

4K88-1  
1-5

WESTWARD REGION SHELLFISH REPORT TO THE  
ALASKA BOARD OF FISHERIES  
APRIL 1988

BY

WESTWARD REGION SHELLFISH STAFF  
COMPILED BY WILLIAM E. NIPPES  
Regional Information Report<sup>1</sup> No. 4K88-1

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
211 Mission Road  
Kodiak, Alaska 99615

April 1988

<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basis uninterrupted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

## TABLE OF CONTENTS

### I. OVERVIEW OF THE WESTWARD REGION

A. Introduction . . . . .	1
B. Shrimp . . . . .	2
C. King Crab. . . . .	2
D. Tanner Crab. . . . .	3
E. Dungeness Crab . . . . .	3

### II. KODIAK MANAGEMENT AREA

A. Introduction. . . . .	17
B. Tanner Crab . . . . .	27
(1) Historical Background. . . . .	27
(2) 1986/87 Fishery. . . . .	27
(3) Stock Status . . . . .	31
(4) 1987/88 Fishery. . . . .	32
(5) Stock Status . . . . .	37
C. Dungeness Crab. . . . .	45
(1) Historical Background. . . . .	45
(2) 1987 Fishery . . . . .	46
(3) Stock Status . . . . .	47
(4) 1987 Dungeness Investigations. . . . .	47
D. King Crab . . . . .	55
(1) Historical Background. . . . .	55
(2) 1987 Fishery Red King Crab . . . . .	62
(3) 1987 Stock Status, Red King Crab . . . . .	62
(4) 1987 Fishery Brown King Crab . . . . .	63
(5) Stock Status, Brown King Crab. . . . .	64
E. Shrimp. . . . .	75
(1) Historical Background - Trawl Fishery. . . . .	75
(2) 1987/88 Fishery - Trawl Fishery. . . . .	80
(3) North Afognak and West Afognak . . . . .	80
(4) Mainland Section . . . . .	81
(5) Undefined. . . . .	81
(6) Stock Status . . . . .	81
(7) Pot Shrimp . . . . .	82

F.	Weathervane Scallops . . . . .	89
	(1) Historical Background . . . . .	89
	(2) 1987 Fishery . . . . .	90
	(3) Stock Status . . . . .	90
G.	Sea Urchins . . . . .	95
	(1) Historical Background . . . . .	95
	(2) 1987 Fishery . . . . .	95
	(3) Stock Status . . . . .	96
H.	Octopus . . . . .	99
	(1) Stock Status . . . . .	99
I.	Razor Clams . . . . .	101
	(1) Historical Background . . . . .	101
	(2) Stock Status . . . . .	101
	(3) 1987 Fishery . . . . .	102

III.

ALASKA PENINSULA AREA

A.	Alaska Peninsula King Crab . . . . .	107
	(1) Introduction - Red King Crab . . . . .	107
	(2) 1987/88 Season Summary . . . . .	108
	(3) Stock Status . . . . .	108
	(4) Introduction - Brown King Crab . . . . .	109
	(5) 1987 Season . . . . .	109
	(6) Stock Status . . . . .	110
B.	Chignik Tanner Crab . . . . .	117
	(1) Introduction . . . . .	117
	(2) 1987 Season Summary . . . . .	118
	(3) Stock Status . . . . .	120
	(4) 1988 Fishery . . . . .	130
	(5) Stock Status . . . . .	133
C.	South Peninsula District Tanner Crab . . . . .	141
	(1) Introduction . . . . .	141
	(2) 1987 Season Summary . . . . .	141
	(3) Stock Status . . . . .	146
	(4) 1987 Survey . . . . .	149
	(5) Introduction . . . . .	161
	(6) 1988 Season Summary . . . . .	161
	(7) Issues . . . . .	165

D.	Dungeness Crab. . . . .	179
	(1) Introduction . . . . .	179
	(2) 1987-88 Fishery. . . . .	180
	(3) Chignik. . . . .	180
	(4) South Peninsula. . . . .	181
	(5) Stock Status . . . . .	182
	(6) Issues . . . . .	184
E.	Shrimp. . . . .	195
	(1) Introduction . . . . .	195
	(2) 1987-88 Fishery. . . . .	195
	(3) Stock Status . . . . .	195
F.	Scallops. . . . .	201
	(1) Introduction . . . . .	201
	(2) 1987 Fishery . . . . .	201
G.	Alaska Peninsula Miscellaneous Species. . . . .	205
	(1) Octopus. . . . .	205

IV. EASTERN ALEUTIAN AREA

A.	Dutch Harbor Red King Crab. . . . .	211
	(1) Introduction . . . . .	211
	(2) Historical Background. . . . .	211
	(3) 1987 Fishery . . . . .	212
	(4) Stock Status . . . . .	212
B.	Dutch Harbor Brown King Crab. . . . .	219
	(1) Historical Background. . . . .	219
	(2) 1987 Permit Season . . . . .	220
	(3) Stock Status . . . . .	221
C.	Tanner Crab . . . . .	229
	(1) Historical Background. . . . .	229
	(2) 1987 Fishery . . . . .	229
	(3) Stock Status . . . . .	230
D.	Dungeness Crab. . . . .	235
	(1) Introduction . . . . .	235
	(2) Historical Background. . . . .	235
	(3) 1987 Fishery . . . . .	236

E.	Shrimp. . . . .	241
	(1) Introduction . . . . .	241
	(2) Historical Background . . . . .	241
	(3) 1987-88 Fishery. . . . .	241
	(4) Stock Status . . . . .	241
F.	Scallops. . . . .	245
	(1) 1987 Fishery . . . . .	245
G.	Miscellaneous Species . . . . .	249

V. WESTERN ALEUTIAN AREA

A.	Adak Brown King Crab . . . . .	253
	(1) Historical Background . . . . .	253
	(2) 1986-87 Fishery . . . . .	253
	(3) 1987-88 Fishery (Preliminary Report). . . . .	253
B.	Adak Red King Crab . . . . .	271
	(1) Introduction. . . . .	271
	(2) Historical Background . . . . .	271
	(3) 1986-87 Fishery . . . . .	272
	(4) 1987-88 Fishery (Preliminary) . . . . .	273
C.	Tanner Crab. . . . .	281
	(1) Introduction. . . . .	281
	(2) Historical Background . . . . .	281
	(3) 1986-87 Fishery . . . . .	281

IV. BERING SEA AREA

A.	Tanner Crab. . . . .	289
	(1) Introduction. . . . .	289
	(2) Historical Background . . . . .	289
	(3) 1987 Fishery. . . . .	290
	(4) Stock Status. . . . .	295
B.	King Crab (Area "T") . . . . .	315
	(1) Introduction. . . . .	315
	(2) Historical Background. . . . .	315
	(3) 1987 Fishery. . . . .	316
	(4) Stock Status. . . . .	319
	(5) Catcher/Processor Report. . . . .	331
C.	St. Matthew King Crab. . . . .	351
	(1) 1987 Fishery. . . . .	351
	(2) Stock Status. . . . .	352

D.	Blue King Crab (Area "Q" - Pribilof District).	363
	(1) Description . . . . .	363
	(2) Historical Background . . . . .	363
	(3) 1987 Fishery. . . . .	364
	(4) Stock Status. . . . .	365
E.	Bering Sea Brown King Crab (Area "Q"). . . . .	373
	(1) 1987 Permit Fishery . . . . .	373
	(2) Northern District . . . . .	373
F.	Korean Hair Crab . . . . .	379
	(1) Introduction. . . . .	379
	(2) 1987 Permit Fishery . . . . .	379
G.	Bering Sea Scallops. . . . .	383
	(1) 1987 Fishery. . . . .	383

ALASKA DEPARTMENT OF FISH AND GAME  
COMMERCIAL FISHERIES DIVISION  
WESTWARD REGION (REGION IV)  
SHELLFISH STAFF (FULLTIME)

Larry D. Nicholson..... Regional Supervisor, Kodiak

Dana Schmidt..... Regional Research Biologist,  
Kodiak

William E. Nippes..... Kodiak Area Shellfish Mgmt.  
Biologist, Act. Reg. Shellfish  
Mgmt. Biologist, Kodiak

James A. Spalinger..... Asst. Kodiak Area Shellfish  
Mgmt. Biologist, Kodiak

4 Dan O. Dunaway..... Chignik-South Peninsula Area  
Shellfish Mgmt. Biologist,  
Sand Point

Kenneth L. Griffin..... Bering Sea & Aleutians Area  
Shellfish Mgmt. Biologist,  
Dutch Harbor

William Donaldson..... Research Biologist, Kodiak

Dave Hicks..... Research Biologist, Kodiak

Forrest Blau..... Research Biologist, Kodiak

Jim Blackburn..... Research Biologist, Kodiak

Karen Alterman..... Regional Shellfish Mgmt.  
Secretary, Kodiak

Lucinda Neel..... Regional Research Secretary,  
Kodiak

Joanne Shaker..... Data Processing Clerk II,  
Kodiak

WESTWARD REGION REPORT  
TO  
THE BOARD OF FISHERIES  
APRIL 1988

Introduction

The Regional Office is located in Kodiak with field offices in Sand Point and Dutch Harbor. This report documents shellfish activities in the Region which are in progress 12 months of the year. Alaska Department of Fish and Game Biologists are charged with the State management and research programs associated with all commercially utilized stocks of shellfish. The staff (full time) consists of four Management Biologists, four Research Biologists, and one Secretary. Approximately twelve seasonal personnel are hired for shellfish assessment cruises, logbook programs, shipboard observations interviews, dockside sampling, and secretarial assistance.

The Westward Region's (Region IV) boundaries extend south from the latitude of Cape Douglas on the Alaskan Peninsula, encompassing Kodiak Island; then 1,200 miles to Attu Island in the Aleutians, then northeast to Norton Sound, including the Bering Sea (Figure 1). The area encompasses 525,000 square miles of the most productive shellfish habitat in the world. The three major shellfish commercial fisheries are king crab (3 species), Tanner crab (2 species), and Dungeness crab, with minor fisheries occurring for scallops, shrimp, clams, octopus and sea urchins. In 1987 approximately 500 catcher vessels, 24 catcher/processors, 19 shore-based processors, and 13 floating processors (Table 1) were actively engaged in harvesting and/or processing shellfish resources. The 1987-88 king crab catch through January 1988 was 27.3 million pounds valued at 95.5 million dollars; the Tanner 1986-87 crab catch was 109.5 million pounds valued at \$2.11 per pound for C.bairdi and \$ .75 per pound for C.opilio totaling

92.5 million dollars; the 1987 Dungeness catch was 1.7 million pounds valued at \$2.1 million. The value of the three major shellfish fisheries was 190 million dollars which was only exceeded by the 1978 - 1982 years when the value was exceeded 250 dollars million (Table 2).

### Shrimp

There was no regional shrimp harvest in 1987 (Table 3). Poor production in 1986 discouraged fishermen and processors from harvesting during 1987. This decision was due in part to more favorable conditions on the Washington and Oregon coast.

The department did survey historically important shrimp grounds during 1987 and found little or no improvement over recent history. These surveys have been reduced to one a year and only a few stocks are being surveyed. Depending on funding these surveys could be reduced further.

### King Crab

The Westward Region 1987-88 king crab harvest should be approximately 26 million pounds after the Adak brown king harvest is complete in August (Table 4). The red king crab seasons were closed once again in Kodiak (K), South Peninsula (M) and Dutch Harbor (O). These areas have been closed continuously since 1983. The department has surveyed these areas to assess the populations which continue to show little or no recruitment as well as associated reproductive problems.

This year, like last, the only area showing improvement was Bristol Bay. A total of 12.3 million pounds were harvested from Bristol Bay which is up slightly from the previous season's 11.1 million pound harvest (Table 4). The Bristol Bay stock is expected to increase slightly in 1988, while other stocks in the Kodiak, South Peninsula, Dutch Harbor, Pribilof, and St. Matthew

Island areas are expected to at best maintain their current levels. Based on past fishery performance and survey information, the 1988-89 harvest is projected to fall between 20-25 million pounds. This projection is subject to revision after the 1988 summer surveys are completed.

#### Tanner Crab

The 1986-87 Tanner crab season produced 109.5 million pounds which is similar to the peak production years of the late 70's and early 80's (Table 5). The difference being the catch in 1986-87 was comprised of approximately 93% C.opilio crab while the 1979 catch was only 28% C.opilio. This shift to C.opilio crab has been prompted by decreases in C.bairdi stocks.

Stocks of C.opilio crab look very healthy with harvest expectations in excess of 100 million pounds for the next few years. C.bairdi stocks while small in a historic sense, are healthy and the harvestable stock is expected to increase in most areas.

#### Dungeness Crab

The 1987 Dungeness crab harvest in the Westward Region was 1.66 million pounds (Table 6). This was an increase in catch over the previous season but still about half of the historic average catch. The Kodiak District produced the majority of the harvest and is expected to do so again during the 1988 season.

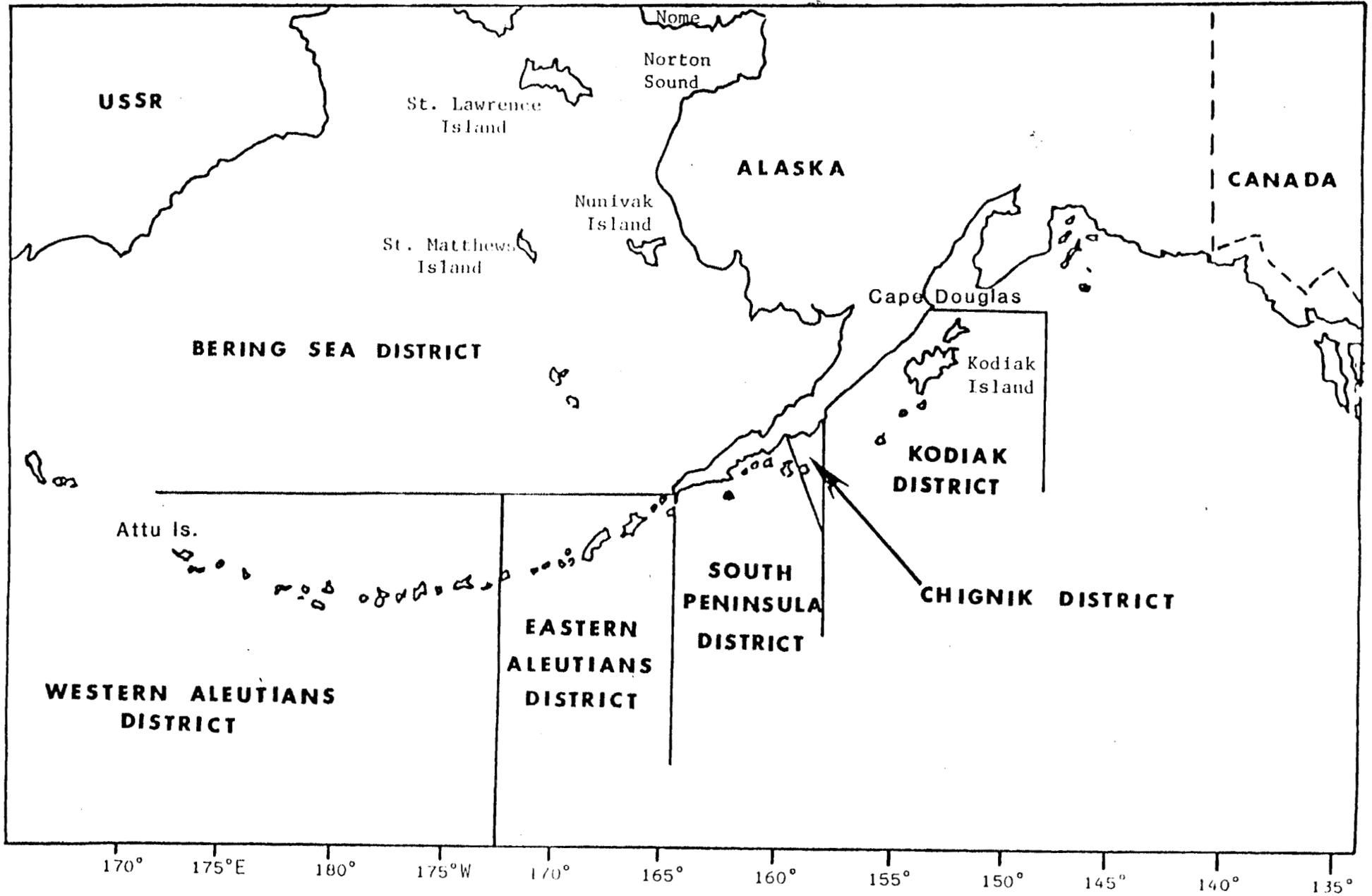


Figure 1. Westward Region (statistical Area "J") Tanner crab districts, 1987.

Table 1. Shellfish processors operating in the Westward Region during the 1987-88 Fishing seasons.

Location	Company	*Products	Superintendent
Kodiak	Alaska Fresh Seafoods	KTMD	Dave Woodruff
	All Alaskan	KTMD	Tim Blott
	Alaska Pacific Seafoods	TMD	John Severe
	Cook Inlet Processing <sup>1</sup>	TMD	Wayne Selby
	East Point Seafoods	KTMDs	Jim Major
	International Seafoods	T	David Rogers
	Kodiak King Crab	KTMD	Stewart Litton
	Skokum Chuck	TD	Ray Fuford
	Smokwa Shell <sup>1</sup>	T	Harold Powell
	Ursin Seafoods	KTMD	John Wilcomb
	Western Alaska Fisheries	KTMD	Ken Allread
Sand Point	Trident Seafoods	TD	Dave Patterson
King Cove	Peter Pan Seafoods	KT	
Akutan	Deep Sea	KTM	
	Trident	KTM	Clyde Lovett
Dutch Harbor	Alyeska Seafoods	KTM	Frank Kelty
	Aleutian Processors	KTM	Pat Ziegler
	East Point Seafoods	KTD	Chuck Corbit
	Sans Souci	KTDM	Nikata

FLOATER/PROCESSORS

Alaska Packer	K
All Alaskan	KTM
Aleutian Queen	KTM
Akutan	KT
Bountiful	KT
Clipperton	KTM
Galaxy	KT
Mr. B	KT
Omni Sea	KT
Polar Command	KTM
Sea Alaska	KTM
Tempest	KTM
Viceroy	KTM

CATCHER/PROCESSORS

Alaskan Enterprise	KT	Richard/Ron Miller
Arctic Discovery	K	Alan Rorvik
Baranof	KT	Chuck Hosner
Bountiful	KT	Victor Scheibert
Courageous	KTM	Pat Cummings
Deep Sea Harvester	K	Richard Hastings
Grizzly	KT	Ron Warren
Isafjord	KTM	Coleman Anderson
Jacquelyn R	K	Dennis Rydman
Nordic Monarch	KT	Gary Mangini/ Arnold Rasmussen

Table 1. (continued) Shellfish processors operating in the Westward Region during the 1987-88 Fishing season.

Location	Company	*Products	Superintendent
	Northern Enterprise	K	Richard Miller
	Optimus Prime	K	Thorn Tasker
	Patricia Lee	KTM	Richard Powell
	Pavlof	KTM	Doug Barber/ Einer Uri
	Pengwin	KTM	Lloyd Olsen
	Rondys	KT	Dave Capri/ Bill Williams
	Seattle Star	K	Erling Skaar
	Seahawker	KT	Magne Ness/Nick
	Seawind	K	Russ Moore
	Shaylen Nicholas	M	Louis Audette
	Shishaldin	KTM	James Coghlan/ Phil Harris
	Skipbladnir	KTM	Pat Berg/ Jerry Howard
	Sourdough	KT	Doug Barber
	Westward Wind	KTM	Walt Casto/ Craig Sandness

\* K = King Crab    T = Tanner Crab    S = Shrimp  
 D = Dungeness    M = Scallops, Clams, Haircrab, Octopus, Urchins

<sup>1</sup> Cook Inlet processing is same plant as Skokum Shell under new ownership.

Table 2. Westward Region king crab, shrimp, Tanner crab and Dungeness crab pounds, price/pound and value to the fishermen 1950 to 1987.

Year	SHRIMP			KING CRAB		TANNER CRAB <sup>1</sup>		DUNGENESS CRAB			TOTAL		
	Lbs. <sup>2</sup>	Price <sup>3</sup>	Value	Lbs. <sup>2</sup>	Price - Value	Lbs. <sup>2</sup>	Price	Value	Lbs. <sup>2</sup>	Price	Value	Lbs. <sup>2</sup>	Value
1950				2.1									
1951				.8									
1952				.7									
1953				3.3									
1954				6.6									
1955				5.5									
1956				10.9									
1957				12.3									
1958				12.4									
1959				16.4									
1960	3.4	.039	.13	30.4	.085	2.58						33.9	2.71
1961	11.0	.04	.44	38.6	.095	3.66						49.6	4.10
1962	12.6	.04	.50	49.5	.10	4.95			1.9	.09	.17	64.0	5.62
1963	10.1	.043	.43	66.8	.10	6.68			2.4	.09	.21	79.3	7.32
1964	3.9	.04	.15	91.8	.10	9.18			4.2	.09	.38	99.9	9.71
1965	13.8	.04	.55	138.2	.128	17.68			3.3	.12	.40	155.3	18.63
1966	24.1	.045	1.08	136.2	.11	14.9			1.2	.13	.16	161.5	16.14
1967	39.6	.045	1.78	103.4	.26	26.88	.1	.07	.007	.13	.86	149.7	29.53
1968	39.7	.04	1.58	69.0	.26	17.94	2.7	.10	.27	.14	1.12	119.4	20.91
1969	45.0	.055	2.48	54.7	.28	15.32	8.5	.11	.94	.16	1.08	115.0	19.82
1970	68.2	.04	2.73	49.9	.30	14.97	11.3	.11	1.24	.14	.80	135.1	19.74
1971	88.6	.04	3.54	52.8	.39	20.59	9.8	.11	1.07	.18	.25	152.6	25.45
1972	78.0	.04	3.12	70.4	.55	38.72	15.6	.13	2.03	.40	.84	166.1	44.71
1973	117.8	.08	9.42	69.3	.45	31.18	38.0	.17	6.46	.50	1.10	247.1	48.16
1974	104.0	.08	8.32	94.3	.45	42.43	43.4	.20	8.68	.8	.38	242.5	59.81
1975	92.1	.08	7.37	96.7	.66	63.82	33.2	.17	5.64	.6	.37	222.6	77.20

10

Table 2. (continued) Westward Region king crab, shrimp, Tanner crab and Dungeness crab pounds, price/pound and value to the fishermen 1950 to 1987.

