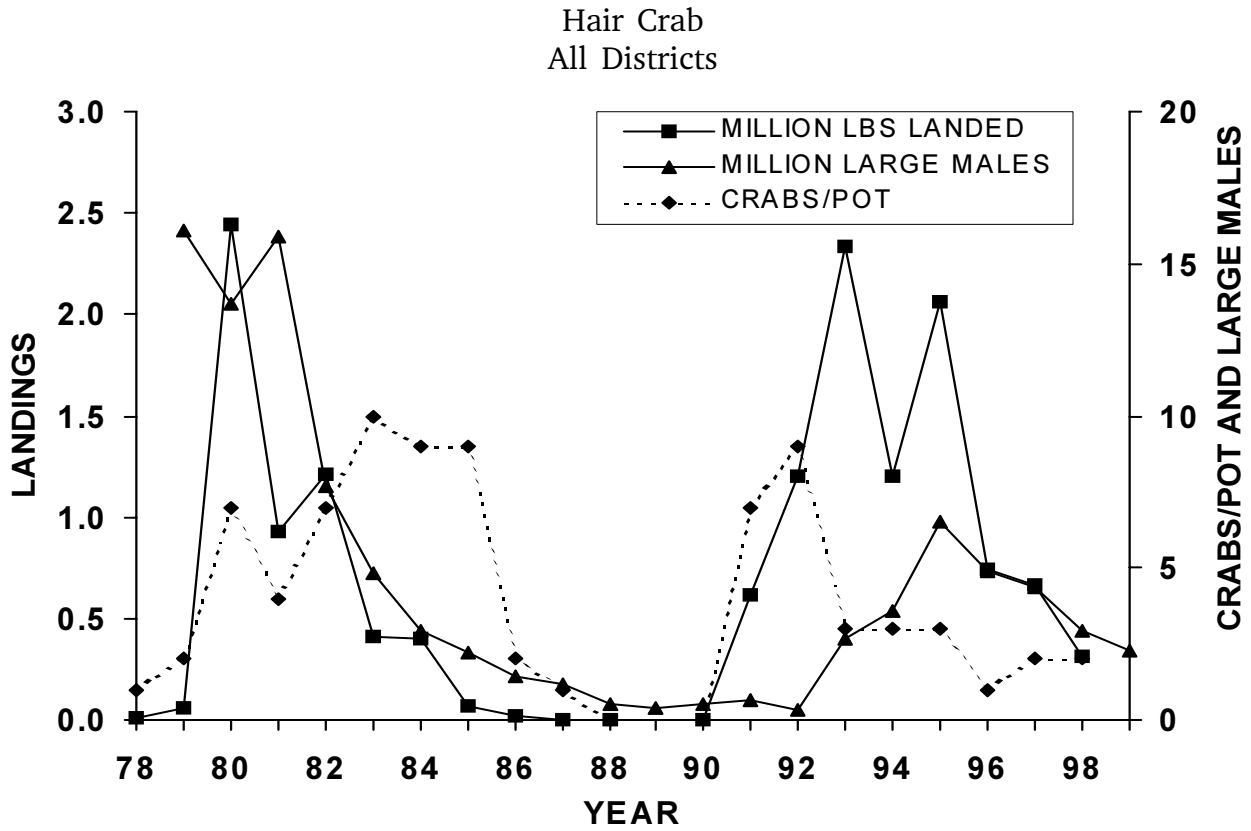

FIGURE 12. U.S. landings in millions of pounds, CPUE as crabs/pot, and the abundance of large male hair crab (*E. isenbeckii*) in millions (all districts combined), estimated from NMFS trawl surveys.

year class that probably hatched in the period 1988-1990. The population reached its peak in 1997 and has declined rapidly in the past year. This conclusion is also supported by the increased prevalence of oldshell crab in the 75-100 mm cw range (Fig. 11).

Among large male crabs, 24% were in molting or softshell condition, 34% were new-hardshells indicating a recent molt, and 41% were oldshells. Among sampled mature females, 22% were new-hardshells, of which 98% carried new eggs and 78% were oldshells, of which 71% carried new eggs and 28% had released their larvae but not yet produced a new clutch.

The spawning biomass (283.5 million lbs) of the eastern Bering Sea stock of *C. opilio* is now below the minimum stock size threshold of 460.8 million lbs, as defined in the 1998 Fishery Management Plan for Bering Sea/Aleutian Islands king and Tanner crab stocks. This stock is now defined as overfished and requires a rebuilding plan. The first step in such a plan is reduction of the harvest exploitation rate, which has been reduced from the previous level of 58% (of commercial-size males) to 22% (i.e., 37.5% of its previous value). The GHL for 2000 has been set at 28.5 million lbs (12,928 t) of large crab ($\geq$4.0 in cw). The fishery will open at noon on January 15, 2000. In 1999, the GHL was 196 million lbs, landings were 194 million lbs and the average CPUE was 158 crab/pot-lift (Fig. 10).

Hair Crab *(Erimacrus isenbeckii)*

Hair crab are present in two areas of the EBS (Chart 5 and Table 11). Historically, areas of concentration have existed just north of the Alaska Peninsula and near the Pribilof Islands. We have never found many female or small male crab during the survey and hence, have little understanding of their distribution.

The abundance index for large male hair crabs declined from 1981-1992, increased

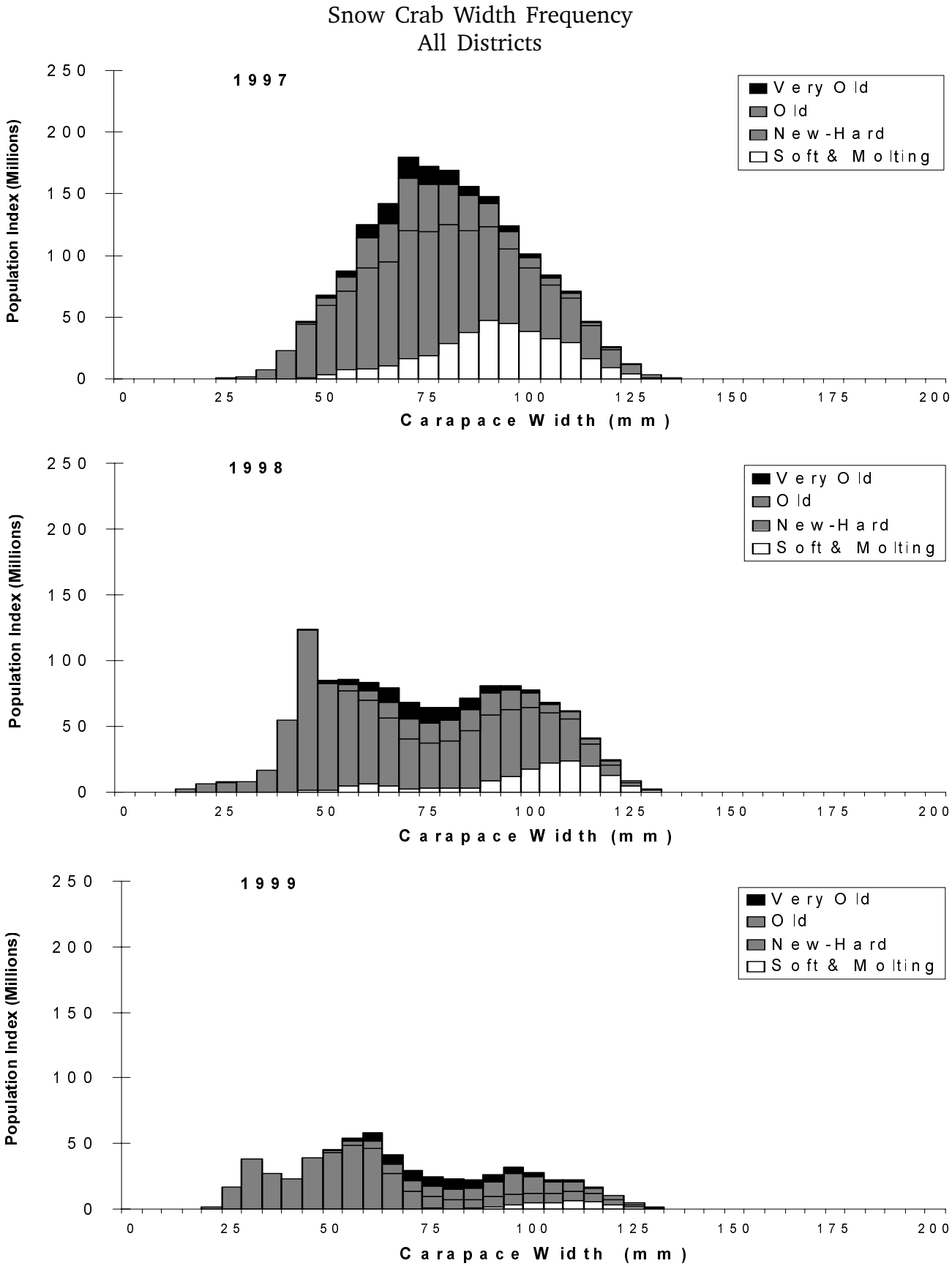

FIGURE 11. Size-frequency of male snow crab (*C. opilio*), all districts combined, by 5 mm width classes, 1997-1999.

TABLE 5. Annual abundance estimates (millions of crabs) for eastern Bering Sea snow crabs *(C. opilio)* from NMFS surveys (all districts combined).

	Males				Females			
	Small	Large	V. Large		Small	Large		
Carapace Width(mm)	<102[1]	≥102[1]	≥110		<50	≥50		Grand
Width(in)	<4.0	≥4.0	≥4.3	Total	<2.0	≥2.0	Total	Total
1980	2502.3	115.2	57.8	2617.6	1827.2	4144.5	5971.7	8589.3
1981	1889.1	54.5	22.2	1943.6	668.6	2607.6	3276.2	5219.8
1982	2003.0	70.2	21.7	2073.2	402.6	2255.8	2658.4	4731.7
1983	1782.8	75.3	22.1	1858.1	673.1	1228.4	1912.6	3771.0
1984	1237.4	153.2	73.9	1390.6	610.5	581.7	1192.2	2582.9
1985	547.8	74.9	40.7	622.7	258.2	123.5	381.7	1004.3
1986	1179.0	83.1	45.9	1262.1	790.6	422.0	1212.5	2474.5
1987	4476.0	144.3	66.4	4620.3	2903.0	2795.0	5698.0	10318.3
1988	3467.2	171.0	90.1	3638.2	1235.3	2322.7	3556.0	7194.2
1989	3646.1	187.1	81.2	3833.2	1922.8	3790.7	5713.4	9546.6
1990	2860.4	420.3	188.7	3280.7	1463.3	2798.1	4261.4	7542.1
1991	3971.2	484.1	323.0	4455.3	3289.0	3575.0	6863.9	11319.2
1992	3158.4	256.4	163.8	3414.8	2433.9	1914.3	4348.2	7763.0
1993	5596.6	135.0	77.9	5731.5	3989.8	1982.6	5972.4	11703.9
1994	4282.5	71.6	39.9	4354.0	3417.6	1674.3	5091.8	9445.9
1995	4086.8	68.8	30.9	4155.6	2090.3	2409.4	4499.7	8655.3
1996	2700.1	171.6	64.8	2871.7	1189.0	1364.2	2553.2	5424.9
1997	1490.8	305.7	160.9	1796.6	927.9	1383.1	2311.0	4107.5
1998	1014.7	254.6	139.2	1269.3	803.0	1160.8	1964.0	3233.3
1999	517.0	94.2	55.8	611.1	315.5	474.3	789.8	1401.0
East(%)[2]	59.5	70.3	73.9	61.1	38.0	45.3	42.4	50.6
Limits[3]								
Lower	398.1	72.5	40.2	488.9	186.1	265.6	481.8	970.7
Upper	635.9	115.8	71.4	733.4	444.8	683.0	1097.8	1831.2
±%	23	23	28	20	41	44	39	31

[1] Values prior to 1984 are interpolated from 5 mm width classes.

[2] Percent of size group in Eastern District (east of 173°).

[3] Mean ± 2 standard errors for most recent year.

from 1992 to 1995 (Table 6 and Fig. 12), and is now declining again. The abundance index of 2.3 million large ($\geq$ 3.25 in cw) males is 22% lower than last year. Size- frequencies (Fig. 13) reflect the declining abundance of this stock. The abundance index of total females shows an increase of 39% from last year, but is usually unreliable. Sixty-five percent of males and 88% of females were new-hardshell crabs.

Changes in abundance indexes of hair crab are difficult to interpret due to patchy distribution, burying habits, in-shore distribution, and suspected variability in catchability between years. Further, changes in fishery practices and management over the time series decreases the usefulness of correlations between fishery and survey data (Fig. 12).

The directed fishery for hair crab in the Pribilof Islands has no statutory minimum legal size regulation, so we have defined large crabs as those larger than a minimum size of 3.25 in cw that has been specified as a condition of permits during recent years. Currently, there are an estimated 1.4 million lbs of large male crab in the Pribilof District. A GHL of 283,000 million lbs was set for the Pribilof District in 1999. In 1998, 0.3 million lbs were taken with CPUE of 2 crab/pot-lift.

Acknowledgments

Successful completion of the annual EBS crab and groundfish survey is crucially dependent on the skippers and crews of the participating vessels. We wish to extend a special thanks to Glenn Sullivan and Randy Rowland of the *F/V Arcturus* and Norman Bakken and Manuel DeCruz of the *F/V Aldebaran* and their crews.

We also wish to thank all of the "crabologists" who participated in this survey, including P. Anderson, C. Armistead, P. Cummiskey, G. Harrington, J. E. Munk and B. O'Gorman. This document was produced by J. Corlew.

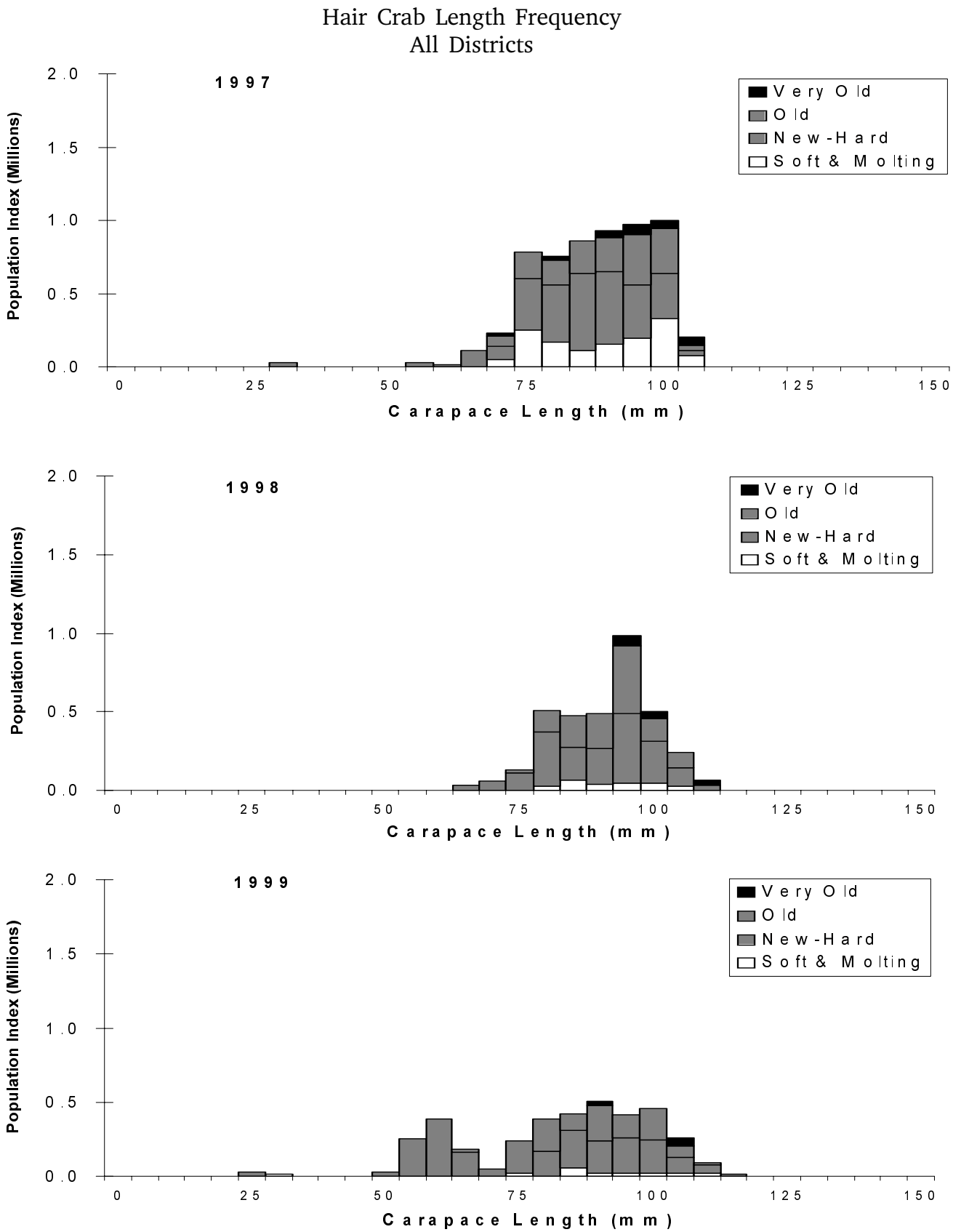

FIGURE 13. Size-frequency of male hair crab (*E. isenbeckii*), by 5 mm length classes, 1997-1999.

TABLE 6. Annual abundance estimates (millions of crabs) for hair crab (*E. isenbeckii*) from NMFS surveys.

