



**Alaska  
Fisheries Science  
Center**

National Marine  
Fisheries Service

U.S. DEPARTMENT OF COMMERCE

## **AFSC PROCESSED REPORT 2002-05**

### Report to Industry on the 2002 Eastern Bering Sea Crab Survey

December 2002



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All data herein are to be considered provisional.

Cover Photo: Unloading opilio crab in Dutch Harbor, January 2002.

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**Alaska Fisheries Science Center  
Processed Report 2002-05**

**REPORT TO INDUSTRY ON THE  
2002  
EASTERN BERING SEA  
CRAB SURVEY**

**by  
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**December 2002**



## RESULTS OF THE 2002 NMFS BERING SEA CRAB SURVEY EXECUTIVE SUMMARY

This document summarizes data presented in the Report to Industry on the 2002 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 or Dr. Robert S. Otto at 907-481-1700, NMFS, 301 Research Court, Kodiak, AK 99615-7400. GHs (Guideline Harvest Levels) are for the combined general and CDQ fisheries. This draft reflects data analysis and management decision-making through December 11, 2002.

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

Legal males: 9.5 million crabs; 85% increase.

Pre-recruits: 10.1 million crabs; 138% increase.

Large Females: 19.0 million crabs; 11% decrease.

Status: Abundance of mature males has essentially doubled relative to last year's estimate. Mature females show little change. Relatively high numbers of sub-legal crab indicate good recruitment for future fisheries. All newshell females carried new eggs. Reproductive population estimates well above the minimum stock size threshold (MSST), stock not considered to be in the overfished level of abundance.

GHL: 9.3 million pounds (4,218 metric tons, t). Fishery opened October 15, 2002.

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

Legal males: 1.8 million crabs; no change.

Pre-recruits: 0.02 million crabs; 99% decrease.

Large Females: 0.44 million crabs; 89% decrease.

Status: Crabs are highly concentrated, and index has very low precision. Females are poorly estimated. Reproductive population estimates are above the MSST, stock not considered to be in the overfished level of abundance. No recruitment is apparent. Red king crabs in the Pribilof Islands are usually harvested along with blue king crabs and are currently the dominant species. Concern that unacceptable levels of blue king crab incidental catch could occur in a red king crab fishery.

GHL: Fishery not opened in 2002.

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

Legal males: 0.2 million crabs; 50% decrease.

Pre-recruits: 0.02 million crabs; 84% decrease.

Large Females: 1.2 million crabs; 23% decrease.

Status: Population is low and trends are not easily detectable. Little or no recruitment is apparent. Reproductive population estimate fell below the MSST in 2002 and the stock is now considered to be in the overfished level of abundance.

GHL: Fishery not opened in 2002.

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

Legal males: 0.6 million crabs; 39% decrease.

Pre-recruits: 0.2 million crabs; 62% decrease.

Large Females: Not well estimated.

Status: Population has declined steeply since 1998. Indices are affected by the portion of the stock occupying untrawlable grounds. Reproductive population estimate continues to be below the MSST in 2002 and the stock is considered to be in the overfished level of abundance.

GHL: Fishery not opened in 2002.

Tanner crab (*Chionoecetes bairdi*) Eastern District.

Legal males: 6.9 million crabs; 10% increase.

Pre-recruits: 15.1 million crabs; 13% decrease.

Large Females: 11.3 million crabs; 14% decrease.

Status: Population decreasing slightly due to continued low recruitment. Reproductive population estimate continues to be below the MSST in 2002 and the stock is considered to be in the overfished level of abundance.

GHL: Fishery not opened in 2002.

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

Large males: 76.1 million crabs; 2% decrease.

Pre-recruits: 248.0 million crabs; 12% decrease.

Large Females: 500.7 million crabs; 67% decrease.

Status: Apparent recruitment that led to increased biomass in each of the past two years has dissipated. Precipitous decrease in large female abundance may reflect the uncertainty of recent estimates as well since estimates have been dominated by a small number of tows. Lack of recruitment to female reproductive stock is evidenced by the increasing prevalence of old shelled crab. Small males and females also declining. Reproductive population estimate that slightly exceeded MSST in 2001 is below the MSST in 2002 and the stock is considered to be in the overfished level of abundance but is above 50% MSST. Under the current rebuilding plan and harvest strategy the fishery would be closed if the stock fell below 50% MSST.

GHL: 25.61 million pounds (11,617 t). Fishery is currently scheduled to open January 15, 2003.

Hair crab (*Erimacrus isenbeckii*) All districts combined.

Large males: 2.1 million crabs; 17% increase.

Large Females: Not well estimated.

Status: Population has been declining for several years. Recruitment trends are unclear due to poor representation of small crabs in survey tows.

GHL: Fishery closed in 2002-2003 season.

# THE 2002 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, Seattle, Washington 98115.

Landing statistics for 2002 are preliminary data obtained from the Alaska Department of Fish and Game (F. Bowers, ADF&G, Dutch Harbor, personal communication). Those needing final statistics should contact ADF&G directly.

## Survey Area and Methods

The 2002 EBS crab survey consisted of 375 bottom trawl tows which covered an area of approximately 140,400 square nautical miles (nmi). The survey area (Figure 1) has been standardized since 1990. The survey was conducted aboard two chartered vessels, the F/V *Aldebaran* and F/V *Arcturus*, between June 2 and July 24. 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 Pribilof Islands, 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 1.44 nmi (2.68 km). Crabs were sorted by species and sex, and then measured (nearest millimeter) to provide a size-frequency distribution. In large catches only a sample of crabs were measured. Crab sizes are reported as carapace width for Tanner and snow and carapace length for all others. Procedures for estimating abundance were similar to previous years (see Appendix A). Note that population estimates are indexes and are most precise for large crabs; they may not represent absolute abundance and are least precise for females and small crab due to variability in crab behavior, availability and gear selectivity.

Because of variations in tow length, 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 a 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 threshold, (NPFMC) North Pacific Fishery Management Council, and (MSFCMA) Magnuson-Stevens Fishery Conservation and Management Act. GHL refers to Guideline Harvest Levels which are for the combined general and Community Development Quota (CDQ) fisheries. FMP refers to the current (1998) version of the Fish



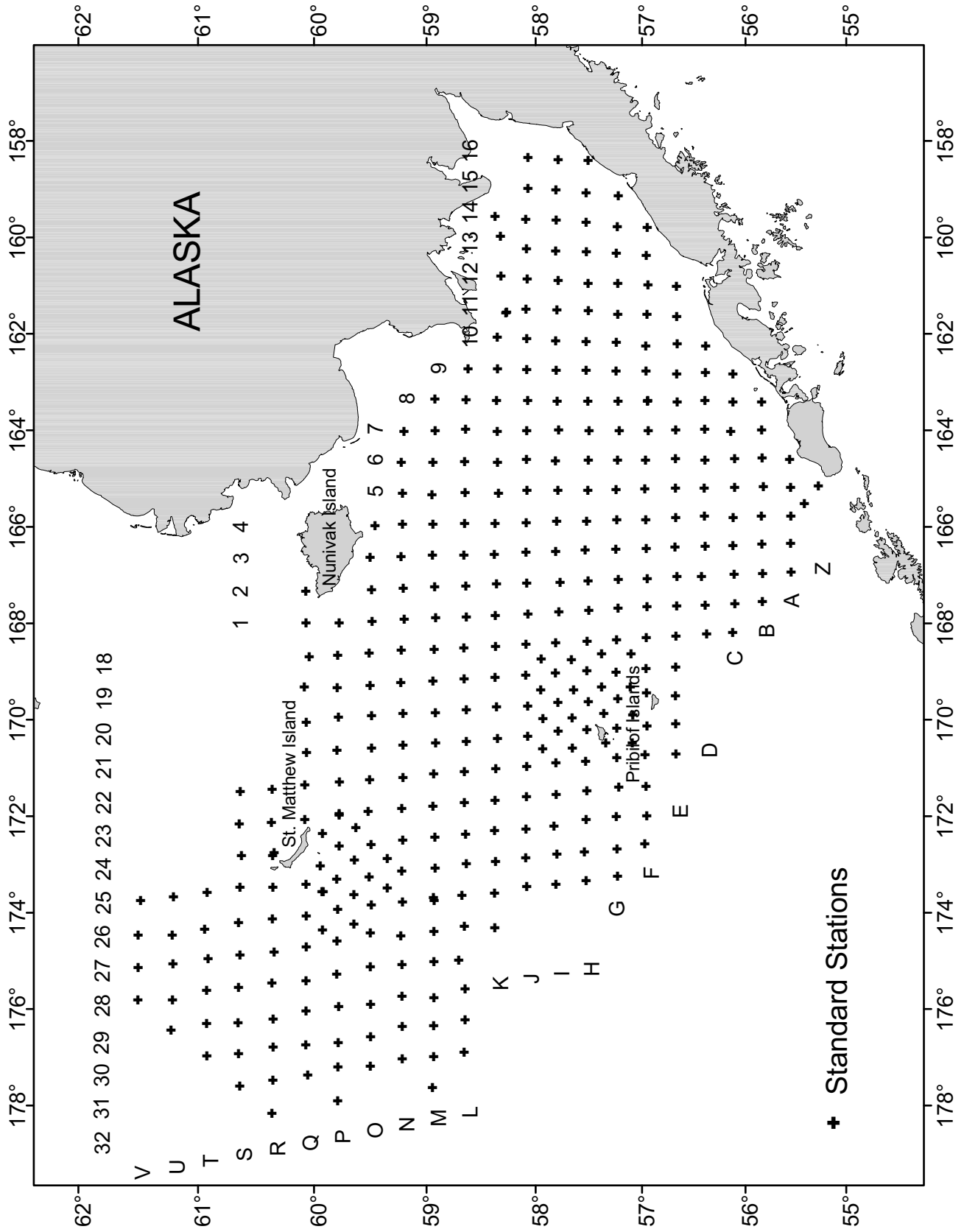


Figure 1. NMFS eastern Bering Sea crab survey area in 2002.

## Red King Crab Bristol Bay Statistical Area

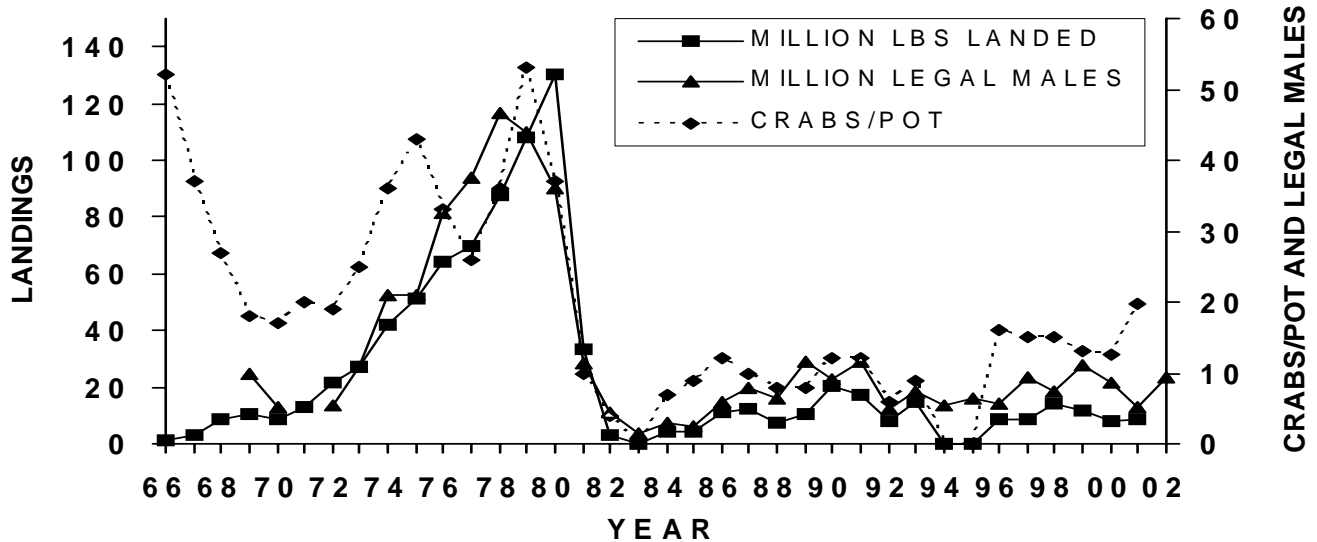


Figure 2. U.S. landings in millions of pounds, CPUE as crabs/pot-lift, and abundance of legal red king crab (*P.camtschaticus*) in millions in Bristol Bay, estimated from NMFS trawl surveys (abundance data include the Pribilof District prior to 1983).

ery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs. 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 ( $\geq 6.5$  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 crab in the Bristol Bay Registration Area (south of 58° 39'N and east of 168°W) was 9.5 million (Table 1 and Figure 2). This estimate represents an 85% increase from last year and exceeds the average for the previous 20 years (7.3 million). The index (10.1 million) for pre-recruit crab (110-134 mm cl) increased by 138%. Abundance of small males increased by 105% due largely to a recruiting cohort

with a modal size of 70 mm (Figure 3). The cohort with a modal size about 80 mm in 2000 grew to about 100 mm in 2001 and 120 mm in 2002. Only one legal male crab was in molting or softshell condition, and 39% were new-hardshell crabs; the remainder were oldshell and older (see Appendix B) crabs.

The abundance index for large ( $\geq 90$  mm cl) females in Bristol Bay was 19.0 million crabs. This estimate represents a 11% decrease from last year. Among female crabs, 67% were mature, of which 97% had molted and extruded new, uneyed eggs. Fluctuations in the timing of 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 data. Resultant estimates of the abundance of mature males and females are used to establish the fishery GHL (ADF&G Regional Information Report 5J99-

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 with a (B) or (P).

Carapace Length(mm) Width(in)	Males				Females			Grand Total
	Small	Pre-recruit	Legal	Total	Small	Large	Total	
	<110 <5.2	110-134 5.2-6.4	≥135 ≥6.5		<90 <4.3	≥90 ≥4.3		
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(B)	10.9	16.5	7.4	34.8	5.5	35.5	40.8	75.6
1999(B)	8.1	7.1	11.0	26.1	6.2	14.5	20.6	46.7
2000(B)	11.2	7.2	8.7	27.0	5.6	17.4	23.0	50.0
2001(B)	9.9	4.3	5.1	19.3	3.8	21.2	24.9	44.2
2002(B)	20.2	10.1	9.5	39.9	18.5	19.0	37.5	77.3
<u>Limits<sup>1</sup></u>								
Lower	3.1	5.5	5.9	19.5	0.0	7.9	10.2	29.6
Upper	37.3	14.8	13.1	60.2	37.0	30.0	64.7	125.0
±%	84	46	38	51	100	58	73	62
1998(P)	0.2	0.5	0.4	1.1	<0.1	1.0	1.0	2.2
1999(P)	6.6	0.6	1.2	8.4	6.5	3.2	9.6	18.1
2000(P)	<0.1	0.4	1.2	1.5	<0.1	0.6	0.6	2.2
2001(P)	1.4	2.5	1.8	5.6	<0.1	4.0	4.0	9.6
2002(P)	<0.1	<0.1	1.8	1.8	0.0	0.4	0.4	2.3

<sup>1</sup> Mean ± 2 standard errors for most recent year; Bristol Bay only.

### Red King Crab Length Frequency Bristol Bay

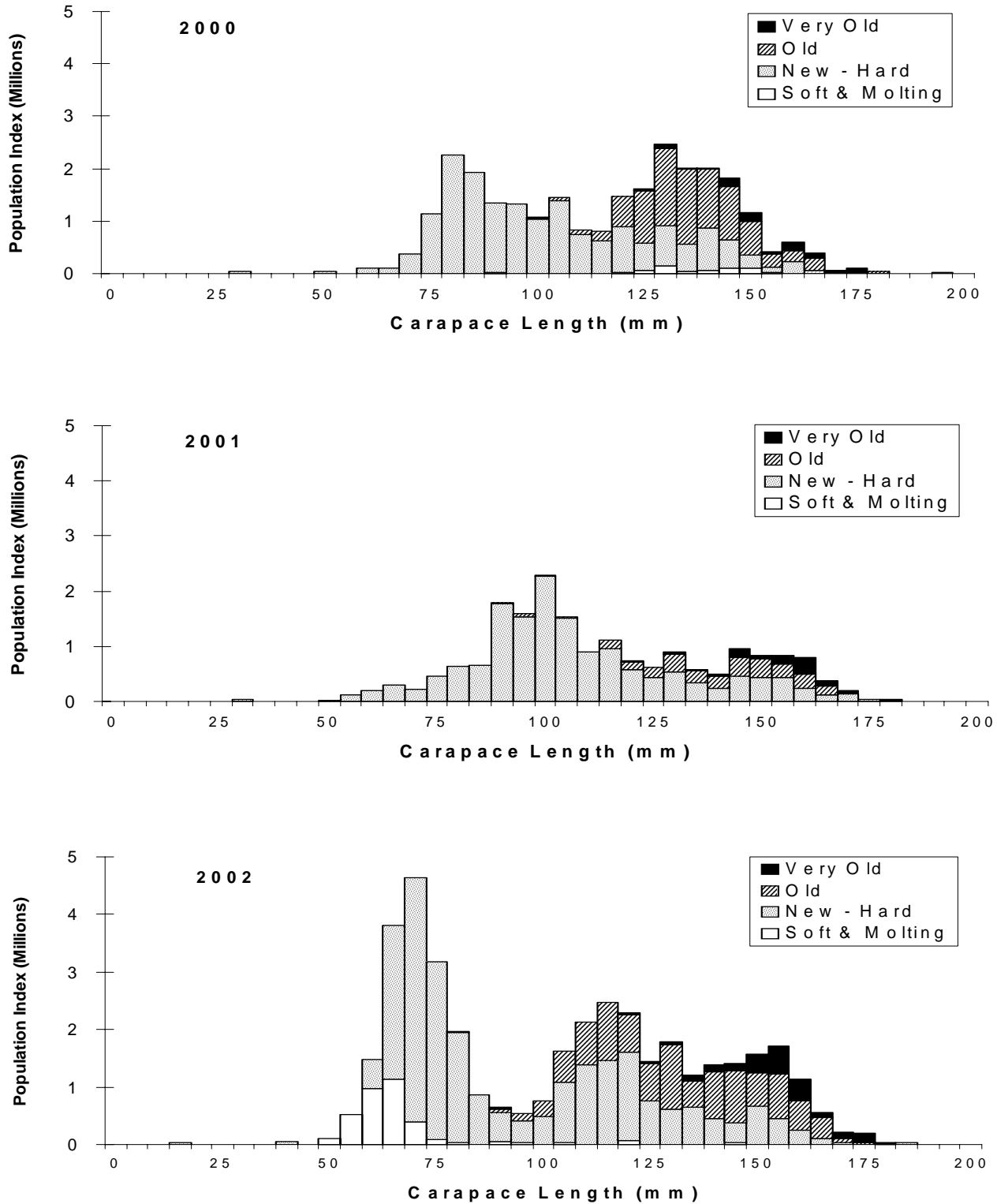


Figure 3. Size-frequency of male red king crab (*P. camtschaticus*) by 5 mm length classes, 2000-2002.

## Blue King Crab Pribilof District

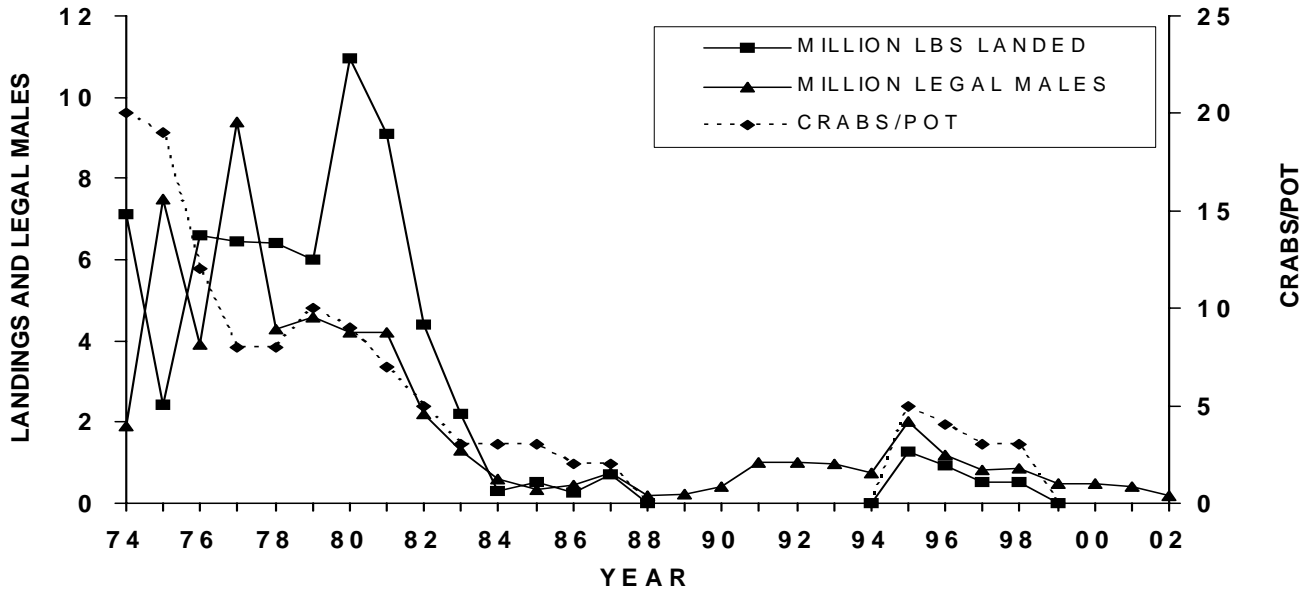


Figure 4. U.S. landings in millions of pounds, CPUE as crabs/pot-lift, and abundance of legal blue king crab (*P. platypus*) in millions in the Pribilof District, estimated from NMFS trawl surveys.