Year	SHRIMP			KING CRAB			TANNER CRAB <sup>1</sup>			DUNGENESS CRAB			TOTAL				
	Lbs. <sup>2</sup>	Price <sup>3</sup>	Value	Lbs. <sup>2</sup>	Price	Value	Lbs. <sup>2</sup>	Price	Value	Lbs. <sup>2</sup>	Price	Value	Lbs. <sup>2</sup>	Value			
1976	119.3	.10	11.93	101.4	1.37	138.91	64.8	.20	12.96	.08	.15	.01	285.6	168.81			
1977	110.6	.13	14.38	94.6	1.34	126.76	86.4	.33	28.51	.1	.30	.03	291.7	169.68			
1978	64.2	.165	10.59	119.9	1.60	191.80	114.3	.43	49.15	1.3	.75	.98	301.4	253.16			
1979	44.6	.225	10.03	151.6	.95	144.02	1.7	.38	.64	84.2	.55	46.30	1.4	.75	1.05	314.0	211.06
1980	43.1	.29	12.49	189.6	1.05	199.08	32.2	.30	9.66	4.0	.55	35.20	2.0	.45	.90	338.20	255.97
1981	21.5	.27	5.81	85.3	2.0	170.60	39.5	.21	8.30	49.3	.65	32.05	5.6	.70	3.92	214.40	226.08
1982	11.2	.27	3.02	38.5	3.75	144.48	52.7	.26	13.70	34.2	1.65	56.43	5.3	.75	3.98	118.5	229.19
1983	2.8	.35	.98	25.0	3.00	75.00	29.3	.73	21.38	31.4	1.25	39.25	5.90	1.05	6.20	91.3	130.60
1984	2.9	.33	.95	17.1	2.75	47.02	26.2	.35	9.17	18.8	1.10	20.68	6.0	1.40	8.40	70.8	86.22
1985	1.2	.20	.24	20.4	2.50	51.00	26.0	.30	7.80	18.4	1.50	27.60	4.6	1.20	5.52	109.1	103.71
1986	.5	.25	.13	17.3	3.50	60.50	64.5	.30	19.35	13.2	1.90	25.08	1.2	1.15	1.38	128.7	144.99
1987	0	0	0	27.3	3.50	95.46	96.5	.60	57.90	7.6	2.11	16.02	1.7	1.25	2.07	138.5	189.98
							101.9	.75	76.43								

<sup>1</sup> *C. bairdi*

*C. opilio*

<sup>2</sup> Millions of pounds

90

Table 3. Historic domestic trawl shrimp catch, Alaska Westward Region, 1960-87.

Calendar Year	Kodiak	Chignik	South Peninsula	Aleutian	Total
1960	3,379,000				3,379,000
1961	11,083,500				11,083,500
1962	12,654,300				12,654,300
1963	10,118,500				10,118,500
1964	3,946,900				3,946,900
1965	13,810,500				13,810,500
1966	24,097,100				24,097,100
1967	38,722,100		879,900		39,602,000
1968	34,468,700	1,153,700	4,137,400		39,759,800
1969	41,243,600	419,900	3,365,600		45,029,100
1970	62,369,300	1,226,800	4,634,700		68,230,800
1971	82,153,724	987,900	5,532,400		88,674,024
1972	58,352,319	4,829,800	14,740,800	94,627	78,017,546
1973	70,511,477	26,884,200	20,022,000	456,179	117,873,858
1974	48,771,375	23,392,400	26,145,900	5,749,407	104,059,082
1975	46,806,799	24,435,400	20,044,400	893,567	92,180,166
1976	51,400,472	27,059,700	37,170,300	3,670,609	119,301,081
1977	31,801,573	27,797,739	46,454,376	4,599,858	110,653,546
1978	22,820,135	22,976,720	11,812,795	6,618,263	64,227,913
1979	14,540,901	23,722,330	3,134,367	3,236,721	44,634,319
1980	27,783,437	12,843,270	C L O S E D	2,479,350	43,106,057
1981	19,030,341	70,948	C L O S E D	2,398,458	21,499,747
1982	10,884,059	0 <sup>1</sup>	0 <sup>1</sup>	341,551	11,225,610
1983	2,779,030	0 <sup>1</sup>	0 <sup>1</sup>	5,600	2,784,630
1984	3,023,438	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>	3,023,438
1985	1,159,912	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>	1,159,912
1986	453,468	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>	453,468
1987	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>	0 <sup>1</sup>
TOTAL	748,165,960	197,800,807	198,074,938	30,544,190	1,174,585,895
AVERAGE (Years Fished)	72,709,850	14,128,629	15,236,533	2,545,349	43,503,181

Source: Westward Region Shellfish Mgmt. Office (3/88).

<sup>1</sup>Season Open - No Catch Reported

Table 4. Historic king crab catch by registration area for Alaska's Westward Region (in thousands of pounds), 1950 to 1988.

Year	K Kodiak	M Chignik South Pen.	O Unalaska	R Adak W. Aleutian	Q Bering Sea	T Bristol Bay	U.S.	Foreign	Total
1950	60.0	2,124.0	NF	NF	NF	NF	2,184.0	0	2,184.0
1951	200.0	599.0	NF	NF	NF	NF	799.0	0	799.0
1952	400.0	298.0	NF	NF	NF	NF	698.0	0	698.0
1953	900.0	380.0	NF	NF	NF	2,000.0	3,280.0	11,356.0	14,636.0
1954	4,000.0	317.0	NF	NF	NF	2,329.0	6,646.0	8,086.0	14,732.0
1955	2,000.0	1,641.0	NF	NF	NF	1,878.0	5,519.0	8,693.0	14,212.0
1956	4,800.0	4,221.0	NF	NF	NF	1,896.0	10,917.0	8,308.0	19,225.0
1957	5,000.0	6,687.0	NF	NF	NF	588.0	12,275.0	8,548.0	20,823.0
1958	5,200.0	7,246.0	NF	NF	NF	7.0	12,453.0	8,136.0	20,589.0
1959	10,200.0	6,167.0	NF	NF	NF	NF	16,367.0	11,602.0	27,969.0
Subtotal	32,760.0	29,680.0	-	-	-	8,698.0	71,138.0	64,729.0	135,867.0
Average	3,276.0	2,968.0	-	-	-	1,449.6	7,113.0	9,247.0	13,586.7
1960-61	21,064.0	6,700.0	NF	2,093.7	NF	598.0	30,456.5	24,611.0	55,067.5
1961-62	28,962.9	3,900.0	533.0	4,776.0	NF	459.0	38,630.9	40,404.0	79,034.0
1962-63	37,626.7	2,273.0	1,536.0	8,006.5	NF	74.0	49,543.2	49,516.2	102,782.2
1963-64	37,716.2	6,539.0	3,893.0	17,903.7	NF	747.0	66,798.9	56,671.0	123,469.9
1964-65	41,596.5	14,354.0	13,761.0	21,193.0	NF	910.0	91,815.0	63,076.0	154,891.3
1965-66	94,431.0	14,713.0	19,196.0	8,040.0	NF	1,762.0	138,142.4	41,405.0	179,547.4
1966-67	73,817.8	22,577.0	32,852.0	5,883.1	NF	997.0	136,126.9	43,998.0	180,124.9
1967-68	43,448.5	17,252.0	22,709.0	16,948.9	NF	3,102.0	103,460.4	32,528.0	135,988.4
1968-69	18,211.4	10,944.0	11,300.0	19,874.8	NF	8,687.0	69,017.2	27,681.0	96,698.2
1969-70	12,200.5	4,137.0	8,950.0	19,055.4	NF	10,403.0	54,745.9	14,113.0	68,858.9
Subtotal	409,076.3	103,389.0	114,730.0	123,778.3	-	27,739.0	778,737.6	394,003.2	1,176,463.6
Average	40,907.6	10,338.9	12,747.8	12,377.6	-	2,773.9	77,873.8	39,400.3	117,646.4

Table 4. (continued) Historic king crab catch by registration area for Alaska's Westward Region (in thousands of pounds), 1950 to 1988.

Year	K Kodiak	M Chignik South Pen.	O Dutch Harbor	R Adak W. Aleutian	Q Bering Sea	T Bristol Bay	U.S.	Foreign	Total
1970-71	11,719.9	3,425.7	9,652.0	16,057.0	NF	8,559.2	49,913.6	12,930.0	62,843.6
1971-72	10,884.1	4,123.1	9,391.6	15,475.9	NF	12,995.8	52,869.7	6,188.0	59,057.7
1972-73	15,479.9	4,069.3	10,450.4	18,724.1	NF	21,744.9	70,490.7	4,721.0	75,211.7
1973-74	14,397.3	4,260.6	12,722.7	9,741.5	1,276.6	26,913.6	69,331.8	1,279.0	70,610.8
1974-75	23,582.7	4,572.1	13,991.1	2,775.0	7,107.3	42,266.3	94,274.0	2,618.0	96,892.0
1975-76	24,061.6	2,605.3	15,906.6	437.1	2,433.7	51,326.2	96,747.4	NF	96,747.4
1976-77	17,966.8	958.8	10,198.4	2.3	8,356.1	63,919.7	101,399.8	NF	101,399.8
1977-78	13,503.6	726.3	3,684.4	953.0	8,201.8 <sup>1</sup>	69,967.8	94,567.9	NF	94,567.9
1978-79	12,021.8	3,093.8	6,824.1	807.2	10,387.7 <sup>1</sup>	87,618.3	119,933.7	NF	119,933.7
1979-80	14,608.9	4,453.5	15,010.9	490.7	9,230.3 <sup>1</sup>	107,828.0	151,647.4	NF	151,647.4
Subtotal	158,226.6	32,288.5	107,832.2	64,973.1	46,993.5	493,138.8	901,176.0	27,736.0	928,912.0
Average	15,822.6	3,228.9	10,783.2	64,973.1	4,699.3	49,313.9	90,117.6	5,547.2	92,891.2
1980-81	20,448.6	5,080.6	19,053.6	1,478.4	11,543.8	129,948.5	89,668.8	NF	189,423.3
1981-82	24,237.6	3,147.5	5,231.1	2,843.0	13,772.5	33,591.4	85,291.4	NF	85,291.4
1982-83	8,729.2	1,627.7	1,616.2	9,708.1	13,447.3	3,001.2	38,497.8	NF	38,497.8
1983-84	111.4 <sup>2</sup>	CLOSED	1,810.0	10,109.6	11,701.9	CLOSED	25,463.1	NF	25,463.1
1984-85	22.2 <sup>2</sup>	CLOSED	1,521.1	5,508.7	4,701.3	4,182.4	17,115.2	NF	17,115.2
1985-86	63.6 <sup>2</sup>	CLOSED	1,968.2	11,931.0	2,959.8	4,174.9	20,405.4	NF	20,405.4
1986-87	146.5 <sup>2</sup>	CLOSED	1,869.2	13,510.2	1,262.1	11,393.9	17,308.5	NF	17,308.5
1987-88	67.2 <sup>2</sup>	CLOSED	1,383.2	3,190.0 <sup>4</sup>	2,200.9	2,289.1	19,130.4	NF	19,130.4
Subtotal	53,826.8	9,855.8	34,453.6	58,279.0	61,589.6	8,581.4	412,880.6	NF	412,880.6
Average	6,728.3	3,285.3	4,306.7	7,284.9	7,698.7	28,368.8	51,610.1		51,610.1

<sup>1</sup> Fishing Year - July 1 through June 30

<sup>2</sup> Brown crab

<sup>3</sup> Calendar Year

<sup>4</sup> Through January 31

NF = No fishing

Table 5. Historic Tanner crab *C.bairdi* and *C.opilio* catch (in pounds) for Alaska, Westward Region, 1965-1987.

Year <sup>1</sup>	Kodiak	Chignik <sup>2</sup>	South Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea		Total U.S. Harvest	Total Foreign Harvest
						<i>C.Opilio</i>	<i>C.bairdi</i>		
1965	0	0	0	0	0	0	0	0	3,936,000
1966	0	0	0	0	0	0	0	0	7,290,000
1967	110,961	0	5,000	0	0	0	0	115,961	24,000,000
1968	2,560,687	0	131,700	0	0	0	17,900	2,710,287	30,940,000
1969	6,796,477	0	644,400	0	0	0	1,008,900	8,449,777	47,668,000
1970	7,749,859	0	2,022,427	0	0	0	1,014,700	11,259,447	47,828,000
1971	7,436,414	152,256	2,140,755	0	0	0	166,100	9,875,888	39,886,000
1972	11,898,054	23,343	3,618,883	0	0	0	107,761	15,662,354	31,186,000
1973	31,113,459	747,788	5,615,563	62,128	168,354	0	231,668	38,008,640	27,886,000
1974	25,479,717	4,202,671	9,503,366	498,836	71,887	0	5,044,197	43,409,968	27,912,000
1975	17,535,844	3,649,444	5,195,800	77,164	3,350	0	7,284,378	33,225,873	18,456,000
1976	23,446,245	6,926,161	11,201,941	534,295	62,180	0	22,341,475	64,818,920	19,286,000
1977	20,720,079	5,672,919	6,773,838	1,301,654	0	0	51,455,221	86,405,326	21,520,173
1978	33,271,472	4,693,830	7,446,270	2,624,016	237,512	1,716,124	66,648,954	116,014,238	33,057,796
1979	29,173,807	2,536,105	8,684,408	1,092,311	197,244	31,102,832	42,547,174	116,411,771	32,914,536
1980	18,623,875	3,517,920	3,961,251	879,807	337,297	39,344,323	36,614,315	103,507,133	15,636,125
1981	11,748,629	3,653,723	3,294,106	654,514	220,716	50,483,055	29,732,086	102,056,808	NF
1982	13,756,159	3,240,526	4,589,042	739,694	838,627	29,351,474	11,008,779	63,542,301	NF
1983	18,927,061	3,497,370	2,863,798	547,830	448,399	26,128,410	5,273,881	57,686,749	NF
1984	14,789,903	659,043	1,789,883	239,395	191,954	26,813,074	1,208,223	45,691,225	NF
1985	12,024,553	385,838	2,561,868	165,529	66,549	65,998,875	3,151,498	82,900,497	NF
1986	8,974,520	184,907	3,763,761	166,939	72,441	97,984,539	NF	109,674,455	NF
1987	4,833,473	195,060	2,400,784	160,292	42,761	101,903,388	NF	109,535,758	NF
TOTAL	320,971,248	43,938,904	88,208,844	9,744,404	2,959,271	471,476,956	284,857,210	1,220,963,376	429,402,630
AVERAGE	15,284,345	2,584,641	4,200,421	649,627	211,377	47,147,696	15,825,401	58,141,113	26,837,664

SOURCE: Westward Regional Shellfish Management Office (3/1/88)

<sup>1</sup> Calendar Year

<sup>2</sup> Chignik and South Peninsula catches combined 1967 through 1970

NF = No fishing

Table 6. Historic Dungeness crab catch (in pounds), Alaska Westward Region, by District 1962-87.

Calendar Year	Kodiak	Alaska Peninsula	Aleutian	Total
1962	1,904,567	NF	NF	1,904,567
1963	2,487,512	NF	NF	2,487,512
1964	4,162,182	NF	NF	4,162,182
1965	3,311,571	NF	NF	3,311,571
1966	1,148,600	NF	NF	1,148,600
1967	6,663,668	NF	NF	6,663,668
1968	6,829,061	1,259,000	NF	8,088,061
1969	5,834,628	1,056,000	NF	6,890,628
1970	5,741,438	13,000	NF	5,754,438
1971	1,445,864	11,000	NF	1,456,864
1972	2,059,536	65,000	NF	2,124,536
1973	2,000,526	194,500	NF	2,195,026
1974	750,057	NF	60,517	810,574
1975	639,813	NF	4,408	644,221
1976	87,110	NF	NF	87,110
1977	113,026	NF	NF	113,026
1978	1,362,306	NF	NF	1,380,340
1979	1,313,650	102,320	1,101	1,417,071
1980	2,011,736	NF	NF	2,100,736
1981	5,566,463	42,296	NF	5,608,759
1982	4,546,311	779,600	36,034	5,361,945
1983	4,752,148	1,200,978	8,975	5,962,101
1984	5,304,921	647,497	91,736	6,044,154
1985	4,153,877	462,258	16,750	4,632,885
1986	965,095	179,367	10,897	1,155,359
1987	1,450,983	182,706	26,627	1,660,316
TOTAL	76,606,649	6,195,522	275,079	83,077,250
AVERAGE (Years Fished)	2,946,409	442,537	27,508	3,195,279

NF = No fishing



KODIAK AREA  
SHELLFISH MANAGEMENT REPORT  
TO  
ALASKA BOARD OF FISHERIES

APRIL 1988

BY  
WILLIAM E. NIPPES - AREA MANAGEMENT BIOLOGIST  
JAMES A. SPALINGER - ASSISTANT AREA MANAGEMENT BIOLOGIST  
DAVID R. JACKSON - FISHERY BIOLOGIST

Kodiak Area Office  
211 Mission Road  
Kodiak, Alaska 99615  
(907) 486-4791



## INTRODUCTION

The Kodiak Shellfish Management Area is located in Southcentral Alaska, south of the latitude of Cape Douglas ( $58^{\circ} 52'$  N. lat.) on the Alaska Peninsula, east of the longitude of Cape Kumlik ( $157^{\circ} 27'$  W. long.) and west of  $148^{\circ} 50'$  W. longitude. The management unit varies slightly for shrimp, where it extends from the latitude of Cape Douglas to the longitude of Kilokak Rocks on the Alaska Peninsula ( $156^{\circ} 19' 25''$  W. long.). This report reviews the 1987 and/or 1986/87 seasonal shellfisheries within the area and provides a synopsis of all landings from within the Kodiak area.

Tanner crab, Dungeness crab, king crab and scallops, as well as three species of shrimp, are the principal commercial species fished. A small harvest of octopus and sea urchins also was landed. Catches are reported by fishermen from individual statistical areas (Figure 1) and summarized by districts or sections (Figures 2 and 3). At the port of Kodiak, 8 million pounds of shellfish were landed during 1987, down from the 14 million pounds of the previous year. The 1987 ex-vessel value of shellfish at the port was 22 million dollars (Table 1). The single most valuable shellfish species delivered was Tanner crab worth 13 million dollars.

A discussion of each shellfishery appears in individual sections of this report. Vessels fishing for shellfish in the

Kodiak area during 1987, ranged in size from less than 20 feet to over 120 feet in keel length (Table 2). During 1987 a total of seven emergency orders were issued for king crab, Tanner Crab, and spat collection in the Kodiak Management Area. An explanation of each one is presented in Table 3. Table 4 lists the amount of pots utilized each year for king, Tanner, and Dungeness crab fishing. The average number of pots fished in the Tanner and Dungeness fishing have declined in recent years.

During the 15th Alaska Legislature, Senate Bill No. 297 was introduced. This bill authorized the Commissioner of the Department of Fish and Game to issue a permit for the collection of bivalve spat for use in connection with aquatic farms. On July 23, 1987 an emergency order was issued allowing commercial spat collection under the terms of a permit issued by the Commissioner. These permits were to expire on October 1, 1987. On September 24, 1987 another emergency order was issued extending the scallop spat collection period to December 31, 1987. This extension was necessary because the scallop spat in the collectors were not large enough for harvest by October 1. A total of four individuals obtained permits to commercially collect scallop spat in the Kodiak area in 1987, but no commercial sales were reported.

Table 1. Ex-vessel\* value of fish and shellfish landed at the port of Kodiak.

KODIAK 1987

<u>SPECIES</u>	<u>POUNDS</u>	<u>EX-VESSEL VALUE</u>
Red King Crab	1,204,515	5,299,866
<u>C.bardi:</u>	5,139,730	13,525,996
Dungeness	1,450,982	1,826,750
Scallops	253,451	874,406
Octopus	11,445	12,360
Salmon	69,007,600	63,873,500
Herring		
Sac Roe	7,154,000	3,687,900
Bait	460,000	85,200
Groundfish (1)	101,626,147	17,545,397
Miscellaneous (2)	<u>308,800</u>	<u>759,980</u>
	186,616,670	107,157,151

(1) Includes: All groundfish except halibut

(2) Includes: C.opilio, brown king crab, sea urchins

Note: Halibut figures not available from ADFG  
 - No shrimp landed 1987

\* Value to fisherman

Table 2. Keel length frequencies of Kodiak District shellfish vessels which made landings during the 1987-88 fishing seasons for Tanner crab, and the 1987 calendar year for brown king crab and Dungeness crab and the 1987-88 shrimp season.

Vessel Keel Length	1987 King Crab (Brown)	1987-88 Tanner Crab	1987 Dungeness Crab	1987-88 Shrimp
20	-	-	2	-
20-29.	-	6	15	-
30-39.	-	54	13	-
40-49.	1	58	11	-
50-59.	-	12	1	-
60-69.	1	18	2	-
70-79.	-	14	-	1
80-89.	2	14	1	-
90-99.	-	9	-	-
100-109.	-	3	-	-
110-119.	-	-	-	-
120-129.	1	1	-	-
130-139.	-	-	-	-
140-149.	-	-	-	-
≥150	-	-	-	-
<b>VESSELS</b>	<b>5</b>	<b>189</b>	<b>45</b>	<b>1</b>
<b>MEAN KEEL LENGTH (feet)</b>	<b>81</b>	<b>53</b>	<b>36.1</b>	<b>77</b>

Table 3. Shellfish emergency orders issued during 1987 for the Kodiak Management District.

Emergency Order	Effective Date	Explanation
TANNER CRAB		
4-S-01-87	January 23, 1987	Closed the Eastside section to Tanner crab fishing effective 12:00 Noon January 23, 1987. Closed the Northeast section to Tanner Crab fishing effective 12:00 noon January 25, 1987.
4-S-03-87	February 2, 1987	Closed Southeast and Westside sections to Tanner crab fishing effective 12:00 Noon February 2, 1987.
4-S-04-87	February 10, 1987	Closed the Southwest section to Tanner crab fishing effective February 10, 1987.
4-S-05-87	February 18, 1987	Closed the North Mainland section to Tanner crab fishing effective 12:00 Noon February 18, 1987. Closed the South Mainland and Semidi Island sections to Tanner crab fishing effective 12:00 Noon February 18, 1987.
KING CRAB		
4-S-17-87	September 25, 1987	Closed Registration Area "K" (Kodiak) to red and blue king crab fishing effective 12:00 Noon September 25, 1987.
MARICULTURE		
4-S-10-87	July 24, 1987	Permits scallop spat collecting in the Kodiak area under terms of a permit.
4-S-19-87	September 24, 1987	Extend scallop spat collecting period until December 31, 1987.

Table 4. Kodiak Management area vessel and gear effort by fishery by registration year.