	Males			Females	
	Small	Large			
Carapace Length(mm)	<83	≥83			Grand
Width (in)	<3.25	≥3.25	Total	Total	Total
1980	2.0	14.9	16.9	2.6	19.5
1981	2.8	14.3	17.2	0.9	18.0
1982	0.5	8.1	8.6	0.4	9.0
1983	0.2	4.4	4.6	0.8	5.5
1984	0.7	3.3	4.1	0.5	4.6
1985	0.3	2.6	2.9	0.3	3.1
1986	0.7	1.8	2.5	0.4	2.9
1987	1.6	1.3	2.9	0.9	3.8
1988	3.0	0.9	3.9	0.9	4.7
1989	11.4	1.5	12.8	0.7	13.5
1990	13.0	1.1	14.1	0.9	15.0
1991	4.5	1.3	5.7	1.2	6.9
1992	2.5	1.2	3.6	0.5	4.2
1993	9.1	2.6	11.8	1.5	13.3
1994	4.7	3.6	8.2	1.3	9.5
1995	4.6	6.5	11.1	0.7	11.8
1996	3.6	4.9	8.4	1.1	9.5
1997	1.6	4.3	5.9	0.3	6.3
1998	0.5	2.9	3.5	1.4	4.9
1999	1.4	2.3	3.7	1.9	5.6
Limits[1]					
Lower	0.0	1.6	1.9	0.6	2.5
Upper	3.1	3.0	5.6	3.2	8.8
±%	120	30	50	67	56

[1] Mean ± 2 standard errors for most recent year.

APPENDIX A

Methods of Estimating Crab Population Size

Population abundance indices are determined by the 'area-swept' method, using a stratified systematic sampling design. Distance traveled by the trawl was determined from positions recorded at the beginning and ending of the trawl. Area fished (= area swept by the trawl) was calculated by multiplying the distance by the effective width of the trawl. Wingspread on this trawl ranges from 47-58 ft. For consistency with previous reports an effective width of 50 ft (15.2 m) was assumed.

All stations (grid squares) within a district or management area were used for estimating the abundance of each species. Stations where multiple (corner or repeat) tows were made were grouped into strata; these include a block of 12 stations southwest of St. Matthew Island and 16 stations around St. Paul Island.

The catch-per-unit-effort (CPUE) was calculated for each station as number of crabs per square nautical mile. Average CPUE was calculated within each multiple tow block and each management district. Abundance indices were calculated by extrapolating the average CPUE of each size/sex group over the geographic area of each district. Variance and standard error (SE) of the index were calculated arithmetically. Confidence intervals were calculated by adding or subtracting 2 SEs to the population estimate. Note that, since the data are usually not normally distributed, variance estimates and confidence intervals are approximate. Nevertheless, they are provided in order to indicate the range of the data relative to previous years' estimates.

Threshold levels have been established for certain crab stocks by the Crab Plan Team of The North Pacific Fishery Management Council. In accordance with Alaska Board of Fisheries policy, and the Alaska Department of Fish and Game's Management Plan for Westward Region Crab stocks, such fisheries will be closed if the abundance index falls below the threshold level.

APPENDIX B

Crab Shell Condition

All crabs measured in the NMFS eastern Bering Sea trawl survey are coded as to shell condition. Shell condition categorizes exoskeleton discoloration, scratching and wear, and fouling by encrusting organisms, and can be used to estimate the time since a crab has last molted. The shell condition categories used in this report and the estimated times since last molting that they imply are given below:

Molting[1]: Joints swollen and/or well developed second exoskeleton present. Crab will molt within days or is actively molting.

Softshell[1]: Carapace is still soft and pliable from recent molt. Crab has molted within weeks.

New-hardshell: Carapace firm to hard and lacking scratches, wear, discoloration, and encrusting organisms. Crab has probably molted within the last year.

Oldshell: Usually has at least some scratching, spine wear. Crab may have darker coloration, and encrusting organisms are frequently present. Crab has probably not molted within the last year.

Very oldshell: Undersides of legs yellowed; abundant scratches and stains; spines and claws very worn; encrusting organisms almost always present and often abundant. Time since the last molting is almost certainly greater than one year but not definitely known.

Very, very oldshell: Shells extensively stained and usually with extensive cover of encrusting organisims. Time since the last molting not definitely known.

[1] Note that in the report, Molting and Softshell categories are frequently combined. The time span over which these conditions occur in a crab is only a matter of weeks. A high percentage of molting and softshell crabs in a survey population indicates that the molting season is not yet over.

APPENDIX C

New Overfishing Definitions Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)

The Fishery Management Plan (FMP) for the King and Tanner Crab Fisheries of the Eastern Bering Sea and Aleutian Islands Regions was rewritten in 1998. The FMP does not include hair crab. For the king and Tanner crab stocks that NMFS surveys annually, there have been changes in management targets and constraints that reflect changes in the MSFCMA. These changes did not materially affect management decision making until the 1999-2000 fishing seasons because the Tanner crab fishery had already been closed due to low stock abundance following the 1996 season. This Appendix provides an explanation of how the North Pacific Fishery Management Council's Crab Plan Team went about defining management parameters as required under the new MSFCMA.

The FMP delegates many management measures to the State of Alaska, including the determination of harvest rate or annual Guideline Harvest Level (GHL) for each fishery. GHLs are constrained such that overfishing is prevented or, in the case of overfished stocks, that stocks may be allowed to recover at a rate specified by a required recovery plan (usually within 10 years). In essence, State harvest strategies may be more conservative than those specified by the FMP but may not be less so.

Crab fisheries in the Eastern Bering Sea (EBS) were never prosecuted in a manner similar to finfish fisheries. In the latter, the entire mature segment of a population (frequently called spawning biomass)is typically vulnerable to fishing and sustainable yield (SY) or its maximum (MSY) can be regarded as a biological parameter related to stock productivity and mortality. By contrast, EBS crab fisheries have been subject to various constraints since their inception in the 1940s. These constraints restricted fisheries from harvesting substantial portions of the mature population. These included prohibition of harvesting of females and size limits that were usually set to ensure that males would have at least one opportunity to breed before reaching legal size. Typically, EBS crab fisheries have also been constrained by quotas or guideline harvest levels (GHLs) that were intended to promote stability in the face of variable recruitment.

In the previous editions of the FMP the mean catch over the history of a fully developed fishery was considered as MSY for a given stock. Considering the history of regulations imposed and in light of the MSFCMA, the averaged crab catch history is more closely related to optimum sustainable yield (OSY) than to MSY. This is because the regulatory process has considered social (e.g., desire for stabilized economy), economic (e.g., processing costs and marketability of females and small males) as well as biological (e.g., growth, mortality, abundance) factors.

For the new FMP, MSY is computed on the basis of what is known of the abundance of the mature portion of the population or total mature biomass (TMB). Note that TMB is simply an estimate of the total biomass of individuals that are physiologically mature and makes no assumptions as to what proportion of them actually spawn. Various State harvest strategies do consider the estimated spawning biomass and are hence examples of more conservative management (see Zheng, Murphy and Kruse 1997).

A fixed fraction of the annual TMB was considered as SY for that year and the average of SYs over a suitable period of time is considered as MSY. In this plan it is assumed that the level of instantaneous fishing mortality (F) that corresponds to MSY is equal to the natural mortality (M) of an unfished stock:

$$F = M = F_{msy}.$$

This strategy is considered as moderately conservative and is one of several that are recommended for situations where moderate amounts of pertinent data are available (Restrepo, et al., 1998). The value of M was determined by taking the largest crab size observed during surveys or other sampling conducted prior to the development of substantial fishing (Wallace, et al., 1949, NMFS unpublished), converting this to estimated age and then computing M from equations given by Hoenig (1983). Longevity of Bristol Bay red king crab was considered as representative for all king crabs (*Paralithodes* and *Lithodes*) and that of Bering Sea Tanner crab (*Chionoecetes bairdi*) representative of all Tanner crabs (genus *Chionoecetes*). The largest red king crab observed by Wallace, et al., (1949) was 197 mm in carapace length (CL) and the largest known from Bristol Bay fisheries are 205 mm CL. growth models (e.g., Balsiger 1974) indicate that a male crab of 157 mm is about 14 years old while tagging studies indicate that a king crab of this size may be recovered as much as 6 years later. The maximum age of red king crab near Kodiak (ADF&G unpublished, news release) was estimated at 24 years. For the purposes of computing MSY, values of 22 to 24 years were considered as maximum and correspond to F-values of 0.19 to 0.20. A value of F=0.20 was chosen for king crab. During the 1969 and 1970 NMFS trawl surveys, 20,117 Tanner crab were measured and a maximum size of 199 mm carapace width (cw) was obtained. Using Somerton's (1981) growth model as well as tagging data, a Tanner crab of this size would be approximately 15 years of age, which corresponds to F = 0.295. A value of F=0.30 was chosen for computing MSY.

In each year, the TMB for surveyed stocks was computed by considering the vulnerability (V = probability of capture in the survey), the proportion mature (P), the mean weight (W) and unadjusted survey index (N) for of the i-th size group (5 mm steps) of each sex group. The mature biomass (B) for a given (i-th) 5 mm size group for the j-th sex (males=1, females =2) was calculated as :

$$B_{i,j} = N_{i,j} * W_{i,j} * P_{i,j} / V_{i,j}.$$

The TMB for a given year is the sum of B over size and sex. This is considered as an estimate of the annual average biomass theoretically available for harvest (W * NFA/Z considered equivalent to TMB). This simplifies Baranov's catch (C) equation to:

$$C = F * TMB = SY.$$

This was done because the timing of fisheries relative to the survey or to recruitment is in part an OY consideration and also varies from stock to stock.

The MSY computations required that environmental (including ecological) conditions remain reasonably constant over the period during which SYs are averaged. In this FMP, the 15-year period (1983-1997) was considered representative of current environmental conditions because: 1) several crab stocks declined from the 1970s until the early 1980s and then stabilized somewhat (e.g., Bristol Bay red king crab), 2)predator/competitor fish populations that increased sharply in the late 1970s (regime shift) seem to have stabilized somewhat by 1983, 3)recruitment from the generally high crab populations of the 1970's would have been evident or have dissipated by 1983 and, 4) for less stable stocks, abundance went through both high and low periods within these 15 years although it was generally less than that of the 1970s. In choosing this period the Plan Team recognized that MSY would be much reduced, for many stocks, as compared to a longer time series but felt that it was extremely important to choose a period that was representative of current environmental conditions. It is recognized that MSY estimates will have to be periodically evaluated and updated as more information becomes available and as environmental conditions may change. Over a representative period the MSY is considered as the average harvest that can be sustained by a stock.

The average of annual sustainable yields (SY) is taken as MSY and the average of the TMBs, providing these SY estimates are taken as the MSY biomass. A stock is considered overfished if the TMB falls below 50% of the MSY biomass, which is also referred to as the minimum stock size threshold (MSST). The history and current condition of stocks regulated under the FMP is shown in Appendix Figures C1-3. Tanner crab, St. Matthew Island blue king crab, and snow crab are currently considered overfished. A recovery plan for Tanner crab has been developed and is under public review. Recovery plans are being developed for blue king crab and snow crab as well.

Citations

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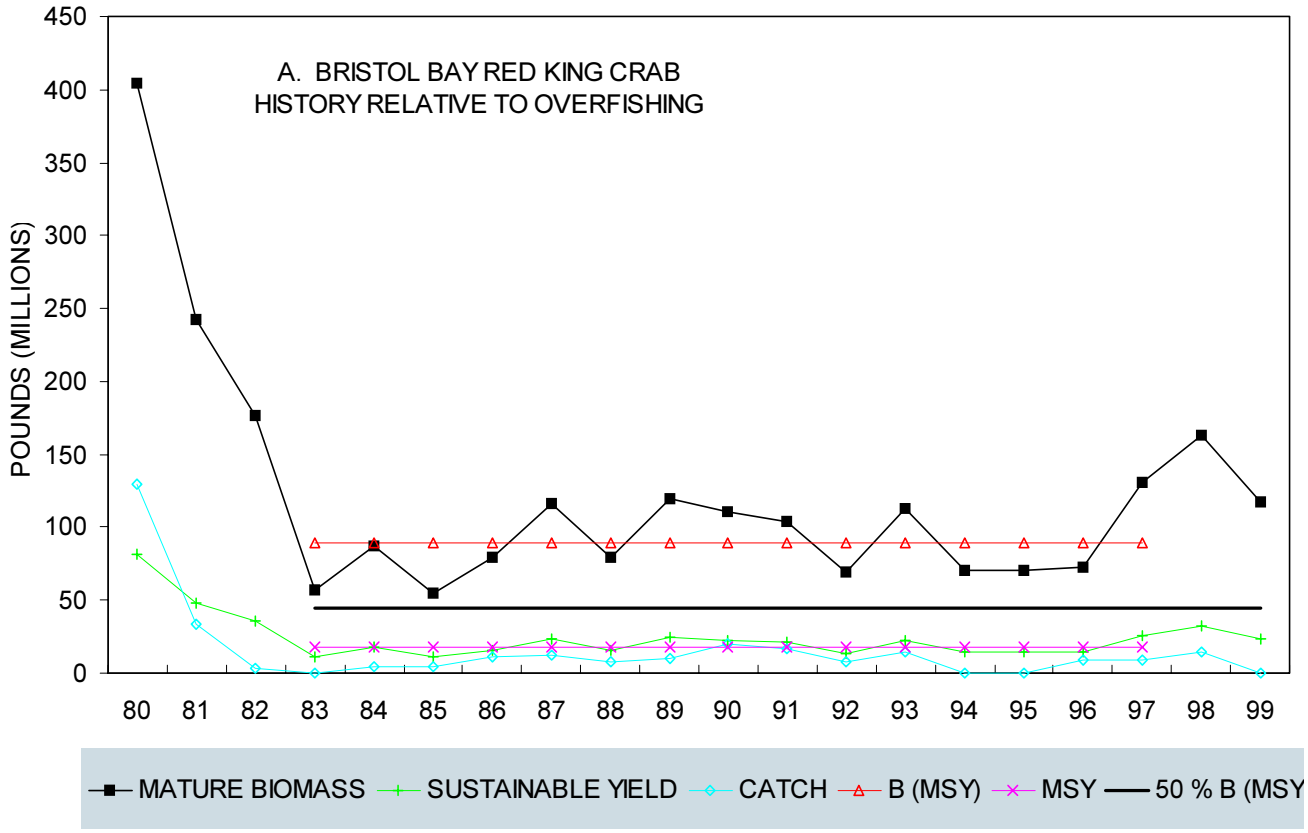
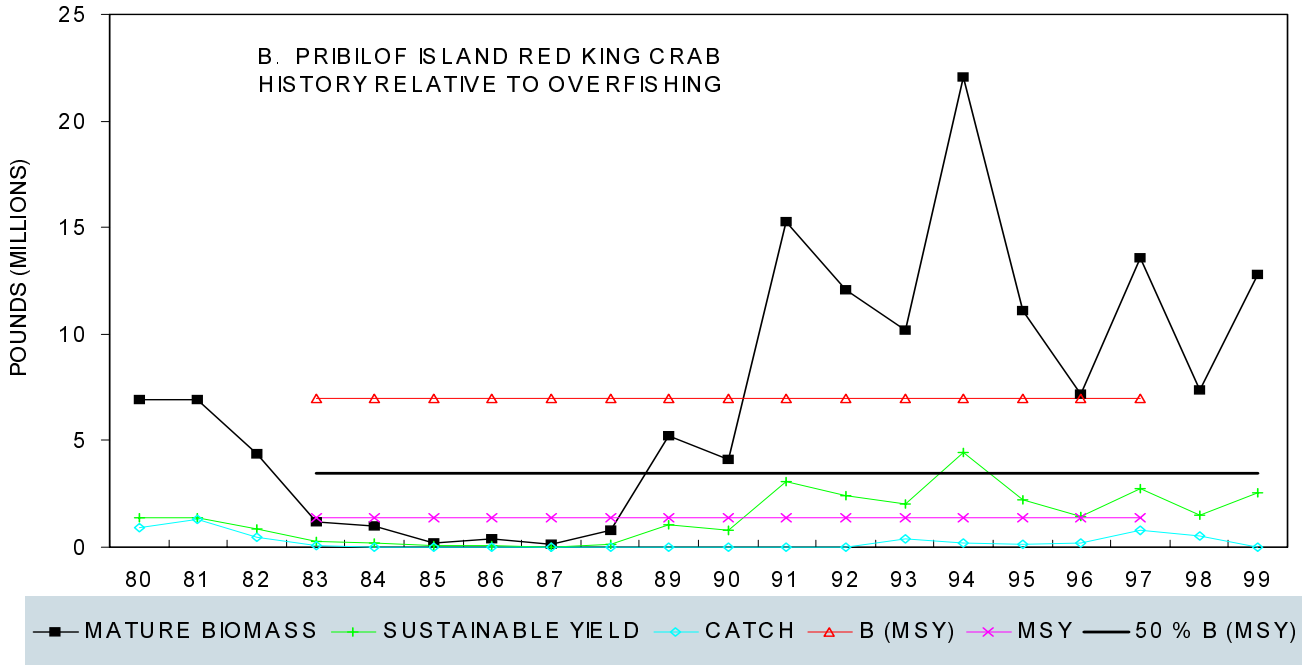
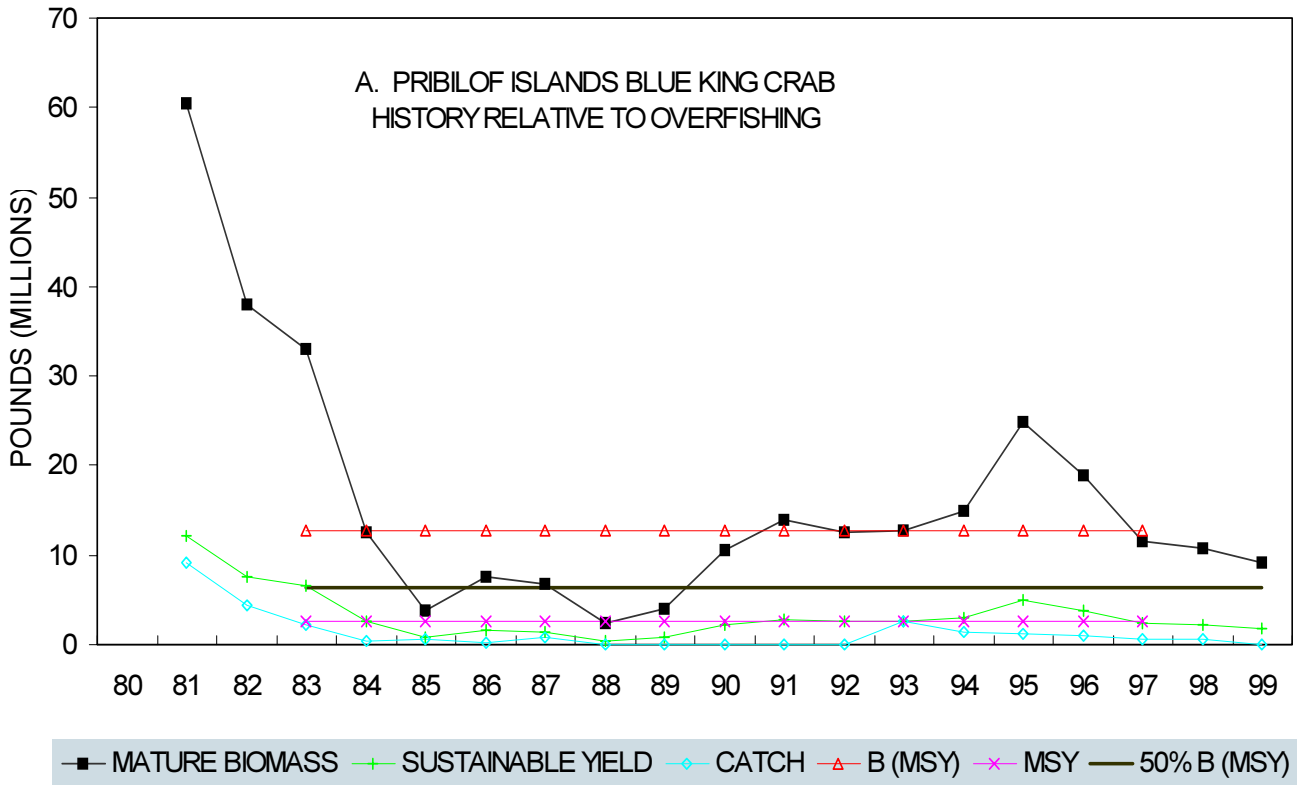
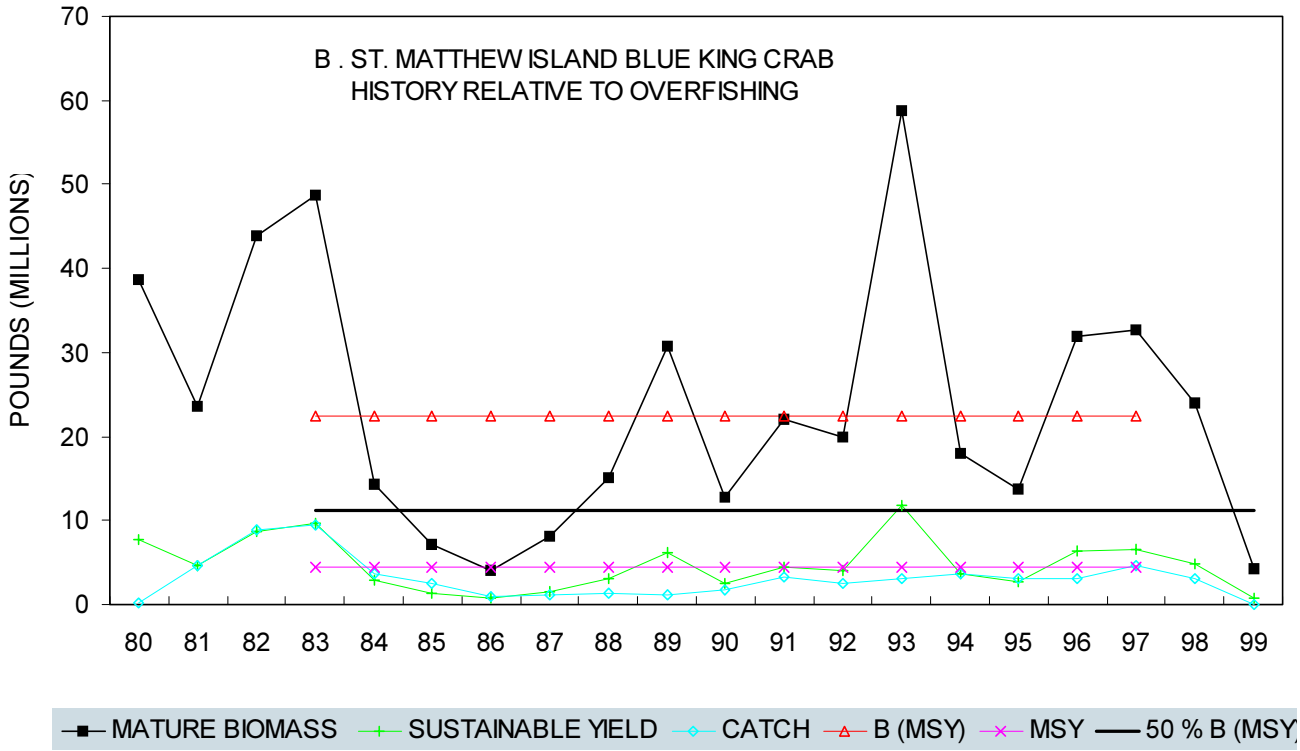