09). The LBA estimate of 18.6 million mature females was slightly smaller than the survey estimate for large females and equated to 37.7 million pounds of effective spawning bio-mass. Total mature biomass is above the MSST threshold, allowing a 10% harvest rate under the ADF&G harvest strategy. This resulted in a GHF of 9.27 million lbs (4,205 t), including 695 thousand lbs of CDQ. The total GHF translates into approximately 1.43 million crabs at an average weight of 6.5 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 1.8 million (Table 1), unchanged from last year. The index for large females showed an 89% decrease from 2001 but females are poorly estimated. From 1996 to 1998, a combined fish-

ery for red and blue king crabs in the Pribilof District opened on September 15. However, due to low abundance of blue king crab (see next section), the combined fishery has not opened since 1998. Historically, red king crab have not been abundant in the Pribilof Islands and landings were taken incidentally during the blue king crab fishery. Although this stock is not considered overfished under provisions of the MSFCMA (Appendix C), the fishery will remain closed due to the desire to avoid bycatch of blue king crab that mingle in the same grounds, and due to the extremely low precision of the abundance estimates. In the absence of a St. Matthew fishery, effort levels were also feared to be excessive.

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

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

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

Carapace Length(mm) Width(in)	<u>Pribilof District</u>							Grand Total
	Males				Females			
	Small	Pre-recruit	Legal	Total	Small	Large	Total	
	<110 <5.2	110-134 5.2-6.4	≥135 ≥6.5		<90 <4.3	≥90 ≥4.3		
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	0.0	2.5	2.5	3.2
2000	0.1	0.2	0.5	0.8	0.0	1.4	1.4	2.2
2001	<0.1	0.1	0.4	0.6	<0.1	1.6	1.6	2.2
2002	0.0	<0.1	0.2	0.2	<0.1	1.2	1.3	1.5
<u>Limits<sup>1</sup></u>								
Lower	-	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0
Upper	-	0.1	0.4	0.4	0.1	3.1	3.1	3.6
±%	-	200	97	93	200	152	149	141

<sup>1</sup> Mean ± 2 standard errors for most recent year.

### Blue King Crab Length Frequency Pribilof District

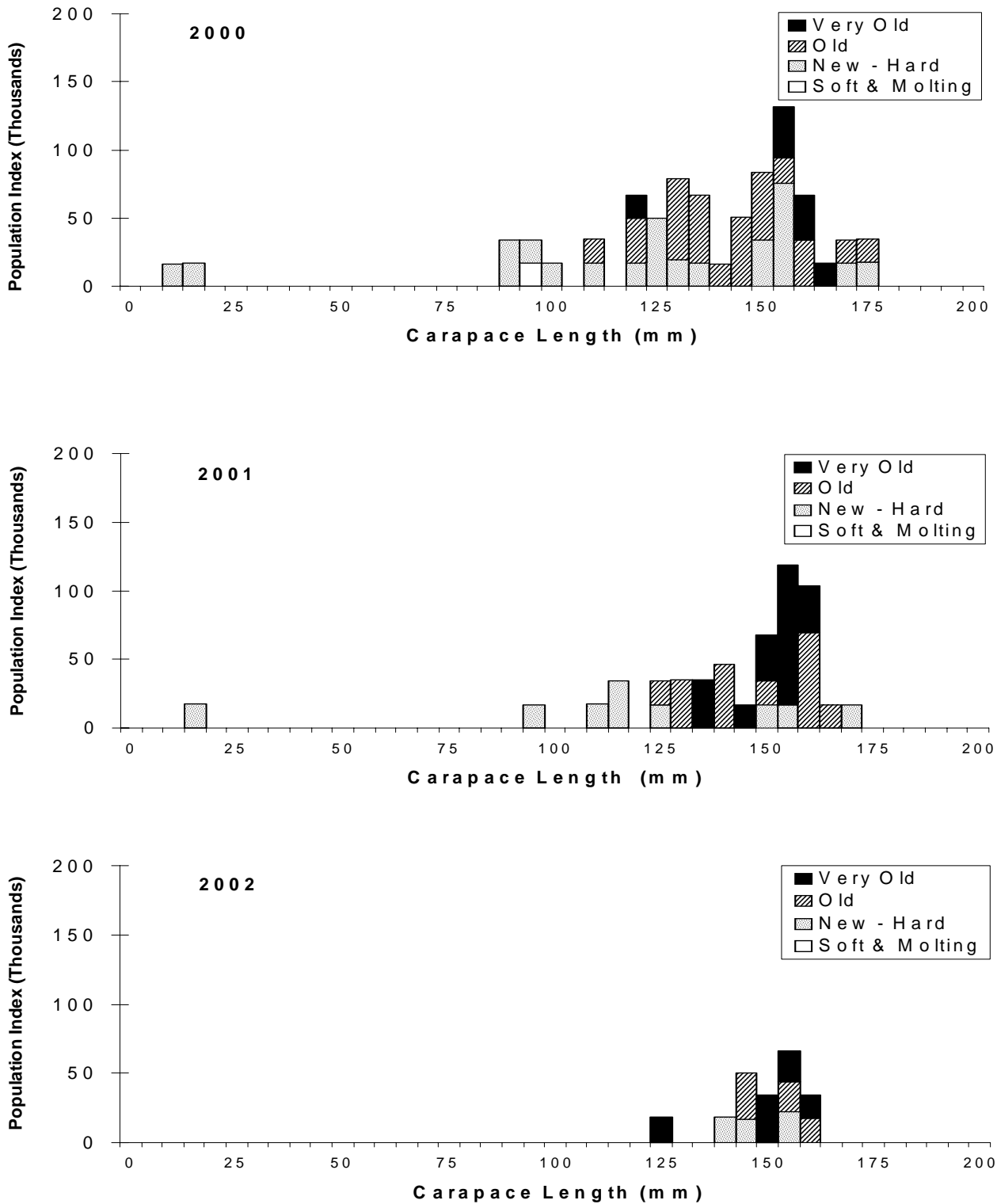


Figure 5. Size-frequency of Pribilof District male blue king crab (*P. platypus*), by 5 mm length classes, 2000-2002.

## Blue King Crab Northern District

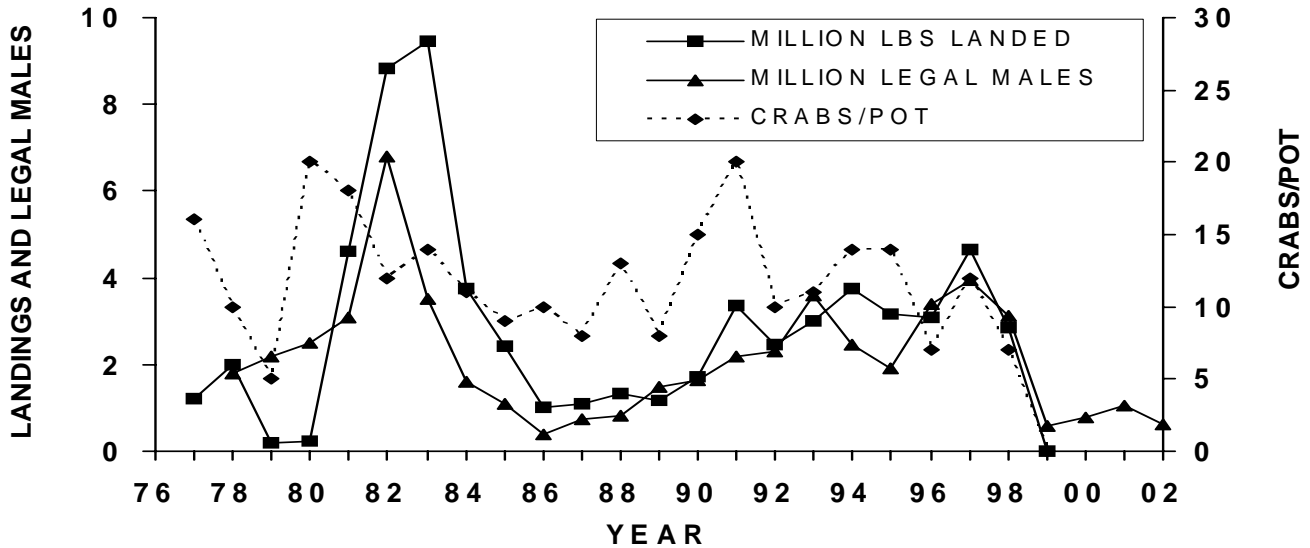


Figure 6. U.S. landings in millions of pounds, CPUE as crabs/pot-lift, and the abundance of legal blue king crabs (*P. platypus*) in millions in the Northern District (St. Matthew Island), estimated from NMFS trawl surveys.

Paul Island (Chart 2 and Table 8A). The abundance index for legal males was 0.2 million (Table 2 and Figure 4), a 52% decrease from last year, and well below the average for the previous 20 years (0.8 million). The index (0.02 million crab) of pre-recruits (110-134 mm cl) is down 84% relative to last year. The abundance of small males (<110 mm cl), is very difficult to determine. Size-frequency data (Figure 5) are very sparse and only 11 legal males were captured. Shell conditions among legal males were 27% new-hardshells, and 73% oldshells and older.

The abundance index (1.2 million crabs) for large ( $\geq 90$  mm cl) females showed a 23% decrease from last year. However, estimates of female abundance are usually very imprecise due to the preference of these crab for rocky habitat which is not well sampled by trawls. Among sampled mature females, 5% were softshell, 27% were new hardshells, of which 100% carried new eggs,

and 68% were oldshells, of which 100% carried empty embryo cases. Blue king crab are predominantly biennial spawners. Only a portion of the female population spawns in a given year, while the remainder is in a non-embryo-bearing phase. This fishery was closed from 1988 through 1994 due to low stock abundance, then re-opened from 1995-1998. The fishery has been closed since then. The population is in extremely low historical abundance (Figure 4), and trends are not easily detectable. Total mature biomass is below MSST (Appendix C) and the stock has fallen into the "overfished" category. The fishery remained closed in 2002 because of low stock abundance since both ADF&G catch-survey analysis and the NMFS survey estimates of mature male abundance are well below the 0.77 million crab level established as a threshold in the ADF&G harvest strategy. A rebuilding plan for this stock is under development.



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

	<u>Northern District</u>							
	<u>Males</u>				<u>Females</u>			<u>Grand Total</u>
	<u>Small</u>	<u>Pre-recruit</u>	<u>Legal</u>	<u>Total</u>	<u>Small</u>	<u>Large</u>	<u>Total</u>	
<u>Length(mm)</u> <u>Width(in)</u>	<u>&lt;105</u> <u>&lt;4.3</u>	<u>105-119</u> <u>4.3-5.4</u>	<u>≥120</u> <u>≥5.5</u>		<u>&lt;80</u> <u>&lt;3.8</u>	<u>≥80</u> <u>≥3.8</u>		
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 <sup>1</sup>	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 <sup>1</sup>	0.3	1.7
2000	0.6	0.3	0.8	1.7	0.1	0.1	0.2	1.7
2001	0.8	0.6	1.1	2.5	0.3	0.2	0.5	2.9
2002	0.2	0.2	0.6	1.0	<0.1	0.1 <sup>1</sup>	0.1	1.2
<u>Limits<sup>2</sup></u>								
Lower	0.0	<0.1	0.2	0.4	0.0	0.0	0.0	0.3
Upper	0.4	0.4	1.1	1.7	0.1	0.3	0.3	2.0
±%	111	91	71	64	200	163	146	73

<sup>1</sup> These estimates have low precision since few crabs were caught.

<sup>2</sup> Mean ± 2 standard errors for most recent year.

### Blue King Crab Length Frequency Northern District

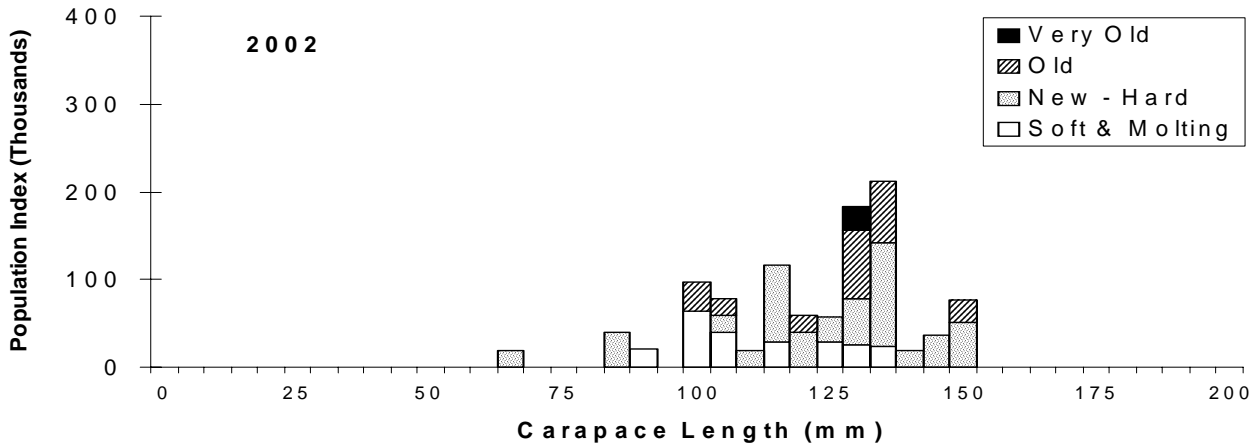
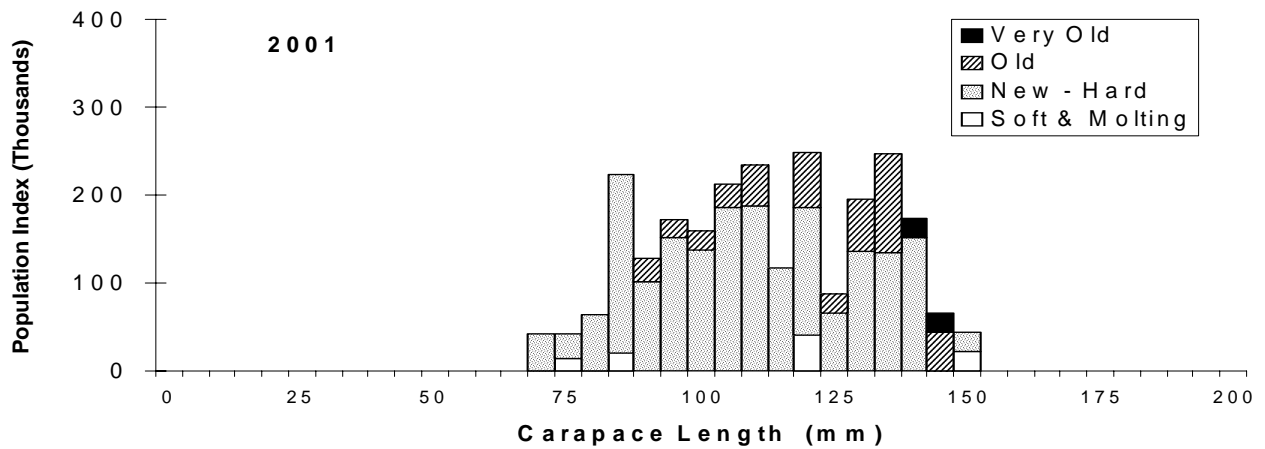
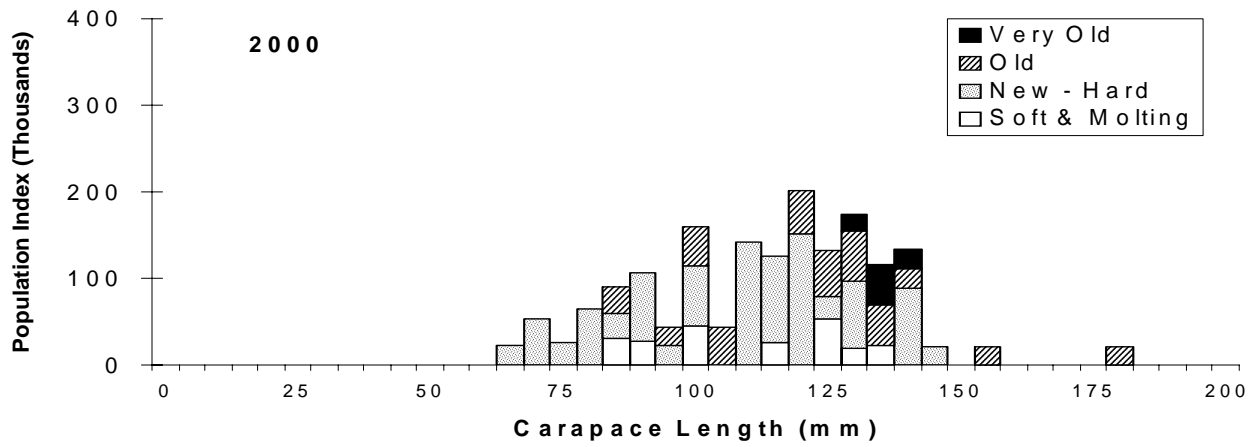


Figure 7. Size-frequency of Northern District (St. Matthew Island) male blue king crab (*P. platypus*), by 5 mm length classes, 2000-2002.

## Tanner Crab Eastern District

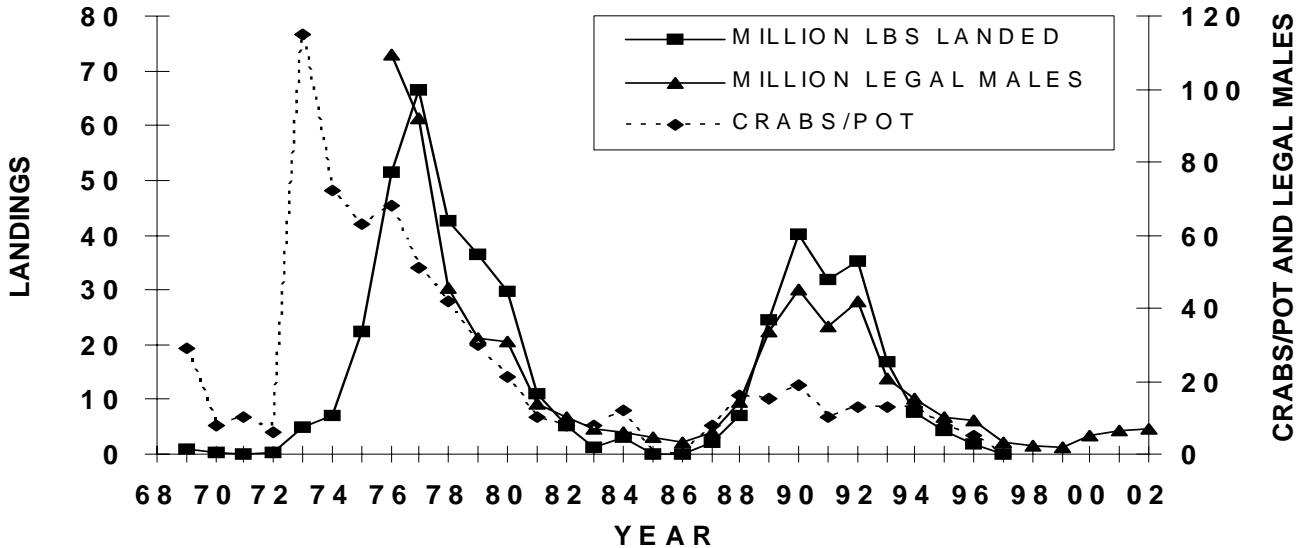


Figure 8. U.S. landings in millions of pounds, CPUE as crabs/pot-lift, and the abundance of legal male Tanner crab (*C. bairdi*) in millions in the Bristol Bay and Pribilof Districts (prior to 1989) or the Eastern District (since 1989), estimated from NMFS trawl surveys.

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

Legal ( $\geq 5.5$  in cw or 120 mm cl) males were captured primarily southwest of St. Matthew Island, although substantial numbers were taken at station Q23 just east of the island (Chart 2 and Table 8B). The abundance index for legal males was 0.6 million crabs (Table 3 and Figure 6), representing a 39% decrease from last year. The abundance index (0.2 million) of pre-recruit crabs (105-119 mm cl) decreased 62% from last year. Legal and pre-recruit male abundance indices are still well below their averages for the previous 20 years (2.2 and 1.2, respectively). Size-frequency is shown in Figure 7. Among legal males captured (14), 7% were softshell, 64% were new-hardshells, and 29% oldshells. The index for large females ( $\geq 80$  mm cl) is poorly determined due to a habitat preference for in-shore, rocky and untrawlable grounds. Only 6 large females were captured. Due to low

stock abundance, the fishery has not opened since the 1998 opening. This stock is considered overfished under the provisions of the MSFCMA and a rebuilding plan has been developed (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 southwest Bristol Bay (Chart 3 and Table 9). The abundance index for legal male *C. bairdi* in the Eastern District (east of 173° W) was 6.9 million crabs (Table 4 and Figure 8), a 10% increase from last year although still only one-half of the 14.0 million crab 20-year average. Virtually all the legal males occurred in the Eastern District. The abundance index (15.1 million) for pre-recruit crabs (110-137 mm cw) showed a 13% decrease, and the index of 201.9

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.

Carapace Width(mm) Width(in)	Males				Females			Grand Total
	Small	Pre-recruit	Legal	Total	Small	Large	Total	
	<110 <4.3	110-137 <sup>1</sup> 4.3-5.4	≥138 <sup>1</sup> ≥5.5		<85 <3.4	≥85 ≥3.4		
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
2000	102.8	18.1	4.9	125.8	79.7	13.1	93.4	219.2
2001	284.8	17.3	6.3	308.3	278.7	13.2	291.9	600.1
2002	201.9	15.1	6.9	224.0	198.0	11.3	209.2	433.2
<u>Limits<sup>2</sup></u>								
Lower	136.3	10.7	3.2	156.0	118.8	7.1	129.0	286.5
Upper	267.5	19.5	10.7	291.9	277.2	15.4	289.4	579.9
±%	32	29	54	30	40	37	38	34

<sup>1</sup> Values prior to 1987 are interpolated from 5 mm width classes.

<sup>2</sup> Mean ± 2 standard errors for most recent year.