	1979-80	1980-81	1981-81	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
KING CRAB 7"									
Avg. Number <sup>1</sup> Pots/Vessel	86	103	113	114	NF	NF	NF	NF	NF
Total Number Vessels	242	161	239	297	-	-	-	-	-
Total Pots on Grounds	20,812	16,583	27,007	33,858	-	-	-	-	-
KING CRAB 7-1/2"									
Avg. Number <sup>1</sup> Pots/Vessel	85	98	104	98	NF	NF	NF	NF	NF
Total Number Vessels	116	76	188	203	-	-	-	-	-
Total Pots on Grounds	9,860	6,080	19,552	19,894	-	-	-	-	-
TANNER CRAB									
Avg. Number <sup>1</sup> Pots/Vessel	128	121	127	120	127	127	119	109	91
Total Number Vessels	211	188	221	348	302	214	233	189	176
Total Pots on Grounds	27,008	22,748	28,067	41,760	38,354	27,178	27,370	20,601	16,016
DUNGENESS									
Avg. Number <sup>1</sup> Pots/Vessel	441	432	399	508	507	491	437	417	383
Total Number Vessels	28	21	50	111	103	106	125	81	45
Total Pots on Grounds	12,348	9,072	19,950	56,388	52,221	52,067	58,375	33,785	17,220

<sup>1</sup>From interviews at tank inspections.

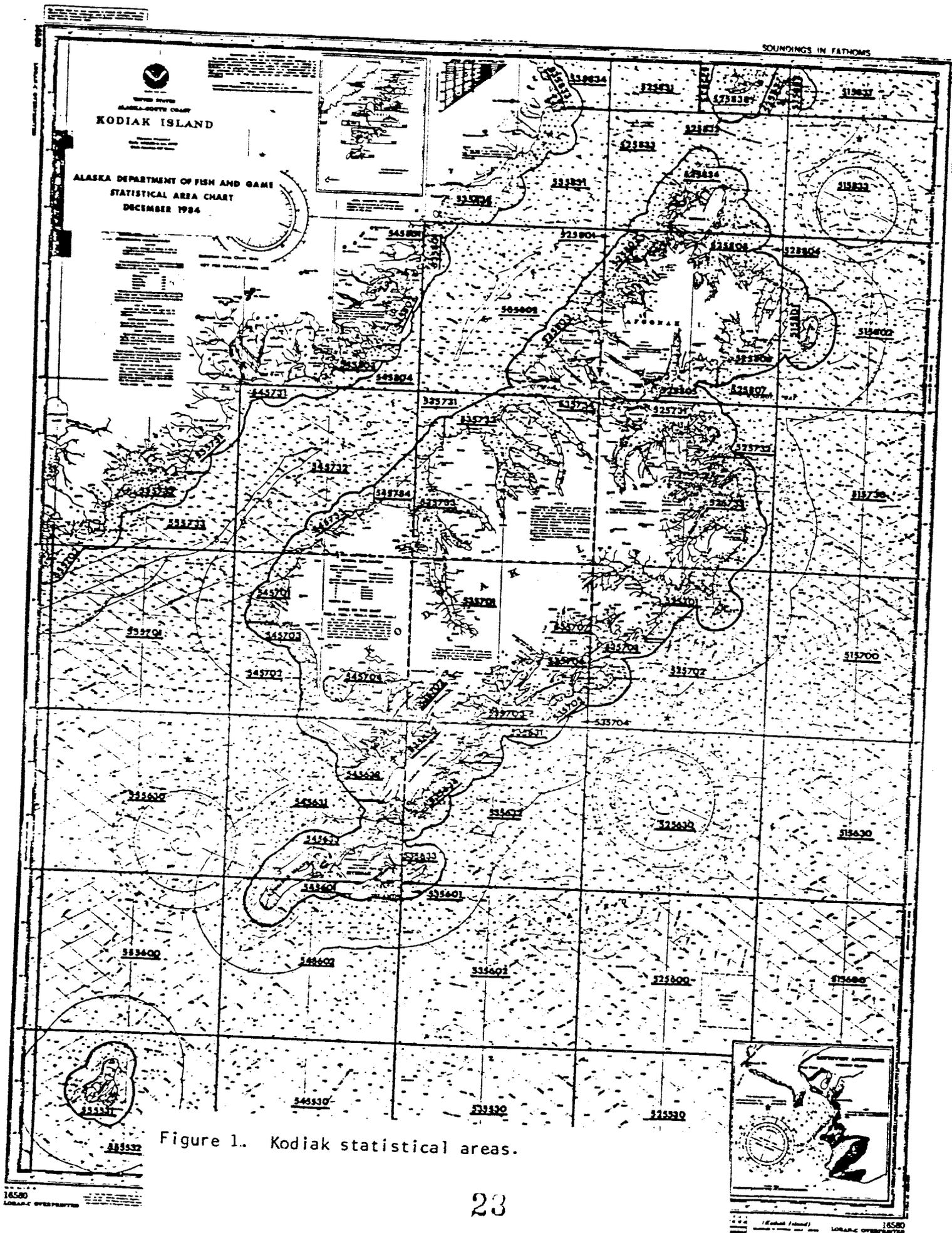


Figure 1. Kodiak statistical areas.







## TANNER CRAB

### Historical Background

The Kodiak Tanner crab (Chionoecetes bairdi) fishery has been in existence since 1967. Through the 1971-72 fishing season, harvest was less than 10 million pounds (Table 1). As king crab abundance declined in the late 1960's and early 70's, markets opened up, prices increased and more vessels participated in the fishery.

By the 1972-73 season, Tanner crab had established itself as the dominate winter and spring shellfishery. During the 1973-74 and 1974-75 seasons, the first harvest level of 30 million pounds was set by the Alaska Board of Fish and Game as a conservation measure. The low catch of 13.6 million pounds in the 1974-75 season was the result of a prolonged strike. The Board of Fisheries adopted an April 30th closure in 1975 to protect crab at the onset of mating. In 1976 the Board established a 5 1/2 inch minimum size.

In 1978 the Federal government entered into joint management responsibilities with the State of Alaska on the domestic Tanner crab fishery. Federal regulations became effective on December 1, 1978.

The commercial harvest peaked in the 1977-78 season at 33.3 million pounds and declined through the 1980-81 season to 11.7 million pounds. The harvest for 1981-82 was 13.8 million pounds and increased to 18.9 million pounds in the 1982-83 season, but has since declined to current low levels.

### 1986-87 Fishery

The 1986-87 Tanner crab fishery opened at 12:00 noon on January 15, 1987. A total of 189 vessels harvested 4,833,473 pounds of Tanner crab.

The fishermen settled on a price of \$2.00 per pound, and by the end of the season the price was as high as \$2.50 per pound. Ten shore-based and two floating processors purchased Tanner crab from the Kodiak area. The Department had an observer aboard one of the floating processors.

Tank inspections began at 12:00 noon on January 14, 1987 and were conducted in Kodiak, Old Harbor, Larsen Bay, and Port Lions. At the time of tank inspections, fishermen were interviewed as to the area they intended to fish and the size and quantity of their gear. The department estimated 20,601 pots on the fishing grounds after the season opening. This was down from the estimated 27,352 pots fished during the previous season.

The department made a pre-season harvest projection for the Eastside section of 1.4 million pounds. The number of vessels fishing the Eastside was estimated to be 79 vessels based on interviews at tank inspection time. The Tanner crab catch per pot was 51 crab at the beginning of the season and dropped to 41 crab on the second day of the fishery. On January 18th and 19th the catch per pot had dropped to 10 crab per pot. These catch rates were significantly lower than 70 crab per pot at the start of last year. The rapid decline in catch rates indicated that the abundance of crab was less than last year's. Based on these data, there was no justification to exceed the pre-season harvest projection of 1.4 million pounds.

On January 20th, the Northeast section was announced to close at 12:00 noon on January 25, 1987. The catch per pot in the Northeast section started at 49 crab and declined to 34 crab on January 17th. On January 18th the catch rate was at 32 crab per pot and declined to less than 10 crab per pot by January 19th. These catch rates were similar to last year, when 646,120 pounds were harvested.

The catch per unit effort trends observed this year did not warrant exceeding the pre-season harvest projection of 600,000 pounds. A total of 64 vessels landed 613,791 pounds of Tanner crab in the Northeast section.

The Southeast section has a pre-season harvest projection of 600,000 pounds based on the summer survey. The catch per pot started at 38 legal crab per pot and declined to 10 crab by January 29th. This catch rate is significantly lower than the 106 crab per pot at the start of last season. Survey results indicate a definite decline in legal crab abundance, one third of its level of one year ago, therefore, the lower catch per pot lift information received by the Department was anticipated. Based on fishery information obtained from the fleet, there was not justification to exceed the harvest project of 600,000 pounds. Therefore, on January 30th the closure of the Southeast section was announced effective for 12:00 noon on February 2, 1987. A total of 31 vessels harvested 513,058 pounds of Tanner crab.

The Westside section also had a pre-season harvest project of 600,000 pounds based on the survey results. The catch per pot lift started at 33 crab and declined to 10 crab by January 29th. These catch rates, while slightly higher than last year's, did not justify exceeding the pre-season projection of 600,000 pounds. On January 30th the closure was announced for the Westside section effective for 12:00 noon on February 2, 1987. A total of 40 vessels landed 663,000 pounds of Tanner crab.

The Southwest section had a pre-season harvest projection of 1.1 million pounds based on survey results. The catch per pot lift started at 20 crab and declined to 5 crab by February 4th. The department was aware of poor fishing performance in late January for the Alitak Bay portion of the Southwest section. Additional fishing time was allowed until an assessment of the off-shore fishery could be made, since the projected harvest had

not been obtained. Later information from the off-shore stocks indicated that catch rates were from one to three crab per pot. Continuation of this fishery was not warranted due to the extremely poor catch rates throughout the section. The closure of the Southwest section was announced on February 6th for an effective date of 12:00 noon on February 10, 1987. The harvest was 475,122 pounds landed by 30 vessels.

The North Mainland section had a harvest projection of 800,000 pounds based on survey results. This area was surveyed with a trawl survey, using the "area swept" technique. This survey design enables a statistical variance to be calculated for the North Mainland section. The estimate ranged from 650,000 to 970,000 pounds.

At the start of the season the catch per pot was 38 crab, and by February 7, had declined to 10 crab per pot. Fishery performance in the North Mainland has traditionally been hampered by strong current and weather that effects the fishermen's ability to retrieve his gear. Inshore and near shore areas are not so severely effected by currents and thus vessels concentrate gear in these areas to avoid gear retrieval problems. The catch per pot in the inshore and bay areas was down to 3 crab per pot, while the off-shore areas were 15 crab per pot. These catch rates did not warrant a continuation of the fishery. On February 18, 1987, the harvest fell short of the pre-season projection of 800,000 pounds. A total of 31 vessels landed 710,730 pounds of Tanner crab in the North Mainland section.

The South Mainland and Semidi Islands sections closed on February 28, 1987. The harvest proejection for these areas is 70,000 pounds and 50,000 pounds, respectively. Since no survey is conducted in these sections, harvest projections are based on the previous seasons harvest. In the South Mainland, a total of 5 vessels landed 26,434 pounds of Tanner crab. The Semidi Islands section had 16,336 pounds landed by 4 vessels.

## STOCK STATUS

The Kodiak Area Trawl Survey, conducted in July and August of 1987, indicates the numbers of legal male Tanner crab are low, however, recruitment into the fishery appears strong. Ninety percent of the 19,354 males captured on the survey were sublegal crab while sixty seven percent of the 12,965 females captured were juvenile crab.

Harvest projections for the 1987/88 season were calculated from the survey results and are as follows:

<u>Section</u>	<u>Forecast</u> <u>(Millions of Pounds)</u>
Northeast	.5
Eastside	.5
Southeast	1.0
Southwest	1.7
Westside	1.4
North Mainland	.7
South Mainland	Open
Semidi Islands	Open

## 1987-88 Fishery

The 1987-88 Tanner crab fishery opened at 12:00 noon on January 15, 1988. A total of 176 vessels harvested 3,887,673 pounds of Tanner crab (Table 1).

Fishermen settled on a price of \$2.25 per pound, however, by the end of the season were paid retroactive at \$2.40 per pound. All product was processed by onshore processing facilities or was air freighted to Japan alive.

Tank inspections began 12:00 noon on January 14th and were given in Kodiak, Port Lions, and Larsen Bay. Due to poor weather conditions the department was not able to fly to Old Harbor to conduct tank inspections. A resident of Old Harbor was appointed to conduct inspections later that day. Vessel operators were interviewed at the time of tank inspections as to the area they were intending to fish as well as size and quantity of their gear. The Department estimated 16,000 pots on the fishing grounds after the season opening. This was down from the 20,000 pots fished last season.

The Department made a preseason harvest projection for the Kodiak District based on a trawl survey, of 5.8 million pounds. The results of this survey were published in "The Alaska Department of Fish and Game Westward Region Crab Survey Results of 1987."

The Northeast section was assigned a harvest projection of 500,000 pounds. Based on survey results, the harvest range for the Northeast Section was 280,000 to 632,000 pounds.

Catch per unit effort (CPUE) started at 22 crab per pot and increased to 24 crab per pot on the second day of fishing. Catch rates then declined to 11 crab per pot on the third day and fell below 10 crab per pot on the fourth day of fishing. At this point in the fishery most of the effort was in Chiniak Bay. Due to the declining catch rates, the fleet, which consisted of 74 vessels, began to fish a larger portion of the Northeast Section.

On January 22 a closure was announced for the Northeast Section to close at 12:00 noon on January 26. Due to declining catch rates and overall fishery performance it was decided that the harvest should not exceed 500,000 pounds preseason projection.

Catch rates for the period of January 20 through January 25 in the Northeast Section increased to 16 crab per pot.

A total of 74 vessels landed 566,129 pounds from the Northeast Section with an overall CPUE of 14 crab per pot.

The Southeast Section was assigned a harvest range of 520,000 to 1,500,000 pounds with a midpoint of 1,000,000 pounds.

CPUE started at 61 crab per pot and by the 25th of January had declined to 13 crab per pot. In last season's fishery, catch rates started at 38 crab per pot and declined to 10 crab per pot by the 29th of January.

Catch rates and harvest trends indicated the midpoint of the harvest projection of 1,000,000 pounds would be attained by 12:00 noon on February 1.

A total of 40 vessels fished the Southeast Section harvesting 1,086,463 pounds. The overall CPUE for the Southeast Section was 22 crab per pot.

The Eastside Section was assigned a preseason harvest range of 325,000 to 675,000 pounds with a midpoint of 500,000 pounds. At the start of the season catch rates were 15 crab per pot with only 24 vessels fishing. This compares to 51 crab per pot last season with 79 vessels fishing. With these reduced catch rates a number of vessels moved from the Eastside to more productive fishing grounds in the Southeast and Southwest Sections. CPUE declined to 10 crab per pot and most of the vessels had moved out of the area. It was evident that the midpoint of the harvest range would not be achieved and possibly not even the low end. On January 28th the Department announced the closure of the Eastside Section at 12:00 noon on February 1, 1988.

The Eastside Section was fished by 24 vessels landing

273,821 pounds with an overall CPUE of 13 crab per pot.

Based on survey results the Westside Section had a preseason harvest range of 800,000 to 2,000,000 pounds with a midpoint of 1.4 million pounds. Catch rates started at 23 crab per pot on the first pick through the gear and declined to 11 crab per pot by January 22.

This compares to the previous seasons catch rates of 33 crab per pot at the start of the season declining to 10 crab per pot by January 25th. Due to the rapidly declining catch rates it appeared that the low end of the guideline harvest range would not be attained. On February 4, the department announced the closure of the Westside Section to Tanner crab fishing at 12:00 noon on February 9th.

The Westside Section had a total of 46 vessels landing 411,135 pounds with an overall CPUE of 8 crab per pot.

The North Mainland Section was assigned a preseason harvest range of 330,000 to 1,150,000 pounds with a midpoint of 700,000 pounds. CPUE at the start of the season was 22 crab per pot and declined to 11 crab per pot by January 23. Nearshore areas of the North Mainland had catch rates below 10 crab per pot while areas midstream in the Shelikof had catch rates of 15 crab per pot. The previous season's catch rates started at 28 crab per pot and declined to 10 crab per pot by February 7th.

The department's analysis of this data indicated the low end of the harvest range was warranted. On February 4th the department announced the closure of the North Mainland Section at 12:00 noon on February 14th.

A total of 22 vessels harvested 388,751 pounds of Tanner crab with an overall CPUE of 12 crab per pot.

The harvest range for the Southwest Section of Kodiak was 853,000 to 2,567,000 pounds with a midpoint of 1.7 million pounds. Catch rates started at 51 crab per pot and remained as high as 40 crab per pot through the 24th of January. By January 27, and 28 catch rates were down to 19 crab per pot and catch rates continued to decline to 10 crab per pot on February 2. Compariable catch rates for the previous year started at 20 crab per pot and declined to less than 5 crab per pot on February 6th.

Reports from fishermen at the time of landing indicated that significant numbers of king crab and sublegal Tanner crab were being sorted through during this fishery. Due to rapidly declining catch rates and increased handling of non-target animals the department announced on February 10th the closure of the Southwest Section at 12:00 noon on February 16.

The Southwest Section had 28 vessels landing 1,143,306

pounds with an overall CPUE of 22 crab per pot.

The South Mainland and Semidi Islands were not surveyed during the summer trawl survey. These sections are low production areas and produced only 5,778 pounds and 12,290 pounds, respectively during the 1987/88 fishery.

On March 10th at 12:00 noon the Kodiak District was closed to Tanner crab fishing along with the Chignik District.

The historic catch by section is depicted in Table 2 for the seasons 1978-79 through 1987-88.

Kodiak District Tanner crab catches are reported by statistical subarea and month. This data is listed in Table 4.

#### Stock Status

The department anticipates conducting a summer trawl to assess the Kodiak District Tanner crab stocks. Prerecruit one abundance as indicated from the 1987 Kodiak trawl survey indicates no substantial increase in legal Tanner crab for 1989.

Table 1. Commercial catch and effort for the Tanner Crab (*Chionoecetes bairdi*), Kodiak Management District, 1967-1988.<sup>1</sup>

Year	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Price Per Lb.	
1967		83		110,961				\$ .07	
1968		817		2,560,687				.10	
1969	85	955		6,827,312	72,748	43		.11	
1969-70 <sup>2</sup>	67	833	3,237,244	8,416,782	78,266	42	2.6	.11	
1970-71	82	453	2,686,067	6,744,163	60,967	44	2.5	.11	
1971-72	46	505	3,878,618	9,475,902	65,907	59	2.4	.13	
1972-73	105	1,466	13,609,668	30,699,777	188,158	67	2.3	.17	
1973-74 <sup>3</sup>	123	1,741	11,857,573	29,820,899	217,523	59	2.5	.20	
1974-75 <sup>3</sup>	74	471	5,459,940	13,649,966	73,826	83	2.5	.17	
1975-76 <sup>4</sup>	104	1,168	10,748,958	27,336,909	199,304	64	2.5	.20	
1976-77 <sup>5</sup>	102	998	7,830,727	20,720,079	164,213	48	2.6	.33	
1977-78 <sup>6</sup>	148	1,483	12,401,243	33,281,472	251,621	49	2.6	.43	
1978-79 <sup>7</sup>	218	1,225	10,702,829	29,173,807	275,455	38	2.7	.55	
1979-80 <sup>7</sup>	211	1,385	6,813,128	18,623,875	282,946	24	2.7	.55	
1980-81 <sup>8</sup>	188	771	4,398,631	11,748,629	174,351	25	2.7	.65	
1981-82 <sup>9</sup>	221	950	5,413,467	13,756,159	230,403	24	2.5	1.65	
1982-83 <sup>9</sup>	348	1,439	7,744,812	18,927,061	377,562	21	2.4	1.25	
1983-84 <sup>9</sup>	303	1,229	5,891,968	14,478,066	303,764	10	2.5	1.20	
1984-85 <sup>10</sup>	214	710	4,567,037	12,024,553	176,830	26	2.6	1.50	
1985-86 <sup>10</sup>	233	601	3,457,930	8,996,151	160,808	21	2.6	1.90	
1986-87 <sup>10</sup>	189	503	1,830,365	4,833,473	110,963	16	2.6	2.62	
1987-88 <sup>10</sup>	176	556	1,614,374	3,887,673	101,438	16	2.4	2.40	
TOTAL			124,144,559	326,094,356	3,567,053	-	-	-	
AVERAGE			162	942	6,533,924	14,822,470	178,352	35	2.6

- 1 Data Source: Alaska Department of Fish & Game Annual Board of Fish & Game Reports and Annual Kodiak Area Management Report
- 2 Fishing Year July 1 - June 30.
- 3 Legal Season November 1 - June 30. Season terminated May 15 due to onset of mating period.
- 4 Legal Season November 1 - April 30
- 5 Legal Season January 1 - April 30
- 6 Legal Season January 1 - May 15
- 7 Legal Season January 5 - May 15
- 8 Legal Season January 22 - May 15
- 9 Legal Season February 10 - May 15
- 10 Legal Season January 15 - May 15

Table 2. Tanner crab, *Chionoecetes bairdi*, catch in pounds by fishing seasons for the Kodiak Management District 1977-78 through 1987-88 fishing season.

Section	1978-79 <sup>2</sup>	1979-80 <sup>2</sup>	1980-81 <sup>2</sup>	1981-82 <sup>3</sup>	1982-83 <sup>4</sup>	1983-84 <sup>4</sup>	1984-85 <sup>5</sup>	1985-86 <sup>5</sup>	1986-87 <sup>5</sup>	1987-88 <sup>5</sup>
Northeast	6,359,777	4,986,120	2,389,483	1,160,945	2,832,979	1,845,103	1,063,906	646,120	613,791	566,129
Eastside	3,032,083	2,119,244	1,310,020	1,362,308	3,124,031	4,460,775	5,070,112	4,137,703	1,814,094	273,821
Southeast	2,529,316	974,921	496,275	549,504	2,371,870	2,290,951	1,977,377	1,660,327	513,058	1,086,463
Southwest	5,185,730	2,647,294	2,544,477	5,188,309	5,587,149	2,240,332	889,176	721,443	475,122	1,143,306
Semidi Is. <sup>1</sup>	722,600	1,292,275	1,075,482	1,210,671	907,952	288,998	30,176	40,457	16,336	12,290
N.Mainland	7,111,498	4,677,742	2,088,933	2,205,260	2,042,885	1,449,068	1,717,556	1,445,135	710,730	388,751
S.Mainland	277,921	500,247	396,155	260,645	149,419	549,712	123,978	85,163	26,434	5,778
Westside	3,954,882	1,426,032	1,447,804	1,818,517	1,910,776	1,353,127	1,151,883	259,803	663,908	411,135
TOTAL	29,173,807	18,623,875	11,748,629	13,756,159	18,927,061	14,478,066	12,024,553	8,996,151	4,833,473	3,887,673

<sup>1</sup> Table revised 1/79 to reflect creation of Semidi, Southeast and Southwest section from old "Southern" section and minor modification of Eastside section description. Semidi Island section added beginning 1978-79 fishing season.