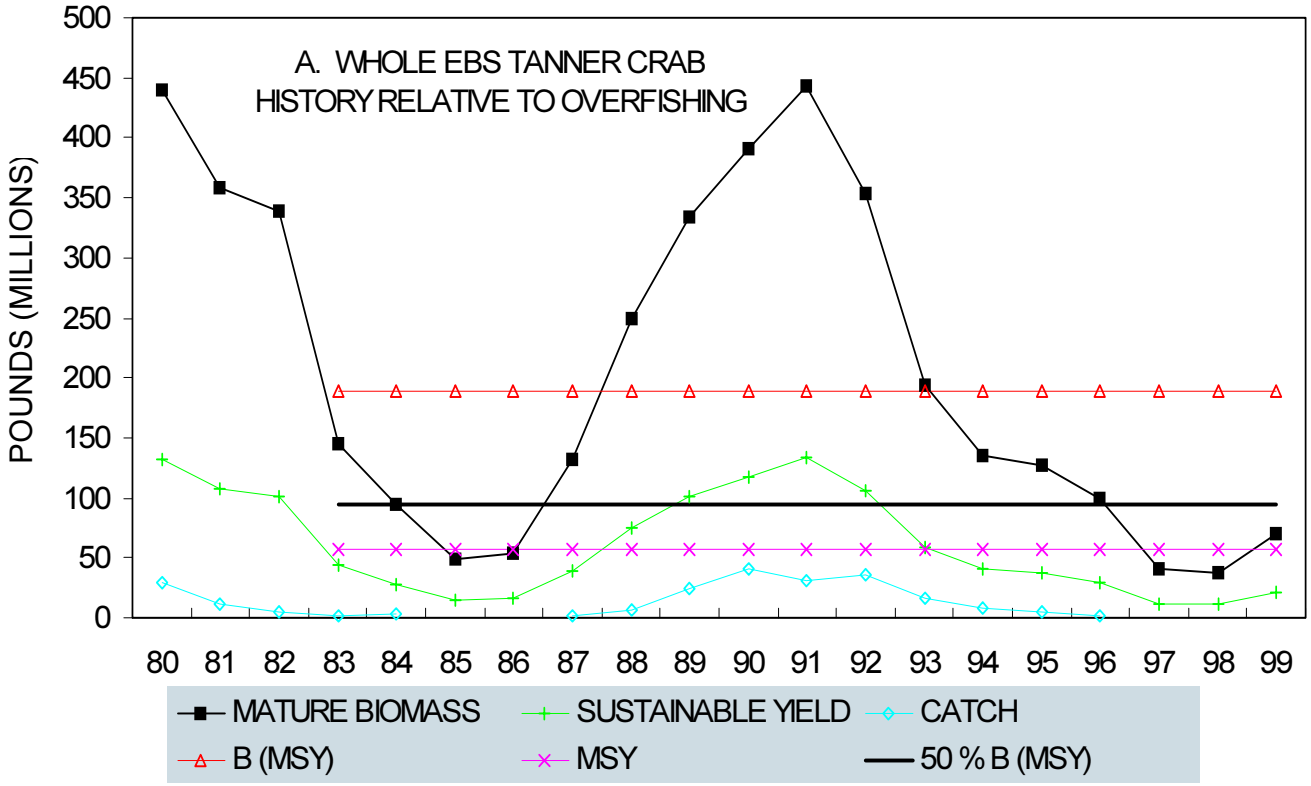


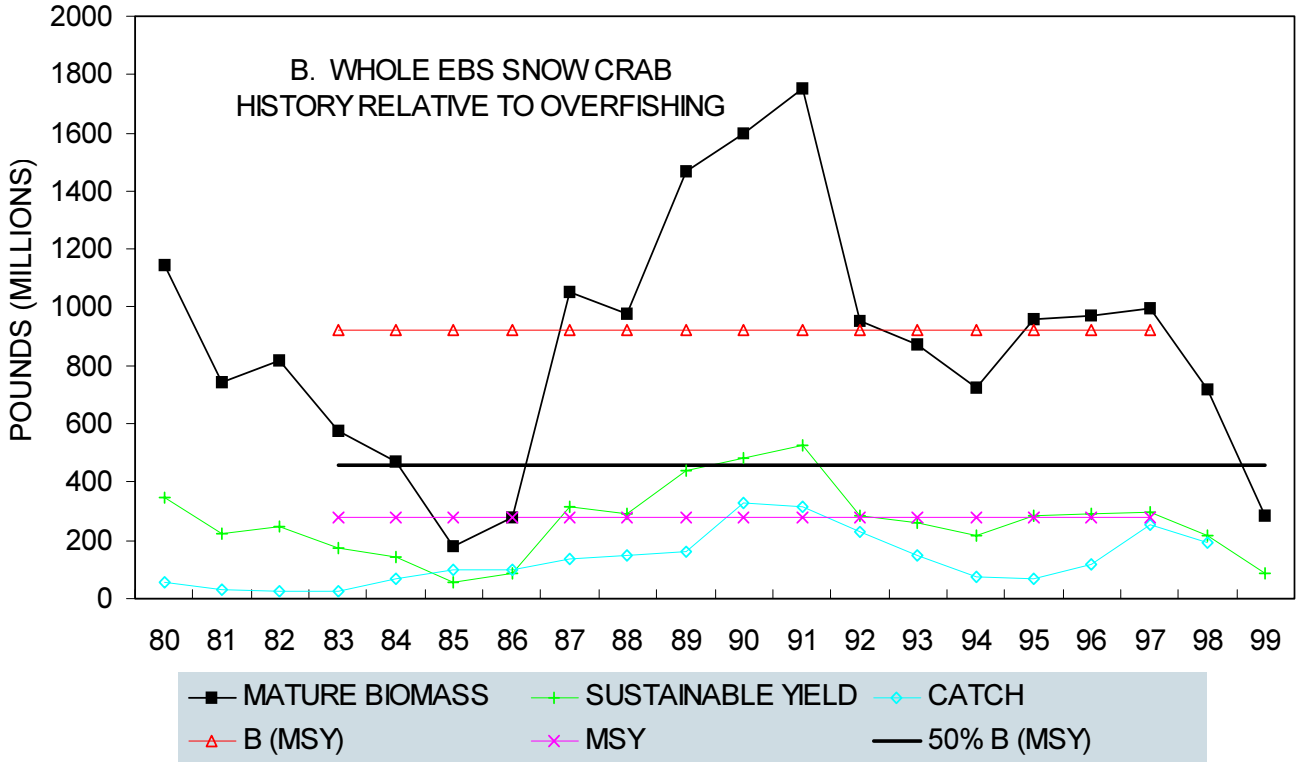
Appendix Figure C-1. History of Bristol Bay (A) and Pribilof Islands (B) red king crab fisheries relative to over fishing under the Magnuson-Stevens Fishery Conservation and Management Act. Stocks are considered overfished if mature biomass is below 50% MSY.





Appendix Figure C-2. History of Pribilof Islands (A) and St. Matthew Island (B) blue king crab fisheries relative to overfishing under the Magnuson-Stevens Fishery Conservation and Management Act. The St. Matthew Island stock is considered overfished because mature biomass falls below 50% MSY.





Appendix Figure C-3. History of eastern Bering Sea Tanner (A) and snow (B) crab fisheries relative to overfishing under the Magnuson-Stevens Fishery Conservation and Management Act. Both stocks are considered overfished because mature biomass is below 50% MSY.

RESULTS OF THE 1999 NMFS BERING SEA CRAB SURVEY
EXECUTIVE SUMMARY

This section summarizes data presented in the Report to Industry on the 1999 Eastern Bering Sea Trawl Survey. Numbers presented are trawl survey indices of population level and do not necessarily represent absolute abundance. For further information, contact Dr. Bradley G. Stevens at (907)481-1726 or Dr. Robert S. Otto at (907)481-1711, NMFS, P.O. Box 1638, Kodiak, AK 99615. (GHL = Guideline Harvest Level.)

Red king crab (*Paralithodes camtschaticus*) Bristol Bay.

Legal males:	11.0 million crabs; 49% increase.
Pre-recruits:	7.1 million crabs; 57% decrease.
Large Females:	14.5 million crabs; 59% decrease.
Outlook:	Abundance of mature males has increased due to growth of a recruiting cohort. However, decreased abundance of mature females requires use of a 10% exploitation rate.
GHL:	10.66 million lbs (4,840 metric tons, mt). Fishery opens October 15.

Red king crab (*P. camtschaticus*) Pribilof District.

Legal males:	1.1 million crabs; 154% increase.
Pre-recruits:	0.6 million crabs; no change.
Large Females:	3.0 million crabs; 200% increase.
Outlook:	Crabs were highly concentrated, and index has very low precision. Despite an increase this year, survey and fishery data indicate a long-term decline.
GHL:	Combined red and blue king crab fishery will not open in 1999.

Pribilof Islands blue king crab (*P. platypus*) Pribilof District.

Legal males:	0.45 million crabs; 46% decrease.
Pre-recruits:	0.22 million crabs; 47% decrease.
Large Females:	2.5 million crabs; 24% increase.
Outlook:	Population is low and long-term trend is declining.
GHL:	Combined red and blue king crab fishery will not open in 1999.

St. Matthew blue king crab (*P. platypus*) Northern District.

Legal males:	0.6 million crabs; 80% decrease.
Pre-recruits:	0.2 million crabs; 88% decrease.
Large Females:	Not well estimated.
Outlook:	Dramatic population decline requires this stock to be defined as overfished.
GHL:	Fishery will not be opened in 1999.

Tanner crab (*Chionoecetes bairdi*) Eastern District.

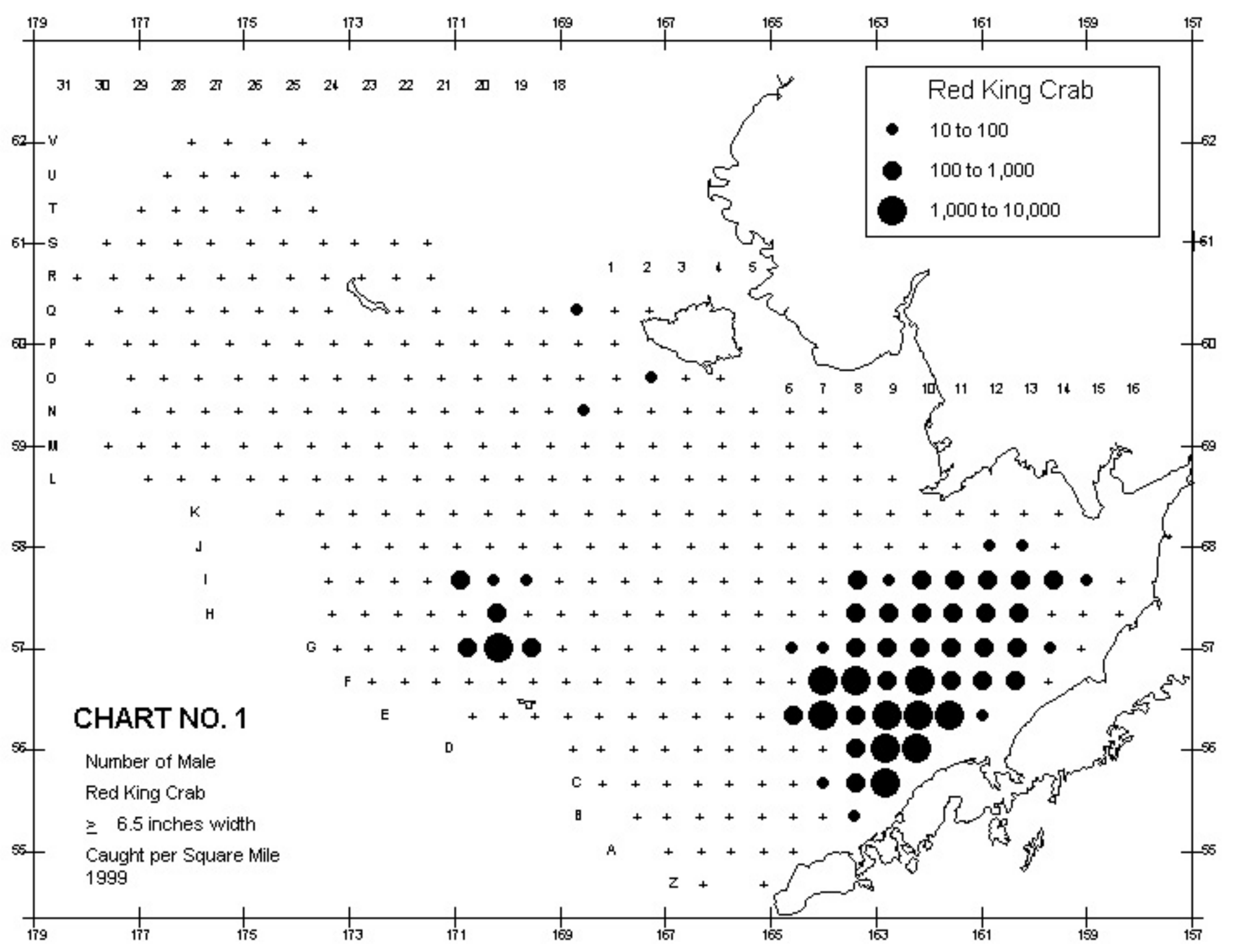
Legal males:	2.0 million crabs; no change.
Pre-recruits:	14.5 million crabs; 20% increase.
Large Females:	16.1 million crabs; 147% increase.
Outlook:	Legal males are at an historic low, but some recruitment is occurring.
GHL:	Fishery was closed in 1997 and 1998, and will not open in 1999.