### Tanner Crab Width Frequency Eastern District

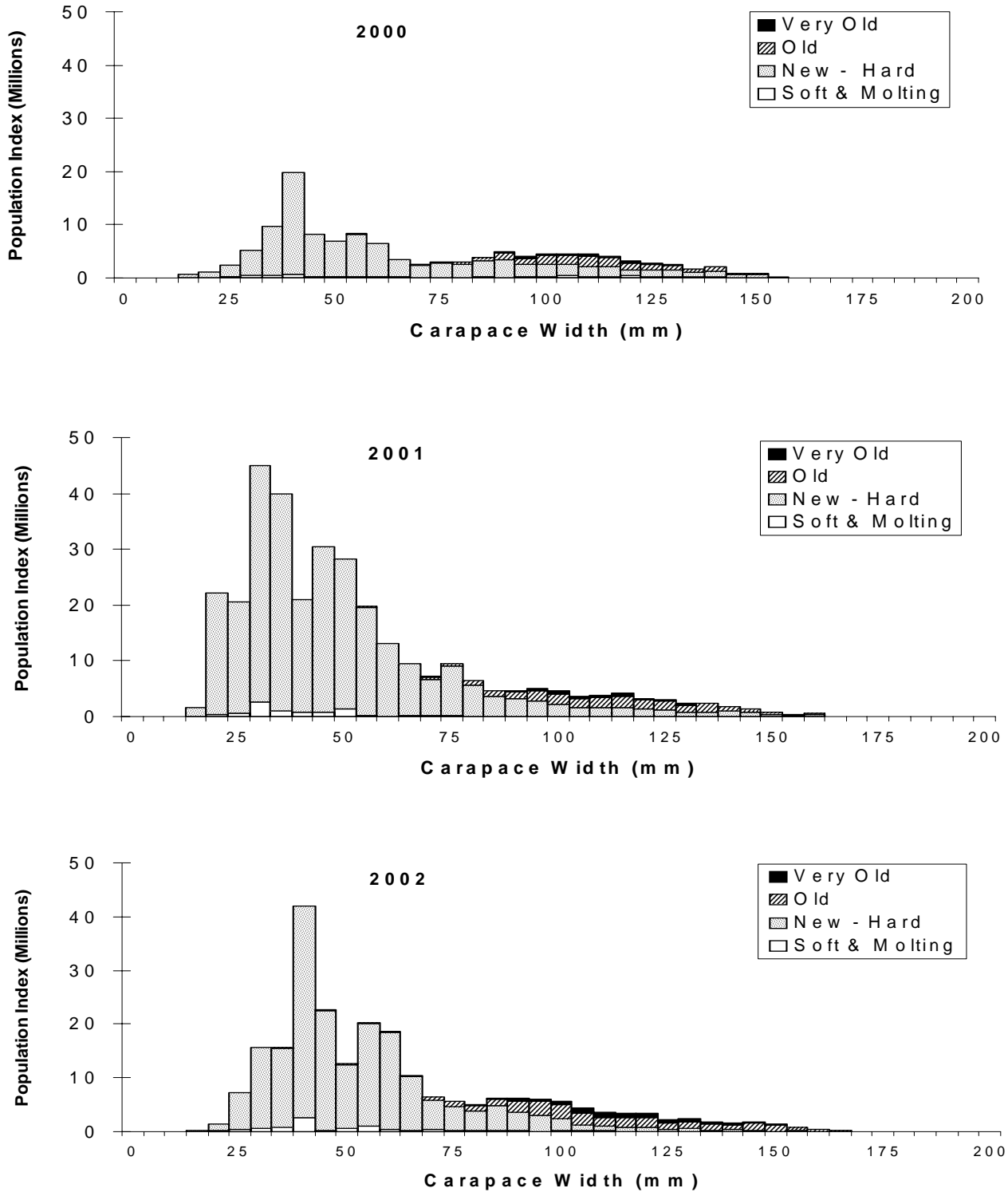


Figure 9. Size-frequency of male Tanner crab (*C. bairdi*) in the Eastern District, by 5 mm width classes, 2000-2002.

## Snow Crab All Districts

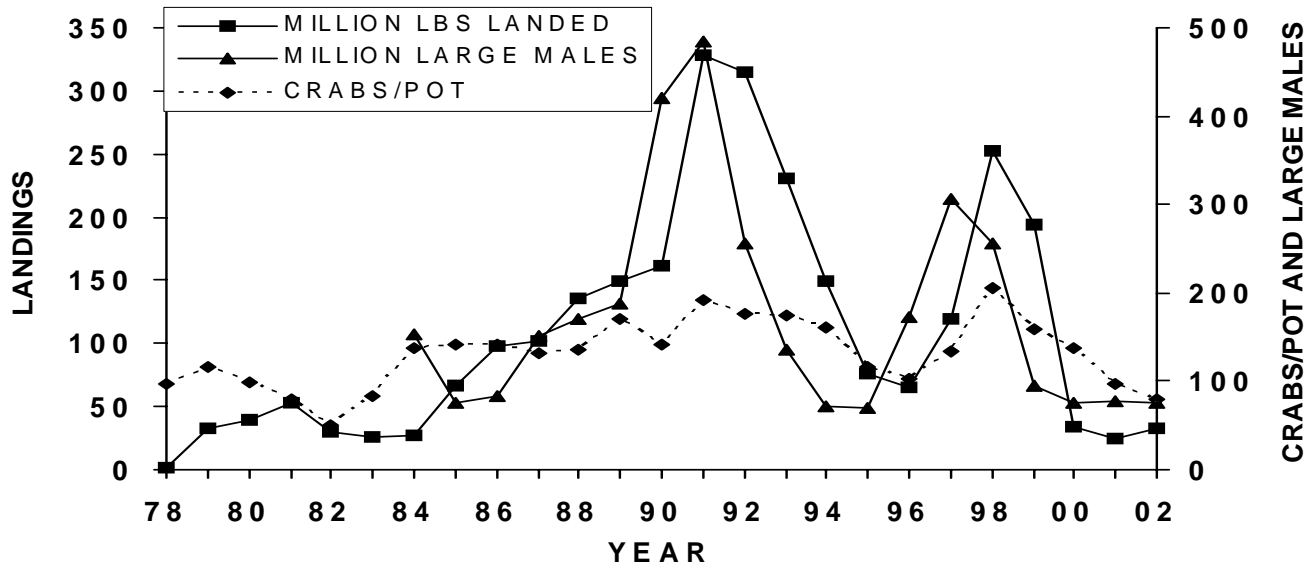


Figure 10. U.S. landings in million of pounds, CPUE as crabs/pot-lift, and the abundance of large male snow crab (*C. opilio*) in millions (all districts combined), estimated from NMFS trawl surveys.

million for small males (<110 mm cw) showed a 29% decrease. The 2002 male size-frequency is dominated by two modes in the 30-70 mm cw range. It is often difficult to follow these modes to larger widths in subsequent survey years. Among legal males, <1% were molting or softshell, 15% were new-hardshells, and 85% were oldshell and older. Most oldshell crab will not molt again during their lifespan. The abundance index (11.3 million) of large ( $\geq 85$  mm cw) females showed a 14% decrease. Among sampled mature females, 13% were softshells; 33% were new-hardshells, of which 97% carried new eggs; and 54% were oldshell and older, of which 95% carried new eggs. Fewer than 1% of mature females sampled had not completed hatching by the time of the survey.

The fishery has been closed since 1996 due to low abundance and it will remain closed in 2002. The estimated spawning biomass for this stock has been below the MSST

since 1997 (Appendix C). The fishery will remain closed this year under the Rebuilding Plan for the Bering Sea *C. bairdi* Stock that has been approved by the Alaska Board of Fisheries and the North Pacific Fishery Management Council.

### Snow Crab (*C. opilio*)

Although the legal minimum size limit for *C. opilio* is 3.1 in cw (78 mm cw), processors currently prefer a minimum size of 4.0 in cw (102 mm). The size ranges for male snow crab used in this report are defined as follows: small, <3.1 in (78 mm); pre-recruits, 3.1-3.9 in cw (78-101 mm); and large  $\geq 4.0$  in cw (102 mm).

Large ( $\geq 102$  mm cw) males had a patchy distribution pattern east of 173°W longitude (Chart 4 and Table 10). The abundance index for large ( $\geq 102$  mm cw) males (Eastern and Western Districts combined) is 76.1 million crabs (Table 5 and Figure 10), which rep-

Table 5. Annual abundance estimates (millions of crabs) for eastern Bering Sea snow crabs (*C. opilio*) from NMFS surveys (all districts combined).<sup>1</sup>

Carapace Width(mm) Width(in)	Males				Females			Grand Total
	Small	Pre-recruit	Large	Total	Small	Large	Total	
	<78 <3.1	78-101 3.1-3.9	≥102 ≥4.0		<50 <2.0	≥50 ≥2.0		
1982	1429.9	573.1	70.2	2073.2	402.7	2255.8	2658.4	4731.6
1983	1292.1	490.7	75.3	1858.1	673.1	1228.5	1901.6	3759.7
1984	912.0	325.5	153.2	1390.6	610.5	581.7	1192.2	2582.8
1985	420.2	127.6	74.9	622.6	258.2	123.5	381.7	1004.3
1986	1039.8	139.2	83.1	1262.0	790.6	422.0	1212.6	2474.6
1987	4070.5	405.2	144.4	4620.0	2903.0	2795.0	5698.0	10318.0
1988	2996.3	470.9	171.0	3638.2	1235.3	2322.7	3558.0	7196.2
1989	2823.7	822.4	187.1	3833.1	1922.8	3790.7	5713.5	9546.6
1990	1834.5	1025.9	420.3	3280.7	1463.3	2798.1	4261.4	7542.1
1991	3277.4	693.8	484.1	4455.3	3289.0	3575.0	6863.9	11319.2
1992	2827.0	331.4	256.4	3414.8	2433.9	1914.3	4348.2	7763.0
1993	5345.9	250.7	135.0	5731.5	3989.8	1982.6	5972.4	11703.9
1994	4027.6	254.9	71.6	4354.0	3417.6	1674.3	5091.8	9445.8
1995	3607.7	479.0	68.8	4155.5	2090.3	2409.4	4499.7	8655.2
1996	1815.2	884.9	171.6	2871.7	1189.0	1364.2	2553.2	5424.9
1997	781.7	709.2	305.7	1796.6	927.9	1383.1	2311.0	4107.6
1998	658.8	356.0	254.6	1269.3	803.0	1160.8	1963.8	3233.1
1999	392.0	124.9	94.2	611.1	315.5	474.3	789.8	1400.9
2000	904.2	131.7	76.1	1111.9	648.4	1480.9	2129.3	3241.2
2001	1509.7	281.1	77.5	1868.4	468.5	1524.5	1992.9	3861.3
2002	487.3	248.0	76.1	811.4	177.0	500.7	677.7	1489.2
East(%) <sup>2</sup>	54.6	48.7	60.3	53.4	48.2	40.1	42.2	48.3
<u>Limits<sup>3</sup></u>								
Lower	230.8	141.3	39.5	500.4	63.2	197.1	275.0	781.0
Upper	743.8	354.8	112.7	1122.5	290.9	804.4	1080.5	2197.4
±%	53	43	48	38	64	61	59	48

<sup>1</sup> Values for 1981-1983, and small and pre-recruit males for 1984, are interpolated from 5 mm width classes.

<sup>2</sup> Percent of size group in Eastern District (east of 173°).

<sup>3</sup> Mean ± 2 standard errors for most recent year.

### Snow Crab Width Frequency All Districts

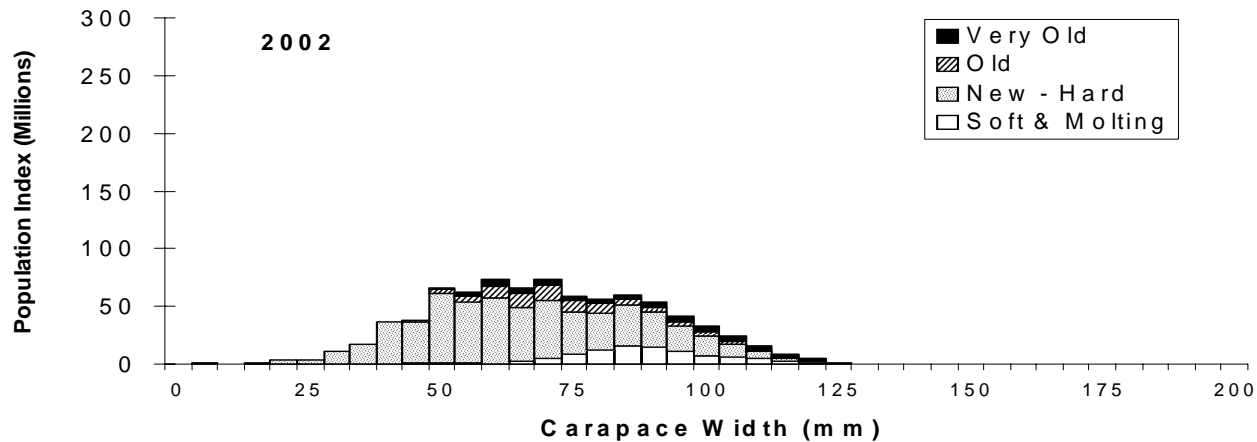
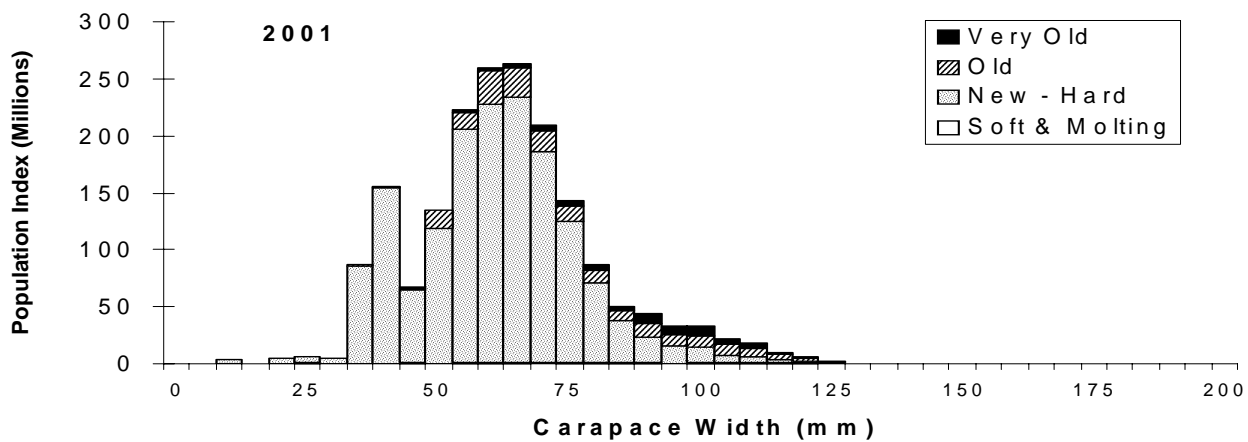
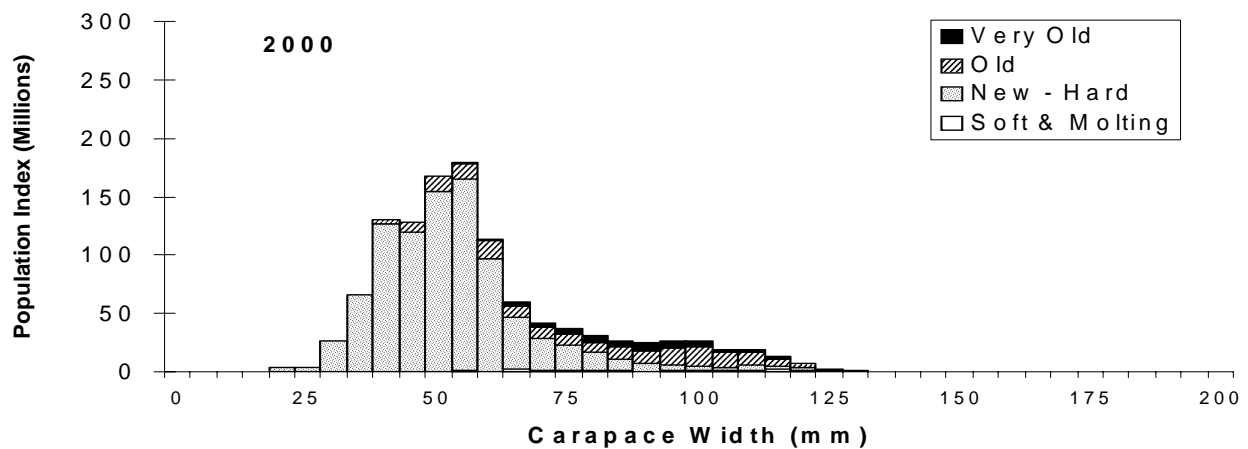


Figure 11. Size-frequency of male snow crab (*C. opilio*), all districts combined, by 5 mm width classes, 2000-2002.



## Hair Crab All Districts

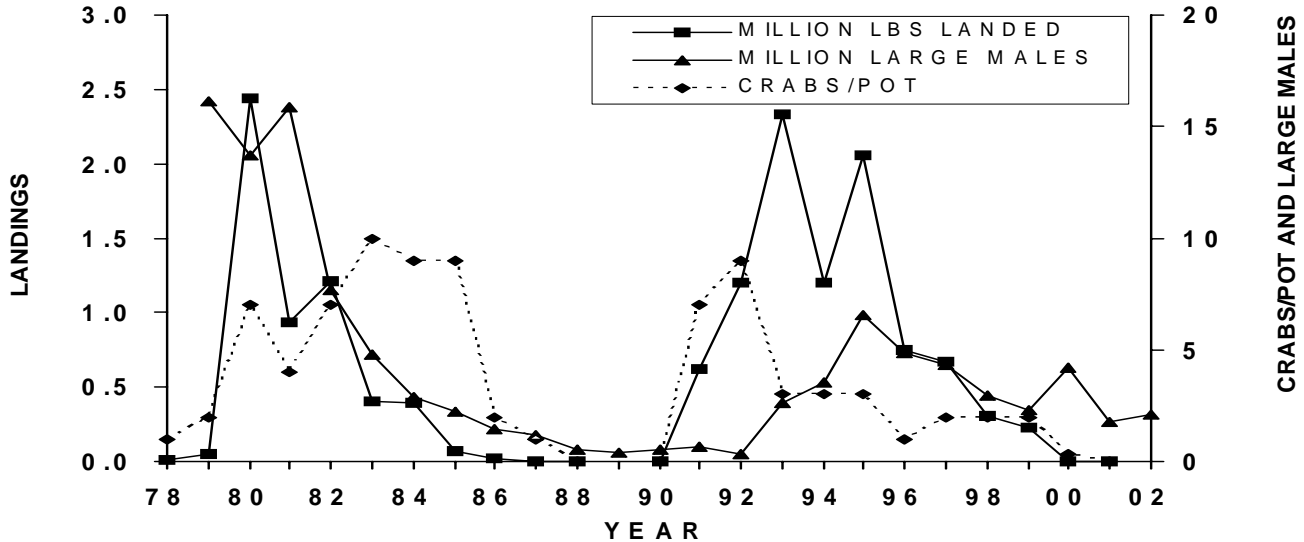


Figure 12. U.S. landings in millions of pounds, CPUE as crabs/pot-lift, and the abundance of large male hair crab (*E. isenbeckii*) in millions (all districts combined), estimated from NMFS trawl surveys.

resents a 2% decrease from last year and is about one-half of the 20-year average (168.8 million). Approximately 60% of these crab were in the Eastern District as compared to 46% in both 2000 and 2001. Pre-recruit males (78-101 mm cw) showed a 12% decrease in abundance. The abundance index (500.7 million) for large females ( $\geq 50$  mm cw) showed a 67% decrease. A strong male size-frequency mode centered at 50-60 mm in 2000 and at 60-70 mm in 2001 could not be followed in 2002 (Figure 11). Among large male crabs, 22% were in molting or softshell condition, 43% were new-hardshells indicating a recent molt, and 35% were oldshell and older. Among sampled mature females, 12% were new-hardshells, of which more than 99% carried new eggs and 88% were oldshells, of which 94% carried new eggs; the remainder had not produced a new clutch.

The spawning biomass (313.3 million lbs) of the eastern Bering Sea stock of *C. opilio*

is below the minimum stock size threshold of 460.8 million lbs as defined in the FMP, a 32% decrease relative to 2001. Expected recruitment of crabs to mature size groups apparently failed. A very restricted fishery was allowed under the current Rebuilding Plan for the Bering Sea *C. opilio* stock. The GHIL for 2003 has been set at 25.61 million lbs (11,617 t) of large crabs ( $\geq 4.0$  in cw) of which 1.92 million lbs are for CDQ fisheries. The fishery will open on January 15, 2003. In 2002, the GHIL was 30.82 million lbs while landings were 32.7 million lbs and the average CPUE for the general and CDQ fisheries was 79 crab/pot-lift.

### Hair Crab (*Erimacrus isenbeckii*)

Historically, hair crab have been concentrated just north of the Alaska Peninsula and near the Pribilof Islands. In recent years, however, abundance of hair crab north of 58° N lat. has been increasing (Chart 5 and Table

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

Carapace Length(mm) Width (in)	Males		Total	Females		Grand Total
	Small	Large		Total	Total	
	<83 <3.25	≥83 ≥3.25				
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	
2000	0.5	4.2	4.7	1.3	6.0	
2001	0.5	1.8	2.3	2.1	4.4	
2002	0.4	2.1	2.4	0.6	3.0	
<u>Limits<sup>1</sup></u>						
Lower	0.1	1.1	1.4	0.2	1.6	
Upper	0.7	3.0	3.5	1.0	4.5	
±%	82	47	43	68	48	

<sup>1</sup> Mean ± 2 standard errors for most recent year.