<sup>2</sup> Fishing season January 5 - May 15.

<sup>3</sup> Fishing season January 22 - May 15, shortened due to price negotiations.

<sup>4</sup> Fishing season February 10 - May 15.

<sup>5</sup> Fishing season January 15 - May 15.

Table 3. Tanner crab catch, landings, vessel effort, catch per pot\* (CPUE), and catch per month by statistical subarea, Kodiak District, 1987.

Stat. Area	Vessels	No. of Lndgs	No. Crab	Pounds Harvested	Avg. Wt.	Pots Lifted	CPUE	Catch by Month (Lbs.)		
								January	February	March
515 801	1	1	7,000	18,208	2.6	300	23	18,208		
525 630	3	3	15,400	39,857	2.6	726	21	14,739	25,118	
525 701	43	83	343,037	957,003	2.8	15,016	23	946,136	10,867	
525 702	19	21	232,894	654,025	2.8	8,190	28	654,025		
525 703	16	25	35,883	96,585	2.7	2,383	15	96,585		
525 731	22	41	32,954	84,145	2.6	3,375	10	84,145		
525 733	39	116	157,853	440,520	2.8	7,911	20	436,611	3,909	
525 802	4	6	33,428	84,120	2.5	1,549	22	58,129	25,991	
525 803	3	3	4,950	13,558	2.7	1,030	13	13,558		
525 805	5	7	10,818	25,930	2.4	1,200	9	25,930		
525 806	2	2	12,080	31,430	2.6	550	22	31,430		
525 833	1	1	956	2,227	2.3	37	26		2,227	
535 631	7	7	9,719	24,606	2.5	1,147	8	17,396	7,210	
535 632	7	8	29,799	80,727	2.7	2,082	13	44,278	36,449	
535 634	1	1	1,725	4,620	2.7	50	35	4,620		
535 703	8	14	16,317	40,691	2.5	1,190	14	15,101	25,590	
535 705	1	1	2,000	5,300	2.7	200	10	5,300		
535 706	7	11	23,139	61,812	2.7	1,189	19	61,812		
535 707	1	1	1,660	4,812	2.9	120	14	4,812		
535 731	1	1	1,700	4,236	2.5	200	9		4,236	
535 732	11	20	56,260	143,754	2.6	5,915	10	120,707	23,047	
535 733	6	17	22,096	51,052	2.3	2,749	8	50,968	84	

(continued)

02

Table 3. (Continued) Tanner crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Kodiak District, 1986-87. Average catch per pot unstandardized for soak period and gear type.

Stat. Area	Vessels	No. of Lndgs.	No. Crab	Pounds Harvested	Avg. Wt.	Pots Lifted	CPUE	Catch by Month (Lbs.)		
								January	February	March
535 734	9	10	17,068	45,664	2.7	1,076	16	37,514	8,150	
535 801	6	8	17,278	45,337	2.7	1,130	15	30,128	15,209	
535 802	16	32	220,533	533,313	2.4	12,895	17	351,756	181,557	
535 803	11	16	19,092	46,794	2.5	2,788	17	39,942	6,852	
535 831	7	9	59,439	147,818	2.5	2,732	22	126,642	21,176	
535 832	7	11	43,554	105,414	2.4	3,232	13	40,215	65,199	
545 601	1	1	7,980	21,553	2.7	500	16	21,553		
545 602	12	14	121,057	335,561	2.8	5,106	24	295,295	40,266	
545 631	18	27	101,048	255,848	2.5	8,114	12	155,081	100,767	
545 632	16	30	81,164	198,143	2.4	7,533	11	143,324	54,819	
545 702	1	1	50	106	2.1	110	1		106	
545 731	1	1	317	717	2.3	300	1		717	
545 732	3	3	3,170	7,938	2.5	235	13		1,137	6,801
545 802	9	16	46,282	122,677	2.7	4,447	10	68,324	54,353	
545 803	4	4	2,589	6,521	2.5	327	8		6,521	
545 804	1	2	13,400	33,032	2.5	510	26		33,032	
555 600	3	3	4,680	10,788	2.3	728	6	6,900	3,888	
555 630	4	4	4,295	10,237	2.4	591	7		10,237	
555 701	2	2	1,972	4,932	2.5	190	10		4,500	432
555 732	1	2	1,885	4,536	2.4	159	12		3,649	887
565 601	1	1	503	1,137	2.3	42	12		1,137	
565 631	2	2	3,564	7,766	2.2	438	8			7,766
565 633	3	3	2,308	5,395	2.3	180	13		3,226	2,169
565 701	2	4	4,629	10,990	2.4	356	13		7,852	3,138
575 631	1	2	840	2,038	2.4	135	6		1,056	982
GRAND TOTAL	189	503	1,830,365	4,833,473	2.6	110,963	16	4,021,164	790,134	22,175

41

TABLE 4. Tanner crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Kodiak District, 1988. Average catch per pot unstandardized for soak period and gear type.

STAT AREA	BOATS	LNDGS.	POT LIFTS	POUNDS HARVESTED	AVG. WT.	CPUE	-CATCH JANUARY	IN POUNDS FEBRUARY	BY MONTH- MARCH
515730	1	2	830	64,465	2.4	32	27,844	36,621	
515802	3	3	510	34,067	2.24	30	34,067		
525701	17	25	3,726	106,079	2.39	12	96,356	9,723	
525702	5	5	2,419	85,711	2.67	13	48,733	36,978	
525703	7	10	1,249	45,587	2.44	14	28,827	16,760	
525731	16	33	2,142	43,230	2.35	9	43,230		
525733	56	170	10,635	313,239	2.48	12	312,345	894	
525802	3	5	1,445	48,795	2.39	14	48,027	768	
525803	3	4	825	43,839	2.41	22	43,839		
525805	5	8	645	11,450	2.44	7	11,450		
525806	4	4	580	22,469	2.26	17	22,469		
525807	2	3	650	33,370	2.51	20	33,370		
525833	2	2	174	12,316	2.43	29	9,866	2,450	
535631	24	39	5,998	443,141	2.38	31	408,922	34,219	
535632	11	16	3,446	202,890	2.56	23	188,259	14,631	
535634	1	1	15	276	2.4	8	276		
535701	1	2	425	15,525	2.45	15	9,886	5,639	
535703	26	53	7,931	367,683	2.48	19	291,354	76,329	
535705	2	2	467	15,607	2.3	15	15,607		
535706	1	1	267	13,199	2.28	22	13,199		
535707	4	5	586	23,245	2.57	14	13,013	10,232	
535731	3	4	400	6,872	2.26	8	587	6,285	
535732	20	65	8,549	120,881	2.45	6	103,008	17,873	
535733	7	17	2,861	50,219	2.46	7	32,879	17,340	
535734	6	10	1,189	18,460	2.3	6	17,521	939	
535801	4	9	1,758	44,601	2.4	11	38,453	6,148	
535802	10	13	3,187	96,358	2.34	13	26,696	69,662	
535803	14	21	4,005	98,826	2.37	10	83,345	15,481	
535831	4	7	3,648	137,482	2.35	16	70,204	67,278	
535832	3	4	1,230	27,965	2.36	10	3,315	24,650	
545602	3	3	2,098	56,862	2.18	12		56,862	
545631	16	28	10,417	630,424	2.34	26	393,598	236,826	
545632	19	41	8,909	425,348	2.36	20	256,083	169,265	
545704	2	3	410	24,838	2.43	25		24,838	
545732	2	3	577	15,240	2.33	11	7,398	7,842	
545802	8	14	3,517	86,549	2.5	10	69,127	17,422	
545803	5	9	724	17,238	2.39	10	5,942	11,296	
545804	1	1	80	2,559	2.32	14		2,559	
555532	2	2	55	4	2	0		4	
555600	2	2	819	26,113	2.35	14		26,113	
555630	5	6	1,325	36,583	2.34	12	12,084	24,499	
555701	1	1	90	3,501	2.33	17		3,501	
555732	2	2	154	1,168	2.33	3		1,168	
565601	1	1	42	1,230	2.01	15		1,230	
565631	1	3	326	10,548	2.27	14		3,540	7,008
565633	1	1	65	512	2.01	4		512	
565701	1	1	38	1,109	2.22	13		1,109	
GR/TOTAL	176	556	101,438	3,887,673	2.41	16	2,821,179	1,059,486	7,008

PERCENT OF TOTAL CRAB MEASURED

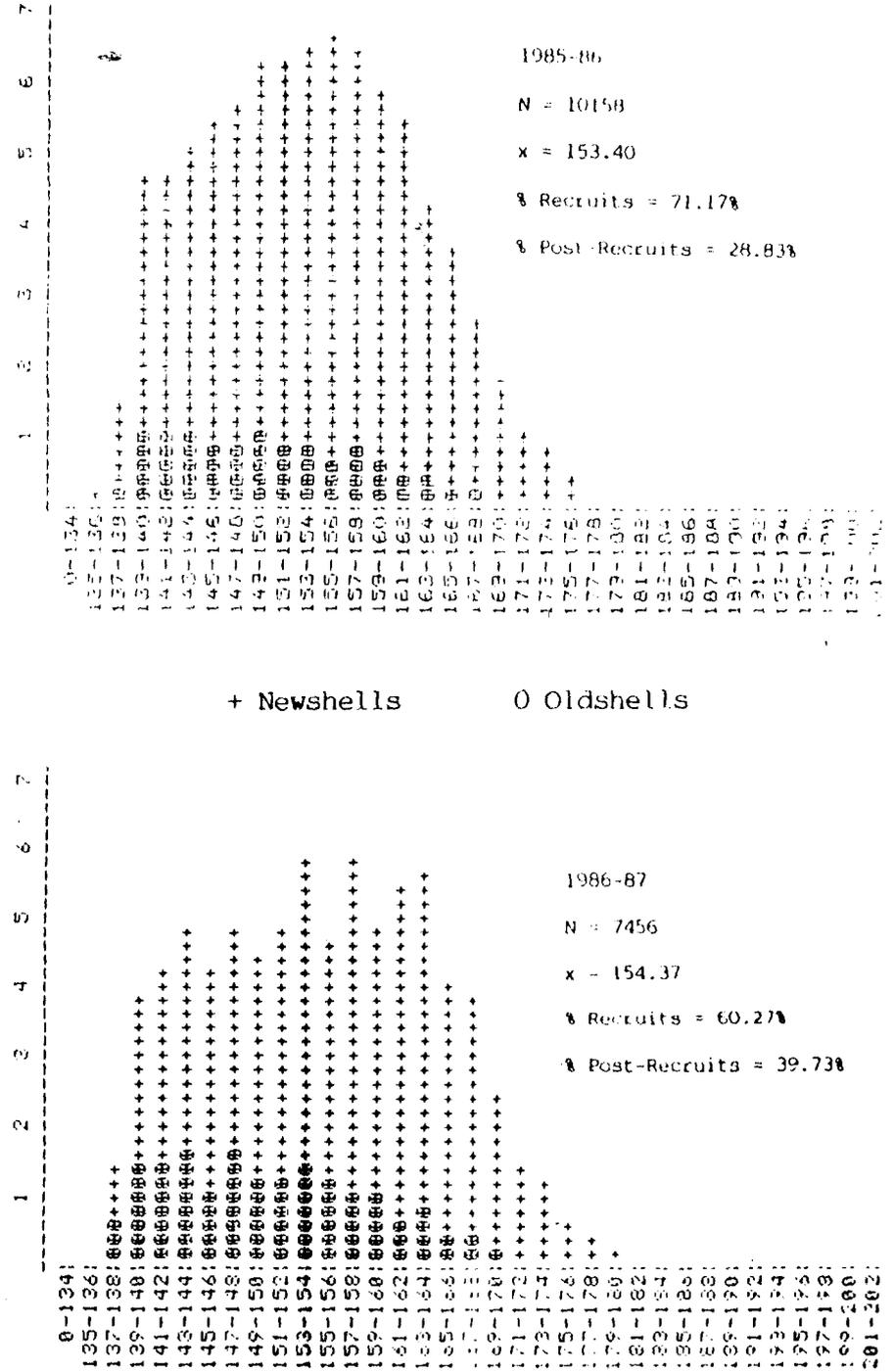
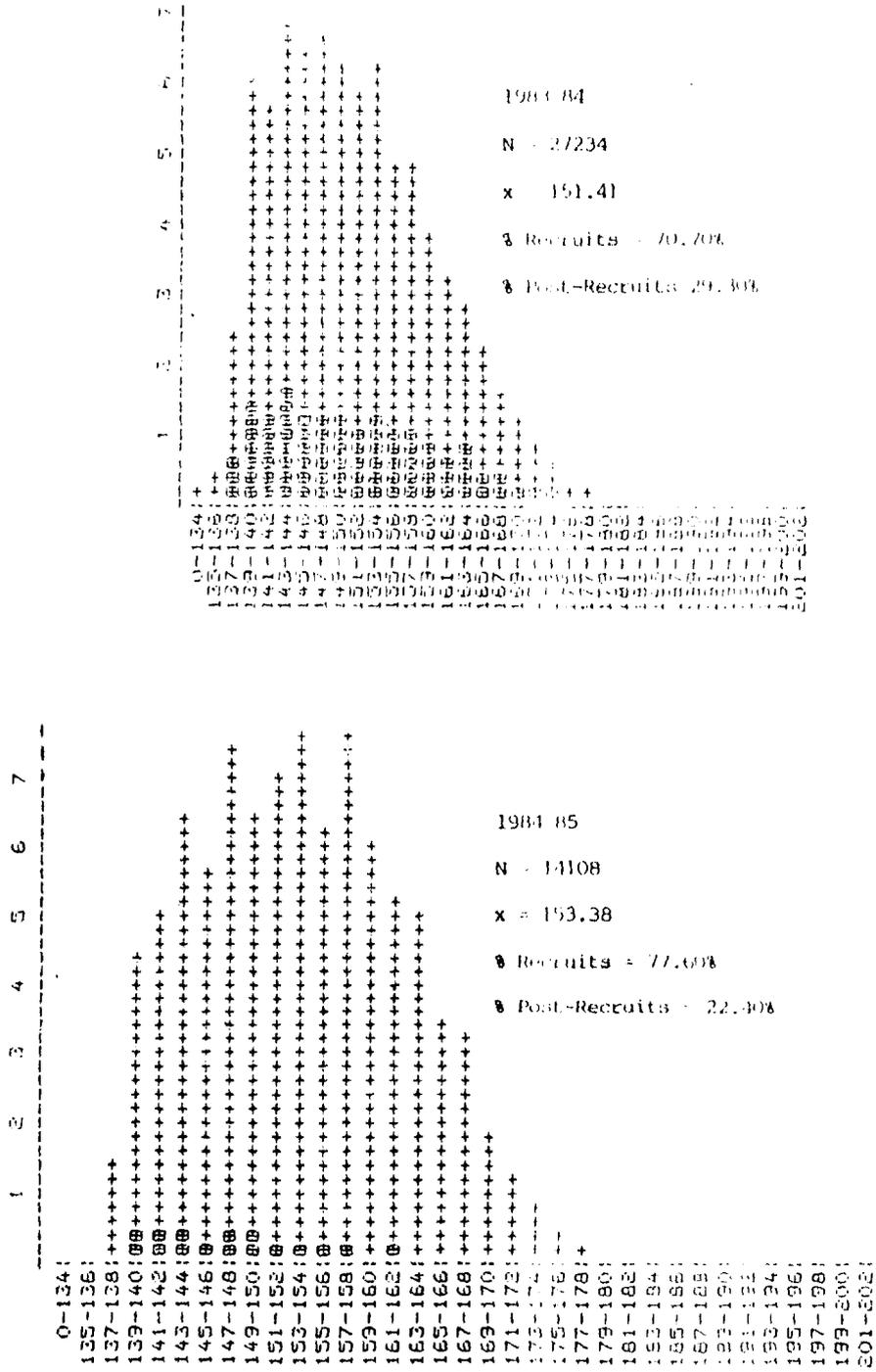


Figure 1. Tanner crab width frequencies from commercial fishery, Kodial Management District, 1983-84, through 1986-87 fishing seasons.



## DUNGENESS CRAB

### Historical Background

The first commercial Dungeness crab fishery in the Kodiak District was in 1962 with a catch of 1.9 million pounds (Table 1). As a result of favorable market conditions and unexploited stocks, commercial harvest increased to a peak in the four year period from 1967 through 1970 with an average annual harvest of 6.3 million pounds. In 1969 the south end of Kodiak Island (Figure 1) was closed from April 1 to June 15. This was due to the high incidence of female king crab in shallow water during this period of time. During the early 1970's the fishery declined due to biological factors accompanied sometimes by adverse marketing conditions. In the mid 1970's, weak markets and other more lucrative fisheries kept the Dungeness production at a low level. In 1977 the season dates were changed from year around to May 1 through December 31 for the northern portion of the island. This closure period would require that crab pots be removed from the water and thus would help to reduce the amount of "derelict" gear. (Declines in other fisheries and favorable market conditions during this decade have encouraged Dungeness fishing.) The 1981-82 harvest of 5.6 million pounds was the largest harvest for the Kodiak area since 1970. Increased effort resulted in the removal of the major portion of post-recruit animals from the stock. As a result production declined to less than 1 million pounds in 1986 for the first time since 1977. The 1987 fishery experienced a modest increase in recruitment as the

catch rose with fewer vessels participating.

### 1987 Fishery

The regulatory opening of the commercial Dungeness crab fishing season was May 1 for the north end of the district and June 15 for the south end. Both areas remained open until December 31, 1987. A total of 45 vessels made 379 landings harvesting 1,450,983 pounds of Dungeness crab. The 1987 season catch was valued at 1.83 million dollars with an average ex-vessel price of \$1.26 per pound (Table 1).

The largest harvest came from the Southeast Section (Table 2). This area accounted for more than half of the island wide catch with July through September being the most productive months (Table 3).

The Department of Fish and Game operated a dockside interview and sampling program during the season. Approximately 75 interviews were obtained from fishermen landing Dungeness crab throughout the course of the fishery. Two thousand one hundred and twenty-three (2,123) crab were sampled for size and shell condition (Table 4) with 1,059 of those also measured for shell hardness (Table 5). The durometer used in measuring shell hardness is being evaluated as a tool to determine molt timing of the Dungeness crab. Eighty one percent (81%) of the sampled catch was recruit sized animals with a mean width of 174 mm.

This compares with the previous season's recruit percentage of 81% but the mean width was the smallest since catch sampling began in 1968.

Soft and molting crab were reported during the fishery from different areas around the island. As in the past, the molting activity was sporadic and timing variable from bay to bay. June through August had the highest incidence of soft crab observed. The department did not observe unmarketable crab discarded at the docks as had occurred the past several years.

#### Stock Status

No assessment of Kodiak Dungeness stocks is conducted independent of the commercial fishery. The 1987 fishery was heavily dependent on recruit size crab and in the absence of a pre-season index survey, a realistic estimate of harvestable stock size cannot be determined. It is expected that the 1988 harvest, again dependent on recruit size animals, will be similar to the 1987 harvest.

#### 1987 Dungeness Investigations

A Dungeness crab handling study was conducted in the Alitak Bay area from July 6th to July 15th. Using the Department of Fish and Game vessel M/V Coho, 630 male Dungeness crab were tagged and released from 278 pot lifts. The durometer reading

(shell hardness) of each crab was recorded and deck holding times varied. By the fishing season's end 116 of the tags were recovered and returned. Results of this study will be published in the departments publication series during 1988.

A similar experiment is being planned for the coming season in the Prince William Sound area.

Table 1. Dungeness crab commercial catch and effort by fishing year for the Kodiak Management District, Statistical Area (J), 1962 through 1987.

Year	Lndgs.	Vessels	Commercial Catch		Pots Lifted	Avg. Catch Per Lndg. (Pounds)	CPUE	Avg. Price Per Pound	Ex-Vessel (Mil. \$)
			No. Crab	No. Pounds					
1962 <sup>1</sup>	149	-		1,904,567		12,782		.09	171,000
1963	354	-		2,487,512		7,026		.09	224,000
1964	395	29		4,254,565		10,537		.09	375,000
1965	351	25		3,311,571		9,434		.12	397,000
1966	144	12		1,416,174		7,976		.13	149,000
1967	439	18		6,663,668		15,179		.13	866,000
1968	536	43		6,829,061		12,741		.14	956,000
1969	455	29		5,834,628	190,967	12,823	12	.16	934,000
1970	318	33		5,741,438	249,800	18,005	9	.14	804,000
1971	173	24	515,653	1,445,864	90,913	8,358	6	.18	260,000
1972	316	34	766,960	2,059,536	140,921	6,517	6	.40	824,000
1973	487	42	879,484	2,000,526	251,467	4,108	3	.50	1,000,000
1974	172	23	337,839	750,057	104,062	4,361	3	.47	353,000
1975	154	15	307,272	639,813	76,411	4,154	4	.61	390,000
1976	6	4	38,072	87,110	4,410	14,518	9	.15	13,000
1977 <sup>2</sup>	16	2	46,333	113,026	3,805	7,064	12	.30	34,000
1978	173	20	618,357	1,362,306	93,633	7,875	6	.75	1,022,000
1979	237	28	595,850	1,311,275	137,951	5,543	4	.75	943,000
1980	197	21	968,829	2,011,736	107,261	10,212	9	.45	905,000
1981-82 <sup>3</sup>	466	50	2,614,545	5,566,463	295,138	11,945	9	.70	3,897,000
1982-83 <sup>4</sup>	991	111	2,004,075	4,546,311	481,542	4,588	4	.75	3,410,000
1983-84 <sup>4</sup>	1,079	103	2,044,505	4,752,148	503,464	4,408	4	1.05	4,989,000
1984-85 <sup>4</sup>	1,163	106	2,393,974	5,303,052	627,441	4,564	4	1.45	7,689,000
1985 <sup>5</sup>	1,243	125	1,791,446	4,160,435	599,291	3,347	3	1.20	4,992,522
1986	577	81	439,738	967,423	199,881	1,667	2	1.15	1,112,500
1987	379	45	747,193	1,450,983	50,067	3,828	5	1.26	1,828,000
Total				76,971,248					38,538,022
Average	421	43	966,772	2,960,433	221,496	7,088	5	.50	1,482,232

- 1 Season open year around 1962-1976
- 2 Open May 1 through December 31, 1977 - 1980
- 3 Open February 27, 1981 through February 1, 1982
- 4 Open May 1, 1982 through February 1, 1983
- 5 Open May 1, 1985 through December 31, 1985

Table 2. Dungeness crab commercial harvest (in pounds) by fishing section, Kodiak Management District, 1977-1987.