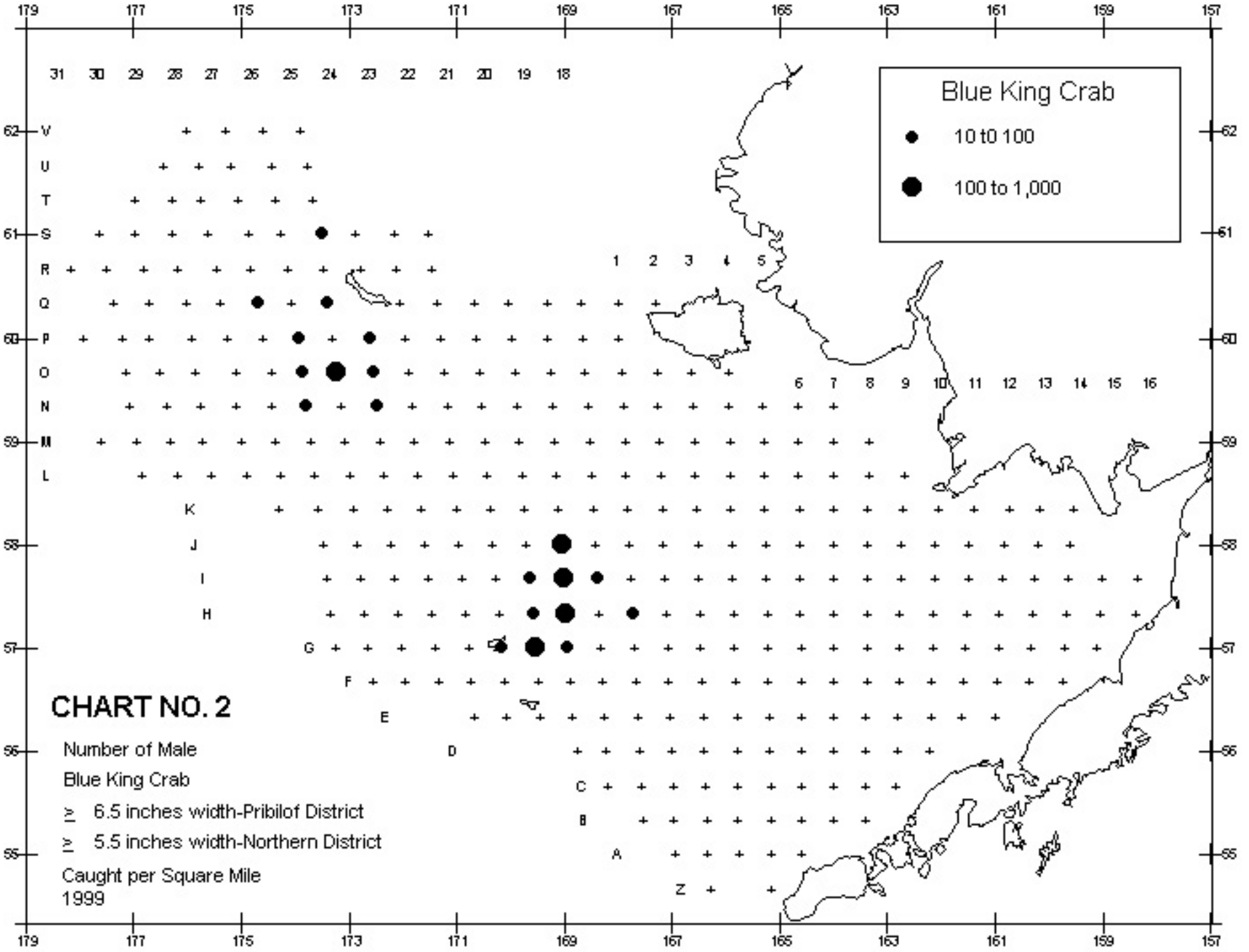
Snow crab (*C. opilio*) All districts combined.

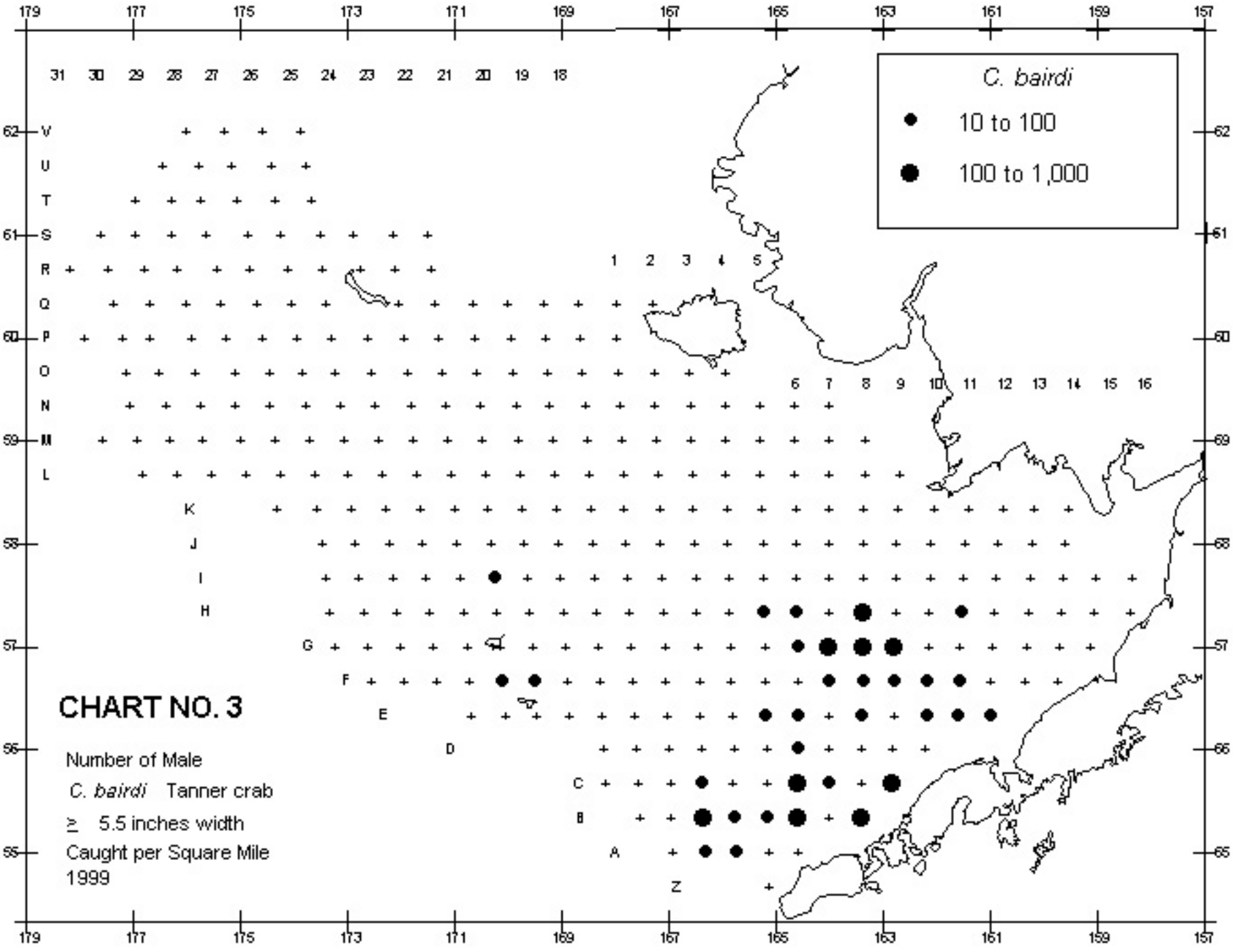
Large males:	94 million crabs; 63% decrease.
Small males:	517 million crabs; 49% decrease.
Large Females:	474 million crabs; 59% decrease.
Outlook:	Abundance has declined precipitously to below threshold and is now defined as over fished. Exploitation rate has been reduced to 22%. Little recruitment is apparent, and fishery may be closed next year.
GHL:	28.5 million lbs (12,940 mt). Fishery opens January 15, 2000.

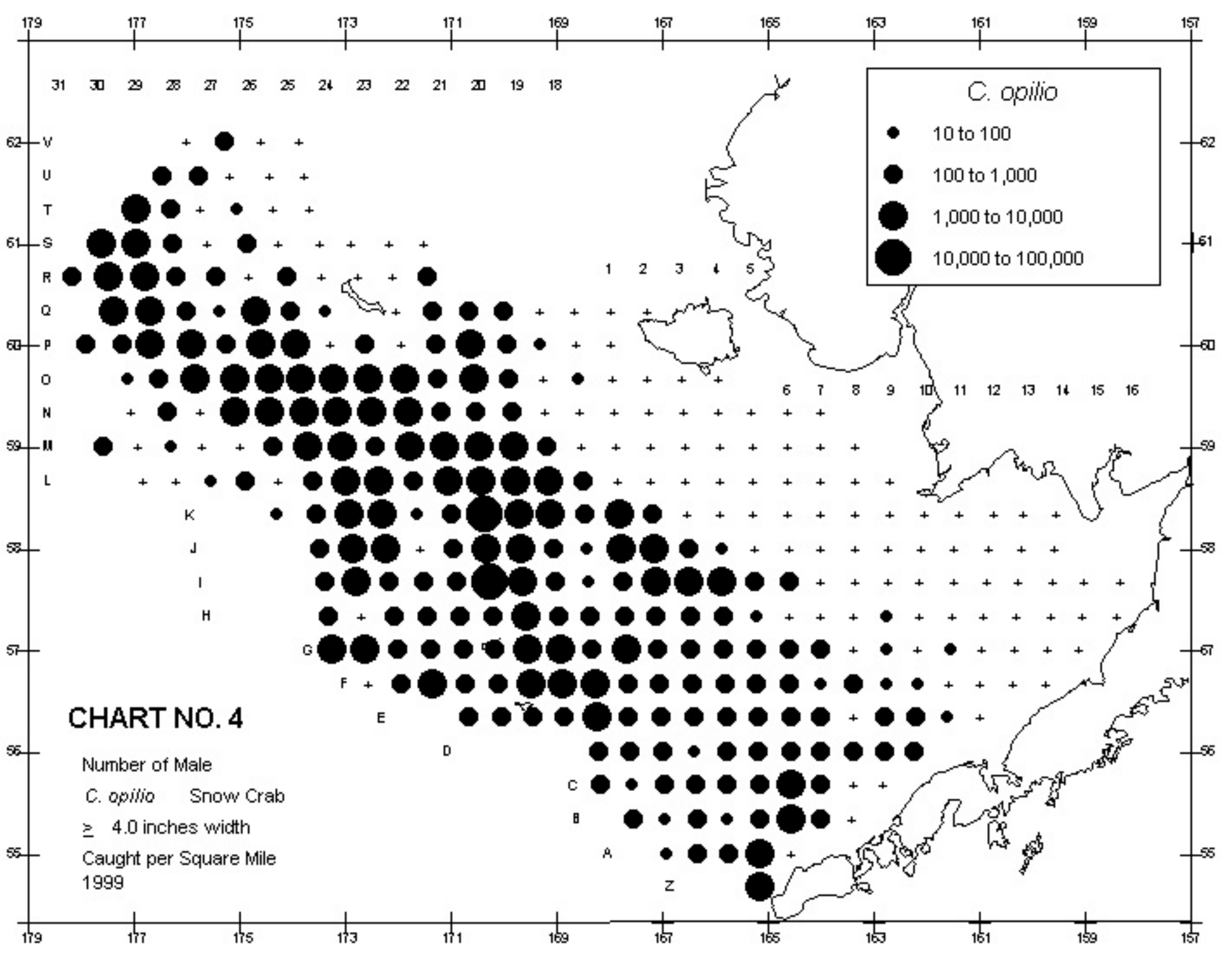
Hair crab (*Erimacrus isenbeckii*)

Large males:	3.7 million crabs; no change.
Large Females:	Not well estimated.
Outlook:	Population is declining and recruitment is not apparent.
GHL:	283,000 lbs (128 mt) Pribilof District only. Fishery opens November 1.


Red King Crab
10 to 100
100 to 1,000
1,000 to 10,000
CHART NO. 1
Number of Male
Red King Crab
≥ 6.5 inches width
Caught per Square Mile
1999


Blue King Crab
10 to 100
100 to 1,000
CHART NO. 2
Number of Male
Blue King Crab
≥ 6.5 inches width-Pribilof District
≥ 5.5 inches width-Northern District
Caught per Square Mile
1999


C. bairdi
10 to 100
100 to 1,000
CHART NO. 3
Number of Male
C. bairdi Tanner crab
≥ 5.5 inches width
Caught per Square Mile
1999


C. opilio
10 to 100
100 to 1,000
1,000 to 10,000
10,000 to 100,000
CHART NO. 4
Number of Male
C. opilio Snow Crab
≥ 4.0 inches width
Caught per Square Mile
1999

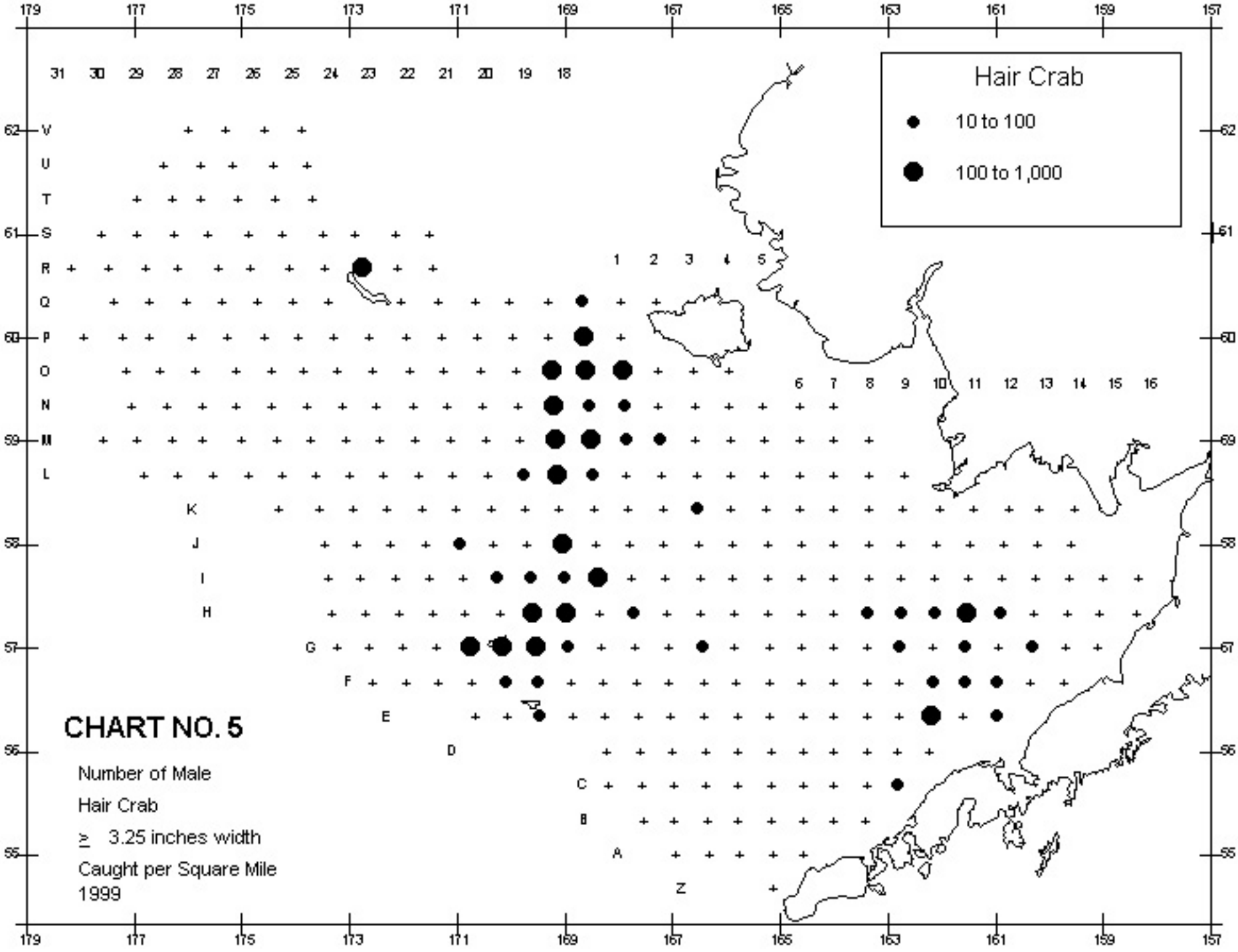

Hair Crab
10 to 100
100 to 1,000
CHART NO. 5
Number of Male
Hair Crab
≥ 3.25 inches width
Caught per Square Mile
1999