### Hair Crab Length Frequency All Districts

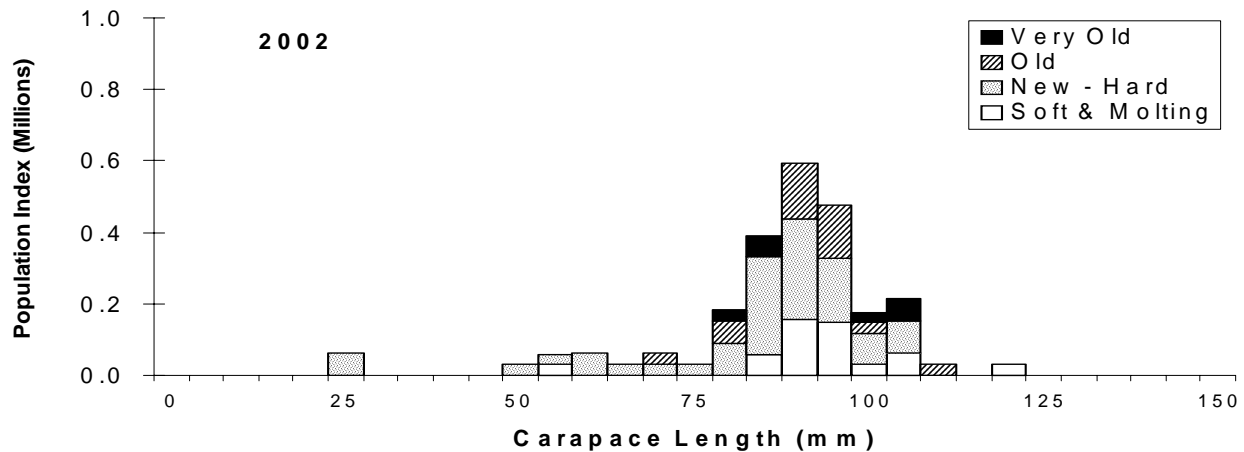
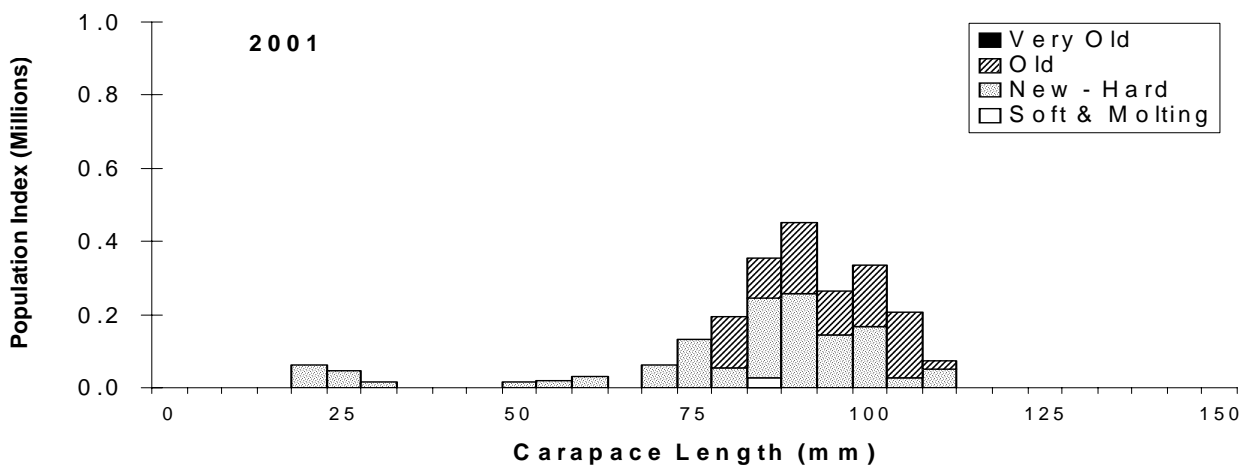
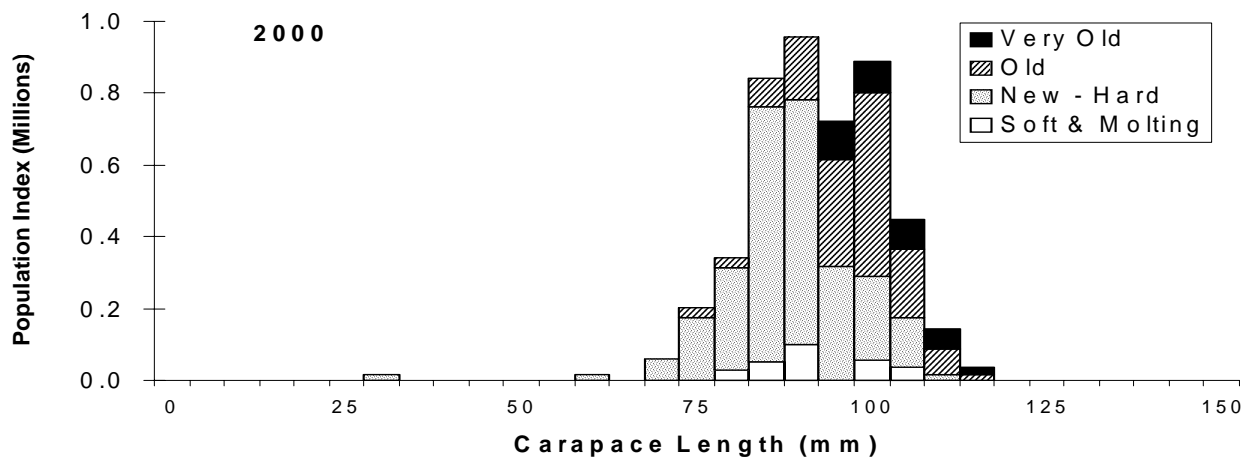


Figure 13. Size-frequency of male hair crab (*E. isenbeckii*), by 5 mm length classes, 2000-2002.

11). Female and small male crabs are infrequently encountered in this survey, therefore, these data provide little understanding of their distribution.

The abundance index for large ( $\geq 3.25$  in cw or  $\geq 83$  mm cl) male hair crab (Table 6 and Figure 12) is 2.1 million, a 17% increase from last year and 70% the 20-year average of 3.0 million. Size-frequencies (Figure 13) indicate little recruitment to the stock. The abundance index of total females is usually unreliable. Forty-five percent of males and 65% 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 of juveniles, 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 (Figure 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. There are also no regulatory districts defined, but management is based on districts defined for red king crab (e.g., Bristol Bay, Pribilof, and Northern Districts). Currently, there are an estimated 1.7 million lbs of large male ( $\geq 83$  mm cw) crabs in the Northern District. No fishery has occurred since 2000.

### **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 Art Kuhr of the F/V *Arcturus* and Norman Bakken and Jeff Boddington of the F/V *Aldebaran* and their crews.

We also wish to thank all of the people who participated in this survey, including P. Cummiskey, K. Gravel, E. Munk, L. Byrne, P. Anderson, D. Pengilly, L. Rugolo, J. Van Atta and K. Swiney. This document was produced by J. Corlew.

## 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 each tow. Area fished (area swept by the trawl) was calculated by multiplying the distance traveled 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 incorporates several factors including 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<sup>1</sup>:** Joints swollen and/or well developed second exoskeleton present. Crab is actively molting or will molt within days.

**Softshell<sup>1</sup>:** 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 organisms. Time since the last molting not definitely known.

<sup>1</sup> 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

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

The Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (FMP) was rewritten in 1998. The FMP does not include hair crab. For the king, Tanner and snow crab stocks that the 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 defined 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 the setting of size limits 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, by policy, were intended to promote stability in the face of variable recruitment, even if it were necessary to forego some harvest.

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, or index, of the total biomass of individuals that are physiologically mature and makes no assumptions as to what proportion of them actually spawn (spawning biomass or SB). Various State harvest strategies do consider estimated spawning biomass and are hence examples of more conservative management (see Zheng et al. 1997).

A fixed fraction of the annual TMB is considered as SY for that year and the average of SYs over a suitable period of time is considered as MSY. In the FMP, 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 (genera *Paralithodes* and *Lithodes*) and that of Bering Sea Tanner crab (*Chionoecetes bairdi*) representative for the 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 crabs. 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 for Tanner and snow crabs.

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 :

$$B_{ij} = N_{ij} * W_{ij} * P_{ij} / V_{ij}$$

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 ( $W * NA/Z$  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.

MSY computations require 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 1970s 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 1983-97, 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 could be sustained by a stock if the fishery were to exploit all mature crabs. In practice, due to constraints noted above, the harvest of legal male crab will be much less than MSY.

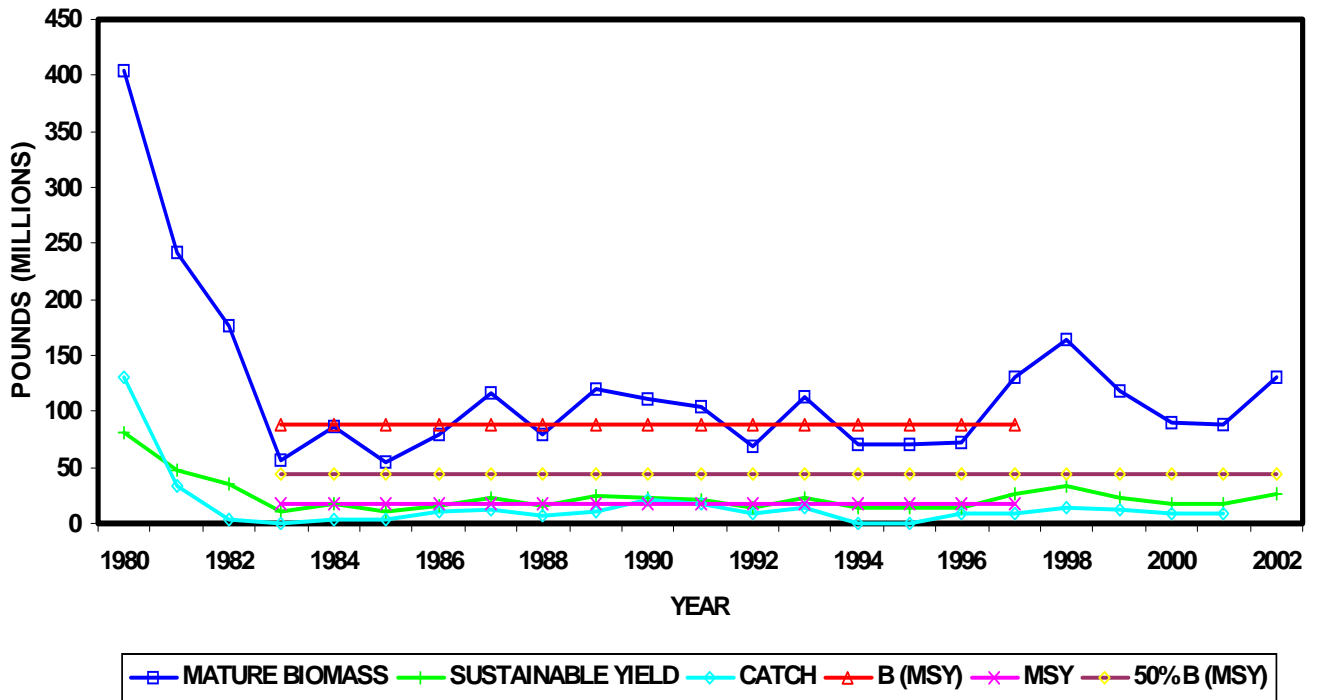
The average of annual sustainable yields (SY) is taken as MSY, and the average of the TMBs, providing these SY estimates are taken as the MSY biomass. A stock is considered overfished if the TMB falls below 50% of the MSY biomass, which is also referred to as the minimum stock size threshold (MSST). The status of surveyed stocks relative to MSST is summarized in Figures C-1 through C-3.

Tanner crab, St. Matthew Island blue king crab, and snow crab are currently considered overfished. A rebuilding plan for Tanner crab was approved by the Alaska Board of Fisheries and approved by the Secretary of Commerce in 1998. Approved rebuilding plans for St. Matthew Island blue king crab and EBS snow crab followed in 1999 and 2000, respectively.

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**BRISTOL BAY RED KING CRAB  
HISTORY RELATIVE TO OVERFISHING**



**PRIBILOF ISLAND RED KING CRAB  
HISTORY RELATIVE TO OVERFISHING**

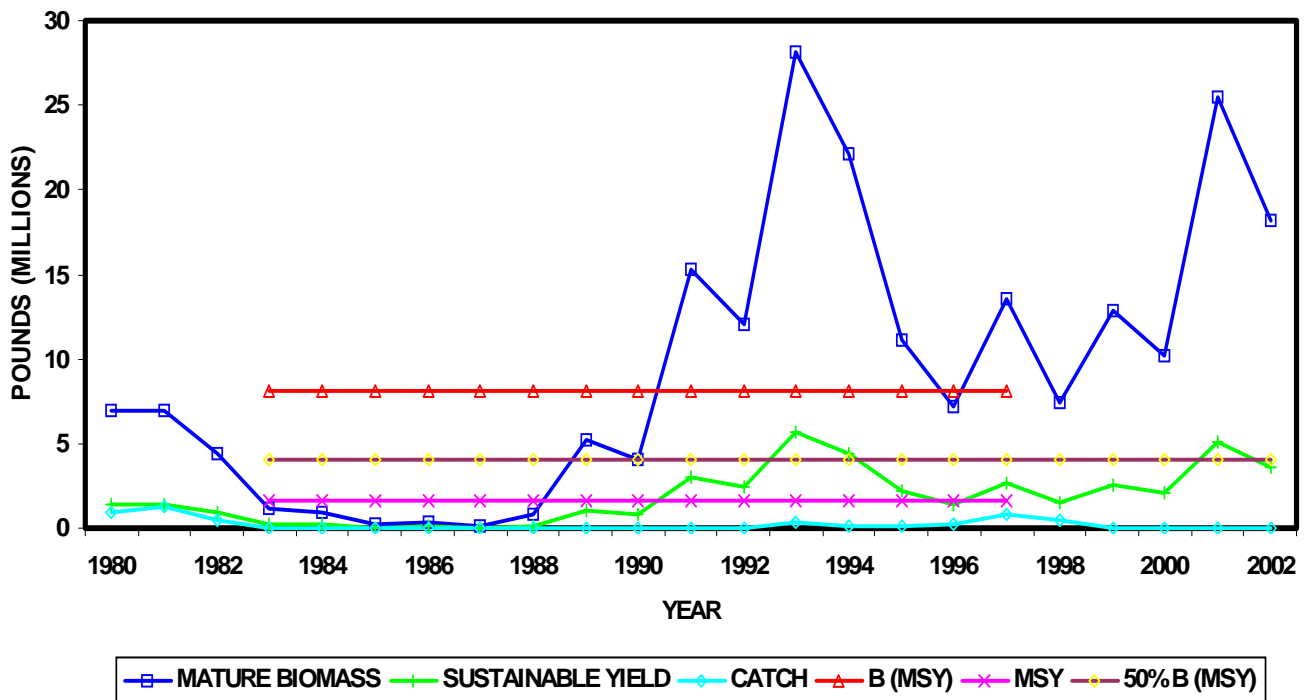
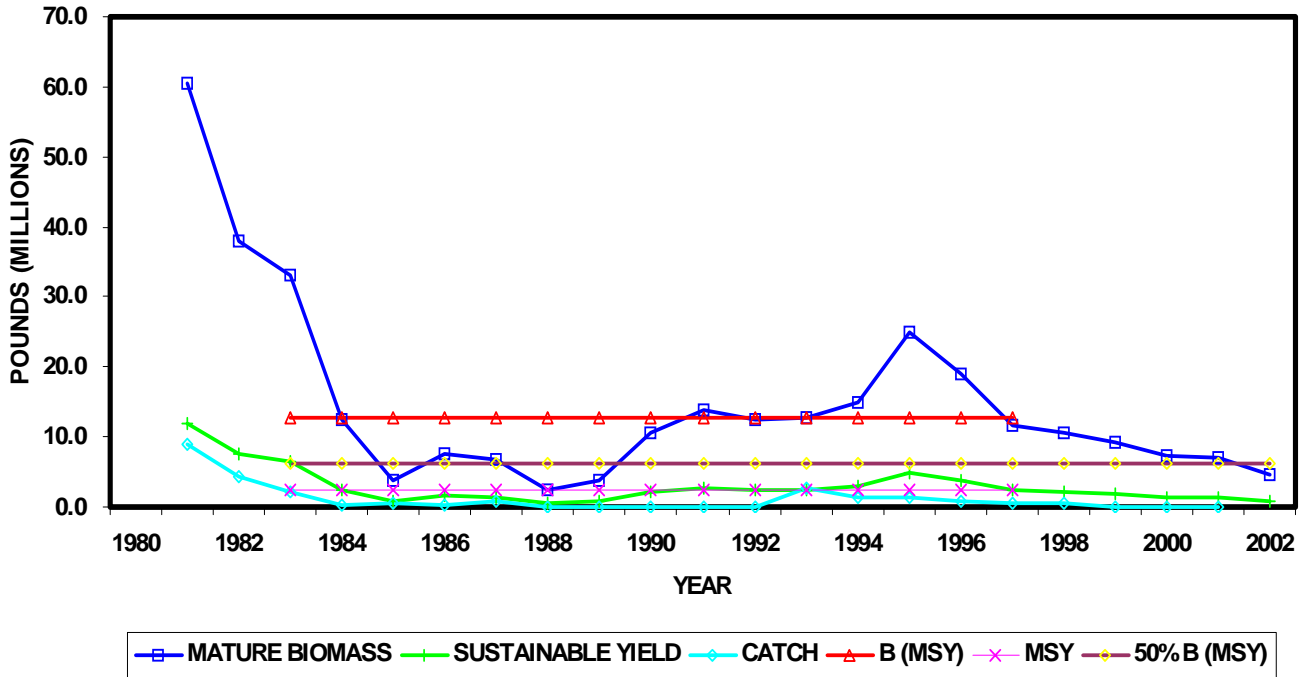


Figure C-1. History of Bristol Bay and Pribilof Islands red king crab fisheries relative to overfishing under the Magnuson-Stevens Fishery Conservation and Management Act. Stocks are considered overfished if mature biomass is below 50% MSY.

PRIBILOF ISLANDS BLUE KING CRAB  
HISTORY RELATIVE TO OVERFISHING



ST. MATTHEW ISLAND BLUE KING CRAB  
HISTORY RELATIVE TO OVERFISHING

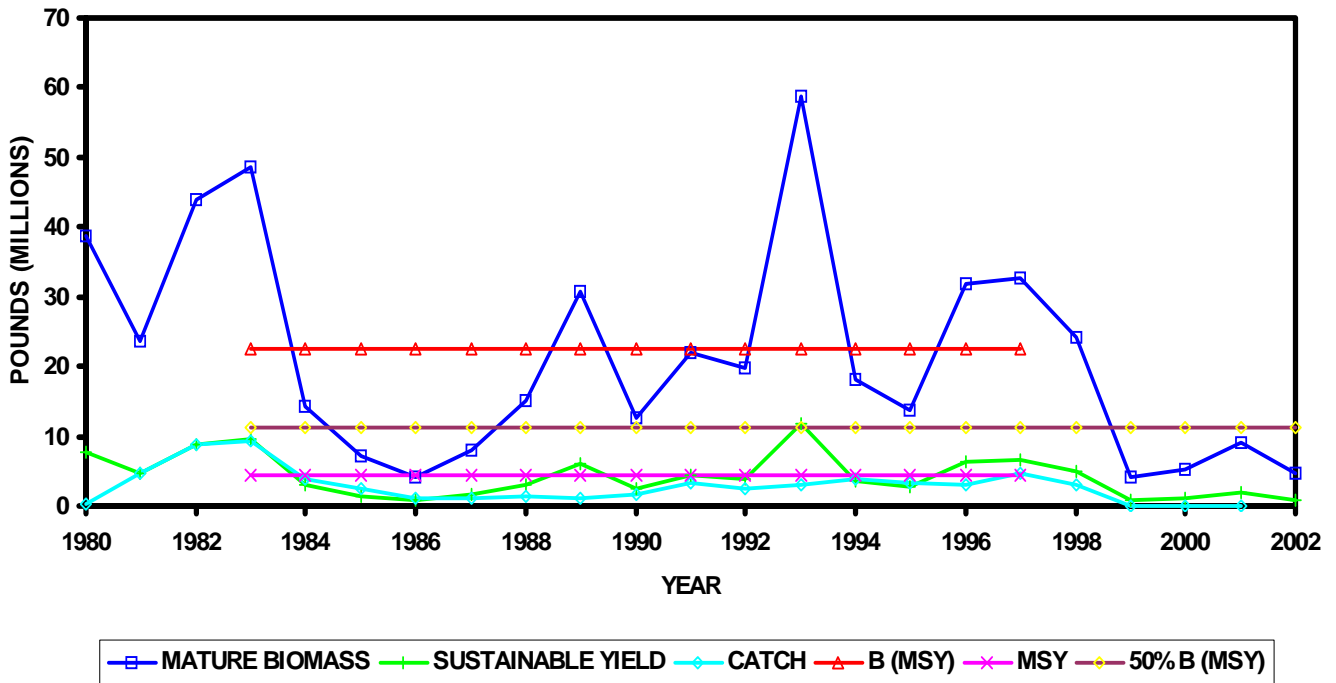
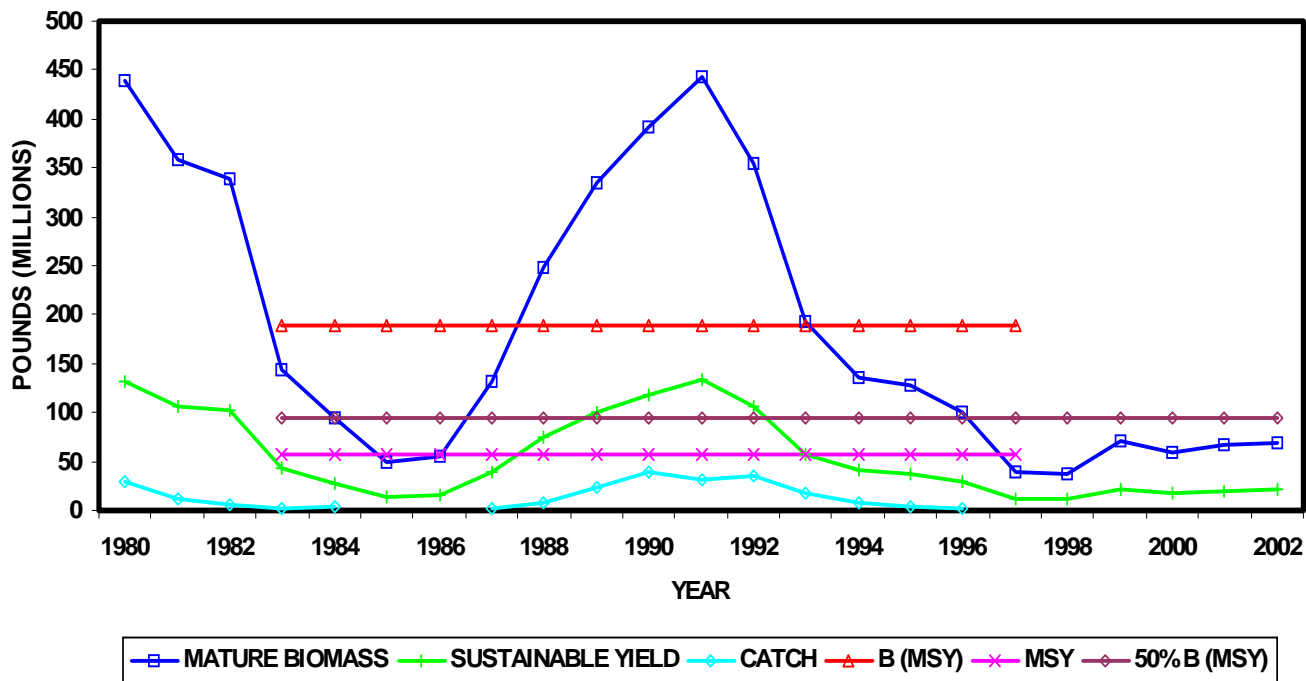


Figure C-2. History of Pribilof Islands and St. Matthew Island blue king crab fisheries relative to overfishing under the Magnuson-Stevens Fishery Conservation and Management Act. The St. Matthew Island stock is considered overfished because mature biomass falls below 50% MSY.