Fishing Section	1981-82 <sup>1</sup>	1982-83 <sup>2</sup>	1983-84 <sup>2</sup>	1984-85 <sup>2</sup>	1985 <sup>4</sup>	1986	1987
Northeast	131,152	363,450	206,386	330,977	346,252	93,428	102,997
Eastside	510,826	484,139	437,477	1,332,175	1,564,019	364,635	173,438
Southeast	1,194,316	818,825	1,995,363	2,137,968	1,156,447	253,179	751,793
Southwest	280,747	590,498	575,937	204,714	392,233	57,231	84,352
N. Mainland	1,087,959	855,013	516,289	430,536	342,001	90,783	106,449
S. Mainland	811,223	577,474	454,646	259,649	37,377	6,222	9,990
Westside	1,550,240	856,912	564,610	607,033	320,691	101,945	221,964
Semidi Is. <sup>4</sup>	0	0	1,440	0	1,415	0	0
Total	5,566,463	4,546,311	4,752,148	5,303,052	4,160,435	967,423	1,450,983

<sup>1</sup> Fishing season February 27, 1981 through February 1, 1982

<sup>2</sup> Fishing season May 1 through February 1

<sup>3</sup> Fishing season May 1 through December 31, 1985

<sup>4</sup> Area added to Kodiak District by Board of Fisheries, 1983

TABLE 3. Dungeness crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Kodiak District, 1987. Average catch per pot unstandardized for soak period and gear type.

STAT AREA	BOATS	LNDGS.	POUNDS HARVESTED	AVG. WT.	CPUE	CATCH IN POUNDS BY MONTH							
						MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.
525701	11	53	128,546	2.1	3.0	8,635	30,220	35,039	32,744	12,961	5,694	1,362	1,891
525703	3	10	15,689	2.2	3.1		2,824	7,155	3,240	321	2,149		
525731	6	34	24,076	2.1	1.9	439	2,731	10,077	2,916	3,210	2,269	2,434	
525732	3	3	3,252	1.9	1.4				1,387	1,865			
525733	20	141	75,669	2.1	1.9	7,565	11,923	21,816	19,518	8,153	4,075	2,619	
535602	1	1	12,275	1.8	10.8					12,275			
535631	2	5	14,138	2.0	3.9				8,688	2,710	1,063	1,677	
535635	3	3	22,388	1.8	8.8				20,573		1,815		
535701	4	15	77,573	2.0	3.9	15,465	9,077	30,038	18,943	1,520		2,530	
535702	2	4	25,219	1.8	9.6			4,764	18,640		1,815		
535703	3	6	20,701	2.3	4.0		4,890	2,524	2,842	3,935	6,510		
535705	3	5	7,822	2.2	2.2	2,346	3,804	630	1,042				
535706	2	6	22,109	2.0	4.1			9,722	4,990	7,397			
535707	2	4	7,094	2.0	4.9		1,089		4,453	499	1,053		
535732	5	16	32,333	2.0	3.5		8,447	4,690	7,282	3,407	8,306	201	
535733	5	21	88,234	2.0	3.2	19,555	1,688	21,481	16,665	17,038	3,315	8,492	
535734	4	19	20,426	2.0	2.3			7,167	6,735	915	5,215		394
535801	1	1	3,643	2.0	4.1						3,643		
535802	1	1	5,915	2.1	5.1					5,915			
535832	1	1	380	2.2	4.3				380				
545601	4	27	382,404	1.9	9.4			90,188	108,397	88,540	39,800	34,813	20,666
545602	4	16	314,453	1.8	10.2			52,348	88,859	124,207	44,468	4,571	
545632	5	26	36,745	1.9	3.9			7,985	11,968	5,210	3,232	3,327	5,023
545731	1	3	9,990	2.0	5.2				6,089		3,901		
545733	1	2	3,398	2.0	1.6			1,807	1,591				
545801	2	6	20,144	2.2	6.4			138	7,827	12,179			
545802	3	12	37,999	2.2	5.1				20,052	8,471	9,476		
545803	2	12	38,368	2.0	4.1		2,088	9,234	17,474	3,575	5,997		
GRAND TOTAL	45	379	1,450,983	1.9	4.9	54,005	78,781	316,803	433,295	324,303	153,796	62,026	27,974

51

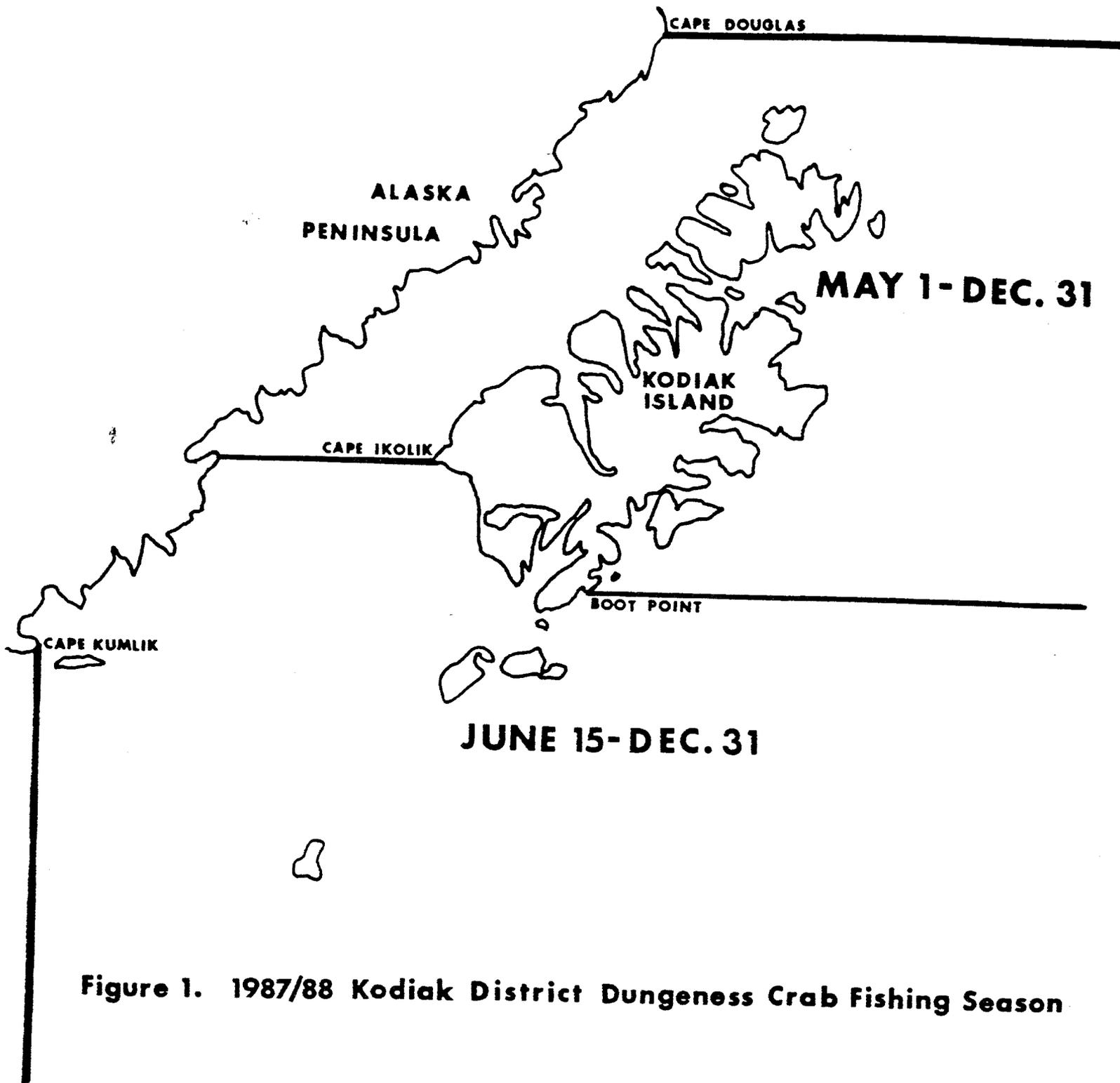
Table 4. Dungeness crab commercial width frequency sampling by fishing section, Kodiak Management District, 1987 fishing season.

Fishing Section	Total Crab Sampled <sup>1/</sup>	Recruits		Post-Recruits		Mean Carapace Width (mm)
		Number	Percent	Number	Percent	
Northeast	26	24	92	2	8	174
Eastside	377	282	75	95	25	178
Southeast	787	748	95	39	5	170
Southwest	52	50	96	2	4	168
Westside	282	220	78	62	22	177
N. Mainland	300	161	54	139	46	178
S. Mainland	50	38	76	12	24	177
<b>TOTAL</b>	<b>1,874</b>	<b>1,523</b>	<b>81</b>	<b>351</b>	<b>19</b>	<b>174</b>

<sup>1/</sup> Additional 249 crab sampled, but not assigned to specific section.

Table 5. Commercial Dungeness crab hardness sampling by month, Kodiak Management District, 1987 fishing season.

	Total Crab Sampled	Number Hardness Tested	Average Durometer Reading
July	487	482	78
Aug.	1006	349	75
Sept.	395	151	82
Oct.	235	97	79
<b>TOTAL</b>	<b>2,123</b>	<b>1,079</b>	<b>78</b>



**Figure 1. 1987/88 Kodiak District Dungeness Crab Fishing Season**



## KING CRAB

### Historical Background

The Kodiak king crab fishery was pioneered by salmon fishermen. Beginning in 1936 small amounts of king crab were landed. Catches were not officially recorded until 1950. This period in the history of the fishery was exploratory in nature. Fishermen were locating crab, determining abundance, and testing gear types. Once the resource was determined abundant enough to support fishermen, then markets had to be developed to sell the product.

During the exploratory period the Bureau of Commercial Fisheries (now NMFS) was the management agency. Regulations in effect during this period provided for retaining only males with a minimum width of 5 1/2 inches. In 1949 the size limit was increased to 6 1/2 inches.

In 1950, 60,000 pounds of king crab were landed, and the fishery was on its way to becoming a major force in the economy of the Alaska fishermen. From 1950 to 1959 the catch increased from 60,000 to 21 million pounds. During this period pots were classified as the only legal gear and area registration was instituted. Also in 1959 the Bureau of Commercial Fisheries transferred management authority to the Alaska Department of Fish and Game.

In 1960 the king crab season opened January 1 and closed December 31. Eight processors bought 21 million pounds of king crab at eight cents per pound from 106 vessels. The Department of Fish and Game recorded the catch in weight and number of crab by geographical area. The months of January and February accounted for approximately 50 percent of the harvest. In 1961 the department recommended that more research was needed to determine the various stocks, breeding habits, and age and size

of maturity before any more regulations were instituted. In 1963 the size limit was increased to seven inches based on Kodiak area growth rate studies and to allow male king crab to breed at least one year before being available to the fishery. The early sixties saw continued growth in the fishery until 1964 when the Good Friday earthquake slowed production. Even with the earthquake the harvest equalled the 37 million pounds harvested in 1963 (Table 1).

In 1965 a newshell crab closure went into effect from April 1 to June 15. There were 19 shellfish processors in Kodiak paying ten cents per pound. The Department had completed king crab tagging studies and had defined four major, separate stocks of crab. Fishermen were required to record their catch by statistical area. In 1965 the staff report to the Fish and Game Board stated that the stocks could not continue to support the large harvests that were then occurring. The staff recommended the implementation of a quota system to curtail the harvest. No numbers were provided by the staff and no action was taken by the Board.

The development period which began in 1950 peaked in 1966, when 177 vessels delivered 90 million pounds to 32 processors in a ten-month fishing season. Catches in January and February accounted for 40 percent of the harvest. From 1965 to 1966, vessel effort had increased 7.3 percent, vessel length had increased from 48' to 55', and there were 37 percent more processors. All these factors combined to produce the peak harvest. In 1966 the Department issued the first emergency order to protect newshell and breeding crab and added its first shellfish management position. After examining 12,000 female king crab, of which only three to five percent were barren, the Department stated that Kodiak king crab stocks were biologically sound. After 1966's 90 million pound harvest, the Department estimated sustained production for the area at 40 to 70 million pounds, with an average harvest of 50 million pounds.

From 1967 to 1970 the king crab fishery expanded to offshore areas, trying to maintain the catch levels of 1965-66. In 1967 the Department began a test fishing program to locate concentrations of pre-recruit crab and to estimate future years' production. The first catch projections predicted a continuing decline in future catches. The 1967-1968 catch dropped to 43 million pounds, 30 million pounds less than the prior year. Also in 1968, females examined from eight different areas showed that 15.7 percent were not carrying eggs.

In 1968-1969 the catch dropped to 18 million pounds, and the fishery was closed by emergency order on February 28. The Department determined that in areas with an intensive commercial harvest, there was a higher incident of barren females. No problem was exhibited on Portlock Bank, but on the Chiniak Flats 25 percent of females were barren and large females were affected more than small females. The fishery was still dependent on a weak recruit class.

On July 21, 1970, the Alaska Board of Fish and Game established a catch quota system and directed the Department to institute surveys for abundance estimates. The goals of the policy were twofold:

- 1) Develop and establish a stable fishery, in so far as possible eliminating extreme fluctuation that had characterized the fishery.
- 2) Develop and maintain a broad base of various age classes, insuring breeding success.

The Department was to present estimates of abundance to the Board, which set the quotas. Quotas were not to be increased unless the Board was notified two weeks in advance. The quotas set by the Board were intended not only to arrest the decline of

the king crab fishery but also to return a degree of economic stability and cost effectiveness. Market conditions and the goal of maintaining sufficient densities of crab to provide a reasonable catch per pot were some of the factors taken into consideration. Sometimes these quotas resulted in very low fishing mortalities of 20 percent to 30 percent and carried over large numbers of crab to following years. This stock pile effect caused extremely short, fast-paced seasons. Many areas historically fished later in the year were left unharvested. By 1972 the decline had been reversed and harvests started increasing. The 1973 fishery lasted ten days under a fixed quota system. The Southern District was reopened for additional harvest on October 17 and closed October 25.

In 1974 the Board adopted an eight-inch size limit for a second season, as proposed by the Kodiak Advisory Committee. The purpose of the eight-inch season was to provide a harvest opportunity later in the season for areas that had produced larger crab but that had not been fished in recent years. Also, the harvests during the seven-inch season were composed of a larger percentage of post-recruit crab because of the restrictive quotas. Many of these crab that escaped the seven-inch season would be lost through natural mortality. Since it was indicated that an increase in harvest could be made, the Board took a cautious approach and decided to increase exploitation on the older post-recruit crab.

The Board also adopted a flexible system of harvest guidelines rather than fixed quotas. The Board directed the Department to continue to manage the fishery using a multi-age-class management strategy based on analysis of crab stocks.

The harvest guideline system provided a more liberal approach to the harvest strategy. During the 1975-76 fishery the Department tried to maximize the harvest within each district by dividing districts into schools and closing each school when a 33

percent fishing mortality was reached, based on tag recovery.

In 1976 the Board adopted a fixed opening date of December 1 for the eight-inch season. The December 1 opening date provided an opportunity for all size of vessels to participate in the second season. This second season was soon relied on by a large portion of the fleet because the additional season allowed a second opportunity to fish and provided an extra stimulus to the local economy.

In 1978 the Board lowered the size limit of the second season from eight inches to 7 1/2 inches. The Department proposed the change because of the large amount of post-recruit crab available between 7 1/2 and eight inches that year. The 1978-79 second season recorded a harvest of 1.7 million pounds, similar to the 1.8 million pounds landed 1977-78. The lowered size limit increased recruit harvest during the second season from .7 percent under an eight-inch size limit to 15 percent the first year that it was in effect (Table 2). In 1981 the Board adopted a management plan for Kodiak. The plans direction was threefold; first - individual stocks of crab are to be managed as a single unit, small closures that leave a portion of a stock open should be avoided, second - utilization of stocks based on overall stock size while considering recruitment and postrecruit population levels, third - a second season for 7 1/2 crab will be provided for with an opening between November 15 and December 15. This plan is delineated in detail in 5 AAC 34.460.

The 1981-82 season's harvest was the highest of the previous 14 years at 24.2 million pounds. This was followed by the 1982-83 season harvest of 8.7 million pounds, the lowest in 24 years. Although this 1982-83 seasons harvest was low, the value of the fishery was the second highest worth 32.7 million dollars. The effort level for this fishery is also the highest on record with 309 vessels participating.

In 1982 the fleet directed some effort toward brown king crab. There had been incidental catches in the past, but this was the first directed fishery and produced 25,000 pounds. This interest was encouraged by reduced populations of red king and the high price paid for crab.

In 1983 the traditional red king crab fishery was not opened by the Department of Fish and Game due to poor stock condition. This was a result of poor recruitment for the previous two years combined with continued low recruitment forecast for the next three years. The population of adult male crab was the lowest the Department had recorded in 13 years of annual population assessments. The Department established threshold levels of legal males needed prior to considering any further fishery. The threshold of 10.3 million pounds of legal crab was nearly twofold the 5.5 million pounds 1983 estimate.

In 1984 the fishery remained closed. The estimate of legal males increased to 8.3 million pounds. Several districts were at or slightly above the Department's threshold level. Those districts were not opened due to prospects for continued growth in the near future being dismal and continued weak recruitment was expected to just barely keep up with natural mortality.

In 1985 red king crab fishery remained closed. The 1985 crab population assessment survey indicated continued improvement in legal king crab populations in the Southeast and Southwest Districts, while other districts showed little if any improvement. The 1985 survey produced a 9.4 million pound population estimate for the entire Kodiak registration area.

The 1986 survey results indicated a decline in red king crab abundance. The Kodiak area populations of all crab size groups were at record low levels. Although the Southwest District had the highest population of female and legal male crabs, it showed a considerable decline from the 1985 survey. The catch per pot

In 1982 the fleet directed some effort toward brown king crab. There had been incidental catches in the past, but this was the first directed fishery and produced 25,000 pounds. This interest was encouraged by reduced populations of red king and the high price paid for crab.

In 1983 the traditional red king crab fishery was not opened by the Department of Fish and Game due to poor stock condition. This was a result of poor recruitment for the previous two years combined with continued low recruitment forecast for the next three years. The population of adult male crab was the lowest the Department had recorded in 13 years of annual population assessments. The Department established threshold levels of legal males needed prior to considering any further fishery. The threshold of 10.3 million pounds of legal crab was nearly twofold the 5.5 million pounds 1983 estimate.

In 1984 the fishery remained closed. The estimate of legal males increased to 8.3 million pounds. Several districts were at or slightly above the Department's threshold level. Those districts were not opened due to prospects for continued growth in the near future being dismal and continued weak recruitment was expected to just barely keep up with natural mortality.

In 1985 red king crab fishery remained closed. The 1985 crab population assessment survey indicated continued improvement in legal king crab populations in the Southeast and Southwest Districts, while other districts showed little if any improvement. The 1985 survey produced a 9.4 million pound population estimate for the entire Kodiak registration area.

The 1986 survey results indicated a decline in red king crab abundance. The Kodiak area populations of all crab size groups were at record low levels. Although the Southwest District had the highest population of female and legal male crabs, it showed a considerable decline from the 1985 survey. The catch per pot

data of the Northeast, Southeast and Shelikof districts also confirm this continuation of declining stocks.

Kodiak Island wide numbers and weights of legal male crabs were calculated using a new method which used commercial catch data from 1973 to 1982 as a basis for the estimates to be compared with the historic survey size and relative abundance data. An estimate of 330,000 legal male crab was derived for the Kodiak area (Table 5).

The fishery remained closed for the 4th consecutive season.

#### 4 1987 Red King Crab Stock Status

The 1987 Kodiak crab assessment surveys were conducted between July 6 and August 15.

A trawl survey was conducted island wide for the first time for both king and Tanner crab. Previous trawl surveys have been restricted to the Shelikof, Northeast and Eastside areas of Kodiak Island. The survey was conducted aboard the chartered vessel F/V Royal Baron and consisted of 188 successful trawl tows. Effort in terms of fishing days was distributed based on the area's historic commercial production of red king and Tanner crab.

Catch data by tow has been presented in a regional report titled "Alaska Department of Fish and Game Westward Region Crab Survey Results for 1987".

A total of 334 red king crab, 163 males and 171 females were captured in 25 tows. Fifty-nine percent of all males captured were legal size and 99 percent of all females were adults (Figure 1). The most productive stations were in Chiniak Bay where 99 and 68 king crab were captured in each to two tows. The average

number of king crab captured per tow mile ranged from 0 in the Southeast District to 4 in the Southwest District. It is estimated that the king crab population consists of 1,025,811 crab, 51 percent of which are females. The 1987 estimate of 317,284 legal males is the lowest estimate to date (Table 5). The threshold levels of adult female king crab and the 1987 trawl estimates by district are depicted in Table 6. Reproductive output of the small adult population remains low as 80 out of 169 adult females were barren; 71% of these were not mated and the remaining 29% had already lost their embryos, probably due to the nemartean egg predator.

The R/V Resolution was utilized for three days of pot fishing in the Alitak Flats area. This area was chosen for pot research fishing because it had the highest densities of red king crab island wide as evidenced from the 1986 survey. Captured in the 99 pots were 233 legal and 12 sublegal males, 593 adult and 2 juvenile females. The actual catch data by individual pots and stations are summarized in a regional report entitled "Alaska Department of Fish and Game Westward Region Crab Survey Results for 1987".

The 1987 survey results indicate a continuation of the decline in red king crab abundance that had been noted during the past 5 years in all stocks. The adult female population is still well below the threshold value by District established by the Department of Fish and Game in its "Kodiak Red King Crab Management Plan." Recruitment to adult males (reproductively active) king crab is still very poor. Therefore, an emergency order was issued closing Registration Area "K" (Kodiak) to red and blue king crab fishing prior to the scheduled September 25th opening.

#### 1987 Brown (Golden) King Crab Fishery

Brown (Golden) king crab in the Kodiak area is a permit fishery. This permit, adopted in 1983 by the Alaska Board of

Fisheries, provides the Department the flexibility to avoid conflicts with fair starts in other fisheries; as well as the ability to adjust the permit provision where it was in the best interest of the industry and the resource.

At the March, 1985 Board of Fisheries meeting, the board reduced the legal size of brown king crab from seven inches to six and one-half inches in width of shell. This regulation became effective on June 28, 1985, the beginning of the new registration year.

A total of 5 vessels fished brown king crab in 1987 and harvested 67,191 pounds.

#### Stock Status

##### Brown King Crab

The Department does no assessment work on brown king crab, and accurate stock size is unknown. However, the scope of the last five years commercial effort indicates the resource is not large.

Table 1. Historic commercial king crab catch and effort for the Kodiak registration Area (K), 1960-61 through 1987/88 fishing seasons (fish ticket data).