Table 7. Summary of crab density by tow (# per square nmi) for Red King Crab, *Paralithodes camtschaticus.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
B08	5/30/99	55 20.1	163 25.4	28		0	0	0	0	78	0	78	78
C07	5/30/99	55 39.9	164 3.2	49		79	0	0	79	0	0	0	79
C08	5/30/99	55 40.5	163 23.6	43		152	0	0	152	0	0	0	152
C09	5/26/99	55 40.3	162 51.5	27		2553	479	0	3032	80	0	80	3111
D07	5/30/99	55 60.0	163 58.7	48		0	78	0	78	0	0	0	78
D08	5/30/99	56 0.3	163 23.2	47		622	311	0	933	0	0	0	933
D09	5/26/99	56 0.3	162 48.4	41		1052	566	0	1618	0	0	0	1618
D10	5/26/99	55 59.3	162 17.4	36		2080	0	0	2080	880	0	880	2960
E06	6/1/99	56 19.7	164 33.3	46		230	0	0	230	0	0	0	230
E07	5/30/99	56 20.0	163 58.4	45		1812	473	0	2284	0	0	0	2284
E08	5/30/99	56 20.0	163 21.7	45		1738	434	0	2172	217	0	217	2390
E09	5/27/99	56 20.0	162 47.5	41		2161	3324	0	5485	249	83	332	5818
E10	5/26/99	56 20.9	162 12.9	44		1532	1129	484	3144	2015	0	2015	5159
E11	5/26/99	56 19.7	161 37.3	33		1751	667	83	2502	8672	83	8756	11257
E12	5/26/99	56 20.6	160 58.9	28		158	158	1340	1655	1103	1418	2522	4177
F07	5/30/99	56 40.0	163 59.1	39		1534	161	0	1695	0	0	0	1695
F08	5/30/99	56 39.6	163 21.7	40		3960	1663	0	5623	0	0	0	5623
F09	5/27/99	56 40.2	162 46.8	38		864	1178	79	2121	236	0	236	2357
F10	5/27/99	56 39.3	162 10.3	39		2058	3403	396	5856	1424	0	1424	7280
F11	5/26/99	56 39.4	161 35.4	48		739	657	164	1560	3941	0	3941	5501
F12	5/26/99	56 40.1	160 59.2	35		391	235	78	705	1487	0	1487	2192
F13	5/23/99	56 40.0	160 21.3	31		0	0	233	233	467	233	700	933
F14	5/23/99	56 40.8	159 39.8	16		0	0	0	0	0	503	503	503
G06	6/2/99	56 59.6	164 36.5	37		83	0	0	83	0	0	0	83
G07	5/29/99	56 59.3	164 2.0	36		81	0	0	81	0	0	0	81
G08	5/29/99	57 1.2	163 23.1	34		231	0	0	231	0	0	0	231
G09	5/27/99	57 0.1	162 47.1	31		323	323	0	645	81	0	81	726
G10	5/27/99	57 0.3	162 9.5	31		892	1561	3346	5799	446	892	1338	7138
G11	5/25/99	56 59.8	161 34.1	36		1281	720	560	2561	2801	80	2881	5442
G12	5/25/99	57 0.4	160 55.9	34		244	0	81	325	1218	0	1218	1543
G13	5/23/99	57 0.2	160 20.4	33		71	143	143	357	357	143	499	856
G14	5/24/99	56 59.6	159 41.1	28		75	0	151	226	75	75	151	377
G20	6/19/99	57 0.8	169 33.3	31		699	544	0	1243	0	0	0	1243

Table 7. Summary of crab density by tow (# per square nmi) for Red King Crab, *Paralithodes camtschaticus.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
G21	6/19/99	57 9.5	169 53.0	25		3112	1598	757	5467	2103	0	2103	7569
G21	6/19/99	57 1.1	170 11.9	35		398	398	30464	31261	12600	30342	42941	74202
G22	6/19/99	57 7.5	170 27.3	30		554	317	0	871	237	158	396	1267
H08	5/29/99	57 20.7	163 23.5	28		325	0	163	488	0	0	0	488
H09	5/27/99	57 20.0	162 46.5	25		642	401	80	1124	0	0	0	1124
H10	5/27/99	57 20.1	162 8.8	26		399	159	638	1196	80	159	239	1435
H11	5/25/99	57 19.7	161 32.5	28		479	80	958	1516	2873	718	3591	5108
H12	5/25/99	57 19.6	160 55.9	32		0	238	0	238	397	0	397	636
H13	5/23/99	57 18.9	160 19.0	32		303	76	76	455	303	0	303	758
H14	5/24/99	57 20.1	159 40.9	29		0	0	81	81	244	0	244	326
H15	5/23/99	57 14.4	159 7.3	24		0	0	155	155	0	155	155	311
H16	5/23/99	57 20.5	158 23.9	16		0	0	0	0	0	73	73	73
H20	6/19/99	57 19.7	169 35.4	32		0	82	0	82	0	0	0	82
H21	6/19/99	57 29.8	169 58.6	34		162	0	0	162	0	0	0	162
H21	6/19/99	57 21.2	170 13.7	31		80	0	0	80	0	0	0	80
I07	5/29/99	57 39.9	164 1.0	26		0	0	0	0	80	0	80	80
I08	5/29/99	57 38.2	163 22.0	24		144	0	0	144	0	0	0	144
I09	5/27/99	57 40.1	162 45.6	22		0	0	73	73	0	0	0	73
I10	5/27/99	57 40.2	162 8.6	24		158	237	237	631	552	237	789	1420
I11	5/25/99	57 39.8	161 30.0	27		318	159	14945	15422	398	15057	15455	30877
I12	5/25/99	57 40.2	160 53.3	28		0	78	78	156	156	0	156	311
I13	5/24/99	57 40.2	160 15.6	28		0	0	0	0	231	0	231	231
I14	5/24/99	57 39.0	159 39.9	25		100	100	200	400	0	601	601	1001
I15	5/24/99	57 34.1	159 7.2	24		77	0	0	77	0	0	0	77
I16	5/23/99	57 38.2	158 20.5	19		0	0	160	160	0	0	0	160
I20	6/15/99	57 49.6	169 22.8	35		157	0	0	157	0	0	0	157
I21	6/20/99	57 41.1	170 19.5	39		77	0	0	77	0	0	0	77
I22	6/19/99	57 31.3	170 34.8	39		229	0	0	229	0	0	0	229
J04	6/4/99	57 59.7	165 53.7	30		0	79	0	79	79	0	79	159
J10	5/27/99	58 0.7	162 10.3	19		0	71	0	71	214	0	214	285
J11	5/25/99	57 59.4	161 29.2	28		0	0	1817	1817	0	1136	1136	2952
J12	5/25/99	57 59.6	160 51.0	22		84	84	0	167	0	0	0	167
J13	5/24/99	58 0.1	160 12.8	26		75	75	0	150	0	150	150	300

Table 7. Summary of crab density by tow (# per square nmi) for Red King Crab, *Paralithodes camtschaticus.*

						Males				Females			GRAND TOTAL
Station	**Date**	**N. Lat.**	**W. Long**	**Fathoms**		**Large**	**Medium**	**Small**	**Total**	**Large**	**Small**	**Total**	
J14	5/24/99	57 59.9	159 36.1	20		0	0	0	0	81	81	162	162
K02	6/12/99	58 20.2	167 12.7	26		0	0	0	0	79	0	79	79
K04	6/4/99	58 20.0	165 55.4	24		0	79	0	79	0	0	0	79
K09	5/28/99	58 18.7	162 43.4	17		0	0	0	0	72	0	72	72
K10	5/28/99	58 19.7	162 4.2	24		0	81	163	244	81	0	81	326
K12	5/25/99	58 18.7	160 41.4	10		0	0	225	225	0	0	0	225
L01	6/13/99	58 39.9	167 52.1	25		0	80	0	80	0	0	0	80
L05	6/3/99	58 40.0	165 17.5	20		0	0	0	0	80	0	80	80
M02	6/13/99	58 59.1	167 13.1	20		0	0	0	0	78	0	78	78
M18	6/15/99	58 59.8	168 32.0	22		0	78	0	78	155	0	155	233
N01	6/13/99	59 19.9	167 55.3	21		0	83	0	83	83	0	83	166
N03	6/4/99	59 20.1	166 35.8	13		0	0	80	80	0	0	0	80
N04	6/4/99	59 20.1	165 55.5	13		0	0	0	0	159	80	239	239
N18	6/14/99	59 20.2	168 35.1	20		82	0	0	82	82	0	82	164
O01	6/13/99	59 39.9	167 57.1	19		0	0	0	0	80	0	80	80
O02	6/13/99	59 40.4	167 18.5	15		77	77	0	154	77	0	77	231
O20	6/21/99	59 40.2	169 54.8	28		0	81	0	81	81	0	81	162
O18	6/14/99	60 19.4	168 40.8	20		81	0	0	81	162	0	162	243

NOTE: Minimum carapace sizes used are: Large Males > 6.5 in; Medium Males = 5.2 to 6.5 in; Large Females > 4.3 in.

Table 8A. Summary of crab density by tow (# per square nmi) for Pribilofs Blue Kings, *Paralithodes platypus.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
F20	6/16/99	56 50.0	169 18.4	42		0	0	0	0	230	0	230	230
F20	6/17/99	56 40.3	169 30.8	43		0	0	0	0	2053	0	2053	2053
G19	6/16/99	57 10.0	168 37.8	39		0	0	0	0	81	0	81	81
G19	6/16/99	56 59.7	168 57.5	42		78	0	0	78	78	0	78	156
G20	6/19/99	57 0.8	169 33.3	31		233	311	78	622	2021	0	2021	2642
G20	6/16/99	57 9.8	169 18.8	38		78	0	0	78	234	0	234	312
G21	6/19/99	57 9.5	169 53.0	25		168	84	0	252	2103	0	2103	2355
G22	6/19/99	57 7.5	170 27.3	30		0	0	79	79	0	0	0	79
H01	6/12/99	57 20.2	167 44.0	39		83	0	0	83	0	0	0	83
H19	6/16/99	57 19.9	168 58.9	38		548	157	157	862	5249	0	5249	6110
H20	6/19/99	57 19.7	169 35.4	32		82	0	0	82	82	0	82	163
H21	6/19/99	57 29.8	169 58.6	34		0	81	0	81	0	0	0	81
I18	6/16/99	57 39.3	168 23.8	36		80	0	0	80	0	0	0	80
I19	6/16/99	57 39.8	169 2.7	37		248	0	0	248	0	0	0	248
I20	6/20/99	57 39.6	169 38.6	36		83	83	0	166	0	0	0	166
I20	6/16/99	57 30.0	169 21.9	38		0	167	83	250	167	0	167	417
I21	6/20/99	57 41.1	170 19.5	39		0	77	0	77	0	0	0	77
J19	6/15/99	57 59.8	169 4.1	37		318	79	0	397	0	0	0	397

NOTE: Minimum carapace sizes used are: Large Males > 6.5 in; Medium Males = 5.2 to 6.5 in; Large Females > 4.3 in.

Table 8B. Summary of crab density by tow (# per square nmi) for St. Matt. Blue Kings, *Paralithodes platypus.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
N24	6/24/99	59 18.1	172 29.5	47		75	0	0	75	0	0	0	75
N25	6/24/99	59 28.4	172 56.3	50		73	0	0	73	0	0	0	73
N25	6/24/99	59 20.4	173 7.8	53		80	80	0	161	0	0	0	161
N26	7/4/99	59 20.5	173 48.3	57		81	81	0	162	0	0	0	162
N26	6/24/99	59 29.7	173 27.1	55		146	0	0	146	0	0	0	146
O03	6/4/99	59 39.1	166 37.7	13		0	0	0	0	79	0	79	79
O24	6/23/99	59 39.9	172 33.4	44		78	0	0	78	0	0	0	78
O25	6/23/99	59 49.8	172 55.4	42		0	80	0	80	80	0	80	159
O25	6/24/99	59 39.0	173 14.5	51		303	0	0	303	0	0	0	303
O26	6/23/99	59 49.0	173 34.4	51		152	152	76	381	0	0	0	381
P24	6/23/99	60 10.0	172 20.3	30		244	81	81	407	0	0	0	407
P24	6/23/99	60 0.1	172 37.4	34		154	77	77	309	0	0	0	309
P24	6/24/99	59 50.5	172 15.7	39		82	0	0	82	0	0	0	82
P26	7/5/99	60 0.5	173 57.2	50		245	0	0	245	0	0	0	245
P27	7/5/99	59 50.5	174 15.5	56		74	74	0	148	0	0	0	148
O19	6/14/99	60 19.1	169 20.2	24		0	80	0	80	0	0	0	80
O23	6/22/99	60 20.1	172 3.7	30		76	0	0	76	0	0	0	76
O25	6/23/99	60 10.3	173 2.5	31		77	0	848	925	0	771	771	1696
O25	6/23/99	60 18.0	173 22.7	33		154	77	693	924	0	308	308	1232
O27	7/5/99	60 20.9	174 41.8	54		149	0	0	149	0	0	0	149
R24	6/22/99	60 39.2	172 44.8	24		0	0	77	77	0	0	0	77
R25	7/5/99	60 40.3	173 27.9	33		0	84	84	168	0	0	0	168
S22	7/6/99	60 60.0	171 30.1	31		0	82	82	165	0	0	0	165
S24	7/6/99	61 0.2	172 49.4	34		0	0	0	0	82	0	82	82
S25	7/6/99	60 59.8	173 30.1	39		91	0	0	91	0	0	0	91
T27	7/6/99	61 18.9	174 57.0	46		77	0	0	77	0	0	0	77

NOTE: Minimum carapace sizes used are: Large Males > 5.5 in; Medium Males = 4.3 to 5.5 in; Large Females > 3.8 in.

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
A02	6/7/99	55 0.1	166 57.3	83		0	248	4214	4462	0	9749	9749	14211
A03	6/6/99	54 59.9	166 20.9	76		82	492	2052	2627	1149	5007	6156	8782
A04	6/6/99	55 0.4	165 44.6	68		0	313	1722	2035	705	3758	4462	6497
A04	6/6/99	54 50.1	165 32.2	81		81	243	1456	1780	162	1133	1294	3074
A05	6/1/99	55 0.4	165 9.0	58		0	166	498	665	0	914	914	1578
A06	6/1/99	55 1.0	164 35.2	33		0	0	80	80	0	80	80	160
B01	6/7/99	55 19.9	167 32.8	79		0	311	3970	4282	0	5761	5761	10042
B02	6/7/99	55 21.2	166 59.4	74		0	0	570	570	0	407	407	976
B03	6/6/99	55 19.7	166 21.0	71		173	346	691	1210	259	1037	1296	2505
B04	6/6/99	55 20.9	165 45.7	64		76	228	608	913	152	1065	1217	2130
B05	6/1/99	55 20.4	165 8.8	58		79	0	945	1024	0	1102	1102	2126
B06	6/1/99	55 19.8	164 36.3	54		949	1424	475	2848	2136	1266	3402	6249
B07	5/30/99	55 20.2	164 2.1	42		0	79	237	316	0	0	0	316
B08	5/30/99	55 20.1	163 25.4	28		951	4906	52249	58106	7604	9321	16926	75031
C01	6/7/99	55 39.9	167 35.9	72		0	0	7053	7053	79	10936	11015	18068
C02	6/7/99	55 40.7	166 59.3	72		0	0	1152	1152	165	1481	1646	2798
C03	6/6/99	55 39.8	166 22.7	67		82	0	0	82	82	247	330	412
C04	6/6/99	55 40.3	165 47.9	63		0	158	237	395	0	1107	1107	1502
C05	6/1/99	55 40.3	165 12.0	56		0	82	0	82	0	572	572	654
C06	6/1/99	55 38.4	164 36.2	51		217	651	2606	3474	434	3691	4126	7600
C07	5/30/99	55 39.9	164 3.2	49		79	1100	2122	3300	629	4951	5579	8880
C08	5/30/99	55 40.5	163 23.6	43		0	76	1139	1214	304	1290	1594	2808
C09	5/26/99	55 40.3	162 51.5	27		319	2633	4867	7818	558	80	638	8457
C18	6/7/99	55 40.0	168 12.2	72		0	0	482	482	0	1044	1044	1526
D01	6/11/99	56 0.4	167 37.4	70		0	0	2879	2879	0	3759	3759	6638
D02	6/11/99	55 59.0	167 2.0	72		0	85	1365	1450	1536	2048	3583	5034
D03	6/6/99	55 59.8	166 23.8	35		0	435	2871	3306	174	3393	3567	6873
D04	6/6/99	55 59.9	165 47.7	57		0	340	7655	7995	170	3402	3572	11568
D05	6/1/99	56 0.3	165 11.0	50		0	84	168	252	168	672	839	1091
D06	6/1/99	56 0.1	164 35.3	49		83	83	2084	2251	583	3834	4418	6668
D07	5/30/99	55 60.0	163 58.7	48		0	157	1722	1879	78	1174	1253	3131
D08	5/30/99	56 0.3	163 23.2	47		0	233	2566	2800	233	1944	2177	4977
D09	5/26/99	56 0.3	162 48.4	41		0	162	404	566	162	566	728	1294