WHOLE EBS TANNER CRAB  
HISTORY RELATIVE TO OVERFISHING



WHOLE EBS SNOW CRAB  
HISTORY RELATIVE TO OVERFISHING

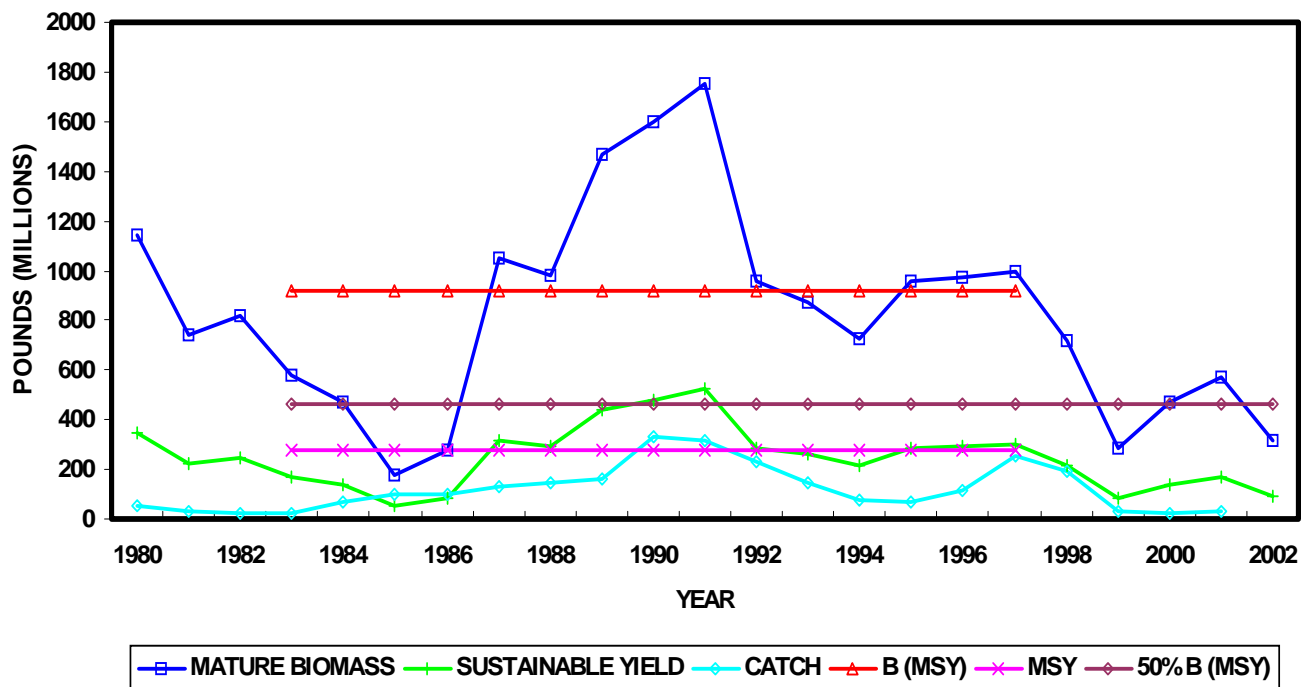
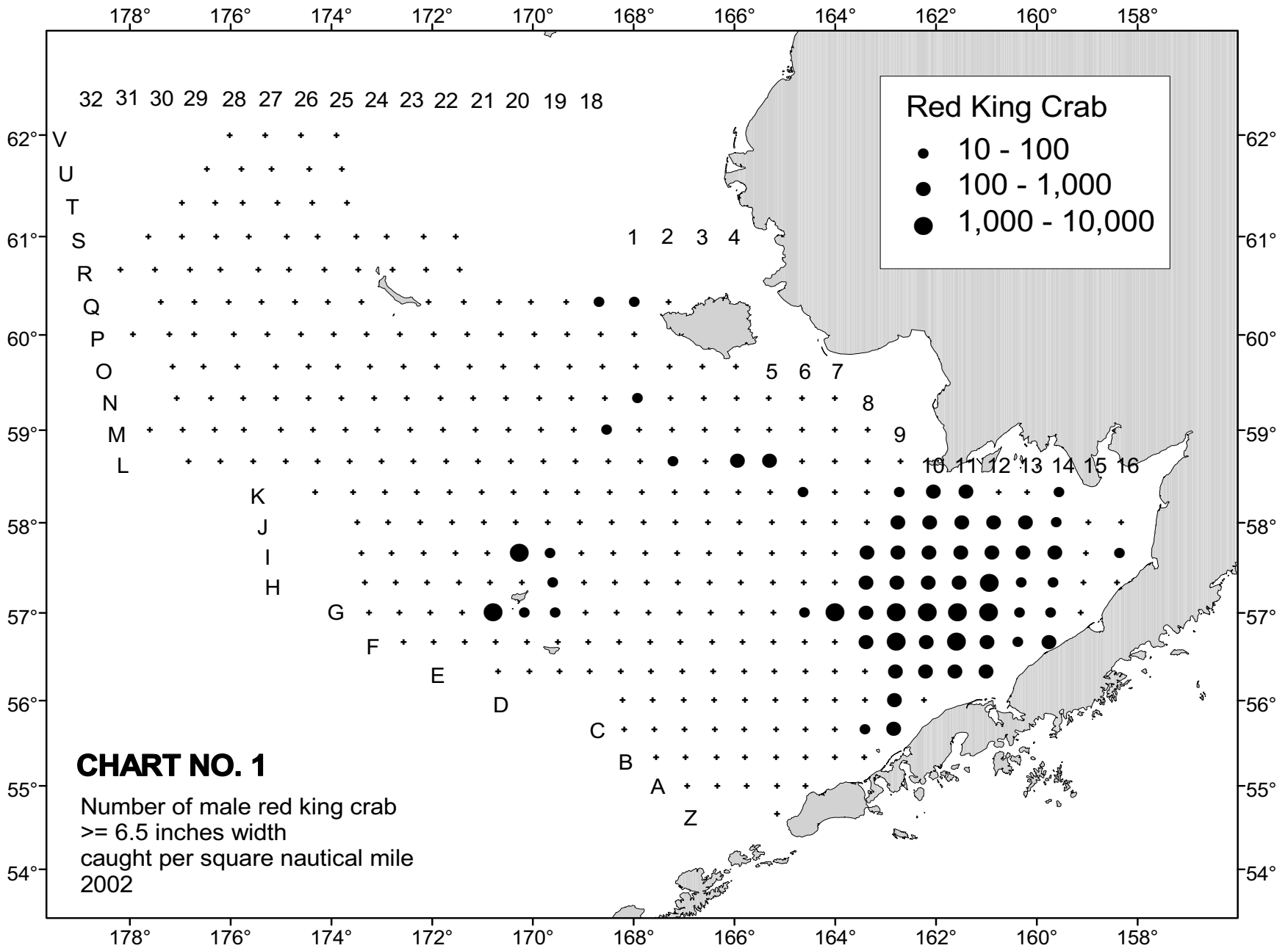
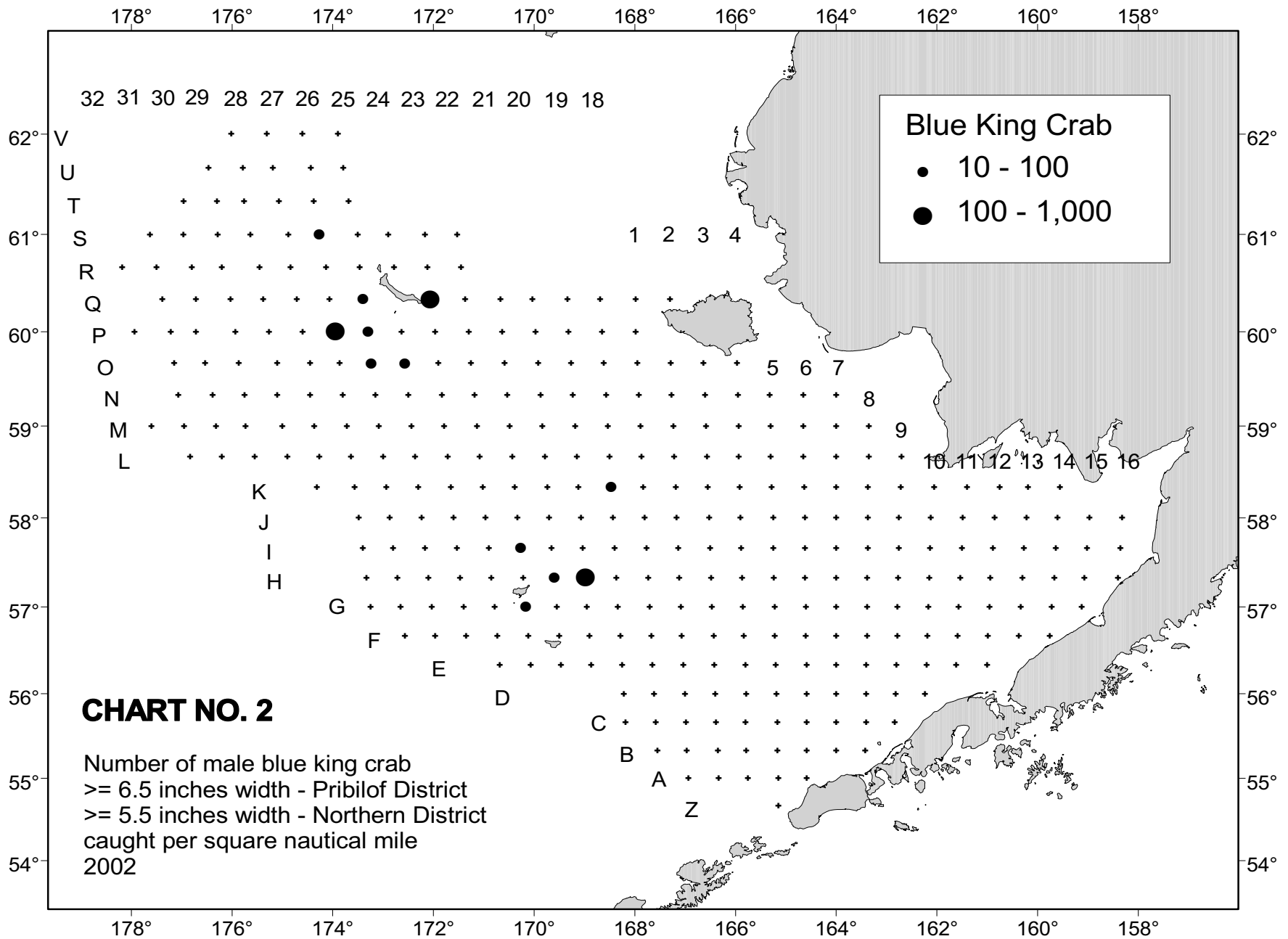
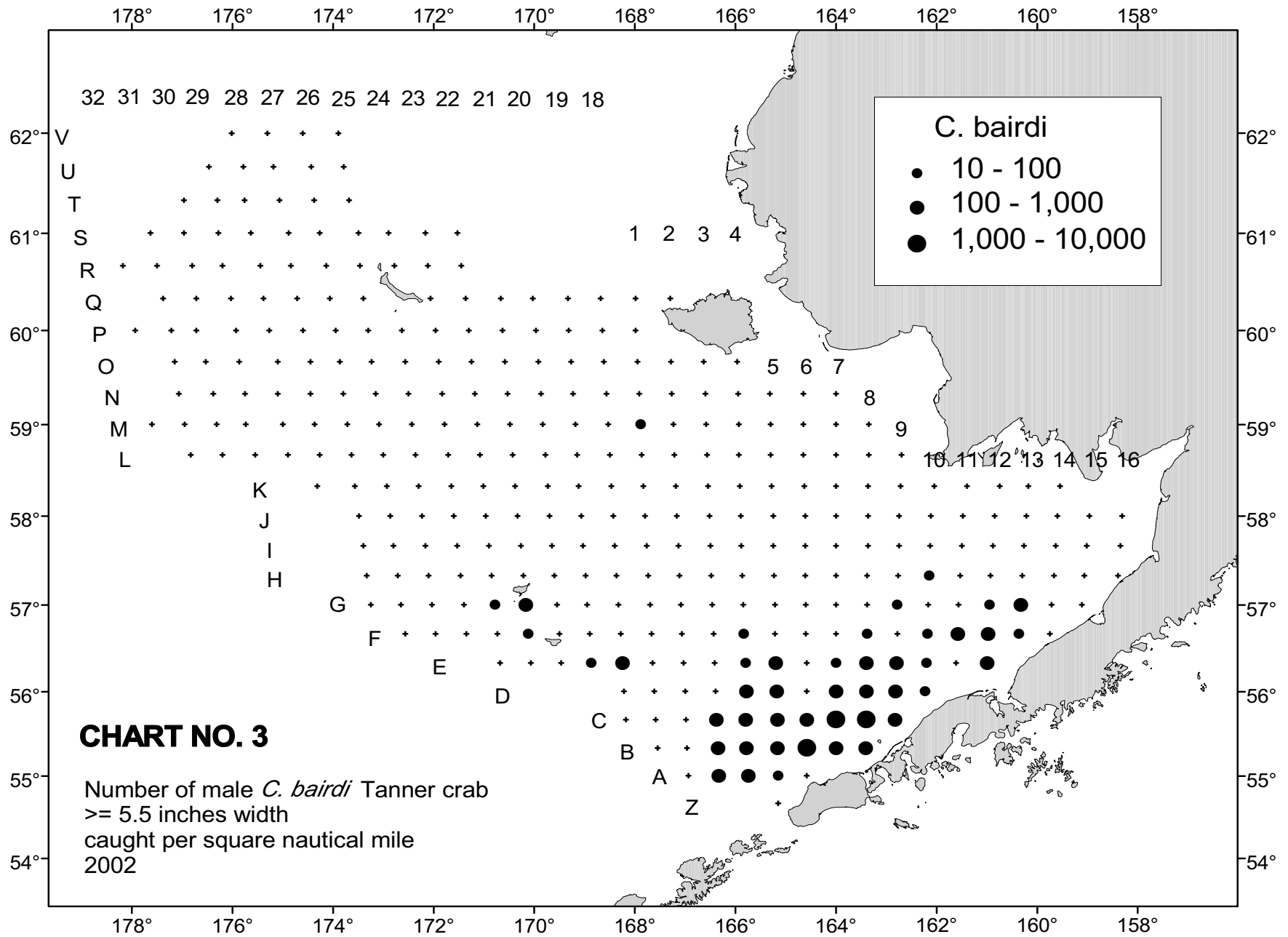


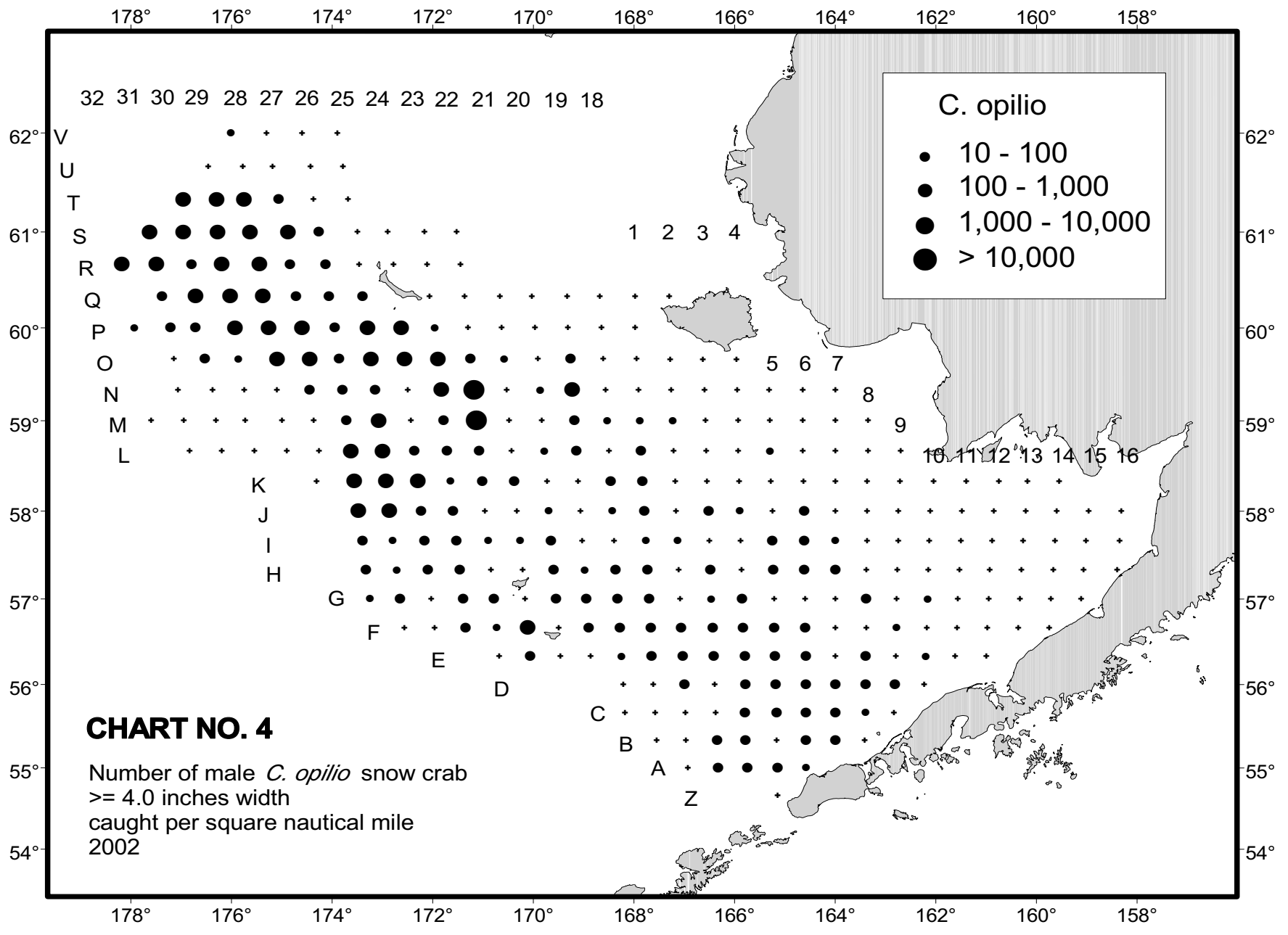
Figure C-3. History of eastern Bering Sea Tanner and snow crab fisheries relative to overfishing under the Magnuson-Stevens Fishery Conservation and Management Act. Both stocks are considered overfished because mature biomass is below 50% MSY.