Fishing <sup>1</sup> Year	No. of Lndgs.	No. of <sup>4</sup> Vessels	No. Crab		Pots Lifted	Avg. Crab Per Pot	Avg. Wt. Per Crab	Avg. Price Per Pound	Ex-Vessel Value (Mil. \$)
			No.	Pounds					
1960-61	-	143	2,116,375	21,064,871	-	-	-	.085	1.8
1961-62	-	148	3,181,554	28,962,900	-	-	-	.95	2.7
1962-63	-	195	4,146,143	37,626,703	-	-	-	.10	3.8
1963-64	-	181	4,158,988	37,716,223	-	-	-	.10	3.8
1964-65	-	189	4,923,309	41,596,518	95,951	51	-	.10	4.1
1965-66	-	175	11,061,709	94,431,026	173,083	64	-	.128	12.1
1966-67 <sup>2</sup>	-	213	8,476,299	73,817,779	223,174	38	-	.11	8.1
1967-68	3,847	227	5,147,321	43,448,492	207,392	25	-	.26	11.2
1968-69	1,839	178	2,348,950	18,211,485	119,146	20	-	.26	4.7
1969-70 <sup>3</sup>	978	136	1,606,181	12,200,571	96,841	17	-	.28	3.4
1970-71	830	100	1,561,318	11,719,970	119,192	13	-	.30	3.5
1971-72	507	89	1,539,157	10,884,152	66,166	23	-	.39	4.2
1972-73	683	88	2,029,670	15,479,916	70,806	29	-	.55	8.5
1973-74	837	129	1,847,679	14,397,287	77,826	24	-	.45	6.5
1974-75	1,195	158	2,910,201	23,582,720	110,297	26	-	.45	10.6
1975-76	1,569	169	2,976,909	24,061,651	113,795	26	8.1	.66	15.9
1976-77	1,165	195	2,177,956	17,966,846	130,777	17	8.2	1.37	24.6
1977-78	1,186	179	1,590,477	13,503,666	145,867	11	8.5	1.34	18.1
1978-79	1,077	194	1,464,021	12,021,850	177,261	8	8.2	1.60	19.2
1979-80	1,346	247	1,979,394	14,608,900	207,991	9	7.3	.95	13.9
1980-81	1,175	164	2,787,199	20,448,654	201,531	14	7.3	1.05	21.5
1981-82	2,214	246	3,035,674	24,237,601	388,751	8	8.0	2.00	48.5
1982-83	1,373	309	1,011,109	8,729,761	283,795	4	8.6	3.75	32.7
1983-84 <sup>5</sup>	36	12	16,349	111,398	8,490	2	6.8	3.00	.3
1984-85 <sup>5</sup>	8	6	3,513	22,066	1,950	2	6.3	2.50	.1
1985-86 <sup>5</sup>	19	4	10,005	63,641	2,693	4	6.4	1.95	.1
1986-87 <sup>5</sup>	31	4	21,862	146,478	5,463	4	6.7	3.00	.4
1987-88 <sup>5</sup>	38	5	9,484	67,191	3,187	3	7.1	3.44	.2
AVERAGE <sup>6</sup>	1,359	174	2,963,898	24,834,120	143,813	21	-	-	-

65

<sup>1</sup> Fishing year defined as May 1 - April 30

<sup>2</sup> July 1 - April 30 season established

<sup>3</sup> August 15 - January 15 established

<sup>4</sup> Number of vessels shown are those actually registered through 1979-80 season. Number of vessels fishing and average number vessels is shown from 1970-71 season

<sup>5</sup> All brown king crab calendar year 1983 (1983-84) and 1984 (1984-85), 1985 (1985-86), 1986 (1986-87)

<sup>6</sup> Average for years listed, excluding 1983-84, 1984-85, 1985-86, 1986-87, 1987-88

Table 2. Kodiak red king crab harvest composition and seasons; 1960-61 through 1987/88 seasons.

Season	Open	Closed	(mil.) Lbs. Catch	Percent Recruits <sup>1/</sup>	% Post Recruits	Size Limit
1960-61	July 1	June 30	18.9	8	92	6-1/2"
1961-62	July 1	June 30	29.0	36	64	6-1/2"
1962-63	July 1	June 30	37.6	26	74	6-1/2"
1963-64	July 1	June 30	35.0	33	67	7"
1964-65	July 1	June 30	41.6	48	52	7"
1965-66	July 1	April 30	94.4	35	65	7"
1966-67	July 1	April 30	73.8	28	72	7"
1967-68	July 1	April 30	43.4	27	73	7"
1968-69	June 15	March 31	18.2	61	39	7"
1969-70	Aug. 15	Jan. 15	12.2	59	41	7"
1970-71	Aug. 15	Jan. 15	11.7	38	62	7"
1971-72	Aug. 15	Oct. 29	10.9	75	25	7"
1972-73	Aug. 15	Oct. 13	15.5	47	53	7"
1973-74	Aug. 15	Oct. 25	14.4	49	51	7"
1974-75	Aug. 15	Sept. 21	20.9	52	48	7"
	Oct. 15	Jan. 15	2.2	3	97	8"
1975-76	Aug. 15	Oct. 20	21.6	48	52	7"
	Oct. 20	Dec. 1	2.5	3	97	8" <sup>2/</sup>
1976-77	Sept. 1	Oct. 16	14.6	33	67	7"
	Dec. 1	Jan. 15	3.1	.5	99.5	8"
1977-78	Sept. 15	Nov. 30	11.7	37	63	7"
	Dec. 1	Jan. 15	1.8	.7	99.3	8"
1978-79	Sept. 10	Nov. 30	10.3	44	56	7"
	Dec. 1	Jan. 15	1.7	15	85	7-1/2"
1979-80	Sept. 10	Nov. 30	13.4	70	30	7"
	Dec. 1	Jan. 15	1.2	30	70	7-1/2"
1980-81	Sept. 15	Nov. 30	18.4	69	31	7"
	Dec. 1	Jan. 15	2.1	22	78	7-1/2" <sup>3/</sup>
1981-82	Sept. 15	Dec. 15	20.3	61	39	7"
	Dec. 15	Jan. 15	3.9	7	93	7-1/2"
1982-83	Sept. 1	Dec. 10	7.5	46	54	7"
	Dec. 10	Dec. 19	1.2	19	81	7-1/2"
1983-84			F I S H E R Y	C L O S E D		
1984-85 <sup>4</sup>			F I S H E R Y	C L O S E D		
1985-86			F I S H E R Y	C L O S E D		
1986-87 <sup>5</sup>			F I S H E R Y	C L O S E D		
1987-88			F I S H E R Y	C L O S E D		

<sup>1</sup> Recruitment after 1963 based on 7" size limit.

<sup>2</sup> Marmot Bay, Chiniak Bay and Kupreanof Straits did not open for 8" crab.

<sup>3</sup> Uganik Bay, Kupreanof Straits, Marmot Bay, Chiniak Bay, Ugak Bay, South Sitkalidak Straits, Kiliuda Bay and Alitak Bay did not open for 7-1/2" crab.

<sup>4</sup> Harvest of crab by test fishery - 33,743 pounds.

<sup>5</sup> Harvest of crab by test fishery - 13,393 pounds.

Table 3. Kodiak king crab forecast and resultant harvest.

Year	(1)	(2)		(3)	(4)
	Harvest Million Pounds	F O R E C A S T		Error (2-1)	Relative Error 2 1x100
		Point	Range		
1970-71	11.7	14.0 <sup>1</sup>	--	- 2.3	- 20%
1971-72	10.8	10.2 <sup>1</sup>	--	+ .6	+ 6%
1972-73	15.4	10.2 <sup>1</sup>	--	+ 5.2	+ 34%
1973-74	14.3	12.5 <sup>1</sup>	--	+ 1.8	+ 13%
1974-75	23.5	15.0 <sup>1</sup>	--	+ 8.5	+ 36%
1975-76	24.0	20.5 <sup>2</sup>	17.0-24.0	+ 3.5	+ 15%
1976-77	17.9	19.0 <sup>2</sup>	14.0-24.0	- 1.1	- 6%
1977-78	13.5	14.5 <sup>2</sup>	10.0-19.0	- 1.0	- 7%
1978-79	12.0	11.0 <sup>2</sup>	7.0-15.0	+ 1.0	+ 8%
1979-80	14.6	26.0 <sup>2</sup>	21.0-31.0	-11.4	- 78%
1980-81	20.4	21.0 <sup>2</sup>	16.0-26.0	- .6	- 3%
1981-82	24.2	21.0 <sup>2</sup>	16.0-26.0	+ 3.2	+ 13%
1981-82	24.2	19.8 <sup>3</sup>	13.6-26.0	+ 4.4	+ 18%
1982-83	8.7	6.9 <sup>3</sup>	3.5-10.2	+ 1.8	+ 21%
1983-84	CLOSED	0. <u>3</u>	0	-	-
1984-85	CLOSED	0. <u>3</u>	0	-	-
1985-86	CLOSED	0.45 <u>3/4</u>	0	-	-
1986-87	CLOSED	-	0	-	-
1987-88	CLOSED	-	0	-	-

<sup>1</sup> Published as quota in regulation book.

<sup>2</sup> Published as guideline harvest level in regulation book.

<sup>3</sup> Published as harvest strategy in regulation book and forecast published in Westward Region King Crab Survey Results.

<sup>4</sup> Fishery closed prior to opening by Commissioner at request of Kodiak Advisory Committee. Southwest District forecast only.

Table 4. Historical catch and effort by district in the Kodiak registration area 1971-72 through 1982-83 season.

Area	1973-74*	1974-75*	1975-76*	1976-77*	1977-78*
<b>NORTHEAST:</b>					
No. Lbs. Landed	1,648,990	4,539,837	7,689,515	6,692,856	3,016,522
No. Landings	-	-	-	-	615
No. Vessels	-	-	-	-	-
CPUE	28	16	11.1	13.3	5
Average Weight	8.2	8.2	8.7	9.2	10.4
<b>SOUTHEAST:</b>					
No. Lbs. Landed	7,896,548	8,156,067	5,077,059	4,749,984	3,499,960
No. Landings	-	-	-	-	239
No. Vessels	-	-	57	54	60
CPUE	34	28	25.1	18	12
Average Weight	7.8	8.14	8.0	7.7	7.8
<b>SOUTHWEST:</b>					
No. Lbs. Landed	4,092,729	9,109,789	9,678,032	5,449,930	6,579,214
No. Landings	-	-	-	-	275
No. Vessels	-	-	53	33	53
CPUE	31	37	33.2	25	18
Average Weight	7.5	7.8	7.7	7.6	8.1
<b>SHELIKOF:</b>					
No. Lbs. Landed	759,020	1,254,641	1,617,004	1,074,076	407,970
No. Landings	-	-	-	-	130
No. Vessels	-	-	55	50	49
CPUE	-	23	18.5	8	3
Average Weight	8.2	7.8	8.0	8.7	9.5
<b>SEMIDI ISLANDS:</b>					
No. Lbs. Landed	-	-	-	-	-
No. Landings	-	-	-	-	-
No. Vessels	-	-	-	-	-
CPUE	-	-	-	-	-
Average Weight	-	-	-	-	-
<b>TOTAL KODIAK ISLAND</b>					
No. Lbs. Landed	14,397,287	23,582,720	24,061,648	17,966,846	13,503,666
No. Landings	837	1,195	1,569	-	1,186
No. Vessels	129	158	169	195	179
CPUE	24	25	26.1	17	11
Average Weight	7.8	8.6	8.1	8.2	8.5

\* Portlock and Northeast districts combined.

Table 4. (Cont.) Historical catch and effort by district in the Kodiak registration area 1971-72 through 1982-83 season.

Area	1978-79*	1979-80*	1980-81*	1981-82*	1982-83*
<b>NORTHEAST:</b>					
No. Lbs. Landed	1,829,649	2,345,934	4,642,631	9,559,327	4,719,292
No. Landings	448	696	-	1,136	-
No. Vessels	-	102	-	-	199
CPUE	4	5	19	7.1	3.5
Average Weight	9.8	8.3	8.3	9.0	9.5
<b>SOUTHEAST:</b>					
No. Lbs. Landed	2,011,580	1,679,972	3,703,322	6,680,999	1,957,237
No. Landings	179	185	-	387	-
No. Vessels	48	-	-	93	-
CPUE	8	8	15	9.7	5.8
Average Weight	8.2	7.1	7.1	7.4	8.1
<b>SOUTHWEST:</b>					
No. Lbs. Landed	7,552,756	9,648,601	10,285,708	6,410,813	1,097,778
No. Landings	477	577	-	582	-
No. Vessels	86	-	-	106	-
CPUE	12	14	19	7.5	-
Average Weight	7.9	7.2	7.0	7.4	-
<b>SHELIKOF:</b>					
No. Lbs. Landed	493,319	842,087	1,790,416	1,576,484	916,379
No. Landings	168	163	-	211	-
No. Vessels	57	-	-	52	-
CPUE	3	5	7	6.9	2.5
Average Weight	7.6	7.6	7.5	7.6	-
<b>SEMIDI ISLANDS:</b>					
No. Lbs. Landed	134,544	92,306	26,577	9,978	14,166
No. Landings	12	9	-	4	10
No. Vessels	6	-	-	2	9
CPUE	6	7	4	3.2	1.2
Average Weight	8.7	8.7	7.3	7.1	8.4
<b>TOTAL KODIAK ISLAND</b>					
No. Lbs. Landed	12,021,850	14,608,900	20,448,654	24,237,601	8,704,870
No. Landings	1,077	1,346	1,175	2,214	1,353
No. Vessels	196	247	164	246	309
CPUE	8	10	14	7.8	3.6
Average Weight	8.5	7.3	7.3	8.0	8.6

\* Portlock and Northeast districts combined.

Table 5. Legal male red king crab, Paralithodes camtschatica, estimates for the Kodiak Area.

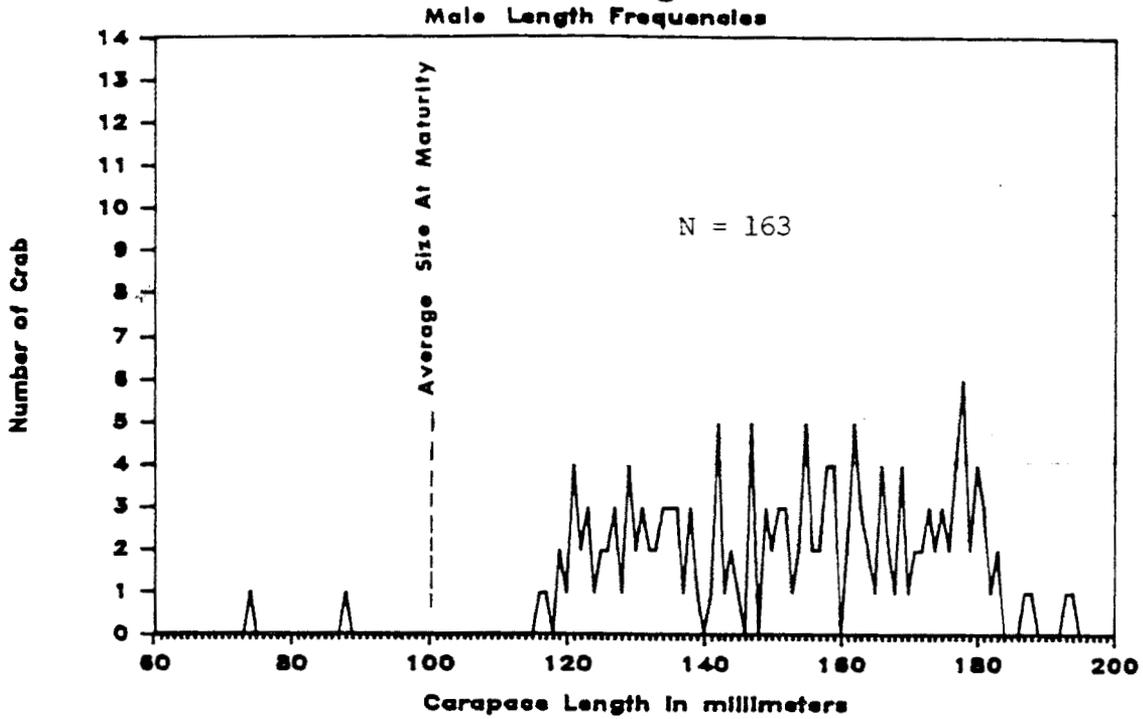
Year	Estimate in No. of Animals X 10 <sup>6</sup>
1973	4.874
1974	8.716
1975	7.622
1976	5.191
1977	3.764
1978	2.874
1979	5.629
1980	5.978
1981	5.873
1982	1.883
1983	0.400
1984	0.397
1985	0.418
1986	0.330
1987*	0.317

\* Trawl Survey

Table 6. Adult female red king crab, Paralithodes camtschatica, thresholds by district for the Kodiak area (millions of animals).

	Threshold	1987 Trawl Estimate
District 1 (Northeast)	1.93	0.30
District 2 (Southeast)	0.72	0.00
District 3 (Southwest)	2.28	0.10
District 4 (Shelikof)	0.19	0.08
TOTAL	5.12	0.48

# 1987 Kodiak Red King Crab Trawl Survey



# 1987 Kodiak Red King Crab Trawl Survey

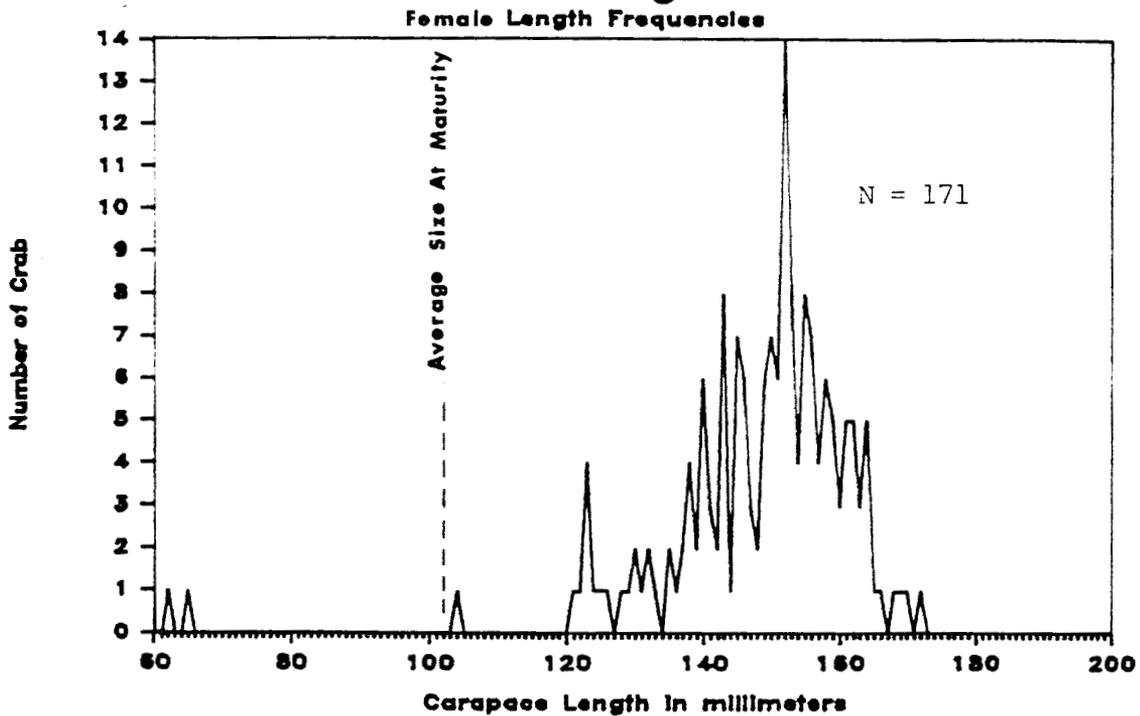


Figure 1. Length frequency of Kodiak red king crab caught in trawl survey, 1987.



4

## SHRIMP

### Historical Background Trawl Fishery

The Kodiak shrimp fishery began in 1958 with an annual harvest of 31,886 pounds. The fishery grew rapidly from 10 to 12 million pounds annually in the early 1960's. The fishery slowed when shore plants and the fishing fleet were badly damaged by the 1964 earthquake and tidal wave, but then grew rapidly to a peak of 82.2 million pounds in 1971 (Table 1). As Kodiak shrimp catches declined in the 1970's, much of the vessel effort shifted into the Chignik and South Peninsula areas until those areas too demonstrated similar declines in the late 1970's.

Vessels participating in the Kodiak fishery are of three types: vessels that fish with beam trawls, vessels that fish a single otter trawl and vessels that fish two otter trawls simultaneously. The single otter trawl vessels have participated in the fishery since 1958. Beam trawl vessels started fishing in 1970 (F/V TAURUS, F/V SUE). The double rigged otter trawl vessels first fished Kodiak in 1969 (F/V PACIFIC CHALLENGER) followed by more efficient stern ramp double otter trawls in 1970 (F/V DAWN). These double rigged vessels increased efficiency; at the same time, hold capacity also increased. Double rigged vessels have hold capacities to 200,000 pounds, while single rigged otter trawls are typically less than 120,000 pounds and beam trawlers typically pack less than 20,000 pounds. The

efficiency and ability to deliver larger loads is what enabled the double rigged otter trawlers to range over a much larger area than was customary. Along with the other innovations to the fishery, the double rigged vessel also introduced Gulf of Mexico style nets which were more efficient than the West Coast manufactured nets used previously. These new style nets were quickly adopted by the single rigged vessels. Gear continued to change as new materials and ideas were tried. Wider nets, higher opening nets, different mesh size, longer nets and roller gear. Along with the increase in gear technology in the 1970's, electronics became more sophisticated and reliable as a tool to locate shrimp.

No regulatory measures were promulgated in the Kodiak shrimp fishery until 1970 when the Board of Fish and Game (later known as Board of Fisheries) adopted an egg hatch closure during March and April for some bays and nearshore areas. In 1971 a quarterly quota system was adopted to provide harvest throughout the year while not allowing unrestricted harvest. The allowable harvest for various fishing sections was divided into four periods. In 1972 the Board of Fisheries adopted a total egg hatch closure for the Kodiak area during March and April. In the late 1970's, the quarterly quota system was reduced to a single opening for certain areas and staggered opening dates for many of the fishing sections, while others retained two fishing periods - fall and winter (September 1 - December 31 and January 1 - February 28). Beginning in 1979, the opening date was changed from May 1 to

June 1. Most of the season date adjusting was due to industry's desire to spread harvest out over a longer time period while trying to prevent conflicts with vessels and processing in other fisheries. Also, during this period in the late 1970's, stocks in some areas were not large enough to support fisheries and these areas were opened and closed by emergency order.

The Department of Fish and Game conducted a voluntary logbook program beginning in 1967. This data base plus trawl surveys conducted by the Department since the early 1970's provided means for establishing harvest by the late 1970's. This data base and harvest adjusting system was quite flexible during its developing stage. By 1981 the industry demanded this flexible management scheme be defined. This led to the Westward Region Shrimp Management Plan which was presented to the Board of Fisheries in April 1982. This plan was reviewed by the Board and amendments in certain areas were made at the Board's request.