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
D10	5/26/99	55 59.3	162 17.4	36		0	80	640	720	640	480	1120	1840
D18	6/17/99	55 59.9	168 13.0	79		0	0	4341	4341	0	3685	3685	8026
E01	6/11/99	56 20.0	167 39.2	68		0	0	83	83	0	665	665	748
E02	6/11/99	56 18.8	167 4.5	61		0	674	14379	15053	1416	8163	9579	24632
E03	6/6/99	56 20.2	166 25.0	54		0	84	3692	3776	84	6210	6294	10070
E04	6/6/99	56 19.9	165 49.7	49		0	77	12819	12896	0	14409	14409	27304
E05	6/2/99	56 20.1	165 11.8	45		83	666	3832	4581	750	4664	5414	9995
E06	6/1/99	56 19.7	164 33.3	46		77	998	4834	5908	1535	5064	6599	12508
E07	5/30/99	56 20.0	163 58.4	45		0	236	788	1024	158	473	630	1654
E08	5/30/99	56 20.0	163 21.7	45		217	652	0	869	217	434	652	1521
E09	5/27/99	56 20.0	162 47.5	41		0	83	249	332	0	83	83	416
E10	5/26/99	56 20.9	162 12.9	44		81	403	645	1129	0	242	242	1370
E11	5/26/99	56 19.7	161 37.3	33		167	334	1251	1751	0	0	0	1751
E12	5/26/99	56 20.6	160 58.9	28		79	315	1024	1418	315	0	315	1734
E18	6/17/99	56 20.1	168 15.8	80		0	175	8589	8764	0	13672	13672	22436
E19	6/17/99	56 19.8	168 52.3	67		0	0	2863	2863	0	3031	3031	5894
E20	6/17/99	56 26.2	169 26.8	57		0	81	3303	3383	81	2417	2497	5880
E21	6/17/99	56 20.1	170 4.9	59		0	243	14904	15147	324	19306	19630	34777
E22	6/17/99	56 19.9	170 40.0	64		0	0	7780	7780	81	12805	12886	20666
F01	6/11/99	56 40.0	167 38.9	55		0	163	1954	2117	0	977	977	3094
F02	6/11/99	56 40.0	167 4.5	51		0	146	26526	26672	281	24347	24629	51301
F03	6/5/99	56 40.0	166 26.5	43		0	319	9417	9737	399	5986	6385	16121
F04	6/5/99	56 40.1	165 51.8	42		0	315	2360	2675	157	944	1101	3776
F05	6/2/99	56 40.1	165 12.6	39		0	618	3397	4015	1081	926	2007	6022
F06	6/2/99	56 40.4	164 36.2	39		0	806	4103	4909	440	2564	3004	7912
F07	5/30/99	56 40.0	163 59.1	39		81	1049	3310	4440	969	2341	3310	7750
F08	5/30/99	56 39.6	163 21.7	40		79	396	158	634	79	158	238	871
F09	5/27/99	56 40.2	162 46.8	38		79	157	393	628	0	0	0	628
F10	5/27/99	56 39.3	162 10.3	39		79	396	396	870	0	0	0	870
F11	5/26/99	56 39.4	161 35.4	48		82	82	82	246	0	0	0	246
F12	5/26/99	56 40.1	160 59.2	35		0	0	235	235	78	0	78	313
F13	5/23/99	56 40.0	160 21.3	31		0	78	311	389	78	0	78	467
F18	6/17/99	56 39.1	168 18.3	56		0	0	2729	2729	0	2647	2647	5376

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
F19	6/17/99	56 40.1	168 54.3	52		0	79	1185	1264	0	1185	1185	2450
F20	6/16/99	56 50.0	169 18.4	42		0	307	1149	1456	77	2912	2989	4444
F20	6/17/99	56 40.3	169 30.8	43		79	0	553	632	316	79	395	1027
F21	6/17/99	56 39.8	170 10.4	53		81	244	3329	3654	650	2355	3004	6658
F22	6/28/99	56 39.8	170 44.1	59		0	328	35868	36196	0	37475	37475	73671
F22	6/19/99	56 49.2	170 29.8	54		0	170	8007	8178	170	4941	5111	13289
F23	6/28/99	56 39.4	171 21.1	62		0	83	2068	2151	83	3226	3308	5459
F24	6/28/99	56 39.0	171 58.3	67		0	0	2812	2812	268	4686	4954	7765
F25	6/28/99	56 40.4	172 32.6	73		0	0	934	934	156	1790	1946	2879
G01	6/12/99	57 0.5	167 41.8	42		0	0	3860	3860	80	2171	2251	6111
G02	6/12/99	56 59.1	167 6.3	40		0	0	1802	1802	0	1018	1018	2820
G03	6/5/99	57 0.0	166 27.9	38		0	408	979	1386	163	489	652	2039
G04	6/5/99	56 59.9	165 50.4	39		0	795	2146	2940	159	79	238	3179
G05	6/2/99	56 59.9	165 12.9	37		0	2605	2857	5463	0	84	84	5547
G06	6/2/99	56 59.6	164 36.5	37		83	744	2479	3305	83	248	330	3635
G07	5/29/99	56 59.3	164 2.0	36		161	1047	967	2175	161	0	161	2336
G08	5/29/99	57 1.2	163 23.1	34		386	309	231	926	77	0	77	1003
G09	5/27/99	57 0.1	162 47.1	31		323	242	161	726	0	0	0	726
G10	5/27/99	57 0.3	162 9.5	31		0	0	0	0	0	223	223	223
G12	5/25/99	57 0.4	160 55.9	34		0	0	81	81	0	0	0	81
G13	5/23/99	57 0.2	160 20.4	33		0	0	71	71	0	0	0	71
G18	6/16/99	57 0.4	168 23.6	40		0	0	397	397	0	477	477	874
G19	6/16/99	57 10.0	168 37.8	39		0	0	323	323	162	162	323	646
G19	6/16/99	56 50.4	168 37.4	49		0	0	1844	1844	0	1173	1173	3018
G19	6/16/99	56 59.7	168 57.5	42		0	0	467	467	0	78	78	545
G20	6/19/99	57 0.8	169 33.3	31		0	78	389	466	78	155	233	699
G20	6/16/99	57 9.8	169 18.8	38		0	156	312	468	0	234	234	702
G21	6/19/99	56 50.5	169 54.2	37		0	320	1359	1679	240	560	800	2478
G21	6/19/99	57 9.5	169 53.0	25		0	84	1262	1346	336	505	841	2187
G21	6/19/99	57 1.1	170 11.9	35		0	1520	22666	24186	3014	1623	4637	28823
G22	6/27/99	56 59.7	170 47.0	49		0	0	4525	4525	85	1537	1622	6147
G22	6/19/99	57 7.5	170 27.3	30		0	158	1187	1346	158	317	475	1821
G23	6/28/99	57 0.2	171 24.1	57		0	0	325	325	0	811	811	1136

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
G24	6/28/99	57 0.4	172 1.7	61		0	0	1051	1051	0	1051	1051	2102
G25	6/28/99	56 56.9	172 43.1	67		0	74	5311	5385	295	10622	10917	16302
G26	6/27/99	57 1.0	173 12.2	73		0	76	76	153	0	76	76	229
H01	6/12/99	57 20.2	167 44.0	39		0	0	83	83	83	166	249	332
H02	6/12/99	57 19.6	167 6.5	38		0	0	4773	4773	80	1830	1909	6683
H03	6/5/99	57 20.1	166 28.8	36		0	568	1299	1867	0	325	325	2192
H04	6/5/99	57 20.2	165 52.6	36		0	167	502	669	0	84	84	753
H05	6/2/99	57 20.0	165 14.0	34		83	581	581	1244	0	166	166	1410
H06	6/2/99	57 21.0	164 37.1	34		76	682	303	1060	76	0	76	1136
H07	5/29/99	57 19.9	164 1.2	32		0	351	70	421	0	0	0	421
H08	5/29/99	57 20.7	163 23.5	28		244	163	569	976	81	163	244	1220
H09	5/27/99	57 20.0	162 46.5	25		0	0	80	80	0	0	0	80
H10	5/27/99	57 20.1	162 8.8	26		0	0	0	0	0	80	80	80
H11	5/25/99	57 19.7	161 32.5	28		80	0	0	80	0	0	0	80
H12	5/25/99	57 19.6	160 55.9	32		0	79	0	79	0	79	79	159
H18	6/16/99	57 18.9	168 24.4	38		0	0	0	0	0	82	82	82
H19	6/16/99	57 29.0	168 43.6	37		0	0	329	329	0	0	0	329
H19	6/16/99	57 19.9	168 58.9	38		0	0	78	78	78	0	78	157
H20	6/19/99	57 19.7	169 35.4	32		0	82	82	163	0	163	163	326
H21	6/19/99	57 29.8	169 58.6	34		0	0	243	243	0	0	0	243
H22	6/27/99	57 19.8	170 50.5	43		0	81	242	322	81	242	322	645
H23	6/27/99	57 19.7	171 28.3	53		0	0	669	669	0	418	418	1087
H24	6/27/99	57 20.3	172 9.6	57		0	0	1386	1386	0	1078	1078	2464
H25	6/27/99	57 20.2	172 44.8	62		0	0	3879	3879	0	4454	4454	8333
H26	6/27/99	57 19.2	173 18.2	64		0	0	2066	2066	0	2435	2435	4501
I01	6/12/99	57 40.2	167 46.2	37		0	0	252	252	0	0	0	252
I02	6/12/99	57 39.2	167 9.4	34		0	0	559	559	0	80	80	639
I03	6/5/99	57 40.0	166 30.1	34		0	83	83	165	0	0	0	165
I04	6/5/99	57 40.1	165 53.5	34		0	0	189	189	0	0	0	189
I05	6/2/99	57 40.0	165 15.4	31		0	0	82	82	0	82	82	164
I06	6/2/99	57 39.7	164 36.9	27		0	0	84	84	0	0	0	84
I13	5/24/99	57 40.2	160 15.6	28		0	0	77	77	0	0	0	77
I18	6/16/99	57 39.3	168 23.8	36		0	0	80	80	80	0	80	159

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
I20	6/15/99	57 49.6	169 22.8	35		0	0	79	79	0	79	79	157
I20	6/16/99	57 30.0	169 21.9	38		0	0	167	167	0	0	0	167
I21	6/20/99	57 49.8	169 58.7	37		81	161	483	725	0	564	564	1288
I21	6/20/99	57 41.1	170 19.5	39		0	0	1467	1467	0	463	463	1930
I22	6/27/99	57 39.3	170 53.2	44		0	96	96	193	96	0	96	289
I22	6/19/99	57 31.3	170 34.8	39		0	381	610	991	76	534	610	1602
I24	6/27/99	57 39.7	172 12.0	57		0	0	1127	1127	0	1728	1728	2855
I25	6/26/99	57 41.6	172 49.1	63		0	0	4463	4463	0	4161	4161	8624
I26	6/26/99	57 41.2	173 22.2	77		0	0	4427	4427	78	5825	5902	10329
J02	6/12/99	58 0.5	167 11.0	32		0	0	75	75	0	0	0	75
J10	5/27/99	58 0.7	162 10.3	19		0	0	0	0	0	71	71	71
J13	5/24/99	58 0.1	160 12.8	26		0	0	75	75	0	75	75	150
J19	6/15/99	57 59.8	169 4.1	37		0	79	0	79	0	0	0	79
J20	6/20/99	57 59.9	169 42.0	36		0	82	82	164	0	164	164	328
J21	6/20/99	58 1.4	170 20.9	40		0	0	153	153	0	230	230	384
J22	6/26/99	57 59.9	170 57.8	45		0	0	83	83	0	0	0	83
J22	6/20/99	57 51.4	170 36.6	41		0	0	149	149	0	0	0	149
J24	6/27/99	57 57.1	172 16.5	56		0	78	937	1016	0	312	312	1328
J26	6/26/99	57 59.1	173 27.4	62		0	0	0	0	0	152	152	152
K10	5/28/99	58 19.7	162 4.2	24		0	0	81	81	0	81	81	163
K22	6/26/99	58 19.9	171 1.6	43		0	0	82	82	0	0	0	82
K24	6/25/99	58 20.5	172 22.0	54		0	0	692	692	0	384	384	1076
K25	6/26/99	58 18.9	172 55.4	57		0	0	0	0	105	421	527	527
K26	7/4/99	58 20.4	173 34.3	60		0	0	336	336	84	1596	1680	2015
K27	7/4/99	58 21.9	174 18.5	102		0	0	4933	4933	0	4008	4008	8941
L02	6/13/99	58 40.8	167 13.5	22		0	0	76	76	0	0	0	76
L08	5/28/99	58 40.1	163 20.9	15		0	0	80	80	0	0	0	80
L24	6/25/99	58 38.1	172 24.0	53		0	0	163	163	0	326	326	489
L25	6/25/99	58 40.6	172 57.7	60		0	0	571	571	0	913	913	1484
L27	7/4/99	58 41.2	174 15.2	80		0	0	1311	1311	0	1165	1165	2476
L28	7/11/99	58 44.6	174 57.4	75		0	0	606	606	0	1061	1061	1667
L29	7/11/99	58 40.4	175 32.3	71		0	0	530	530	0	379	379	909
L30	7/11/99	58 39.1	176 11.4	76		0	0	391	391	0	469	469	860

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
L31	7/11/99	58 39.6	176 48.8	73		0	0	1079	1079	0	2004	2004	3083
M24	6/25/99	58 59.8	172 34.2	52		0	0	243	243	0	81	81	324
M25	6/25/99	58 58.2	173 3.5	56		0	149	298	447	0	149	149	597
M26	7/4/99	59 0.3	173 43.0	62		0	0	721	721	0	641	641	1362
M27	7/4/99	59 0.7	174 22.3	67		0	0	1432	1432	0	1739	1739	3171
M28	7/11/99	59 0.4	174 58.8	71		0	81	161	242	0	161	161	403
M29	7/11/99	59 0.1	175 43.9	72		0	170	1364	1534	0	682	682	2216
M30	7/11/99	59 0.1	176 17.5	73		0	87	1303	1390	0	1303	1303	2694
M31	7/11/99	58 59.9	176 55.7	73		0	0	645	645	81	968	1049	1694
M32	7/11/99	59 0.1	177 34.5	73		0	0	1407	1407	0	1572	1572	2979
N19	6/14/99	59 20.0	169 14.4	27		0	0	161	161	0	0	0	161
N25	6/24/99	59 28.4	172 56.3	50		0	0	290	290	0	73	73	363
N26	6/24/99	59 29.7	173 27.1	55		0	0	73	73	0	0	0	73
N27	7/4/99	59 21.0	174 25.3	63		0	0	77	77	0	0	0	77
N30	7/10/99	59 17.7	176 23.2	73		0	0	860	860	234	469	703	1563
N31	7/10/99	59 20.8	177 1.4	79		0	0	232	232	0	77	77	309
O23	6/24/99	59 39.9	171 53.2	40		0	0	82	82	0	0	0	82
O25	6/24/99	59 39.0	173 14.5	51		0	0	0	0	0	76	76	76
O27	7/5/99	59 40.7	174 27.2	61		0	0	149	149	0	0	0	149
O30	7/10/99	59 40.0	176 35.9	72		0	77	461	538	77	691	768	1306
O31	7/10/99	59 38.7	177 5.7	91		0	292	585	877	0	0	0	877
P30	7/10/99	59 58.3	176 44.8	75		0	0	76	76	0	228	228	304
P31	7/9/99	59 60.0	177 13.3	73		0	0	75	75	0	0	0	75
O18	6/14/99	60 19.4	168 40.8	20		0	0	191	191	0	0	0	191
O30	7/9/99	60 20.6	176 47.1	73		0	0	78	78	0	0	0	78
O31	7/9/99	60 18.4	177 21.5	77		0	78	0	78	0	0	0	78
R30	7/9/99	60 39.7	176 49.4	69		0	0	303	303	0	76	76	379
R31	7/8/99	60 40.3	177 31.3	78		0	85	0	85	0	0	0	85
R32	7/8/99	60 40.2	178 7.9	85		0	0	78	78	0	155	155	233
S30	7/8/99	61 1.6	176 58.6	64		0	0	1392	1392	0	696	696	2088
Z05	6/1/99	54 41.5	165 8.6	24		0	0	80	80	0	239	239	318

Table 9 Summary of crab density by tow (# per square nmi) for Tanner Crab, *Chionoecetes bairdi.*

					Males				Females			GRAND TOTAL
Station	**Date**	**N. Lat.**	**W. Long**	**Fathoms**	**Large**	**Medium**	**Small**	**Total**	**Large**	**Small**	**Total**	

NOTE: Minimum carapace sizes used are: Large Males > 5.4 in; Medium Males > 4.3 in; Large Females > 3.3 in.

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
A02	6/7/99	55 0.1	166 57.3	83		83	165	248	496	0	0	0	496
A03	6/6/99	54 59.9	166 20.9	76		492	164	246	903	82	0	82	985
A04	6/6/99	55 0.4	165 44.6	68		313	391	313	1018	0	0	0	1018
A04	6/6/99	54 50.1	165 32.2	81		485	485	324	1294	0	0	0	1294
A05	6/1/99	55 0.4	165 9.0	58		1828	665	914	3406	0	0	0	3406
B01	6/7/99	55 19.9	167 32.8	79		234	156	156	545	0	0	0	545
B02	6/7/99	55 21.2	166 59.4	74		81	81	81	244	0	0	0	244
B03	6/6/99	55 19.7	166 21.0	71		432	173	518	1123	0	0	0	1123
B04	6/6/99	55 20.9	165 45.7	64		76	228	152	456	0	0	0	456
B05	6/1/99	55 20.4	165 8.8	58		709	394	236	1339	0	0	0	1339
B06	6/1/99	55 19.8	164 36.3	54		2294	1503	2373	6170	0	0	0	6170
B07	5/30/99	55 20.2	164 2.1	42		316	237	79	632	0	0	0	632
B08	5/30/99	55 20.1	163 25.4	28		0	78	470	549	0	0	0	549
C01	6/7/99	55 39.9	167 35.9	72		79	238	158	475	0	0	0	475
C02	6/7/99	55 40.7	166 59.3	72		247	247	247	741	0	0	0	741
C03	6/6/99	55 39.8	166 22.7	67		330	82	247	660	0	0	0	660
C04	6/6/99	55 40.3	165 47.9	63		237	79	316	632	0	0	0	632
C05	6/1/99	55 40.3	165 12.0	56		245	163	327	735	0	0	0	735
C06	6/1/99	55 38.4	164 36.2	51		2171	760	2171	5103	0	0	0	5103
C07	5/30/99	55 39.9	164 3.2	49		550	629	2436	3615	0	0	0	3615
C08	5/30/99	55 40.5	163 23.6	43		0	304	911	1214	0	0	0	1214
C09	5/26/99	55 40.3	162 51.5	27		0	399	239	638	0	0	0	638
C18	6/7/99	55 40.0	168 12.2	72		401	161	0	562	0	0	0	562
D01	6/11/99	56 0.4	167 37.4	70		320	80	240	640	0	0	0	640
D02	6/11/99	55 59.0	167 2.0	72		512	256	256	1024	0	0	0	1024
D03	6/6/99	55 59.8	166 23.8	35		87	261	87	435	0	0	0	435
D04	6/6/99	55 59.9	165 47.7	57		766	766	510	2041	0	85	85	2126
D05	6/1/99	56 0.3	165 11.0	50		252	588	923	1763	0	0	0	1763
D06	6/1/99	56 0.1	164 35.3	49		333	333	1250	1917	0	0	0	1917
D07	5/30/99	55 60.0	163 58.7	48		235	626	1409	2270	0	0	0	2270
D08	5/30/99	56 0.3	163 23.2	47		389	933	4199	5521	0	0	0	5521
D09	5/26/99	56 0.3	162 48.4	41		324	566	243	1133	0	0	0	1133
D10	5/26/99	55 59.3	162 17.4	36		240	320	80	640	0	0	0	640