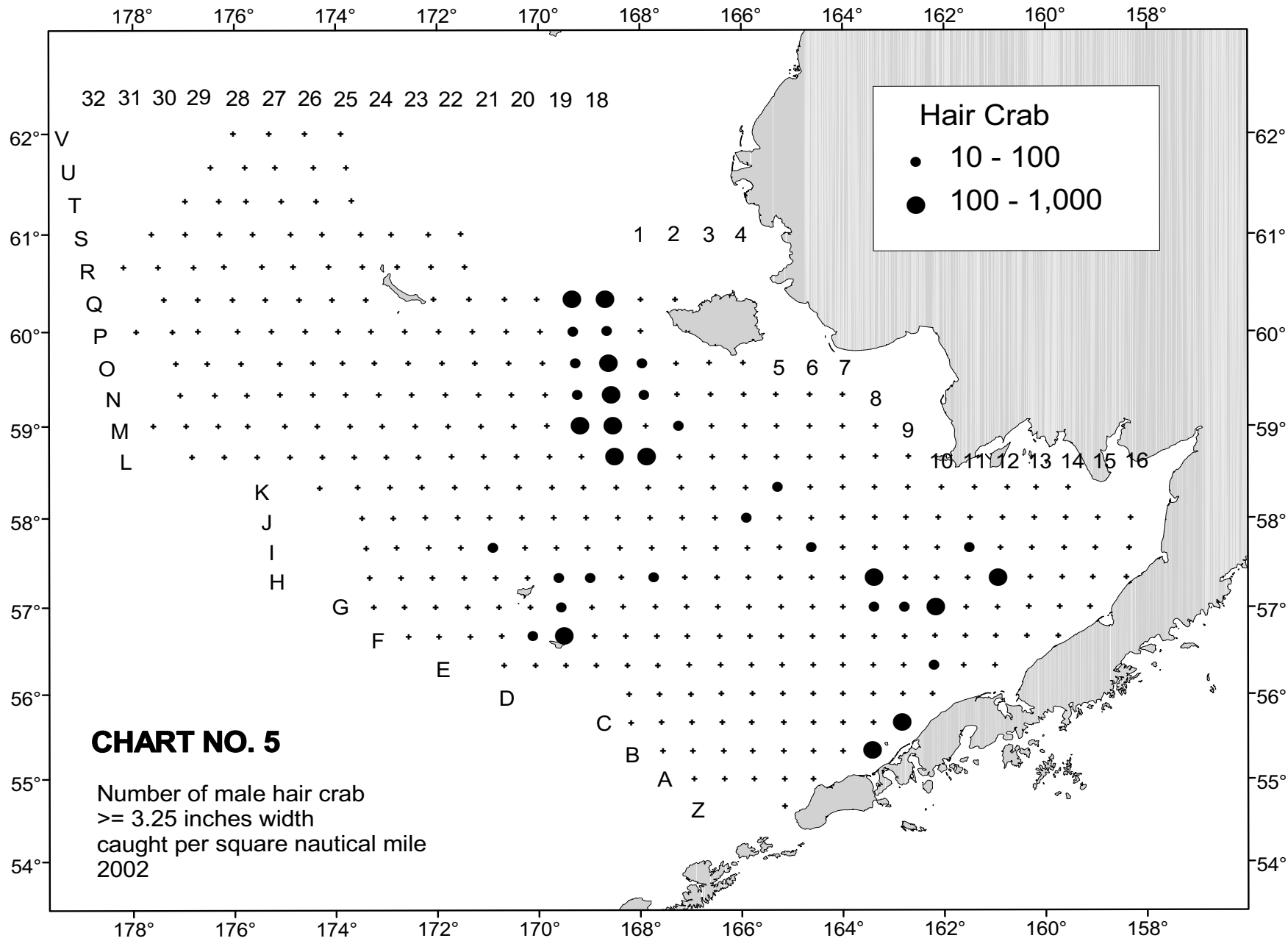




35







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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
C08	6/10/02	55 39.8	163 24.4	42	81	0	0	81	0	0	0	81
C09	6/10/02	55 40.5	162 50.2	25	123	0	0	123	123	0	123	247
D09	6/10/02	55 59.8	162 49.3	41	229	458	0	687	382	0	382	1068
D10	6/10/02	55 59.2	162 15.5	36	0	0	0	0	84	0	84	84
E08	6/13/02	56 19.9	163 24.2	45	0	81	0	81	0	0	0	81
E09	6/9/02	56 19.5	162 48.4	40	152	455	227	834	530	0	530	1364
E10	6/9/02	56 18.5	162 12.9	38	135	1488	14203	15826	1881	13721	15602	31428
E11	6/5/02	56 20.0	161 36.8	33	959	1358	399	2716	4634	80	4714	7430
E12	6/5/02	56 20.4	160 59.8	28	401	482	161	1043	722	0	722	1766
F08	6/13/02	56 39.9	163 23.1	39	831	499	166	1497	0	0	0	1497
F09	6/9/02	56 39.8	162 46.8	37	1012	1245	389	2646	233	0	233	2879
F10	6/9/02	56 40.0	162 15.3	35	237	791	317	1345	1504	79	1583	2928
F11	6/5/02	56 40.1	161 35.1	46	2078	1039	297	3414	1188	0	1188	4602
F12	6/5/02	56 39.8	160 58.4	37	829	415	15131	16374	10776	17878	28653	45027
F13	6/4/02	56 39.9	160 22.7	30	77	307	153	537	77	0	77	614
F14	6/4/02	56 39.9	159 45.5	18	244	569	0	813	244	0	244	1057
G06	6/17/02	56 59.0	164 36.7	36	83	0	0	83	0	0	0	83
G07	6/13/02	56 59.3	163 59.8	36	1404	165	0	1569	0	0	0	1569
G08	6/13/02	56 60.0	163 24.0	34	998	499	0	1498	0	0	0	1498
G09	6/9/02	57 0.1	162 47.3	31	2005	4234	1783	8022	297	0	297	8319
G10	6/9/02	56 59.7	162 10.1	31	1400	494	82	1977	247	0	247	2224
G11	6/5/02	57 0.1	161 34.1	36	1061	1143	327	2531	1224	163	1388	3918
G12	6/5/02	57 0.3	160 57.4	32	1784	2637	776	5196	4963	78	5041	10237
G13	6/4/02	57 0.1	160 20.2	33	75	679	377	1132	1434	0	1434	2566
G14	6/4/02	56 59.7	159 44.6	29	77	231	77	385	1387	0	1387	1772
G20	7/4/02	56 60.0	169 32.9	31	82	0	0	82	0	0	0	82
G21	7/4/02	57 0.8	170 11.0	35	173	0	0	173	0	0	0	173
G21	7/4/02	57 9.3	169 53.2	25	0	0	0	0	247	0	247	247
G22	7/4/02	57 7.0	170 27.9	26	4940	0	84	5024	502	0	502	5526
H08	6/13/02	57 20.1	163 24.0	27	207	207	0	414	0	0	0	414
H09	6/9/02	57 20.1	162 46.3	25	473	0	0	473	158	0	158	631
H10	6/9/02	57 20.1	162 9.1	26	427	512	341	1280	427	0	427	1707
H11	6/5/02	57 19.9	161 33.3	28	804	536	2234	3574	2770	3842	6612	10185

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
H12	6/5/02	57 20.2	160 56.7	31	1099	628	549	2276	4239	0	4239	6515
H13	6/4/02	57 20.1	160 18.1	32	78	390	156	624	312	0	312	935
H14	6/4/02	57 19.9	159 40.6	29	75	150	75	299	898	0	898	1197
H15	6/4/02	57 19.9	159 4.1	26	0	0	874	874	0	238	238	1113
H20	7/4/02	57 19.8	169 36.6	32	173	0	0	173	520	0	520	694
I08	6/13/02	57 40.7	163 23.0	23	164	82	0	246	0	0	0	246
I09	6/9/02	57 40.1	162 45.7	22	381	152	0	533	229	0	229	762
I10	6/9/02	57 40.2	162 9.1	24	164	246	82	491	246	82	327	818
I11	6/6/02	57 40.4	161 28.7	27	317	396	1504	2217	2850	1979	4829	7045
I12	6/5/02	57 40.0	160 52.9	29	405	243	324	971	567	0	567	1538
I13	6/3/02	57 40.2	160 16.1	27	242	162	162	566	404	0	404	970
I14	6/3/02	57 39.8	159 37.8	25	234	234	390	857	467	390	857	1714
I15	6/4/02	57 40.0	159 0.1	25	0	0	0	0	0	0	0	0
I16	6/2/02	57 40.0	158 23.0	19	82	0	0	82	82	0	82	164
I20	6/26/02	57 40.2	169 38.8	37	85	0	0	85	0	0	0	85
I21	6/26/02	57 30.3	169 58.5	36	2870	0	0	2870	698	0	698	3569
I21	6/26/02	57 50.0	169 59.2	37	88	0	0	88	0	0	0	88
I22	6/30/02	57 40.1	170 53.1	44	0	0	0	0	83	0	83	83
J05	6/14/02	58 0.2	165 15.8	26	0	0	0	0	76	0	76	76
J06	6/14/02	58 0.4	164 37.3	23	0	76	0	76	152	0	152	228
J09	6/6/02	58 0.1	162 45.3	20	241	0	0	241	161	0	161	402
J10	6/6/02	57 60.0	162 6.8	19	232	155	464	851	155	0	155	1006
J11	6/6/02	57 59.7	161 29.0	28	163	82	2121	2366	897	1795	2692	5058
J12	6/6/02	58 0.3	160 50.8	23	582	83	83	748	249	0	249	998
J13	6/3/02	57 59.4	160 14.0	26	454	605	303	1362	530	227	757	2118
J14	6/3/02	58 0.1	159 37.9	21	74	0	6456	6530	297	6307	6604	13134
J15	6/2/02	57 59.9	158 58.3	20	0	0	80	80	80	160	241	321
J16	6/2/02	57 59.9	158 19.7	17	0	0	0	0	0	160	160	160
J21	6/26/02	57 59.9	170 19.6	38	0	81	0	81	0	0	0	81
K06	6/14/02	58 19.9	164 39.5	22	80	0	0	80	0	0	0	80
K08	6/14/02	58 20.6	163 23.2	18	0	76	0	76	0	0	0	76
K09	6/6/02	58 19.9	162 42.7	16	84	0	0	84	0	0	0	84
K10	6/6/02	58 20.0	162 3.8	24	155	155	155	464	77	0	77	541

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
K11	6/6/02	58 13.5	161 33.3	19	608	1217	0	1825	0	0	0	1825
K12	6/6/02	58 17.1	160 48.3	15	0	149	299	448	0	0	0	448
K13	6/3/02	58 16.5	159 58.0	22	0	0	77	77	0	0	0	77
K14	6/3/02	58 20.0	159 33.4	13	77	0	0	77	77	0	77	155
L02	6/23/02	58 40.4	167 12.7	22	81	0	0	81	0	0	0	81
L04	6/15/02	58 39.7	165 55.8	18	165	0	82	247	0	0	0	247
L05	6/8/02	58 40.1	165 18.0	19	167	0	0	167	83	0	83	250
M03	6/15/02	59 0.2	166 34.9	17	0	0	0	0	79	0	79	79
M18	6/25/02	58 59.1	168 31.8	23	81	0	0	81	0	0	0	81
M19	6/25/02	58 59.8	169 11.2	27	0	0	0	0	81	0	81	81
N01	6/23/02	59 19.7	167 55.2	20	78	0	0	78	0	0	0	78
N02	6/23/02	59 20.3	167 16.2	15	0	0	82	82	82	0	82	165
N03	6/15/02	59 20.1	166 36.6	13	0	0	0	0	78	0	78	78
O01	6/23/02	59 39.7	167 57.6	18	0	79	79	159	0	0	0	159
O18	6/24/02	59 40.1	168 37.5	19	0	81	0	81	0	0	0	81
P18	6/24/02	59 59.6	168 39.6	19	0	0	0	0	80	0	80	80
Q01	6/24/02	60 19.2	167 59.1	15	80	0	0	80	0	0	0	80
Q18	6/24/02	60 18.8	168 40.8	18	82	0	0	82	82	0	82	164

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*)**

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL		
					Large	Medium	Small	Total	Large	Small	Total			
F20	7/3/02	56	40.0	169	26.7	40	0	0	0	0	326	0	326	326
G20	7/3/02	57	9.7	169	19.1	38	0	0	0	0	261	0	261	261
G20	7/3/02	56	50.5	169	18.4	42	0	0	0	0	179	0	179	179
G20	7/4/02	56	60.0	169	32.9	31	0	0	0	0	82	0	82	82
G21	7/4/02	57	9.3	169	53.2	25	82	0	0	82	0	0	0	82
H19	7/3/02	57	19.6	168	58.7	36	404	0	0	404	4361	0	4361	4764
H19	7/3/02	57	29.9	168	44.1	37	0	0	0	0	332	0	332	332
H20	6/26/02	57	29.7	169	23.5	37	79	0	0	79	0	0	0	79
H20	7/4/02	57	19.8	169	36.6	32	87	87	0	173	0	0	0	173
I19	6/25/02	57	49.8	168	44.6	36	0	0	0	0	0	82	82	82
I21	6/26/02	57	30.3	169	58.5	36	155	0	0	155	0	0	0	155
K18	6/25/02	58	19.7	168	28.0	33	81	0	0	81	0	0	0	81

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*)**

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
O24	7/12/02	59 40.1	172 34.4	24	86	0	0	86	0	0	0	86
O25	7/13/02	59 49.4	172 54.0	42	243	0	0	243	0	0	0	243
O26	7/15/02	59 40.3	173 50.6	55	77	0	0	77	0	0	0	77
P24	7/13/02	59 59.8	172 38.4	34	245	82	0	327	327	0	327	653
P25	7/13/02	60 0.3	173 18.6	39	158	79	79	316	0	0	0	316
P26	7/14/02	60 9.6	173 34.4	39	754	0	0	754	0	0	0	754
Q19	6/24/02	60 20.4	169 20.2	22	0	0	77	77	0	0	0	77
Q23	6/28/02	60 20.0	172 4.1	30	80	0	80	159	0	0	0	159
Q23	7/13/02	60 10.1	172 20.0	30	328	82	0	411	0	0	0	411
Q25	7/13/02	60 10.5	173 1.1	31	84	167	251	501	84	84	167	668
Q25	7/13/02	60 19.9	173 25.7	32	470	157	313	939	0	0	0	939
R24	7/13/02	60 40.2	172 48.0	12	0	202	0	202	0	0	0	202
R25	7/13/02	60 40.6	173 29.6	34	79	0	0	79	0	0	0	79
S23	6/28/02	60 59.7	172 10.3	33	0	83	0	83	0	0	0	83
S24	7/14/02	60 59.5	172 49.2	34	0	0	0	0	138	0	138	138
S26	7/16/02	61 0.3	174 11.2	43	79	0	0	79	0	0	0	79
U25	7/14/02	61 40.0	173 40.1	36	0	84	0	84	0	0	0	84
V26	7/15/02	61 60.0	174 29.8	38	0	0	0	0	0	79	79	79

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*)**

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
A02	6/21/02	55 0.4	166 56.3	83	0	496	13803	14299	1219	20969	22188	36486
A03	6/12/02	54 59.9	166 19.1	77	220	661	3157	4039	1028	3304	4332	8371
A04	6/12/02	54 59.8	165 44.6	69	144	288	6414	6846	649	14485	15134	21980
A04	6/12/02	54 50.3	165 29.9	81	84	168	23248	23500	0	25889	25889	49389
A05	6/12/02	54 59.8	165 8.9	59	74	591	1035	1700	74	296	370	2070
A06	6/12/02	55 1.3	164 35.4	32	0	0	165	165	0	0	0	165
B01	6/21/02	55 20.6	167 33.5	79	0	0	5987	5987	0	8904	8904	14891
B02	6/21/02	55 20.5	166 58.4	74	0	87	2780	2866	0	3301	3301	6167
B03	6/18/02	55 19.6	166 20.8	71	157	1260	3859	5276	2362	3386	5749	11025
B04	6/18/02	55 19.8	165 46.7	63	327	1225	5880	7431	0	6125	6125	13556
B05	6/12/02	55 20.0	165 9.9	59	289	361	4041	4690	0	5845	5845	10535
B06	6/12/02	55 20.8	164 33.3	53	3600	560	560	4720	800	400	1200	5921
B07	6/10/02	55 19.8	164 0.3	39	448	149	895	1492	373	597	970	2462
B08	6/10/02	55 19.7	163 24.3	26	723	3213	2570	6506	161	723	884	7390
C01	6/21/02	55 39.9	167 35.1	72	0	80	477	557	0	716	716	1273
C02	6/21/02	55 40.4	166 59.3	71	0	86	9949	10035	257	1630	1887	11922
C03	6/18/02	55 39.9	166 23.5	67	162	162	3725	4049	1215	729	1944	5993
C04	6/18/02	55 39.9	165 48.2	62	376	1252	14594	16221	0	18485	18485	34706
C05	6/12/02	55 40.2	165 10.8	57	289	578	8017	8884	0	10762	10762	19646
C06	6/12/02	55 40.1	164 35.0	50	481	321	401	1203	481	481	962	2165
C07	6/10/02	55 41.3	164 0.7	49	1278	677	5938	7893	977	8945	9922	17815
C08	6/10/02	55 39.8	163 24.4	42	2423	1857	2342	6622	565	2261	2826	9448
C09	6/10/02	55 40.5	162 50.2	25	370	247	864	1481	0	0	0	1481
C18	7/8/02	55 40.1	168 11.0	72	0	0	1879	1879	0	2725	2725	4605
D01	6/21/02	56 0.7	167 37.0	70	0	0	576	576	0	906	906	1482
D02	6/21/02	56 3.2	167 1.3	71	0	658	10361	11019	1233	13650	14883	25902
D03	6/18/02	55 59.5	166 24.1	66	276	414	414	1104	2346	2346	4692	5796
D04	6/18/02	55 59.7	165 46.5	56	548	1424	22134	24107	1730	17302	19032	43138
D05	6/17/02	55 59.8	165 11.2	50	227	454	3025	3706	302	3554	3857	7562
D06	6/17/02	55 59.3	164 36.8	49	0	410	8666	9076	164	5255	5419	14495
D07	6/10/02	56 0.3	163 59.3	47	670	1206	11260	13136	536	14075	14611	27747
D08	6/10/02	56 0.3	163 24.4	46	366	1098	5271	6736	0	4905	4905	11641
D09	6/10/02	55 59.8	162 49.3	41	153	0	382	534	305	305	611	1145

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
D10	6/10/02	55 59.2	162 15.5	36	84	337	421	842	421	337	758	1600
D18	7/8/02	55 58.2	168 12.9	79	0	243	1298	1541	0	568	568	2109
E01	6/21/02	56 20.3	167 39.2	68	0	76	3028	3104	151	5980	6132	9236
E02	6/21/02	56 20.1	167 1.6	60	0	810	4782	5592	729	2674	3404	8996
E03	6/16/02	56 19.9	166 25.4	55	0	314	1650	1965	550	786	1336	3300
E04	6/16/02	56 19.5	165 48.6	48	81	650	1380	2111	244	1380	1624	3735
E05	6/17/02	56 19.6	165 11.7	45	160	239	3670	4069	638	2792	3431	7499
E06	6/17/02	56 19.6	164 34.3	45	0	644	1288	1932	80	322	402	2334
E07	6/13/02	56 20.3	164 0.5	45	78	623	467	1167	0	545	545	1712
E08	6/13/02	56 19.9	163 24.2	45	325	162	2274	2761	81	1300	1381	4142
E09	6/9/02	56 19.5	162 48.4	40	303	379	303	985	0	227	227	1212
E10	6/9/02	56 18.5	162 12.9	38	78	626	548	1252	78	157	235	1487
E11	6/5/02	56 20.0	161 36.8	33	0	240	479	719	0	0	0	719
E12	6/5/02	56 20.4	160 59.8	28	482	241	241	963	0	0	0	963
E18	7/8/02	56 20.0	168 14.7	81	165	1485	23881	25531	82	42032	42114	67645
E19	7/8/02	56 20.1	168 52.8	69	79	237	39361	39677	233	72212	72446	112123
E20	7/8/02	56 20.5	169 29.2	76	0	90	11014	11104	0	15612	15612	26716
E21	7/8/02	56 20.2	170 3.1	57	0	662	12336	12998	0	9774	9774	22772
E22	7/8/02	56 19.8	170 40.8	64	0	86	2763	2849	0	2331	2331	5180
F01	6/21/02	56 40.5	167 39.8	54	0	0	2074	2074	0	1755	1755	3828
F02	6/22/02	56 40.4	167 4.2	50	0	82	6750	6832	1070	4528	5598	12430
F03	6/16/02	56 39.5	166 26.3	44	0	236	9522	9758	79	5745	5823	15581
F04	6/16/02	56 39.9	165 51.2	40	78	234	5543	5855	781	1952	2732	8587
F05	6/17/02	56 40.5	165 12.6	39	0	548	157	705	0	78	78	783
F06	6/17/02	56 40.0	164 36.1	39	0	165	82	247	0	0	0	247
F07	6/13/02	56 39.7	164 0.1	39	0	272	182	454	363	91	454	908
F08	6/13/02	56 39.9	163 23.1	39	83	83	915	1081	0	166	166	1247
F09	6/9/02	56 39.8	162 46.8	37	0	311	389	700	0	0	0	700
F10	6/9/02	56 40.0	162 15.3	35	79	237	237	554	0	79	79	633
F11	6/5/02	56 40.1	161 35.1	46	148	297	594	1039	0	0	0	1039
F12	6/5/02	56 39.8	160 58.4	37	666	750	250	1666	250	167	416	2082
F13	6/4/02	56 39.9	160 22.7	30	77	153	153	384	0	77	77	460
F14	6/4/02	56 39.9	159 45.5	18	0	0	81	81	0	0	0	81



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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
F18	7/3/02	56 39.9	168 17.0	56	0	81	3089	3170	0	3007	3007	6177
F19	7/3/02	56 40.1	168 54.8	53	0	0	977	977	0	1058	1058	2035
F19	7/3/02	56 49.9	168 38.2	51	0	85	6254	6339	0	6254	6254	12593
F20	7/3/02	56 40.0	169 26.7	40	0	163	1791	1954	0	489	489	2443
F21	7/4/02	56 40.4	170 7.9	51	176	616	5367	6159	3255	3871	7127	13285
F21	7/4/02	56 49.9	169 53.2	38	0	496	1241	1738	0	579	579	2317
F22	7/8/02	56 40.4	170 43.5	60	0	393	15440	15832	492	14258	14750	30582
F23	7/7/02	56 40.0	171 21.4	63	0	85	1792	1877	341	3071	3413	5289
F24	7/7/02	56 40.0	171 57.8	67	0	0	1602	1602	0	445	445	2047
F25	7/7/02	56 40.5	172 33.9	71	0	0	1604	1604	0	1520	1520	3123
G01	6/22/02	57 0.1	167 41.5	40	0	0	3861	3861	164	1725	1889	5750
G02	6/22/02	56 60.0	167 5.8	38	0	0	1194	1194	0	239	239	1433
G03	6/16/02	57 0.0	166 28.1	38	0	0	454	454	0	302	302	756
G04	6/16/02	56 59.5	165 50.9	37	0	0	160	160	0	0	0	160
G05	6/17/02	56 60.0	165 13.1	37	0	162	81	243	0	0	0	243
G06	6/17/02	56 59.0	164 36.7	36	0	0	83	83	0	0	0	83
G07	6/13/02	56 59.3	163 59.8	36	0	83	330	413	0	0	0	413
G08	6/13/02	56 60.0	163 24.0	34	0	0	83	83	0	0	0	83
G09	6/9/02	57 0.1	162 47.3	31	74	223	223	520	0	149	149	668
G10	6/9/02	56 59.7	162 10.1	31	0	165	165	330	0	0	0	330
G11	6/5/02	57 0.1	161 34.1	36	0	0	82	82	0	82	82	163
G12	6/5/02	57 0.3	160 57.4	32	78	155	78	310	78	0	78	388
G13	6/4/02	57 0.1	160 20.2	33	151	75	0	226	0	75	75	302
G14	6/4/02	56 59.7	159 44.6	29	0	0	308	308	0	231	231	539
G18	7/3/02	56 59.9	168 19.6	42	0	162	17832	17994	81	19109	19190	37184
G19	7/3/02	57 0.1	168 59.5	42	0	0	2695	2695	0	2605	2605	5301
G19	7/3/02	57 9.7	168 37.9	39	0	85	2118	2203	85	932	1017	3220
G20	7/3/02	57 9.7	169 19.1	38	0	0	1133	1133	0	1046	1046	2178
G20	7/3/02	56 50.5	169 18.4	42	0	0	2235	2235	0	1073	1073	3307
G20	7/4/02	56 60.0	169 32.9	31	0	0	2214	2214	0	1804	1804	4017
G21	7/4/02	57 0.8	170 11.0	35	388	2716	30653	33757	316	19925	20242	53999
G21	7/4/02	57 9.3	169 53.2	25	0	0	3873	3873	82	2307	2390	6263
G22	7/4/02	56 50.5	170 28.7	53	194	1166	22160	23521	1230	16698	17929	41449