The objectives of this management plan are to maintain shrimp stocks at a level termed "representative biomass" (RBI) determined by survey "index"; while allowing a fishery during rebuilding periods. Exploitation rates increase as the population level approaches or exceeds RBI and decline if the survey index is less than the RBI level. Additionally, a minimum level at which any harvest would occur was established ("minimum acceptable biomass index"). This MABI is 40 percent of the representative index level.

At the same meeting the Board endorsed the Westward Region Shrimp Management Plan, they provided for an "economical alternative". This was in the form of an alternative management strategy known as the Mainland Shrimp Mangement Plan.

"5 AAC 31.530. MAINLAND SHRIMP MANAGEMENT PLAN. (a) The Board of Fisheries recognizes that shrimp stocks in the Westward Area have drastically declined in recent years. The board agrees that the conservative management strategy proposed by the department in the 1982 Westward Region Shrimp Management Plan is appropriate, but recognizes that exact parameters governing the selection of harvest levels will probably change as more data becomes available. Alternative management strategies should be evaluated while safeguarding the viability of major shrimp stocks upon which future significant production will have to be based.

(b) The board is adopting this management plan for all waters of the Alaska Peninsula in Statistical Area J from the latitude of Cape Douglas southwest to the longitude of Foggy Cape. These waters include the Mainland section of the Kodiak district and the Aniakchak, Nakalilok and Chiginagak Bay sections of the Chignik district. This management plan will be used to evaluate reactions of shrimp stocks in these sections to harvest levels and seasons differing from those used in the balance of the region and

to provide an economic alternative to the shrimp industry.

(c) The board recognizes that this management plan is not without biological risks to the shrimp resource, but thinks that with proper monitoring knowledge will be gained relative to the reactions of the stock to this management plan and that questions regarding stock distribution and variability will be answered. This will require that the information, including logbooks and accurate catch reporting, provided by the shrimp fishing fleet be of a quality needed to perform this evaluation. Without this information, along with biological surveys conducted by the department, this experimental plan cannot succeed and will be terminated.

(d) The department is directed not to close the sections covered by this management plan based on any shrimp stock population estimates. The department may close any section covered by this management plan for the following reasons:

- (1) wastage of shrimp;
- (2) unlawful catch reporting;
- (3) predominant harvest of shrimp less than two years of age; or
- (4) in accordance with 5 AAC 39.185.

Since both of these management plans have been in effect, stocks have continued to decline. Under the Westward Region Shrimp Management Plan few areas have been open the past five years. The Mainland fishery, while open, has steadily declined in both production and area fished.

#### 1987-88 Trawl Fishery

The trawl fishery opened in the Kodiak District on June 15, 1987. For the fourth year, East Point Seafoods was the only processor to purchase shrimp in Kodiak. The average price paid was \$ .23 a pound with a range of \$ .22 to \$ .32. The price varied depending on recovery, fish contamination, and overall quality. Only one vessel made landings for 10,841 pounds.

The department did conduct a fall trawl survey in selected areas around Kodiak Island during October. These areas included Alitak, Chiniak, Marmot, Uganik, Wide, and Kukak Bays. Due to budget cuts and vessel availability the department does not anticipate conducting another shrimp trawl survey until the fall of 1989.

#### West Afognak

The West Afognak section was closed to bottom trawling by the Alaska Board of Fisheries in order to protect king crab. This closure also restricted shrimp trawls and thus no fishery

occurred in this section.

#### North Afognak

The North Afognak section opened June 15, 1986 and closed February 28, 1988. No fishing occurred in this section.

#### Mainland Section

This was the sixth year the Mainland has been managed under the Mainland Shrimp Management Plan. A total of one vessel harvested 10,841 pounds of product, most of which came from Wide Bay.

#### Undefined Areas

Undefined areas are those which do not lie within the defined sections. They are open for the entire 259 day regulatory season from June 15 through February 28. There was no effort reported in undefined areas.

#### Stock Status

Stocks in the Kodiak District remain at very low levels. There appears to be little if any improvement in stock conditions overall. Areas fished during the previous years (1984-85) have declined to where those managed under the Westward Shrimp

Management Plan were not opened this year. Areas under the Mainland Shrimp Management Plan, while remaining open, continues to decline in production.

Until stock conditions improve the Kodiak area harvest in all probability will remain less than one million pounds.

#### Pot Shrimp Fishery

Currently, no assessment of stock size or condition is conducted by the Department other than information from the fleet.

During 1987 no harvest was reported from the Kodiak area.

Table 1. Historic commercial shrimp catch and effort for the Kodiak District of Westward Statistical Area (J), 1958 through 1987-88 season.

Calendar Year	Fishing Year	No. Vessels	No. Landings	Commercial Pounds	Harvest Price
1958		-	-	31,886	.035
1959		-	-	2,861,900	.035
1960		11	94	3,197,985	.039
1961		12	203	11,083,500	.04
1962		11	204	12,654,027	.04
1963		-	-	10,118,472	.043
1964		6	-	4,339,114	.04
1965		11	320	13,823,061	.04
1966		17	551	24,097,141	.045
1967		23	-	38,267,856	.045
1968		16	-	34,468,713	.04
1969		26	935	41,353,461	.055
1970		18	1,024	62,181,204	.04
1971		49	1,746	82,153,724	.04
1972		63	1,398	58,352,319	.04
1973		50	1,283	70,511,477	.055
	1973-74	63	1,029	56,203,992	.08
	1974-75	75	1,100	58,235,982	.08
	1975-76	58	884	49,086,591	.08
	1976-77	62	762	46,712,083	.10
	1977-78	58	653	26,409,366	.13
	1978-79	50	328	20,506,021	.165
	1979-80	37	242	12,863,536	.225
	1980-81	67	462	27,101,218	.29
	1981-82	55	298	19,112,367	.27
	1982-83	40	224	10,391,207	.27
	1983-84	14	63	2,779,030	.35
	1984-85	13	59	2,942,922	.33
	1985-86	5	26	1,145,980	.20
	1986-87	2	10	455,468	.25
	1987-88	1	2	10,841	.23
AVERAGE (fishing year)		33	556	25,917,820	.12

Table 2. Kodiak District shrimp seasons, harvest and effort by section, 1987-88 season.

Section	Regulatory Season	Actual Harvest Period	Harvest <sup>1</sup> Goal (mil. lbs.)	Pounds Hvstd.	Survey Index	Vesls.	Landgs.
Inner	Opened & Closed by EO	CLOSED	--	--	.368	--	--
Ugak Bay	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Kiliuda Bay	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Two Headed	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Alitak Bay	Opened & Closed by EO	CLOSED	--	--	.132	--	--
Olga Bay	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Uyak Bay	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Uganik Bay	Opened & Closed by EO	CLOSED	--	--	.204	--	--
W. Afognak	Closed to Bottom Trawls	CLOSED	--	--	.----	--	--
N. Afognak	June 15 - Feb. 28	June 15 - Feb. 28	<u>1</u> / <sub>2</sub>	0	.----	--	--
Marmot Is.	Opened & Closed by EO	CLOSED	--	--	.408	--	--
Chiniak Bay	Opened & Closed by EO	CLOSED	--	--	.152	--	--
Alitak Flts	Opened & Closed by EO	CLOSED	--	--	.----	--	--
Mainland	June 15 - Feb. 28	June 15 - Feb. 28	<u>1</u> / <sub>2</sub>	10,841	.----	1	2
Undefined	June 15 - Feb. 28	June 15 - Feb. 28	<u>1</u> / <sub>2</sub>	0	.----	0	0

<sup>1</sup> No harvest guideline based on survey indexes

Table 3. Comparison of Kodiak District trawl shrimp harvest by fishing section for the 1977-78 through the 1987-88 fishing seasons. Sections with no catch are indicated by zero. Where dashes appear, no section existed that year.

Fishing Section	1977-78	1978-79 <sup>4</sup>	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Inner Marmot	1,482,689	473,700	0	0	1,958,074	0	0	0	0	0	0
Marmot Island	3,298,643	0	0	0	87,408	0	0	0	0	0	0
Chiniak Bay	33,811	1,163,818	925,388	135,804	2,598,072	0	0	0	0	0	0
Kalsin Bay	1,913,233										
Kiliuda Bay	6,059,204	0	0	0	0	0	0	0	0	0	0
Two Headed Is.	4,038,294	1,600	0	2,141,048	3,043,926	0	0	0	0	0	0
Southern	4,416,986	3,485,531	-	-	-	-	-	-	-	-	-
Alitak Bay	-	-	3,537,017	4,716,875	4,136,381	3,627,209	510,086	1,474,255	0	0	0
Alitak Flats	-	-	-	-	1,728,553	0	0	0	0	0	0
Olga Bay	-	1,794,091	2,259,906	1,164,641	760,179	944,067	820,675	399,882	1,397 <sup>3</sup>	0	0
Ugak Bay	19,000	0	533,598	1,052,092	104,161	0	0	0	0	0	0
Uyak Bay	2,309,710	1,003,946	0	426,800	0	0	0	0	0	0	0
Uganik Bay	1,481,186	367,838	0	0	0	0	0	0	0	0	0
West Afognak	258,730	879,082	478,327	1,177,302	230,582	1,000	20,704	5,209	0	0	0
North Afognak	46,407	1,149,071	1,430,362	2,204,871	748,639	1,206,275	6,617	0	0	2,000	0
South Mainland	274,484	-	-	-	-	-	-	-	-	-	-
Kukak Bay	776,989	586,496	534,187	1,167,805	549,323	-	-	-	-	-	-
Wide Bay	-	-	1,181,936	977,682	926,158	-	-	-	-	-	-
Puale Bay	-	-	1,841,223	663,954	1,597,845	-	-	-	-	-	-
Mainland	-	-	-	-	-	3,236,991	1,420,948	466,694	918,277	447,675	10,841
Portlock	0	-	-	-	-	-	-	-	-	-	-
Non-Section	0	9,600,848	141,592	11,272,344	643,066	0	0	596,882	226,306	5,793	-
<b>TOTAL</b>	<b>26,409,366</b>	<b>20,506,021</b>	<b>12,863,536</b>	<b>27,101,218</b>	<b>19,112,367</b>	<b>10,391,206</b>	<b>2,779,030</b>	<b>2,942,922</b>	<b>1,145,980</b>	<b>455,468</b>	<b>10,841</b>

<sup>1</sup> Prior to 1979-80 season part of the South Mainland

<sup>2</sup> Mainland

<sup>3</sup> Test fishing survey

<sup>4</sup> Chiniak & Kalsin Bay combined

Table 4. Pot shrimp catch statistics, Kodiak District of Statistical Area "J", 1969-1987.

Year	No. Vessels	No. Landings	No. Pounds
1969	1	5	4,750
1970	-	20	12,302
1971*	-	-	-
1972	2	2	4,300
1973	2	5	328
1974	6	73	10,336
1975	7	77	12,782
1976	2	12	1,053
1977	3	26	2,565
1978	2	7	1,781
1979	1	2	152
1980	4	25	4,700
1981	4	6	2,511
1982	6	18	9,754
1983	12	31	18,686
1984	6	21	4,361
1985	2	11	4,332
1986	2	7	2,685
1987*	-	-	-

\* No commercial landings recorded for 1971 or 1987

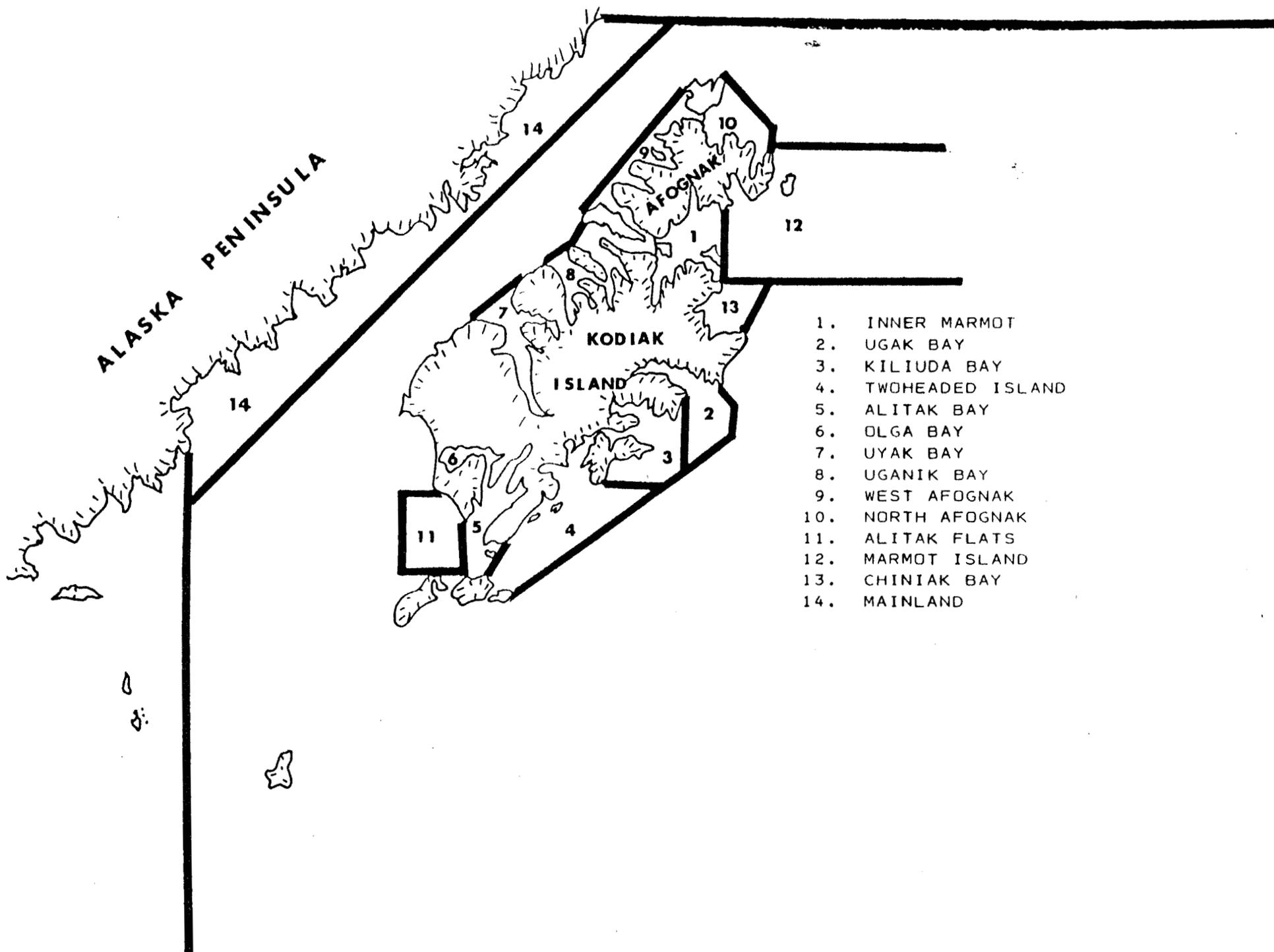


Figure 1. Kodiak District Shrimp trawl fishing sections, 1987-88 season.



## WEATHERVANE SCALLOPS

### Historical Background

The weathervane scallop fishery began in the Kodiak Management District in 1967 (Table 1). By 1969 the fishery had developed to a million pound fishery and had its first restrictions. The Eastside Kodiak bays and Southend of the Island were closed to scallop fishing due to king crab conflicts. Seasons were also instituted to keep scallop gear off molting king crab (Figure 1).

After reaching a peak of 1.4 million pounds in the early 1970's, the fishery declined due to static price conditions, a difficulty in gathering experienced crews and the pursuit of more lucrative fisheries by potential scallop vessels. Consequently, the remaining scallop vessels either entered more profitable crab fisheries here in Alaska or returned to the east coast.

In 1977 and 1978 no landings were made, but in 1979 four landings were made by one vessel. Improved market conditions and poor stocks on the east coast promoted renewed interest in Alaskan scallops in the early 1980's. Even with the largest fleet to ever fish (15 vessels) in 1981, the harvest of 424,000 pounds was only 30 percent of the historic high. The effort soon dwindled until there was only one full time vessel operating in 1982 and 1983. With the king crab closures in 1982-1984 and high ex-vessel price for scallops, there has been new interest but this time mostly by smaller vessels and not the traditional 80 foot plus vessels. Sporadic scallop populations, marginal catch per effort and alternative fisheries diminished much of this renewed interest with 1985 vessel effort in Kodiak being the lowest since 1979.

### 1987 Fishery

The 1987 fishery produced 253,451 pounds of scallops harvested by 3 vessels making 23 landings.

### Stock Status

No stock assessment program exists outside of dockside interviews and samples. Based on this and the historic catch, it appears the stocks will not withstand large amounts of pressure. There was little growth or increase in stocks during the late 1970's, even though there was little or no effort.

Table 1. Historic commercial catch, effort, and value of weathervane scallops Kodiak Management District, 1967 - 1987; excluding 1977 and 1978 when no effort occurred.

Year	No of Vssls.	Lndgs.	Commercial Catch (pounds)	Avg. Catch Per Landing (pounds)	Average Price/Lbs.	Est. Value Ex-Vessel (dollars)
1967	2	6	7,718 <sup>1</sup>	1,298	.07	500
1968	8	89	872,803 <sup>3</sup>	8,983	.85	618,000
1969	11	86	1,012,860	11,777	.85	861,000
1970	7	102	1,417,612	13,898	1.00	1,500,000
1971	5	48	841,211	17,525	1.05	883,000
1972	5	68	1,038,793	15,276	1.15	1,200,000
1973	4	42	935,705	22,279	1.20	1,123,000
1974	3	14	147,945	10,568	1.30	192,000
1975	3	29	294,142	10,143	1.40	412,000
1976	1	6	75,245	12,541	1.59	119,000
1979	1	4	24,826	6,206	2.78	69,000
1980	7	33 <sup>4</sup>	371,018 <sup>5</sup>	11,045	3.60	1,275,000
1981	15	60	424,394	7,073	4.00	1,698,000
1982	8	62	435,645	7,026	3.25	1,416,000
1983	4	24	147,747	6,424	5.00	739,000
1984	7	37	309,502	8,365	4.00	1,238,000
1985	3	10	46,971	4,697	4.00	188,000
1986	5	21	180,600	8,600	4.25	767,550
1987	3	23	253,451	11,019	3.45	874,406
TOTAL <sup>6</sup>		695	8,658,963			15,173,456
AVERAGE <sup>6</sup>	5	37	455,735	12,430	1.75	798,603

<sup>1</sup> Unshucked scallops only.

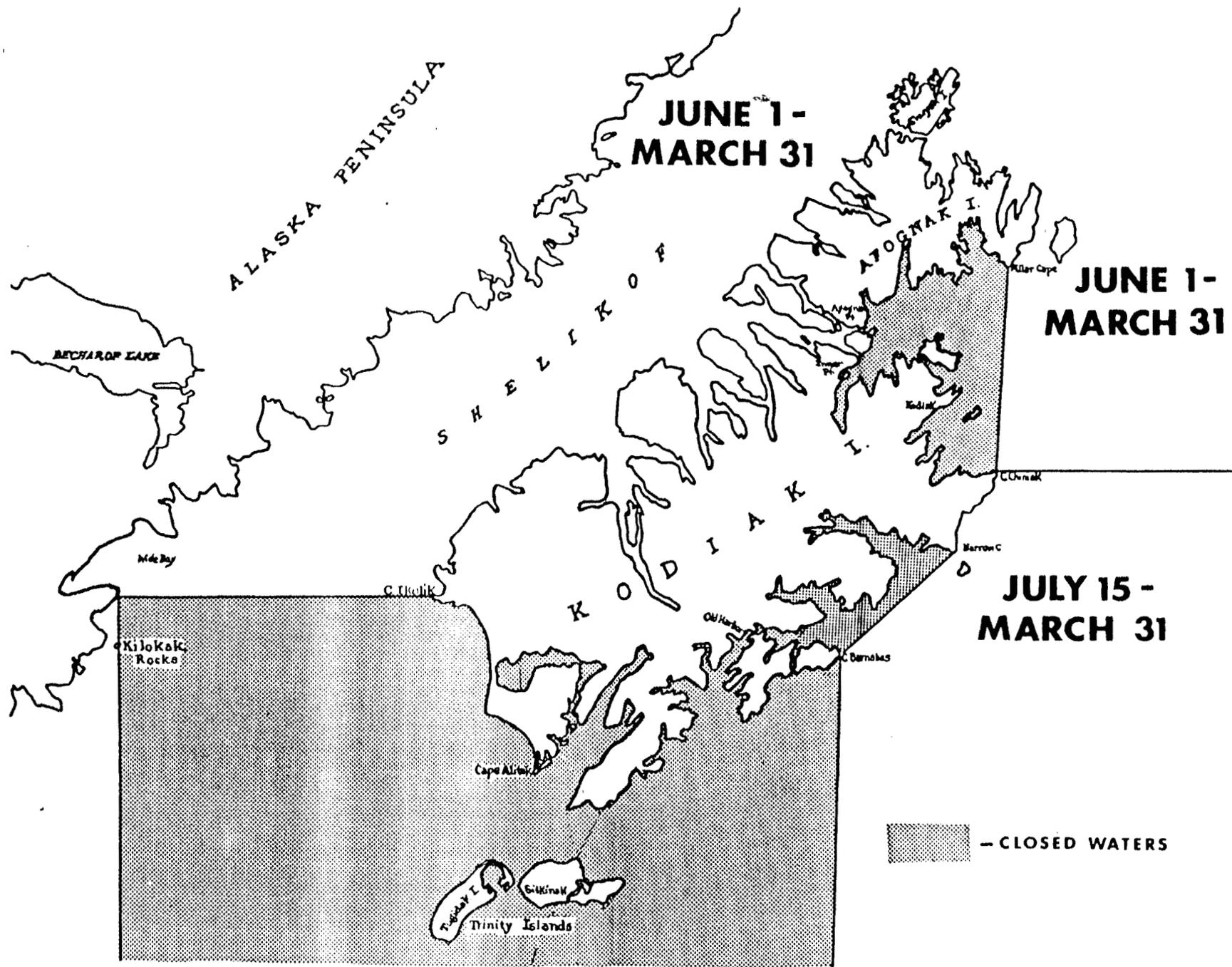
<sup>2</sup> Shucked scallops - 80 landings, nine landings unshucked. Average pounds/landing based on shucked weight and landings.

<sup>3</sup> Shucked scallops - 718,671 pounds; unshucked - 154,132

<sup>4</sup> Shucked scallops - 32 landings, unshucked - one landing. Average pounds/landing based on shucked weight and landings.

<sup>5</sup> Shucked scallops - 353,443 pounds; unshucked scallops - 17,575 pounds.

<sup>6</sup> Total and average, shucked scallops only, 1968 through 1985.