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
D18	6/17/99	55 59.9	168 13.0	79		246	0	82	328	0	0	0	328
E01	6/11/99	56 20.0	167 39.2	68		333	249	0	582	0	0	0	582
E02	6/11/99	56 18.8	167 4.5	61		583	750	500	1832	0	0	0	1832
E03	6/6/99	56 20.2	166 25.0	54		503	671	839	2014	0	0	0	2014
E04	6/6/99	56 19.9	165 49.7	49		464	773	541	1778	0	0	0	1778
E05	6/2/99	56 20.1	165 11.8	45		416	1000	1499	2915	83	0	83	2999
E06	6/1/99	56 19.7	164 33.3	46		307	537	1765	2609	0	0	0	2609
E07	5/30/99	56 20.0	163 58.4	45		315	315	709	1339	0	158	158	1497
E08	5/30/99	56 20.0	163 21.7	45		0	217	1086	1303	0	0	0	1303
E09	5/27/99	56 20.0	162 47.5	41		249	499	166	914	0	0	0	914
E10	5/26/99	56 20.9	162 12.9	44		161	564	242	967	0	0	0	967
E11	5/26/99	56 19.7	161 37.3	33		83	250	0	334	0	0	0	334
E12	5/26/99	56 20.6	160 58.9	28		0	158	0	158	0	0	0	158
E18	6/17/99	56 20.1	168 15.8	80		1753	701	438	2892	175	0	175	3067
E19	6/17/99	56 19.8	168 52.3	67		589	84	0	674	0	0	0	674
E20	6/17/99	56 26.2	169 26.8	57		242	81	81	403	0	0	0	403
E21	6/17/99	56 20.1	170 4.9	59		729	973	682	2384	81	277	358	2743
E22	6/17/99	56 19.9	170 40.0	64		729	1864	162	2755	0	0	0	2755
F01	6/11/99	56 40.0	167 38.9	55		733	570	244	1547	0	0	0	1547
F02	6/11/99	56 40.0	167 4.5	51		518	370	370	1257	0	0	0	1257
F03	6/5/99	56 40.0	166 26.5	43		399	1038	479	1915	0	0	0	1915
F04	6/5/99	56 40.1	165 51.8	42		157	236	472	865	236	79	315	1180
F05	6/2/99	56 40.1	165 12.6	39		618	1776	2702	5096	1699	618	2316	7412
F06	6/2/99	56 40.4	164 36.2	39		440	1319	5421	7180	879	1172	2051	9231
F07	5/30/99	56 40.0	163 59.1	39		81	323	1776	2180	0	81	81	2260
F08	5/30/99	56 39.6	163 21.7	40		238	475	317	1029	0	0	0	1029
F09	5/27/99	56 40.2	162 46.8	38		79	157	79	314	0	0	0	314
F10	5/27/99	56 39.3	162 10.3	39		79	79	0	158	0	0	0	158
F11	5/26/99	56 39.4	161 35.4	48		0	246	0	246	0	0	0	246
F12	5/26/99	56 40.1	160 59.2	35		0	78	0	78	0	0	0	78
F18	6/17/99	56 39.1	168 18.3	56		2895	3226	2068	8188	248	0	248	8437
F19	6/17/99	56 40.1	168 54.3	52		1106	553	553	2213	79	0	79	2292
F20	6/16/99	56 50.0	169 18.4	42		2835	1073	766	4674	0	77	77	4751

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
F20	6/17/99	56 40.3	169 30.8	43		632	474	237	1342	0	79	79	1421
F21	6/17/99	56 39.8	170 10.4	53		568	487	244	1299	0	0	0	1299
F22	6/28/99	56 39.8	170 44.1	59		328	1311	437	2076	0	0	0	2076
F22	6/19/99	56 49.2	170 29.8	54		341	1789	341	2470	0	85	85	2556
F23	6/28/99	56 39.4	171 21.1	62		1820	1654	331	3805	83	165	248	4053
F24	6/28/99	56 39.0	171 58.3	67		669	268	0	937	0	0	0	937
F25	6/28/99	56 40.4	172 32.6	73		0	311	0	311	0	0	0	311
G01	6/12/99	57 0.5	167 41.8	42		1206	1528	2814	5548	0	1287	1287	6835
G02	6/12/99	56 59.1	167 6.3	40		627	1097	1645	3368	0	940	940	4308
G03	6/5/99	57 0.0	166 27.9	38		489	1142	1386	3017	82	652	734	3751
G04	6/5/99	56 59.9	165 50.4	39		159	238	715	1113	159	79	238	1351
G05	6/2/99	56 59.9	165 12.9	37		168	840	1008	2017	84	0	84	2101
G06	6/2/99	56 59.6	164 36.5	37		248	1074	2148	3470	165	330	496	3966
G07	5/29/99	56 59.3	164 2.0	36		242	1128	2094	3464	564	242	806	4269
G08	5/29/99	57 1.2	163 23.1	34		0	386	540	926	77	386	463	1388
G09	5/27/99	57 0.1	162 47.1	31		81	0	161	242	0	161	161	403
G10	5/27/99	57 0.3	162 9.5	31		0	446	0	446	0	0	0	446
G11	5/25/99	56 59.8	161 34.1	36		80	240	80	400	0	0	0	400
G12	5/25/99	57 0.4	160 55.9	34		0	162	0	162	0	0	0	162
G18	6/16/99	57 0.4	168 23.6	40		477	556	954	1987	0	0	0	1987
G19	6/16/99	57 10.0	168 37.8	39		888	1131	646	2665	0	81	81	2746
G19	6/16/99	56 50.4	168 37.4	49		2598	3269	1760	7628	168	84	251	7879
G19	6/16/99	56 59.7	168 57.5	42		3661	7479	1558	12698	234	0	234	12932
G20	6/19/99	57 0.8	169 33.3	31		2565	1710	855	5129	0	0	0	5129
G20	6/16/99	57 9.8	169 18.8	38		2263	3043	6477	11784	4058	546	4604	16388
G21	6/19/99	56 50.5	169 54.2	37		240	400	240	879	0	0	0	879
G21	6/19/99	57 9.5	169 53.0	25		0	168	84	252	84	0	84	336
G21	6/19/99	57 1.1	170 11.9	35		309	1159	232	1700	0	0	0	1700
G22	6/27/99	56 59.7	170 47.0	49		342	939	342	1622	0	0	0	1622
G22	6/19/99	57 7.5	170 27.3	30		0	237	158	396	0	0	0	396
G23	6/28/99	57 0.2	171 24.1	57		325	1298	325	1947	0	162	162	2109
G24	6/28/99	57 0.4	172 1.7	61		175	701	0	876	0	0	0	876
G25	6/28/99	56 56.9	172 43.1	67		1475	2065	221	3762	0	0	0	3762

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
G26	6/27/99	57 1.0	173 12.2	73		1224	459	0	1683	0	0	0	1683
H01	6/12/99	57 20.2	167 44.0	39		415	914	1495	2824	0	0	0	2824
H02	6/12/99	57 19.6	167 6.5	38		557	1909	3580	6046	159	2228	2387	8433
H03	6/5/99	57 20.1	166 28.8	36		731	974	1218	2923	244	325	568	3491
H04	6/5/99	57 20.2	165 52.6	36		836	669	1171	2676	1171	167	1338	4014
H05	6/2/99	57 20.0	165 14.0	34		83	1161	4811	6056	6636	249	6885	12941
H06	6/2/99	57 21.0	164 37.1	34		0	1136	3559	4695	3105	833	3938	8633
H07	5/29/99	57 19.9	164 1.2	32		0	70	1405	1475	70	281	351	1826
H08	5/29/99	57 20.7	163 23.5	28		0	488	1871	2359	81	0	81	2440
H09	5/27/99	57 20.0	162 46.5	25		80	80	161	321	0	0	0	321
H10	5/27/99	57 20.1	162 8.8	26		0	0	80	80	0	0	0	80
H11	5/25/99	57 19.7	161 32.5	28		0	80	0	80	0	0	0	80
H12	5/25/99	57 19.6	160 55.9	32		0	79	0	79	0	0	0	79
H16	5/23/99	57 20.5	158 23.9	16		0	0	73	73	0	0	0	73
H18	6/16/99	57 18.9	168 24.4	38		247	247	411	905	0	0	0	905
H19	6/16/99	57 29.0	168 43.6	37		246	164	575	986	0	0	0	986
H19	6/16/99	57 19.9	168 58.9	38		940	627	1175	2742	0	0	0	2742
H20	6/19/99	57 19.7	169 35.4	32		1956	1223	897	4076	163	0	163	4239
H21	6/19/99	57 29.8	169 58.6	34		1537	1375	890	3801	81	0	81	3882
H22	6/27/99	57 19.8	170 50.5	43		403	1773	483	2659	0	0	0	2659
H23	6/27/99	57 19.7	171 28.3	53		418	585	418	1422	1004	0	1004	2425
H24	6/27/99	57 20.3	172 9.6	57		154	847	308	1309	0	231	231	1540
H25	6/27/99	57 20.2	172 44.8	62		0	216	144	359	0	0	0	359
H26	6/27/99	57 19.2	173 18.2	64		369	221	0	590	0	0	0	590
I01	6/12/99	57 40.2	167 46.2	37		168	337	757	1262	0	168	168	1431
I02	6/12/99	57 39.2	167 9.4	34		1358	399	1118	2875	0	240	240	3115
I03	6/5/99	57 40.0	166 30.1	34		3057	661	578	4296	0	165	165	4462
I04	6/5/99	57 40.1	165 53.5	34		3439	819	20231	24489	26957	1644	28600	53089
I05	6/2/99	57 40.0	165 15.4	31		164	492	4349	5005	738	410	1149	6154
I06	6/2/99	57 39.7	164 36.9	27		253	758	2694	3705	1431	253	1684	5389
I07	5/29/99	57 39.9	164 1.0	26		0	80	0	80	0	0	0	80
I18	6/16/99	57 39.3	168 23.8	36		80	0	159	239	0	0	0	239
I19	6/15/99	57 49.7	168 45.0	36		318	318	478	1115	0	239	239	1353

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
I19	6/16/99	57 39.8	169 2.7	37		248	331	828	1408	0	0	0	1408
I20	6/20/99	57 39.6	169 38.6	36		1078	2156	1161	4395	166	83	249	4644
I20	6/15/99	57 49.6	169 22.8	35		786	707	314	1807	0	79	79	1886
I20	6/16/99	57 30.0	169 21.9	38		1333	2166	1750	5249	0	0	0	5249
I21	6/20/99	57 49.8	169 58.7	37		24103	2625	2864	29592	81	886	966	30558
I21	6/20/99	57 41.1	170 19.5	39		618	2085	1235	3938	154	309	463	4401
I22	6/27/99	57 39.3	170 53.2	44		385	96	96	578	2505	96	2601	3179
I22	6/19/99	57 31.3	170 34.8	39		839	1983	839	3661	153	0	153	3813
I23	6/27/99	57 39.8	171 32.1	51		744	248	83	1075	331	165	496	1572
I24	6/27/99	57 39.7	172 12.0	57		526	1277	0	1803	0	150	150	1953
I25	6/26/99	57 41.6	172 49.1	63		1286	1891	303	3480	151	227	378	3858
I26	6/26/99	57 41.2	173 22.2	77		544	621	0	1165	0	777	777	1942
J01	6/12/99	58 0.1	167 48.4	36		1054	162	487	1703	243	0	243	1946
J02	6/12/99	58 0.5	167 11.0	32		4152	1208	1434	6795	1812	75	1887	8682
J03	6/5/99	57 59.8	166 31.2	31		398	955	2627	3981	1911	239	2149	6130
J04	6/4/99	57 59.7	165 53.7	30		79	238	1669	1987	1431	0	1431	3418
J05	6/3/99	58 0.2	165 15.1	25		0	82	571	652	82	82	163	815
J18	6/15/99	58 0.3	168 26.7	35		95	190	190	475	0	190	190	666
J19	6/15/99	57 59.8	169 4.1	37		636	159	397	1192	0	0	0	1192
J20	6/20/99	57 59.9	169 42.0	36		4841	1149	985	6974	0	0	0	6974
J21	6/20/99	58 1.4	170 20.9	40		1841	4449	1534	7824	920	384	1304	9128
J22	6/26/99	57 59.9	170 57.8	45		248	413	83	744	0	0	0	744
J22	6/20/99	57 51.4	170 36.6	41		1413	2975	1116	5504	223	223	446	5950
J23	6/26/99	57 59.9	171 35.6	50		0	85	0	85	85	0	85	171
J24	6/27/99	57 57.1	172 16.5	56		2187	1562	312	4062	469	78	547	4609
J25	6/26/99	58 0.5	172 56.2	57		2661	7391	3843	13895	125099	67513	192612	206507
J26	6/26/99	57 59.1	173 27.4	62		610	1676	686	2971	1371	1600	2971	5943
K01	6/12/99	58 20.6	167 50.3	32		2879	3658	12685	19222	3891	311	4202	23424
K02	6/12/99	58 20.2	167 12.7	26		317	396	4118	4831	1029	158	1188	6018
K03	6/4/99	58 20.0	166 33.2	24		0	0	80	80	0	0	0	80
K04	6/4/99	58 20.0	165 55.4	24		0	79	0	79	0	0	0	79
K06	6/3/99	58 20.8	164 39.7	22		0	0	0	0	0	78	78	78
K18	6/15/99	58 20.2	168 28.1	33		562	241	562	1364	80	0	80	1444

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
K19	6/15/99	58 19.8	169 6.6	36		1850	402	0	2252	0	0	0	2252
K20	6/20/99	58 20.0	169 44.1	36		4504	885	161	5550	0	0	0	5550
K21	6/20/99	58 22.0	170 23.0	40		16251	3722	744	20717	72	0	72	20789
K22	6/26/99	58 19.9	171 1.6	43		904	2218	493	3614	329	246	575	4189
K23	6/26/99	58 19.8	171 39.7	50		80	80	161	321	0	80	80	402
K24	6/25/99	58 20.5	172 22.0	54		2540	5528	1195	9263	97226	25586	122812	132075
K25	6/26/99	58 18.9	172 55.4	57		2423	3898	527	6849	2739	527	3266	10115
K26	7/4/99	58 20.4	173 34.3	60		504	840	252	1596	84	84	168	1764
K27	7/4/99	58 21.9	174 18.5	102		77	308	77	462	0	154	154	617
L01	6/13/99	58 39.9	167 52.1	25		0	80	1512	1592	318	80	398	1990
L02	6/13/99	58 40.8	167 13.5	22		0	0	152	152	0	0	0	152
L03	6/4/99	58 40.2	166 33.8	21		0	79	0	79	0	0	0	79
L18	6/15/99	58 40.0	168 29.6	27		577	165	1566	2308	165	165	330	2638
L19	6/15/99	58 39.9	169 8.7	34		1521	480	2401	4402	240	3442	3682	8084
L20	6/20/99	58 40.0	169 46.9	34		1847	1365	321	3533	80	0	80	3613
L21	6/20/99	58 41.5	170 25.6	39		1400	590	147	2137	0	0	0	2137
L22	6/26/99	58 40.1	171 5.3	43		4514	2660	242	7416	484	0	484	7900
L23	6/25/99	58 39.8	171 42.7	48		500	583	0	1082	333	83	416	1499
L24	6/25/99	58 38.1	172 24.0	53		1958	2121	82	4160	245	82	326	4487
L25	6/25/99	58 40.6	172 57.7	60		3083	4796	571	8450	2398	1599	3996	12446
L26	7/4/99	58 40.6	173 37.8	66		845	4301	2458	7604	85280	93808	179088	186693
L27	7/4/99	58 41.2	174 15.2	80		0	146	146	291	0	73	73	364
L28	7/11/99	58 44.6	174 57.4	75		303	76	76	455	0	0	0	455
L29	7/11/99	58 40.4	175 32.3	71		76	0	76	152	0	227	227	379
L30	7/11/99	58 39.1	176 11.4	76		0	0	0	0	0	234	234	234
L31	7/11/99	58 39.6	176 48.8	73		0	0	308	308	0	77	77	385
M01	6/13/99	59 0.1	167 53.0	22		0	78	78	157	0	0	0	157
M18	6/15/99	58 59.8	168 32.0	22		0	0	388	388	0	155	155	543
M19	6/15/99	58 59.8	169 11.4	29		163	650	8128	8941	2113	5283	7396	16337
M20	6/21/99	58 59.7	169 49.6	32		2883	1201	320	4405	240	160	400	4806
M21	6/21/99	59 0.9	170 28.2	38		2220	1824	714	4758	0	79	79	4837
M22	6/25/99	59 0.3	171 8.2	39		1622	4056	295	5973	147	74	221	6194
M23	6/25/99	58 59.9	171 47.4	45		2472	3873	247	6593	412	0	412	7005