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
G22	7/4/02	57 7.0	170 27.9	26	0	680	16989	17669	1172	5275	6447	24116
G22	6/30/02	57 0.0	170 48.0	50	0	467	2489	2956	0	467	467	3423
G23	7/7/02	56 59.4	171 22.9	58	0	0	1391	1391	0	2354	2354	3746
G24	7/7/02	57 0.0	171 59.5	62	0	0	2646	2646	85	2902	2987	5633
G25	7/7/02	56 59.9	172 39.1	65	0	0	6275	6275	170	9413	9582	15858
G26	7/7/02	57 0.4	173 14.3	74	0	0	2243	2243	0	2333	2333	4577
H01	6/22/02	57 19.7	167 44.2	38	0	0	1347	1347	79	872	951	2298
H02	6/22/02	57 20.1	167 7.6	36	0	80	1284	1364	80	562	642	2006
H03	6/16/02	57 20.7	166 28.9	36	0	82	328	411	0	0	0	411
H04	6/16/02	57 19.7	165 52.5	35	0	0	332	332	0	0	0	332
H05	6/17/02	57 18.9	165 14.5	35	0	157	394	551	79	0	79	630
H06	6/17/02	57 18.5	164 36.7	34	0	0	166	166	0	0	0	166
H07	6/13/02	57 19.6	164 0.3	32	0	79	159	238	0	0	0	238
H08	6/13/02	57 20.1	163 24.0	27	0	103	0	103	0	0	0	103
H09	6/9/02	57 20.1	162 46.3	25	0	394	473	868	0	0	0	868
H10	6/9/02	57 20.1	162 9.1	26	85	0	85	171	0	85	85	256
H11	6/5/02	57 19.9	161 33.3	28	0	89	0	89	0	0	0	89
H12	6/5/02	57 20.2	160 56.7	31	0	78	235	314	0	78	78	392
H13	6/4/02	57 20.1	160 18.1	32	0	0	78	78	0	0	0	78
H14	6/4/02	57 19.9	159 40.6	29	0	0	75	75	0	0	0	75
H15	6/4/02	57 19.9	159 4.1	26	0	0	159	159	0	0	0	159
H18	7/3/02	57 19.5	168 21.6	38	0	0	2906	2906	0	2199	2199	5104
H19	7/3/02	57 19.6	168 58.7	36	0	0	323	323	0	0	0	323
H19	7/3/02	57 29.9	168 44.1	37	0	83	3989	4072	0	2327	2327	6399
H20	6/26/02	57 29.7	169 23.5	37	0	79	11209	11288	79	11068	11147	22434
H20	7/4/02	57 19.8	169 36.6	32	0	87	2255	2342	0	260	260	2602
H22	6/30/02	57 20.3	170 51.1	43	0	0	81	81	0	0	0	81
H23	6/30/02	57 19.8	171 27.5	53	0	189	851	1040	0	189	189	1229
H24	7/7/02	57 20.3	172 4.9	57	0	0	1204	1204	0	562	562	1765
H25	7/6/02	57 21.1	172 43.9	62	0	0	582	582	0	333	333	915
H26	7/6/02	57 20.0	173 19.3	64	0	0	345	345	0	689	689	1034
I01	6/22/02	57 39.6	167 46.0	35	0	0	317	317	0	79	79	396
I02	6/22/02	57 38.6	167 9.8	35	0	79	714	794	0	318	318	1111

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
I04	6/16/02	57 39.5	165 53.3	33	0	0	327	327	0	0	0	327
I05	6/14/02	57 39.9	165 15.1	32	0	0	150	150	0	0	0	150
I06	6/14/02	57 40.2	164 37.6	27	0	0	232	232	0	0	0	232
I07	6/13/02	57 39.7	164 0.1	26	0	0	236	236	0	0	0	236
I08	6/13/02	57 40.7	163 23.0	23	0	0	82	82	0	0	0	82
I12	6/5/02	57 40.0	160 52.9	29	0	0	81	81	0	243	243	324
I18	6/25/02	57 40.3	168 23.5	36	0	0	599	599	0	513	513	1112
I19	6/25/02	57 40.3	169 1.9	36	0	0	316	316	0	0	0	316
I19	6/25/02	57 49.8	168 44.6	36	0	0	164	164	0	82	82	246
I20	6/26/02	57 40.2	169 38.8	37	0	0	678	678	0	848	848	1526
I21	6/26/02	57 30.3	169 58.5	36	0	0	1009	1009	0	931	931	1939
I21	6/26/02	57 39.8	170 14.7	38	0	0	546	546	0	546	546	1092
I21	6/26/02	57 50.0	169 59.2	37	0	0	3679	3679	0	3241	3241	6921
I22	7/4/02	57 30.5	170 34.8	39	0	0	418	418	0	84	84	501
I23	6/30/02	57 40.0	171 31.8	53	0	77	999	1076	0	154	154	1229
I24	7/6/02	57 41.4	172 11.7	57	0	0	0	0	0	164	164	164
I25	7/6/02	57 39.9	172 48.2	63	0	0	672	672	0	252	252	924
I26	7/6/02	57 40.1	173 23.7	78	0	0	2513	2513	0	4073	4073	6586
J01	6/22/02	57 59.9	167 48.5	34	0	0	318	318	0	0	0	318
J03	6/16/02	57 59.8	166 31.6	31	0	80	80	160	0	0	0	160
J04	6/16/02	57 59.6	165 54.5	28	0	79	0	79	0	0	0	79
J05	6/14/02	58 0.2	165 15.8	26	0	76	152	229	0	0	0	229
J13	6/3/02	57 59.4	160 14.0	26	0	0	0	0	0	76	76	76
J20	6/25/02	57 50.1	169 22.7	34	0	0	619	619	0	309	309	928
J20	6/26/02	57 60.0	169 42.7	36	0	0	85827	85827	0	39941	39941	125769
J21	6/26/02	57 59.9	170 19.6	38	0	0	1138	1138	0	1382	1382	2520
J22	6/26/02	57 50.1	170 36.5	40	0	0	234	234	0	234	234	469
J22	6/30/02	57 59.3	170 57.5	45	0	0	83	83	0	0	0	83
J23	6/30/02	57 59.4	171 35.7	52	0	0	79	79	157	79	236	315
J24	7/6/02	57 59.8	172 15.1	55	0	0	493	493	82	0	82	575
J25	7/6/02	57 59.9	172 51.7	57	0	85	85	169	169	592	761	930
J26	7/6/02	58 0.1	173 28.8	61	0	0	3064	3064	0	2742	2742	5806
K03	6/15/02	58 20.5	166 33.8	24	0	0	78	78	0	0	0	78

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
K18	6/25/02	58 19.7	168 28.0	33	0	0	323	323	0	161	161	484
K20	6/26/02	58 20.5	169 43.9	36	0	0	1734	1734	0	260	260	1994
K21	6/26/02	58 19.9	170 23.1	38	0	0	232	232	77	77	155	387
K22	6/30/02	58 19.6	171 1.0	44	0	0	649	649	0	162	162	811
K23	6/30/02	58 20.1	171 39.3	51	0	0	74	74	0	74	74	149
K24	7/6/02	58 20.4	172 17.5	54	0	0	0	0	338	0	338	338
K25	7/6/02	58 19.7	172 55.8	57	0	0	254	254	0	424	424	678
K26	7/5/02	58 20.6	173 34.4	62	0	158	1030	1188	0	713	713	1901
K27	7/24/02	58 20.2	174 19.3	93	0	0	1400	1400	0	2470	2470	3870
L19	6/25/02	58 40.0	169 8.9	32	0	0	155	155	0	0	0	155
L20	6/26/02	58 40.1	169 47.6	34	0	0	246	246	0	0	0	246
L22	6/29/02	58 39.8	171 4.7	43	0	0	161	161	80	0	80	241
L23	6/30/02	58 39.8	171 43.2	49	0	0	151	151	0	76	76	227
L24	7/5/02	58 40.5	172 22.6	53	0	0	702	702	88	439	527	1229
L25	7/5/02	58 39.9	173 0.1	60	0	0	930	930	85	1099	1184	2114
L26	7/5/02	58 41.4	173 38.1	67	0	163	652	815	0	489	489	1304
L27	7/24/02	58 39.9	174 17.0	84	0	0	2595	2595	0	1865	1865	4461
L28	7/18/02	58 44.5	174 57.5	77	0	0	647	647	0	728	728	1375
L29	7/18/02	58 40.2	175 33.2	72	0	80	797	877	80	398	478	1355
L30	7/18/02	58 40.1	176 11.5	75	0	159	637	796	0	557	557	1354
L31	7/18/02	58 40.6	176 52.4	72	0	0	1146	1146	0	409	409	1556
M01	6/23/02	58 59.7	167 52.7	21	80	0	80	160	0	0	0	160
M18	6/25/02	58 59.1	168 31.8	23	0	0	81	81	0	0	0	81
M19	6/25/02	58 59.8	169 11.2	27	0	0	483	483	0	0	0	483
M20	6/27/02	58 59.8	169 51.2	33	0	0	82	82	0	0	0	82
M25	7/5/02	58 59.9	173 5.2	56	0	0	0	0	0	168	168	168
M26	7/5/02	58 59.4	173 43.3	62	0	0	260	260	0	347	347	606
M27	7/24/02	58 60.0	174 22.0	67	0	82	817	899	82	490	572	1471
M28	7/24/02	59 0.0	174 59.7	69	0	161	643	803	0	161	161	964
M29	7/24/02	58 59.9	175 44.0	71	0	248	2815	3064	0	2236	2236	5299
M30	7/23/02	59 0.2	176 19.4	72	0	83	414	496	0	0	0	496
M31	7/23/02	58 59.9	176 57.5	72	0	0	87	87	0	0	0	87
M32	7/18/02	59 0.5	177 36.6	72	0	78	78	157	0	78	78	235

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
N19	6/24/02	59 20.3	169 14.2	25	0	0	328	328	0	0	0	328
N26	7/5/02	59 20.1	173 47.8	58	0	0	171	171	0	257	257	428
N27	7/22/02	59 20.4	174 28.1	63	0	83	0	83	0	83	83	166
N28	7/22/02	59 20.3	175 6.1	70	0	80	319	398	0	159	159	558
N29	7/23/02	59 20.2	175 45.1	73	0	0	248	248	166	166	331	579
N30	7/23/02	59 20.0	176 22.6	72	0	120	1205	1325	0	361	361	1687
O24	7/12/02	59 40.1	172 34.4	24	0	0	0	0	0	86	86	86
O25	7/12/02	59 41.4	173 16.4	50	0	0	0	0	0	158	158	158
O25	7/12/02	59 30.1	172 53.4	27	0	0	83	83	0	0	0	83
O26	7/12/02	59 30.2	173 30.1	54	0	0	181	181	0	181	181	362
O26	7/15/02	59 40.3	173 50.6	55	0	0	0	0	77	0	77	77
O27	7/15/02	59 40.1	174 26.3	61	0	0	0	0	0	79	79	79
O28	7/22/02	59 40.1	175 6.4	66	0	180	628	808	0	0	0	808
O29	7/22/02	59 39.9	175 52.4	72	0	0	170	170	0	0	0	170
O30	7/22/02	59 40.0	176 32.6	72	0	89	801	890	178	979	1156	2046
O31	7/21/02	59 40.0	177 9.3	93	0	255	255	511	0	85	85	596
P24	7/13/02	59 59.8	172 38.4	34	0	0	163	163	0	0	0	163
P29	7/21/02	59 59.6	175 55.3	69	0	168	335	503	0	84	84	587
P31	7/21/02	60 0.2	177 13.3	73	0	0	305	305	0	76	76	381
Q25	7/13/02	60 19.9	173 25.7	32	0	0	157	157	0	0	0	157
Q26	7/14/02	60 19.0	174 3.7	48	0	0	123	123	0	0	0	123
Q31	7/20/02	60 19.7	177 22.2	78	0	0	238	238	0	79	79	317
R31	7/19/02	60 40.2	177 30.0	77	0	0	79	79	0	0	0	79
R32	7/17/02	60 40.1	178 10.4	86	0	84	586	670	503	586	1089	1759
Z05	6/12/02	54 39.7	165 8.4	43	0	0	312	312	0	1874	1874	2187

NOTE: Minimum carapace sizes used are: Large Males > 5.5 in; Medium Males = 4.3 to 5.5 in; Large Females > 3.4 in.

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

Station	Date	N. Lat.		W. Long		Fathoms	Males				Females			GRAND TOTAL
							Large	Medium	Small	Total	Large	Small	Total	
A02	6/21/02	55	0.4	166	56.3	83	0	83	248	331	0	0	0	331
A03	6/12/02	54	59.9	166	19.1	77	147	147	73	367	0	0	0	367
A04	6/12/02	54	59.8	165	44.6	69	360	216	0	577	0	0	0	577
A04	6/12/02	54	50.3	165	29.9	81	0	168	84	252	0	0	0	252
A05	6/12/02	54	59.8	165	8.9	59	148	74	74	296	0	0	0	296
A06	6/12/02	55	1.3	164	35.4	32	82	82	82	247	0	0	0	247
B03	6/18/02	55	19.6	166	20.8	71	157	79	79	315	0	0	0	315
B04	6/18/02	55	19.8	165	46.7	63	408	163	82	653	0	0	0	653
B05	6/12/02	55	20.0	165	9.9	59	0	72	0	72	0	0	0	72
B06	6/12/02	55	20.8	164	33.3	53	400	560	0	960	0	0	0	960
B07	6/10/02	55	19.8	164	0.3	39	149	298	75	522	0	0	0	522
B08	6/10/02	55	19.7	163	24.3	26	0	161	80	241	0	0	0	241
C03	6/18/02	55	39.9	166	23.5	67	0	81	0	81	0	0	0	81
C04	6/18/02	55	39.9	165	48.2	62	125	0	125	250	0	0	0	250
C05	6/12/02	55	40.2	165	10.8	57	361	217	650	1228	0	0	0	1228
C06	6/12/02	55	40.1	164	35.0	50	641	160	80	882	0	0	0	882
C07	6/10/02	55	41.3	164	0.7	49	526	150	75	752	0	0	0	752
C08	6/10/02	55	39.8	163	24.4	42	81	242	0	323	0	0	0	323
C09	6/10/02	55	40.5	162	50.2	25	0	0	123	123	123	0	123	247
D02	6/21/02	56	3.2	167	1.3	71	164	247	329	740	0	0	0	740
D03	6/18/02	55	59.5	166	24.1	66	276	138	0	414	0	0	0	414
D04	6/18/02	55	59.7	165	46.5	56	550	236	393	1178	0	0	0	1178
D05	6/17/02	55	59.8	165	11.2	50	832	151	605	1588	0	0	0	1588
D06	6/17/02	55	59.3	164	36.8	49	410	902	820	2132	0	0	0	2132
D07	6/10/02	56	0.3	163	59.3	47	268	804	402	1474	0	0	0	1474
D08	6/10/02	56	0.3	163	24.4	46	146	0	0	146	586	0	586	732
D09	6/10/02	55	59.8	162	49.3	41	229	153	76	458	0	0	0	458
D10	6/10/02	55	59.2	162	15.5	36	0	84	84	168	0	0	0	168
E01	6/21/02	56	20.3	167	39.2	68	227	0	76	303	0	0	0	303
E02	6/21/02	56	20.1	167	1.6	60	162	0	243	405	81	0	81	486
E03	6/16/02	56	19.9	166	25.4	55	393	157	314	864	0	0	0	864
E04	6/16/02	56	19.5	165	48.6	48	487	81	244	812	81	0	81	893
E05	6/17/02	56	19.6	165	11.7	45	160	80	80	319	0	0	0	319

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
E06	6/17/02	56 19.6	164 34.3	45	241	402	80	724	0	0	0	724
E07	6/13/02	56 20.3	164 0.5	45	0	78	0	78	0	0	0	78
E08	6/13/02	56 19.9	163 24.2	45	325	162	325	812	0	0	0	812
E09	6/9/02	56 19.5	162 48.4	40	0	76	0	76	0	0	0	76
E10	6/9/02	56 18.5	162 12.9	38	78	157	0	235	0	0	0	235
E18	7/8/02	56 20.0	168 14.7	81	82	247	412	742	0	0	0	742
E19	7/8/02	56 20.1	168 52.8	69	0	237	158	396	0	0	0	396
E21	7/8/02	56 20.2	170 3.1	57	166	414	331	911	0	0	0	911
E22	7/8/02	56 19.8	170 40.8	64	0	86	86	173	0	0	0	173
F01	6/21/02	56 40.5	167 39.8	54	160	0	319	479	0	0	0	479
F02	6/22/02	56 40.4	167 4.2	50	329	247	659	1235	0	0	0	1235
F03	6/16/02	56 39.5	166 26.3	44	315	630	551	1495	0	0	0	1495
F04	6/16/02	56 39.9	165 51.2	40	781	625	1483	2888	1171	0	1171	4059
F05	6/17/02	56 40.5	165 12.6	39	157	235	78	470	0	0	0	470
F06	6/17/02	56 40.0	164 36.1	39	165	82	0	247	0	0	0	247
F08	6/13/02	56 39.9	163 23.1	39	0	166	249	416	0	0	0	416
F09	6/9/02	56 39.8	162 46.8	37	78	78	0	156	0	0	0	156
F18	7/3/02	56 39.9	168 17.0	56	163	163	81	406	81	0	81	488
F19	7/3/02	56 40.1	168 54.8	53	570	163	163	895	0	0	0	895
F19	7/3/02	56 49.9	168 38.2	51	507	169	507	1183	0	85	85	1268
F21	7/4/02	56 40.4	170 7.9	51	176	88	352	616	0	0	0	616
F21	7/4/02	56 49.9	169 53.2	38	15102	20765	1678	37546	165	0	165	37711
F22	7/8/02	56 40.4	170 43.5	60	79	236	314	628	79	79	157	785
F23	7/7/02	56 40.0	171 21.4	63	341	171	171	683	0	0	0	683
F24	7/7/02	56 40.0	171 57.8	67	0	89	178	267	0	0	0	267
G01	6/22/02	57 0.1	167 41.5	40	329	164	1068	1561	0	0	0	1561
G02	6/22/02	56 60.0	167 5.8	38	0	80	159	239	0	0	0	239
G03	6/16/02	57 0.0	166 28.1	38	76	227	76	378	0	0	0	378
G04	6/16/02	56 59.5	165 50.9	37	160	240	80	480	0	0	0	480
G05	6/17/02	56 60.0	165 13.1	37	0	81	162	243	0	0	0	243
G06	6/17/02	56 59.0	164 36.7	36	0	83	83	166	0	0	0	166
G07	6/13/02	56 59.3	163 59.8	36	0	83	83	165	0	0	0	165
G08	6/13/02	56 60.0	163 24.0	34	333	250	0	582	0	0	0	582

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

Station	Date	N. Lat.		W. Long		Fathoms	Males				Females			GRAND TOTAL
							Large	Medium	Small	Total	Large	Small	Total	
G09	6/9/02	57	0.1	162	47.3	31	0	74	74	149	0	0	0	149
G10	6/9/02	56	59.7	162	10.1	31	82	0	0	82	0	0	0	82
G18	7/3/02	56	59.9	168	19.6	42	243	81	1298	1622	0	81	81	1703
G19	7/3/02	57	0.1	168	59.5	42	809	359	270	1438	90	180	270	1707
G19	7/3/02	57	9.7	168	37.9	39	254	254	593	1102	0	0	0	1102
G20	7/3/02	57	9.7	169	19.1	38	174	349	610	1133	261	0	261	1394
G20	7/3/02	56	50.5	169	18.4	42	89	179	268	536	0	0	0	536
G20	7/4/02	56	60.0	169	32.9	31	246	656	246	1148	0	0	0	1148
G21	7/4/02	57	0.8	170	11.0	35	0	0	259	259	0	0	0	259
G22	7/4/02	56	50.5	170	28.7	53	165	248	413	827	0	0	0	827
G22	6/30/02	57	0.0	170	48.0	50	311	389	156	856	0	156	156	1011
G23	7/7/02	56	59.4	171	22.9	58	963	214	214	1391	107	0	107	1498
G24	7/7/02	57	0.0	171	59.5	62	0	341	256	597	85	0	85	683
G25	7/7/02	56	59.9	172	39.1	65	170	85	170	424	0	0	0	424
G26	7/7/02	57	0.4	173	14.3	74	90	0	90	179	0	0	0	179
H01	6/22/02	57	19.7	167	44.2	38	238	238	317	792	0	0	0	792
H02	6/22/02	57	20.1	167	7.6	36	0	401	321	722	0	0	0	722
H03	6/16/02	57	20.7	166	28.9	36	246	246	82	575	0	0	0	575
H04	6/16/02	57	19.7	165	52.5	35	0	166	249	415	0	0	0	415
H05	6/17/02	57	18.9	165	14.5	35	157	551	157	866	0	0	0	866
H06	6/17/02	57	18.5	164	36.7	34	331	663	580	1574	83	0	83	1657
H07	6/13/02	57	19.6	164	0.3	32	477	874	0	1351	0	0	0	1351
H08	6/13/02	57	20.1	163	24.0	27	0	103	0	103	0	0	0	103
H18	7/3/02	57	19.5	168	21.6	38	157	0	707	864	0	79	79	942
H19	7/3/02	57	19.6	168	58.7	36	0	162	81	242	0	81	81	323
H19	7/3/02	57	29.9	168	44.1	37	83	166	499	748	83	249	332	1080
H20	6/26/02	57	29.7	169	23.5	37	236	472	1965	2673	236	2044	2280	4952
H20	7/4/02	57	19.8	169	36.6	32	173	87	173	434	0	0	0	434
H22	6/30/02	57	20.3	170	51.1	43	0	0	81	81	81	81	161	242
H23	6/30/02	57	19.8	171	27.5	53	189	189	756	1134	95	473	567	1701
H24	7/7/02	57	20.3	172	4.9	57	883	1043	321	2247	80	0	80	2327
H25	7/6/02	57	21.1	172	43.9	62	83	83	0	166	0	0	0	166
H26	7/6/02	57	20.0	173	19.3	64	172	689	172	1034	86	0	86	1120



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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
I01	6/22/02	57 39.6	167 46.0	35	79	238	158	475	0	0	0	475
I02	6/22/02	57 38.6	167 9.8	35	79	318	1746	2143	159	556	714	2858
I03	6/16/02	57 40.1	166 30.6	34	0	321	160	481	0	0	0	481
I04	6/16/02	57 39.5	165 53.3	33	0	0	164	164	0	0	0	164
I05	6/14/02	57 39.9	165 15.1	32	150	375	150	676	0	0	0	676
I06	6/14/02	57 40.2	164 37.6	27	154	154	0	309	0	0	0	309
I07	6/13/02	57 39.7	164 0.1	26	79	0	0	79	0	0	0	79
I08	6/13/02	57 40.7	163 23.0	23	0	82	0	82	0	0	0	82
I18	6/25/02	57 40.3	168 23.5	36	0	86	599	684	0	0	0	684
I19	6/25/02	57 40.3	169 1.9	36	0	79	79	158	158	316	474	632
I19	6/25/02	57 49.8	168 44.6	36	0	164	985	1149	0	328	328	1477
I20	6/26/02	57 40.2	169 38.8	37	170	254	1866	2290	509	933	1442	3731
I21	6/26/02	57 30.3	169 58.5	36	0	310	465	776	78	0	78	853
I21	6/26/02	57 39.8	170 14.7	38	218	109	1092	1420	0	0	0	1420
I21	6/26/02	57 50.0	169 59.2	37	88	263	1665	2015	175	263	438	2453
I22	7/4/02	57 30.5	170 34.8	39	0	167	84	251	84	0	84	334
I22	6/30/02	57 40.1	170 53.1	44	83	0	83	165	165	0	165	330
I23	6/30/02	57 40.0	171 31.8	53	692	1306	77	2075	0	0	0	2075
I24	7/6/02	57 41.4	172 11.7	57	658	164	164	987	82	82	164	1151
I25	7/6/02	57 39.9	172 48.2	63	84	84	0	168	84	0	84	252
I26	7/6/02	57 40.1	173 23.7	78	953	1820	0	2773	0	0	0	2773
J01	6/22/02	57 59.9	167 48.5	34	159	0	398	557	0	0	0	557
J02	6/22/02	58 0.7	167 10.1	33	0	82	82	164	0	0	0	164
J03	6/16/02	57 59.8	166 31.6	31	160	239	239	638	0	80	80	718
J04	6/16/02	57 59.6	165 54.5	28	79	474	2767	3320	632	0	632	3953
J05	6/14/02	58 0.2	165 15.8	26	0	305	0	305	0	0	0	305
J06	6/14/02	58 0.4	164 37.3	23	152	76	76	304	0	0	0	304
J18	6/25/02	57 59.8	168 26.2	36	83	83	0	165	0	165	165	331
J19	6/25/02	57 59.9	169 4.6	36	0	246	164	409	0	409	409	818
J20	6/25/02	57 50.1	169 22.7	34	0	155	464	619	232	851	1083	1701
J20	6/26/02	57 60.0	169 42.7	36	88	442	9019	9550	1014	6420	7434	16983
J21	6/26/02	57 59.9	170 19.6	38	0	325	2601	2926	163	244	406	3332
J22	6/26/02	57 50.1	170 36.5	40	0	234	156	391	0	0	0	391

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

Station	Date	N. Lat.		W. Long		Fathoms	Males				Females			GRAND TOTAL
							Large	Medium	Small	Total	Large	Small	Total	
J22	6/30/02	57	59.3	170	57.5	45	0	83	413	496	0	0	0	496
J23	6/30/02	57	59.4	171	35.7	52	472	79	236	787	157	0	157	944
J24	7/6/02	57	59.8	172	15.1	55	821	246	0	1067	1396	821	2217	3284
J25	7/6/02	57	59.9	172	51.7	57	2536	2959	3297	8793	48057	0	48057	56850
J26	7/6/02	58	0.1	173	28.8	61	1693	1210	484	3387	1693	0	1693	5080
K01	6/22/02	58	21.1	167	49.8	30	513	770	385	1668	0	0	0	1668
K02	6/23/02	58	20.5	167	11.5	26	0	0	479	479	0	0	0	479
K03	6/15/02	58	20.5	166	33.8	24	0	0	235	235	0	0	0	235
K04	6/15/02	58	20.1	165	55.3	22	0	0	660	660	82	0	82	742
K05	6/14/02	58	19.3	165	18.1	22	0	154	77	232	0	0	0	232
K06	6/14/02	58	19.9	164	39.5	22	0	161	80	241	0	0	0	241
K18	6/25/02	58	19.7	168	28.0	33	564	2258	1855	4677	242	242	484	5161
K19	6/25/02	58	20.0	169	7.5	35	0	244	893	1137	81	81	162	1300
K20	6/26/02	58	20.5	169	43.9	36	0	607	1127	1734	87	87	173	1907
K21	6/26/02	58	19.9	170	23.1	38	155	541	851	1547	232	387	619	2166
K22	6/30/02	58	19.6	171	1.0	44	162	974	1947	3083	162	162	325	3408
K23	6/30/02	58	20.1	171	39.3	51	74	968	372	1415	223	0	223	1638
K24	7/6/02	58	20.4	172	17.5	54	2707	7443	4060	14209	308774	112821	421596	435805
K25	7/6/02	58	19.7	172	55.8	57	1526	3306	2458	7290	64515	4692	69207	76497
K26	7/5/02	58	20.6	173	34.4	62	2854	4139	3140	10133	23824	322	24146	34279
K27	7/24/02	58	20.2	174	19.3	93	0	82	0	82	0	0	0	82
L01	6/23/02	58	40.0	167	51.6	24	163	1219	406	1788	163	0	163	1951
L02	6/23/02	58	40.4	167	12.7	22	0	162	81	243	0	0	0	243
L05	6/8/02	58	40.1	165	18.0	19	83	83	83	250	0	0	0	250
L18	6/25/02	58	40.1	168	29.7	27	0	324	567	891	0	0	0	891
L19	6/25/02	58	40.0	169	8.9	32	155	233	1322	1710	233	78	311	2021
L20	6/26/02	58	40.1	169	47.6	34	82	164	1310	1556	82	82	164	1720
L21	6/26/02	58	39.6	170	26.5	38	0	1074	1718	2792	0	0	0	2792
L22	6/29/02	58	39.8	171	4.7	43	883	3051	3131	7066	482	0	482	7547
L23	6/30/02	58	39.8	171	43.2	49	378	1814	907	3100	605	302	907	4007
L24	7/5/02	58	40.5	172	22.6	53	615	2634	702	3951	88	0	88	4039
L25	7/5/02	58	39.9	173	0.1	60	1522	2029	761	4312	56829	17338	74167	78479
L26	7/5/02	58	41.4	173	38.1	67	5970	4606	171	10746	81	0	81	10828

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
L30	7/18/02	58 40.1	176 11.5	75	0	0	80	80	0	0	0	80
M01	6/23/02	58 59.7	167 52.7	21	80	80	80	239	80	0	80	319
M02	6/23/02	59 0.3	167 14.2	19	84	84	0	168	0	0	0	168
M18	6/25/02	58 59.1	168 31.8	23	81	485	2670	3236	566	324	890	4126
M19	6/25/02	58 59.8	169 11.2	27	559	3165	8378	12101	322	725	1047	13148
M20	6/27/02	58 59.8	169 51.2	33	0	1147	2047	3194	82	0	82	3276
M21	6/27/02	58 59.7	170 29.3	37	0	243	405	648	0	0	0	648
M22	6/29/02	58 59.5	171 6.7	40	41186	97199	8237	146623	331	83	413	147036
M23	6/29/02	58 59.9	171 47.5	46	166	12467	3989	16622	2654	227	2881	19504
M24	7/5/02	58 59.9	172 25.9	51	0	279	0	279	0	0	0	279
M25	7/5/02	58 59.9	173 5.2	56	1761	2264	1761	5786	54249	9403	63652	69438
M26	7/5/02	58 59.4	173 43.3	62	520	0	0	520	260	173	433	953
M28	7/24/02	59 0.0	174 59.7	69	0	0	161	161	0	80	80	241
M29	7/24/02	58 59.9	175 44.0	71	0	0	0	0	0	166	166	166
M32	7/18/02	59 0.5	177 36.6	72	0	235	628	863	157	471	628	1491
N18	6/24/02	59 19.9	168 33.2	21	0	0	326	326	245	0	245	571
N19	6/24/02	59 20.3	169 14.2	25	2437	12187	248625	263250	7313	31689	39002	302251
N20	6/27/02	59 20.4	169 52.4	31	81	2345	6065	8491	0	0	0	8491
N21	6/27/02	59 20.3	170 31.8	35	0	327	491	818	0	0	0	818
N22	6/29/02	59 18.9	171 11.1	39	14540	49898	13549	77987	1915	0	1915	79902
N23	6/29/02	59 19.6	171 49.8	42	1665	18010	3481	23156	775	0	775	23930
N24	7/5/02	59 20.4	172 29.7	45	0	431	0	431	0	0	0	431
N25	7/5/02	59 20.3	173 9.2	53	167	251	251	669	6017	1504	7521	8190
N26	7/5/02	59 20.1	173 47.8	58	257	428	257	941	2994	513	3507	4448
N27	7/22/02	59 20.4	174 28.1	63	749	83	166	998	2912	499	3411	4410
N28	7/22/02	59 20.3	175 6.1	70	0	0	80	80	159	80	239	319
N29	7/23/02	59 20.2	175 45.1	73	0	83	0	83	83	248	331	414
N30	7/23/02	59 20.0	176 22.6	72	0	0	120	120	0	241	241	361
O19	6/24/02	59 39.5	169 17.1	24	239	636	2704	3579	80	0	80	3658
O20	6/27/02	59 40.1	169 54.8	29	0	323	565	888	0	0	0	888
O21	6/27/02	59 40.0	170 34.3	35	82	1646	1810	3538	165	0	165	3703
O22	6/29/02	59 39.8	171 14.7	38	714	3569	3331	7613	238	0	238	7851
O23	6/29/02	59 40.8	171 53.3	40	2138	8016	5077	15230	3067	0	3067	18297

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
O24	7/12/02	59 40.1	172 34.4	24	1115	943	1715	3774	600	172	772	4546
O24	7/13/02	59 49.6	172 15.5	21	7555	6973	5562	20090	2740	581	3321	23411
O25	7/12/02	59 41.4	173 16.4	50	158	711	553	1422	0	79	79	1501
O25	7/13/02	59 49.4	172 54.0	42	7154	24118	5519	36791	1620	972	2592	39382
O25	7/12/02	59 30.1	172 53.4	27	0	83	0	83	83	0	83	166
O26	7/12/02	59 30.2	173 30.1	54	0	90	90	181	0	181	181	362
O26	7/14/02	59 49.9	173 36.2	50	736	900	654	2291	164	82	245	2536
O26	7/15/02	59 40.3	173 50.6	55	0	309	77	386	464	464	927	1314
O27	7/15/02	59 40.1	174 26.3	61	1270	1984	952	4206	63923	17046	80969	85175
O28	7/22/02	59 40.1	175 6.4	66	3322	2514	180	6015	83165	4536	87701	93716
O29	7/22/02	59 39.9	175 52.4	72	85	0	85	170	0	85	85	255
O30	7/22/02	59 40.0	176 32.6	72	267	178	2313	2758	356	2313	2669	5426
P19	6/24/02	60 0.0	169 19.7	23	0	181	812	993	90	90	181	1174
P20	6/27/02	60 0.6	169 56.2	27	0	0	82	82	0	0	0	82
P21	6/27/02	60 0.8	170 38.0	33	0	2177	3918	6094	174	0	174	6269
P22	6/29/02	59 58.6	171 17.5	36	0	1311	4588	5899	0	0	0	5899
P23	6/29/02	59 58.7	171 56.7	35	80	1521	2161	3762	640	640	1281	5042
P24	7/13/02	59 59.8	172 38.4	34	3511	8099	140089	151700	30353	46696	77049	228748
P25	7/13/02	60 0.3	173 18.6	39	3367	16413	3156	22937	3636	4111	7747	30684
P26	7/14/02	60 9.6	173 34.4	39	1961	25342	4073	31376	1207	603	1810	33186
P26	7/14/02	60 0.0	173 56.9	50	396	792	396	1584	0	0	0	1584
P26	7/15/02	59 51.0	174 13.8	56	813	1175	632	2620	1084	542	1626	4246
P27	7/15/02	60 1.5	174 35.1	57	1062	2860	981	4903	9561	7304	16865	21768
P28	7/20/02	60 0.6	175 16.4	62	1443	2885	3366	7694	139968	61011	200979	208673
P29	7/21/02	59 59.6	175 55.3	69	4276	5115	2683	12075	37588	576	38164	50238
P30	7/21/02	60 0.1	176 43.3	74	465	387	77	930	620	465	1085	2015
P31	7/21/02	60 0.2	177 13.3	73	609	761	990	2360	17107	295	17402	19762
P32	7/21/02	60 0.3	177 55.3	75	80	80	318	478	478	0	478	955
Q19	6/24/02	60 20.4	169 20.2	22	0	0	0	0	0	77	77	77
Q20	6/27/02	60 20.5	170 3.1	26	0	247	412	660	82	82	165	825
Q21	6/27/02	60 20.4	170 40.0	32	0	244	813	1057	0	0	0	1057
Q22	6/28/02	60 19.9	171 21.2	34	0	3323	9725	13048	405	0	405	13453
Q23	6/28/02	60 20.0	172 4.1	30	0	398	6291	6690	1035	159	1195	7884

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
Q23	7/13/02	60 10.1	172 20.0	30	0	82	493	575	82	493	575	1150
Q25	7/13/02	60 10.5	173 1.1	31	0	84	1337	1420	334	2423	2757	4177
Q25	7/13/02	60 19.9	173 25.7	32	1722	18625	10330	30676	1878	0	1878	32554
Q26	7/14/02	60 19.0	174 3.7	48	1095	9123	11313	21531	10130	1333	11462	32994
Q26	7/15/02	60 10.1	174 20.1	53	243	1375	647	2265	3560	2508	6067	8333
Q27	7/16/02	60 20.6	174 42.8	54	336	1429	1093	2858	14217	2133	16349	19208
Q28	7/20/02	60 20.0	175 23.2	59	1795	8650	653	11098	245	0	245	11343
Q29	7/20/02	60 20.0	176 1.1	63	3226	2710	387	6323	1549	129	1678	8001
Q30	7/20/02	60 20.1	176 43.0	72	2730	5119	3072	10921	143345	8532	151878	162799
Q31	7/20/02	60 19.7	177 22.2	78	714	476	2776	3965	2458	1983	4441	8406
R22	6/28/02	60 39.8	171 26.0	32	0	2248	7387	9635	723	80	803	10438
R23	6/28/02	60 40.2	172 7.8	32	0	681	6048	6730	1107	767	1874	8604
R25	7/13/02	60 40.6	173 29.6	34	0	0	0	0	0	157	157	157
R26	7/14/02	60 39.7	174 8.8	46	142	12965	8121	21228	7591	783	8373	29601
R27	7/16/02	60 40.1	174 49.0	51	505	2019	673	3197	3197	841	4038	7236
R28	7/19/02	60 40.4	175 27.7	56	1881	7523	1411	10814	313	0	313	11128
R29	7/19/02	60 40.0	176 13.4	62	1566	4699	723	6988	482	482	964	7952
R30	7/19/02	60 40.1	176 48.2	68	566	1982	283	2831	377	472	849	3680
R31	7/19/02	60 40.2	177 30.0	77	1819	2611	554	4984	79	79	158	5142
R32	7/17/02	60 40.1	178 10.4	86	3183	1173	419	4774	503	419	921	5696
S22	6/28/02	60 59.1	171 29.3	31	0	239	25288	25527	4064	80	4144	29671
S23	6/28/02	60 59.7	172 10.3	33	0	902	37426	38328	8299	332	8631	46958
S24	7/14/02	60 59.5	172 49.2	34	0	1021	51557	52578	17866	8167	26034	78612
S25	7/14/02	60 59.9	173 28.8	39	0	8952	56197	65149	19893	1492	21385	86534
S26	7/16/02	61 0.3	174 11.2	43	919	31555	14093	46567	2145	1532	3676	50243
S27	7/16/02	61 0.7	174 52.1	49	3121	30728	9603	43452	2110	812	2922	46374
S28	7/19/02	61 0.4	175 32.9	54	1652	8923	5453	16028	1818	2148	3966	19994
S29	7/17/02	61 0.4	176 17.8	59	1665	3405	1438	6508	1362	227	1589	8097
S30	7/17/02	61 0.8	176 57.1	65	1924	4098	418	6440	167	167	335	6774
S31	7/17/02	61 0.2	177 37.4	72	2887	3135	247	6270	330	247	577	6847
T25	7/14/02	61 20.2	173 34.8	38	0	788	37832	38620	20492	9458	29950	68570
T26	7/16/02	61 20.2	174 20.0	40	0	2228	22650	24878	9283	3713	12996	37873
T27	7/16/02	61 19.5	174 57.9	46	247	10232	22314	32793	19342	2198	21540	54333

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
T28	7/16/02	61 19.9	175 38.0	51	7442	61284	32831	101556	5501	809	6310	107866
T29	7/17/02	61 19.8	176 16.5	56	1905	8141	5716	15762	29776	3080	32856	48618
T30	7/17/02	61 19.9	176 57.1	62	2479	6114	1818	10410	330	0	330	10741
U25	7/14/02	61 40.0	173 40.1	36	0	0	32413	32413	18590	25263	43853	76267
U26	7/16/02	61 40.1	174 26.6	40	0	1799	36889	38689	7642	5394	13036	51725
U27	7/16/02	61 40.0	175 5.0	44	0	1571	27488	29059	10995	5498	16493	45552
U28	7/15/02	61 40.0	175 46.8	50	0	10673	81825	92497	54075	14230	68306	160803
U29	7/15/02	61 40.2	176 27.4	55	0	3130	4575	7705	8909	241	9150	16855
V25	7/14/02	61 59.3	173 44.9	32	0	1215	104462	105677	12147	29760	41906	147583
V26	7/15/02	61 60.0	174 29.8	38	0	0	19194	19194	5041	6204	11245	30439
V27	7/15/02	61 60.0	175 10.1	42	0	195	23049	23244	1953	16994	18947	42192
V28	7/15/02	62 0.0	175 50.0	48	77	154	6874	7106	2935	1390	4325	11431

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

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
B08	6/10/02	55 19.7	163 24.3	26	241	80	0	321	0	80	80	402
C09	6/10/02	55 40.5	162 50.2	25	370	0	0	370	0	0	0	370
D10	6/10/02	55 59.2	162 15.5	36	0	84	0	84	0	0	0	84
E10	6/9/02	56 18.5	162 12.9	38	78	0	0	78	0	0	0	78
F20	7/3/02	56 40.0	169 26.7	40	163	163	163	489	0	326	326	814
F21	7/4/02	56 49.9	169 53.2	38	165	0	0	165	0	165	165	331
G08	6/13/02	56 60.0	163 24.0	34	83	0	0	83	0	0	0	83
G09	6/9/02	57 0.1	162 47.3	31	74	0	0	74	0	0	0	74
G10	6/9/02	56 59.7	162 10.1	31	165	0	0	165	0	0	0	165
G14	6/4/02	56 59.7	159 44.6	29	0	77	0	77	0	0	0	77
G20	7/4/02	56 60.0	169 32.9	31	164	0	0	164	0	82	82	246
H01	6/22/02	57 19.7	167 44.2	38	79	0	0	79	0	0	0	79
H08	6/13/02	57 20.1	163 24.0	27	103	0	0	103	0	0	0	103
H12	6/5/02	57 20.2	160 56.7	31	157	0	0	157	0	0	0	157
H15	6/4/02	57 19.9	159 4.1	26	0	79	0	79	0	0	0	79
H19	7/3/02	57 19.6	168 58.7	36	162	0	0	162	0	0	0	162
H20	6/26/02	57 29.7	169 23.5	37	79	0	0	79	79	0	79	157
I06	6/14/02	57 40.2	164 37.6	27	77	0	0	77	0	0	0	77
I11	6/6/02	57 40.4	161 28.7	27	79	0	0	79	0	0	0	79
I14	6/3/02	57 39.8	159 37.8	25	0	78	0	78	0	0	0	78
I22	7/4/02	57 30.5	170 34.8	39	84	0	0	84	0	0	0	84
J04	6/16/02	57 59.6	165 54.5	28	79	0	0	79	0	0	0	79
J14	6/3/02	58 0.1	159 37.9	21	0	74	0	74	0	0	0	74
K05	6/14/02	58 19.3	165 18.1	22	77	0	0	77	0	0	0	77
L01	6/23/02	58 40.0	167 51.6	24	163	0	0	163	0	0	0	163
L18	6/25/02	58 40.1	168 29.7	27	162	0	0	162	0	0	0	162
M01	6/23/02	58 59.7	167 52.7	21	0	0	0	0	0	80	80	80
M02	6/23/02	59 0.3	167 14.2	19	84	0	0	84	0	0	0	84
M18	6/25/02	58 59.1	168 31.8	23	485	0	0	485	0	0	0	485
M19	6/25/02	58 59.8	169 11.2	27	161	0	0	161	161	0	161	322
N01	6/23/02	59 19.7	167 55.2	20	78	78	0	156	0	0	0	156
N02	6/23/02	59 20.3	167 16.2	15	0	0	0	0	0	82	82	82
N18	6/24/02	59 19.9	168 33.2	21	897	0	0	897	163	0	163	1060

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

Station	Date	N. Lat.	W. Long	Fathoms	Males				Females			GRAND TOTAL
					Large	Medium	Small	Total	Large	Small	Total	
N19	6/24/02	59 20.3	169 14.2	25	82	0	0	82	246	0	246	328
O01	6/23/02	59 39.7	167 57.6	18	79	0	0	79	0	0	0	79
O18	6/24/02	59 40.1	168 37.5	19	242	0	0	242	0	0	0	242
O19	6/24/02	59 39.5	169 17.1	24	80	0	0	80	80	0	80	159
P18	6/24/02	59 59.6	168 39.6	19	80	0	0	80	0	0	0	80
P19	6/24/02	60 0.0	169 19.7	23	90	0	0	90	0	0	0	90
Q18	6/24/02	60 18.8	168 40.8	18	164	82	0	246	82	0	82	328
Q19	6/24/02	60 20.4	169 20.2	22	385	0	0	385	0	0	0	385

NOTE: Minimum carapace sizes used are: Large Males > 3.25 in; Medium Males = 2.0 to 3.25 in; Large Females > 2.6 in.