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
M24	6/25/99	58 59.8	172 34.2	52		648	1134	81	1863	0	162	162	2025
M25	6/25/99	58 58.2	173 3.5	56		1761	6164	4256	12181	83811	35919	119730	131911
M26	7/4/99	59 0.3	173 43.0	62		1682	2723	961	5366	1442	561	2002	7368
M27	7/4/99	59 0.7	174 22.3	67		102	102	205	409	0	511	511	921
M28	7/11/99	59 0.4	174 58.8	71		0	81	81	161	0	161	161	323
M29	7/11/99	59 0.1	175 43.9	72		0	170	170	341	0	170	170	511
M30	7/11/99	59 0.1	176 17.5	73		87	0	174	261	0	521	521	782
M31	7/11/99	58 59.9	176 55.7	73		0	81	242	323	0	161	161	484
M32	7/11/99	59 0.1	177 34.5	73		248	165	0	414	331	0	331	745
N02	6/13/99	59 19.9	167 15.4	15		0	0	154	154	0	0	0	154
N19	6/14/99	59 20.0	169 14.4	27		0	80	5225	5305	643	2251	2894	8199
N20	6/21/99	59 20.3	169 52.1	31		844	253	1097	2194	506	253	759	2954
N21	6/21/99	59 20.7	170 32.5	36		394	394	236	1024	315	0	315	1339
N22	6/25/99	59 19.9	171 10.4	39		542	2323	774	3639	697	77	774	4413
N23	6/25/99	59 20.1	171 50.1	42		1704	7496	681	9881	937	256	1193	11074
N24	6/24/99	59 18.1	172 29.5	47		4530	4756	151	9437	1132	226	1359	10796
N25	6/24/99	59 28.4	172 56.3	50		9097	2558	1563	13218	73	1306	1379	14597
N25	6/24/99	59 20.4	173 7.8	53		883	1846	1364	4093	9835	1834	11669	15762
N26	7/4/99	59 20.5	173 48.3	57		162	1457	567	2186	3238	648	3886	6072
N26	6/24/99	59 29.7	173 27.1	55		4016	1387	1460	6864	0	3505	3505	10369
N27	7/4/99	59 21.0	174 25.3	63		2151	1229	154	3533	154	77	230	3764
N28	7/10/99	59 20.0	175 5.2	73		1060	1875	408	3343	3425	652	4077	7420
N29	7/10/99	59 20.0	175 40.0	73		0	344	344	687	515	1890	2405	3092
N30	7/10/99	59 17.7	176 23.2	73		156	156	156	469	0	547	547	1016
O18	6/14/99	59 40.6	168 38.4	19		79	0	79	157	0	0	0	157
O19	6/14/99	59 39.8	169 16.2	25		0	0	35857	35857	3752	17720	21473	57330
O20	6/21/99	59 40.2	169 54.8	28		324	81	7783	8188	2351	4459	6810	14999
O21	6/21/99	59 41.5	170 35.4	36		1166	3343	1944	6452	1633	155	1788	8241
O22	6/24/99	59 39.9	171 15.2	37		243	6157	1458	7858	2025	0	2025	9884
O23	6/24/99	59 39.9	171 53.2	40		1752	9492	2629	13873	4029	1645	5674	19547
O24	6/23/99	59 39.9	172 33.4	44		1789	2566	622	4977	156	1244	1400	6377
O25	6/23/99	59 49.8	172 55.4	42		636	2465	1591	4692	318	2863	3181	7873
O25	6/24/99	59 39.0	173 14.5	51		6960	1898	1107	9965	0	1667	1667	11632

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
O26	7/5/99	59 40.0	173 52.2	50		1150	1807	986	3943	329	575	904	4846
O26	6/23/99	59 49.0	173 34.4	51		3353	2286	1753	7393	229	2134	2363	9755
O27	7/5/99	59 40.7	174 27.2	61		2154	7279	4382	13816	105399	8267	113666	127481
O28	7/10/99	59 39.8	175 6.4	66		1591	2545	1511	5646	128026	58526	186552	192199
O29	7/10/99	59 39.9	175 52.2	72		2538	2200	338	5077	3554	4400	7953	13030
O30	7/10/99	59 40.0	176 35.9	72		538	1229	999	2765	1690	2304	3994	6759
O31	7/10/99	59 38.7	177 5.7	91		73	146	0	219	0	146	146	365
P18	6/14/99	59 59.7	168 37.9	19		0	0	803	803	241	0	241	1045
P19	6/14/99	59 59.8	169 18.9	25		80	0	59681	59761	4314	23729	28043	87805
P20	6/21/99	60 0.4	169 57.8	27		405	729	10848	11982	3724	4048	7772	19753
P21	6/21/99	60 1.4	170 36.8	34		1080	4398	5169	10647	9413	309	9721	20369
P22	6/24/99	59 60.0	171 17.9	36		243	1863	1296	3401	4859	162	5021	8423
P23	6/24/99	60 0.4	171 56.8	33		0	948	1983	2931	3448	776	4224	7154
P24	6/23/99	60 10.0	172 20.3	30		81	407	488	977	0	0	0	977
P24	6/23/99	60 0.1	172 37.4	34		232	309	1390	1930	0	695	695	2625
P24	6/24/99	59 50.5	172 15.7	39		1067	4350	5745	11163	4922	8826	13749	24911
P26	7/5/99	60 0.5	173 57.2	50		897	1060	652	2609	0	815	815	3425
P26	6/23/99	60 7.0	173 46.1	46		1403	1714	4987	8105	312	11066	11378	19482
P27	7/5/99	59 50.5	174 15.5	56		1703	2961	444	5108	3109	444	3554	8662
P27	7/5/99	60 0.3	174 33.4	57		1206	6270	3697	11173	24823	1986	26809	37981
P28	7/10/99	60 0.3	175 14.6	63		160	1281	2403	3844	12183	5178	17361	21206
P29	7/9/99	60 0.3	175 56.1	68		1281	1830	732	3842	6953	10796	17749	21591
P30	7/10/99	59 58.3	176 44.8	75		1293	2357	532	4182	38920	22533	61453	65635
P31	7/9/99	59 60.0	177 13.3	73		600	1951	975	3526	24709	13531	38240	41766
P32	7/9/99	60 1.4	177 51.8	75		538	922	614	2074	307	538	845	2919
O18	6/14/99	60 19.4	168 40.8	20		0	0	32549	32549	10148	16083	26231	58780
O19	6/14/99	60 19.1	169 20.2	24		0	0	50602	50602	13494	22209	35703	86305
O20	6/21/99	60 20.1	170 1.5	26		239	958	16043	17240	16769	4532	21301	38541
O21	6/21/99	60 20.5	170 39.2	33		486	4377	11185	16048	24731	353	25085	41133
O22	6/22/99	60 19.8	171 21.7	34		163	734	1793	2690	10830	0	10830	13519
O23	6/22/99	60 20.1	172 3.7	30		0	0	76	76	302	0	302	378
O25	6/23/99	60 10.3	173 2.5	31		0	154	1927	2081	154	1233	1387	3468
O25	6/23/99	60 18.0	173 22.7	33		77	154	11558	11789	653	26326	26979	38768

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
O26	7/5/99	60 20.5	174 3.7	47		588	3191	5710	9489	1764	1260	3023	12513
O27	7/5/99	60 11.2	174 23.6	53		3738	11978	2136	17852	1144	305	1450	19302
O27	7/5/99	60 20.9	174 41.8	54		223	2228	1188	3640	2303	1114	3417	7056
O28	7/9/99	60 20.9	175 23.7	58		83	993	414	1489	165	165	331	1820
O29	7/9/99	60 20.4	176 2.7	63		170	849	340	1359	5860	1953	7813	9172
O30	7/9/99	60 20.6	176 47.1	73		1176	4470	2431	8077	110578	6380	116958	125035
O31	7/9/99	60 18.4	177 21.5	77		1168	1090	1012	3271	1090	389	1480	4750
R22	6/22/99	60 39.9	171 25.3	32		168	168	2607	2944	11859	84	11943	14886
R23	6/22/99	60 39.9	172 7.5	33		0	791	12133	12924	41439	3182	44620	57544
R24	6/22/99	60 39.2	172 44.8	24		0	77	2168	2246	4260	620	4879	7125
R25	7/5/99	60 40.3	173 27.9	33		0	252	3359	3611	2099	1092	3191	6802
R26	7/6/99	60 40.8	174 12.2	46		150	2851	10578	13579	2476	525	3001	16579
R27	7/6/99	60 39.6	174 44.8	51		0	1563	1328	2891	3595	1719	5314	8205
R28	7/9/99	60 40.0	175 28.7	56		920	2510	1004	4434	84	167	251	4685
R29	7/9/99	60 40.2	176 11.6	62		421	2613	1264	4299	169	169	337	4636
R30	7/9/99	60 39.7	176 49.4	69		1667	2349	1061	5077	3637	379	4016	9093
R31	7/8/99	60 40.3	177 31.3	78		9561	3554	0	13114	85	0	85	13199
R32	7/8/99	60 40.2	178 7.9	85		233	1164	0	1397	0	155	155	1552
S22	7/6/99	60 60.0	171 30.1	31		0	265	39273	39538	44902	20885	65787	105325
S23	7/6/99	61 0.0	172 9.9	32		0	0	40793	40793	18352	20799	39152	79945
S24	7/6/99	61 0.2	172 49.4	34		0	402	49835	50236	11715	30562	42277	92513
S25	7/6/99	60 59.8	173 30.1	39		0	0	39702	39702	7270	17721	24992	64694
S26	7/6/99	61 0.5	174 11.8	43		0	320	8634	8954	7162	2328	9489	18443
S27	7/6/99	61 0.4	174 52.5	49		148	3628	10513	14288	13604	1388	14992	29280
S28	7/8/99	61 0.2	175 33.4	54		0	723	1286	2009	482	0	482	2492
S29	7/8/99	61 0.0	176 15.6	59		479	1596	2075	4150	160	2075	2235	6385
S30	7/8/99	61 1.6	176 58.6	64		6342	5027	17424	28792	696	10010	10706	39499
S31	7/8/99	60 58.7	177 38.1	72		2719	1964	1057	5740	151	604	755	6495
T25	7/7/99	61 20.4	173 34.1	38		0	482	39064	39546	4834	5852	10686	50232
T26	7/7/99	61 22.0	174 16.6	42		0	542	21130	21672	22671	13603	36274	57946
T27	7/6/99	61 18.9	174 57.0	46		77	308	5781	6166	6403	2668	9071	15237
T28	7/8/99	61 20.5	175 41.5	53		0	1438	2200	3638	8127	1060	9187	12826
T29	7/8/99	61 19.7	176 17.9	57		166	2907	1495	4568	498	249	747	5315

Table 10 Summary of crab density by tow (# per square nmi) for Snow Crab, *Chionoecetes opilio.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
T30	7/8/99	61 20.9	176 59.7	62		4424	3880	4191	12495	310	3492	3803	16297
U25	7/7/99	61 40.2	173 39.6	36		0	0	49798	49798	10903	18171	29074	78872
U26	7/7/99	61 38.8	174 28.0	41		0	210	25012	25223	11789	17315	29104	54326
U27	7/7/99	61 40.5	175 4.9	45		0	233	14978	15211	3060	7650	10710	25921
U28	7/7/99	61 40.9	175 47.7	50		232	1779	16087	18098	6918	4151	11068	29166
U29	7/8/99	61 39.5	176 28.1	55		417	3198	11125	14740	1137	5931	7069	21809
V25	7/7/99	62 0.4	173 44.6	32		0	0	23734	23734	5138	25263	30401	54136
V26	7/7/99	62 0.1	174 30.7	38		0	0	20008	20008	14009	30819	44828	64836
V27	7/7/99	62 0.7	175 11.0	42		902	902	45109	46914	1804	74881	76686	123599
V28	7/7/99	61 58.3	175 49.8	49		0	975	22750	23725	19863	11499	31362	55087
Z05	6/1/99	54 41.5	165 8.6	24		1591	398	80	2068	0	0	0	2068

NOTE: Minimum carapace sizes used are: Large Males > 4.0 in; Medium Males > 3.1 in; Large Females > 2.0 in.

Table 11 Summary of crab density by tow (# per square nmi) for Hair Crab, *Erimacrus isenbeckii.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
C08	5/30/99	55 40.5	163 23.6	43		0	0	0	0	76	0	76	76
C09	5/26/99	55 40.3	162 51.5	27		80	0	0	80	0	0	0	80
E10	5/26/99	56 20.9	162 12.9	44		161	0	0	161	0	0	0	161
E12	5/26/99	56 20.6	160 58.9	28		158	0	0	158	0	0	0	158
E20	6/17/99	56 26.2	169 26.8	57		81	161	0	242	0	81	81	322
F10	5/27/99	56 39.3	162 10.3	39		79	0	0	79	0	0	0	79
F11	5/26/99	56 39.4	161 35.4	48		82	0	0	82	0	0	0	82
F12	5/26/99	56 40.1	160 59.2	35		157	0	0	157	0	0	0	157
F20	6/17/99	56 40.3	169 30.8	43		79	0	0	79	0	0	0	79
F21	6/17/99	56 39.8	170 10.4	53		81	0	0	81	162	0	162	244
G03	6/5/99	57 0.0	166 27.9	38		82	0	0	82	0	0	0	82
G08	5/29/99	57 1.2	163 23.1	34		0	0	0	0	77	0	77	77
G09	5/27/99	57 0.1	162 47.1	31		81	0	0	81	0	0	0	81
G10	5/27/99	57 0.3	162 9.5	31		0	0	0	0	223	0	223	223
G11	5/25/99	56 59.8	161 34.1	36		80	0	0	80	0	0	0	80
G12	5/25/99	57 0.4	160 55.9	34		0	0	0	0	81	0	81	81
G13	5/23/99	57 0.2	160 20.4	33		71	0	0	71	0	0	0	71
G19	6/16/99	57 10.0	168 37.8	39		81	0	0	81	0	81	81	162
G20	6/19/99	57 0.8	169 33.3	31		233	78	0	311	78	0	78	389
G21	6/19/99	56 50.5	169 54.2	37		80	0	0	80	0	0	0	80
G21	6/19/99	57 9.5	169 53.0	25		925	168	0	1093	0	0	0	1093
G21	6/19/99	57 1.1	170 11.9	35		386	0	0	386	0	77	77	464
G22	6/19/99	57 7.5	170 27.3	30		475	0	0	475	79	0	79	554
H01	6/12/99	57 20.2	167 44.0	39		83	0	0	83	0	0	0	83
H08	5/29/99	57 20.7	163 23.5	28		81	0	81	163	81	0	81	244
H09	5/27/99	57 20.0	162 46.5	25		80	0	0	80	0	0	0	80
H10	5/27/99	57 20.1	162 8.8	26		80	0	0	80	0	0	0	80
H11	5/25/99	57 19.7	161 32.5	28		239	0	0	239	0	0	0	239
H12	5/25/99	57 19.6	160 55.9	32		159	0	0	159	159	0	159	318
H18	6/16/99	57 18.9	168 24.4	38		0	0	0	0	0	82	82	82
H19	6/16/99	57 29.0	168 43.6	37		82	0	0	82	0	0	0	82
H19	6/16/99	57 19.9	168 58.9	38		392	78	0	470	157	78	235	705
H20	6/19/99	57 19.7	169 35.4	32		163	0	0	163	82	0	82	245

Table 11 Summary of crab density by tow (# per square nmi) for Hair Crab, *Erimacrus isenbeckii.*

						Males				Females			GRAND TOTAL
Station	Date	N. Lat.	W. Long	Fathoms		Large	Medium	Small	Total	Large	Small	Total	
H21	6/19/99	57 29.8	169 58.6	34		0	0	0	0	162	0	162	162
H21	6/19/99	57 21.2	170 13.7	31		0	0	80	80	0	80	80	161
I18	6/16/99	57 39.3	168 23.8	36		159	0	0	159	0	0	0	159
I19	6/16/99	57 39.8	169 2.7	37		83	0	0	83	83	0	83	166
I20	6/20/99	57 39.6	169 38.6	36		0	0	0	0	83	0	83	83
I20	6/15/99	57 49.6	169 22.8	35		79	0	0	79	0	0	0	79
I20	6/16/99	57 30.0	169 21.9	38		83	0	0	83	83	0	83	167
I21	6/20/99	57 49.8	169 58.7	37		161	0	0	161	322	0	322	483
I21	6/20/99	57 41.1	170 19.5	39		0	77	0	77	232	77	309	386
J19	6/15/99	57 59.8	169 4.1	37		159	0	0	159	0	0	0	159
J22	6/20/99	57 51.4	170 36.6	41		74	0	0	74	0	0	0	74
K02	6/12/99	58 20.2	167 12.7	26		0	79	0	79	79	0	79	158
K03	6/4/99	58 20.0	166 33.2	24		80	0	0	80	0	0	0	80
L01	6/13/99	58 39.9	167 52.1	25		0	239	0	239	80	0	80	318
L18	6/15/99	58 40.0	168 29.6	27		82	0	0	82	165	0	165	247
L19	6/15/99	58 39.9	169 8.7	34		160	0	0	160	0	0	0	160
L20	6/20/99	58 40.0	169 46.9	34		80	0	0	80	0	0	0	80
M01	6/13/99	59 0.1	167 53.0	22		78	0	0	78	0	0	0	78
M02	6/13/99	58 59.1	167 13.1	20		78	0	0	78	0	0	0	78
M18	6/15/99	58 59.8	168 32.0	22		310	0	0	310	0	0	0	310
M19	6/15/99	58 59.8	169 11.4	29		163	0	0	163	163	163	325	488
N01	6/13/99	59 19.9	167 55.3	21		83	166	0	249	0	0	0	249
N18	6/14/99	59 20.2	168 35.1	20		82	0	0	82	0	0	0	82
N19	6/14/99	59 20.0	169 14.4	27		241	0	0	241	0	0	0	241
O01	6/13/99	59 39.9	167 57.1	19		239	160	0	399	0	0	0	399
O18	6/14/99	59 40.6	168 38.4	19		236	0	0	236	0	0	0	236
O19	6/14/99	59 39.8	169 16.2	25		158	79	0	238	0	79	79	317
P01	6/13/99	60 0.1	167 59.5	14		0	0	0	0	73	0	73	73
P18	6/14/99	59 59.7	168 37.9	19		161	0	0	161	0	0	0	161
P20	6/21/99	60 0.4	169 57.8	27		0	0	0	0	81	0	81	81
O18	6/14/99	60 19.4	168 40.8	20		81	81	0	162	162	0	162	323
O19	6/14/99	60 19.1	169 20.2	24		0	161	0	161	161	80	241	402
R24	6/22/99	60 39.2	172 44.8	24		155	0	0	155	0	0	0	155

Table 11 Summary of crab density by tow (# per square nmi) for Hair Crab, *Erimacrus isenbeckii.*

					Males				Females			GRAND TOTAL
Station	**Date**	**N. Lat.**	**W. Long**	**Fathoms**	**Large**	**Medium**	**Small**	**Total**	**Large**	**Small**	**Total**	

NOTE: Minimum carapace sizes used are: Large Males > 3.3 in; Medium Males > 2.0 in; Large Females > 2.6 in.