**FIGURE 1. KODIAK AREA SCALLOP SEASONS**





## Sea Urchins

### Historical Background

The green urchin (Strongylocentrotus droebachiensis) was not harvested commercially in the Kodiak Area until 1980 when 923 pounds were landed. There was little further interest in urchins until 1985 when 13,866 pounds were harvested. In 1986 the harvest increased to 31,694 pounds with 3 divers participating.

Sea urchins are harvested for their roe content and seem to be prime for harvest in the Kodiak area between September and December. However, it appears some urchin beds have commercial quality roe as late as mid-February. All urchins are harvested by the use of scuba or hookah diving gear.

All the urchins harvested in the Kodiak area were placed in shipping boxes live and air-shipped to Japan via Anchorage. The roe was then extracted and prepared for market.

### 1987 Fishery

A total of 26 divers registered to harvest urchins in the Kodiak area, however, landings were reported by only 12 divers. The urchin harvest for 1987 was 104,139 pounds with an average price of 69 cents per pound.

Stock Status

No assessment work is currently being done on Sea urchins in the Kodiak area. Unutilized beds of urchins exist around Kodiak Island, and if a processing facility for urchins was available in Kodiak, the Department would expect a dramatic increase in the urchin harvest.

Table 1. Historic harvest of sea urchins in the Kodiak area.

Year	Permittee	Landings	Pounds Harvested (Live Weight)	Per/lb.
1980	1	1	923	.25
1985	2	7	13,866	.55
1986	3	19	31,694	.55
1987	12	78	104,139	.69





## OCTOPUS

The giant Pacific octopus (Octopus dofleini) exists throughout Alaskan waters and is quite numerous in the Kodiak district. Most recorded catches have been incidental to other commercial fishing activities such as crabbing and bottomfishing (Table 1). The harvest had increased through the years to a peak of over 19,000 pounds in 1980. Reduced catches after 1980 may have been the result of shortened Tanner crab seasons. Interest in the fishery has been increasing due to the demand by longline fishermen for bait octopus.

### Stock Status

Although the octopus is numerous, no estimate of abundance is available. The Department currently has no directed study concerning octopus.

Table 1. Commercial catch, effort, and value for octopus in the Kodiak Management Area, 1977-1987.

Year	Number of Vessels	Number of Landings	Commercial Catch (Pounds)	Avg. Price Per Pound	Est. Value Ex-Vessel (dollar)
1977	5	9	1,000	.71	1,136
1978	11	21	3,336	.75	2,502
1979	20	43	6,978	.74	5,164
1980	27	61	19,342	.75	14,506
1981	21	46	5,872	.70	4,110
1982	12	29	3,854	.70	2,697
1983	12	20	3,764	.70	2,634
1984	17	43	6,487	.70	4,341
1985	10	12	4,812	.78	3,753
1986	5	8	643	.70	450
1987	8	15	14,151	1.08	15,300



## RAZOR CLAMS

### Historical Background

Razor clams have been harvested in the Kodiak Management area since the early 1920's. Though many Kodiak Island beaches were explored with some success, the principal commercial harvest occurred in Kukak Bay, Hallo Bay, Big River and the Swikshak Beach regions about 70 miles northwest of Kodiak. Digging continued somewhat on a regular basis until the early 1960's when a combination of increasing Federal and State regulations in processing the product, poor market conditions, and the earthquake of 1964 brought a decline. Commercial harvesting of clams for human consumption has never become re-established and the fishery has been strictly hand-digging for use as bait in the Dungeness crab fishery. In 1985, 1986, and 1987, there were not any beaches in the Kodiak area that the clams were certified by the Alaska Department of Environmental Conservation as safe for human consumption. The last samples taken for certification as safe for human consumption were taken in July of 1980.

Many of the principal harvest areas along the Alaska Peninsula are adjacent to the Katmai National Monument. This includes all the land above mean high water from Cape Douglas to Cape Kubugakli. Commercial activity within the monument is restricted. Current policy of U.S. Park Service dictates a ban on camping in the monument in support of a business enterprise. In 1986 the Alaska Board of Fisheries adopted a regulation prohibiting hydraulic mechanical dredges from harvesting clams in the Kodiak area east of Kilokak Rocks.

### Stock Status

The potential for a razor clam harvest in the Kodiak Management area has been established by historic catch records and studies conducted by the Department. These studies, however,

were conducted in the mid 70's and of little benefit in judging stock status at this time due to environmental changes which have occurred. Based on success by diggers the past few years, it appears the clam populations have drastically declined in the Swikshak - Big River area, which historically produced a large portion of the razor clam harvest.

#### 1987 Fishery

During 1987 no landings of clams were made from the Kodiak area.

4

Table 1. Historic commercial razor clam catch, effort, and value for Kodiak Management District, 1960 - 1987.

Year	Number <sup>1</sup> Registered Diggers	Number of Landings	Commercial Catch (pounds)	Avg. Catch Per Landing (pounds)	Avg. Price Per Pound	Est. Price Ex-Vessel (dollars)
1960	76		420,636		.105	44,000
1961	95		381,971		.105	40,000
1962	66		297,516		.105	31,000
1963	39		323,757		.11	35,600
1964	2		0		-	-
1965	4		20,000		.25	5,000
1966	29		15,429		.38	6,000
1967	9		2,155		.40	900
1968	19		6,384		.40	2,600
1969	5	6	12,029	2,005	.40	4,812
1970	6	32	132,261	4,133	.40	53,000
1971	73	82	190,394	2,322	.30	57,000
1972	95	128	152,116	1,188	.35	53,000
1973	64	140	165,282	1,181	.40	66,000
1974	58	74	198,381	2,681	.50	99,000
1975	18	5	6,188	1,238	.50	3,000
1976	9	0	0	0	-	-
1977	8	1	400	400	1.00	400
1978	-	1	1,352	1,352	.73	1,000
1979	-	0	0	0	-	-
1980	-	8	8,006	1,001	.79	6,325
1981	-	5	8,186 <sup>2</sup>	1,637	1.00	8,186
1982	-	11	11,608 <sup>3</sup>	1,055	1.00	11,608
1983	-	7	7,920	1,131	1.00	7,920
1984	-	21	33,972	1,613	1.00	33,972
1985 <sup>4</sup>	-	11	16,945	1,540	1.00	16,945
1986	-	4	3,993	998	1.00	3,993
1987	-	-	-	-	-	-

<sup>1</sup> Represents registered diggers, not actual diggers; no data unavailable after 1977 due to "statewide" issuance of Interim Use Permits.

<sup>2</sup> Additional 985 pounds of hardshell clams harvested.

<sup>3</sup> Additional 1,506 pounds of hardshell clams harvested.

<sup>4</sup> Additional 1,496 pounds of hardshell clams harvested.



ALASKA PENINSULA  
SHELLFISH MANAGEMENT REPORT  
TO  
ALASKA BOARD OF FISHERIES

APRIL 1987

BY  
DAN O. DUNAWAY - AREA MANAGEMENT BIOLOGIST

Sand Point Area Office  
P. O. Box 127  
Sand Point, Alaska 99661  
(907) 383-2066



## ALASKA PENINSULA KING CRAB

### INTRODUCTION

The red king crab fishery in the Alaska Peninsula Registration Area (M), (Figure 1) began in 1947, when 141,000 pounds were landed. The historic high catch of 22.6 million pounds occurred in 1966 (Table 1). Thirteen million pounds of that harvest came from the Unimak Bight District (Table 2).

Of the three Area "M" king crab districts, (Figure 1), the major portion of the harvest in the last decade or so has come from the Central District (Table 3), with Pavlof Bay being the big producer. The annual catch in the Unimak Bight District during the same period averaged less than half the Central District annual harvest. Catches in the Chignik District during this period have varied somewhat depending on effort but did not exceed 400,000 pounds (Table 4).

During the 1980-81 season the Area "M" harvest reached just over five million pounds, the highest catch since the 1968-69 season (Table 1). The high catch was the result of strong recruitment from 1978 through 1980. Recruitment has declined severely since that time.

### 1987-88 Season Summary:

As has been the case since 1983-84, the 1987-88 commercial fishery in Area "M" was not opened due to the extremely low population levels of male and female king crab found during the index survey. The closure was announced by Emergency Order 4-S-16-87 issued in Sand Point on September 9, 1987.

### Stock Status:

An index survey of Area "M" was conducted using pots aboard the R/V Resolution from July 22 to August 11, 1987. The survey design was the same used since 1984, covering Ikatan, Morzhovoi, Cold, Belkofski, Volcano, Pavlof, Beaver and Balboa Bays. No survey was done in Stepovak Bay, Chignik district or Unimak Bight district.

Four hundred thirty four pots were pulled at 145 stations. Of the 28 male king crab caught, 17 were of sublegal size and 11 were of legal size (Table 5). This catch was much lower than the 117 males caught in 1986 or the 54 caught in 1985 (Table 5). Only 260 female king crab were caught during the 1987 survey; again less than the 756 and 308 caught in 1986 and 1985 respectively. Nearly half of the females were caught in one pot in Pavlof Bay. The majority of the adult females had egg clutches over 80% full but with such low abundance, reproductive output is severely limited.

The variation seen in the catches of the last three surveys underscore the extremely low population and spotty distribution of the crab and do not indicate any significant change in the overall abundance. The very low numbers of prerecruit males and juvenile females indicate that the king crab population will remain in a severely depressed condition during the next few years.

Complete survey results are available in the "Westward Region Crab Survey Results For 1987" Alaska Department of Fish and Game, Kodiak, November 1987.

#### BROWN KING CRAB INTRODUCTION

Occasionally fishermen express an interest in exploring Area "M" for commercial quantities of brown king crab (Lithodes aequispina). In 1983 five vessels were registered but no catch was recorded.

Presently, male brown king crab six inches or greater in shell width may be taken from January 1 through December 31 under the conditions of a permit issued by the commissioner.

#### 1987 Season

No vessels were registered to fish for brown king crab in

Area "M" during 1987.

Stock Status

Stock status is unknown at this time. However, no commercial quantities have been found to date.

Table 1. Catch and effort statistics for king crab in Area "M".

Year	Vssls.	No. of Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Price Per Lb.
1947			18,800	141,000			7.5	
1948			518,500	3,363,000			6.5	
1949			205,500	3,476,000			12.0	
1950			270,000	2,124,000			7.9	
1951			86,500	599,000			6.9	
1952			32,400	298,000			7.6	
1953			38,400	380,000			10.0	
1954			31,666	316,660			10.0	
1955			164,069	1,640,688			10.0	
1956			421,651	4,221,496			10.0	
1957			668,709	6,687,092			10.0	
1958			724,595	7,245,947			10.0	
1959			568,303	6,166,974			10.9	
1960		1,496	677,100	6,700,000			9.9	
1961		959	419,354	3,900,000			9.3	
1962		657	287,624	2,273,013			7.9	
1963	27	1,037	970,739	6,539,129			6.7	.09
1964	40	1,297	1,906,018	14,354,060			7.5	.10
1965	36	1,081	1,813,728	14,713,501			8.1	.10
1966	37	1,255	2,494,949	22,577,587			9.0	.10
1967	39	1,062	1,943,463	17,252,307			8.9	.19
1968-69	34	885	1,273,567	10,944,472			8.6	.34
1969-70	33	415	558,800	4,137,000	51,300	11	7.7	.25
1970-71	25	339	446,042	3,425,760	38,995	11	7.7	.25
1971-72	26	364	597,394	4,123,130	41,759	14	6.9	.28
1972-73	29	301	610,300	4,069,362	34,408	18	6.7	.NA
1973-74	36	389	658,632	4,260,674	53,642	12	6.9	.72
1974-75	36	318	644,054	4,572,101	44,951	14	7.1	.43
1975-76	37	248	367,221	2,605,310	35,104	11	7.2	.41
1976-77	26	122	125,778	958,069*	17,748	7	7.7	.61
1977-78	15	73	119,641	726,382	10,551	11	6.1	1.00
1978-79	33	226	520,168	3,093,859	31,142	17	5.9	1.27
1979-80	68	288	738,859	4,453,557	41,753	18	6.0	.92
1980-81	51	358	821,071	5,080,632*	54,114	15	6.2	.96
1981-82	56	341	515,882	3,168,689	51,776	10	6.1	1.40
1982-83	63	157	271,237	1,683,654	30,894	9	6.2	3.20
1983-84			N O	F I S H E R Y				
1984-85			N O	F I S H E R Y				
1985-86			N O	F I S H E R Y				
1986-87			N O	F I S H E R Y				
1987-88			N O	F I S H E R Y				

\* Combined 6-1/2 inch and 7-1/2 inch seasons.

Table 2. Seventeen year comparison of 6-1/2 inch season king crab data in the Unimak Bight District.

Year	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Avg. Percent Recruits	Length (mm)
1971-72	54	175,154	1,310,886	9,226	7.5	19	16	163.2
1872-73	22	97,825	741,881	3,726	7.6	26	13	163.6
1973-74	34	166,103	1,280,397	8,618	7.7	19	17	162.3
1974-75	40	186,028	1,538,554	9,906	8.3	19	13	168.4
1975-76	29	97,493	757,955	7,028	7.8	14	19	166.5
1976-77	4	7,216	55,286	700	7.7	10	11	167.1
1977-78	3	1,868	13,292	820	7.1	2	N O	D A T A
1978-79	8	31,169	198,660	4,026	6.4	8	63	149.6
1979-80	50	274,336	1,699,954	12,242	6.2	22	57	151.3
1980-81	37	304,949	1,849,636	10,141	6.1	30	52	153.0
1981-82	22	90,338	571,905	6,615	6.3	14	32	156.0
1982-83	4	2,767	18,017	1,172	6.5	2	N O	D A T A
1983-84			N O	F I S H E R Y				
1984-85			N O	F I S H E R Y				
1985-86			N O	F I S H E R Y				
1986-87			N O	F I S H E R Y				
1987-88			N O	F I S H E R Y				

Table 3. Seventeen year comparison of 6-1/2 inch season king crab data in the Central District.

Year	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Avg. Percent Recruits	Length (mm)
1971-72	310	422,240	2,812,244	32,533	6.7	13	41	154.0
1972-73	271	494,610	3,194,229	29,170	6.5	17	57	150.6
1973-74	319	447,535	2,882,437	36,937	6.4	12	54	149.3
1974-75	263	445,412	2,935,707	33,057	6.6	14	57	151.9
1975-76	205	251,440	1,715,545	26,657	6.8	9	48	156.0
1976-77	82	80,088	557,790	9,613	7.2	8	40	155.2
1977-78	48	90,670	512,448	6,588	5.7	14	69	145.5
1978-79	201	471,825	2,757,088	25,432	5.8	19	79	147.2
1979-80	209	447,227	2,604,300	27,328	5.8	16	70	147.5
1980-81	225	449,597	2,692,815	32,014	6.0	14	67	149.8
1981-82	174	392,889	2,329,170	27,679	5.9	14	66	148.0
1982-83	143	261,387	1,609,681	27,142	6.2	10	66	149.5
1983-84			N O	F I S H E R Y				
1984-85			N O	F I S H E R Y				
1985-86			N O	F I S H E R Y				
1986-87			N O	F I S H E R Y				
1987-88			N O	F I S H E R Y				

Table 4. Sixteen year comparison of 6-1/2 inch season king crab data in the Chignik District.

Year	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Percent Recruits	Avg. Length (mm)
1972-73	9	17,865	133,252	1,512	7.5	12	23	NA
1973-74	37	44,994	385,305	8,087	8.6	6	41	169.2
1974-75	15	12,614	97,840	1,988	7.8	7	36	162.0
1975-76	13	18,288	131,810	1,419	7.2	13	5	160.4
1976-77	6	9,859	76,406	673	7.8	15	26	167.1
1977-78	22	27,103	200,692	3,143	7.4	9	33	159.6
1978-79	17	17,174	138,111	1,684	8.0	10	23	160.9
1979-80	29	20,472	168,368	2,183	8.2	9	29	161.5
1980-81	36	24,314	194,095	3,403	8.0	7	15*	167.8
1981-82	3	1,359	12,280	318	9.0	4	NO	D A T A
1982-83	11	7,083	55,580	2,580	7.9	3	32	156.1
1983-84			NO	F I S H E R Y				
1984-85			NO	F I S H E R Y				
1985-86			NO	F I S H E R Y				
1986-87			NO	F I S H E R Y				
1987-88			NO	F I S H E R Y				

\* Based on only one sample.

Table 5. Comparative male king crab catch data, Alaska Peninsula abundance survey.

Year	Stations Fished	Pots Lifted	Legals		Sublegals	
			Number	CPUE	Number	CPUE
1975	110	610	815	1.4	4,776	7.8
1976	129	801	874	1.1	8,006	10.0
1977	75	354	3,610	10.2	16,986	48.0
1978	62	355	7,259	20.4	10,960	30.9
1979	69	330	4,411	13.4	7,141	21.6
1980	120	700	8,110	11.6	7,263	10.4
1981	127	750	4,545	6.1	2,538	3.4
1982	113	630	1,197	1.9	805	1.3
1983	77	307	317	1.0	216	.7
1984	218	498	324	.65	25	.05
1985	138	410	36	.09	18	.04
1986	129	400	65	.16	52	.13
1987	145	434	11	.03	17	.04

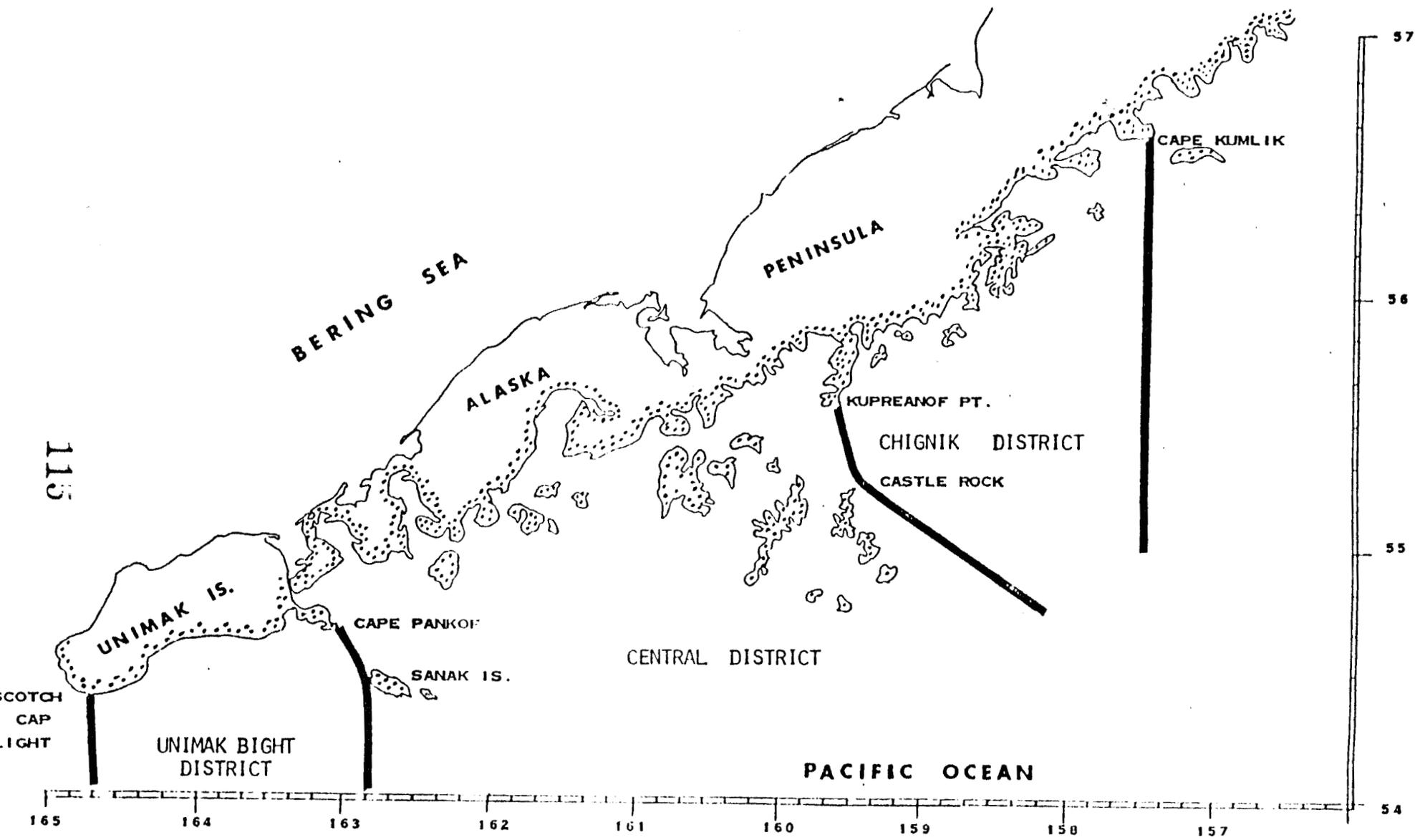


Figure 1. Alaska Peninsula Area "M".



## CHIGNIK TANNER CRAB

### INTRODUCTION

The Chignik District of Statistical Area J consists of the waters south of the Alaska Peninsula from Cape Kumlik west to Kupreanof Point (Figure 1). Tanner crab were first harvested from the area in 1968 (Table 1). The fishery remained at a relatively low level until 1974 when 25 vessels produced 4.1 million pounds (Table 1). From 1974 through 1983 catches fluctuated between 2.5 and 6.9 million pounds. Prior to 1981, the Chignik fishery generally occurred in late March as vessels moved into the area following closures in the Kodiak district. Since 1981, the fleet has commenced fishing on the opening date of the season and continued until the district was closed. During recent years the fleet has been composed of a few locally owned vessels as well as a few from Kodiak, Sand Point and other ports.

During the early years of the fishery, a guideline harvest level of 5 to 10 million pounds was set based on historical catch and relative effort. From 1981 to 1984 a trawl survey was used in the district to give the Departement the first direct information on the size of the population. From 1981 until 1985 all harvest forecasts were based on the trawl survey population estimate. The first trawl survey indicated poor recruitment could be expected after the 1983 fishing season. The prediction

was confirmed by the 1983 and 1984 surveys and harvest projections were drastically reduced for the 1984 and 1985 fisheries. As predicted, the commercial harvests dropped sharply beginning in 1984, reaching the lowest level in 15 years in 1986 when only 188,000 pounds were caught despite a four month season (Table 1). Lack of funds have eliminated the Chignik District surveys after 1984 and harvest projections have again been based on the performance of the previous year's fishery.

#### 1987 FISHERY

As no survey was conducted in the Chignik District in 1986 the preseason harvest projection of 180,000 pounds was based on the 1986 harvest.

Registrations and tank inspections for the 1987 Chignik Tanner crab fishery began at noon January 14, 1987. The four vessels initially registered for the fishery were locally owned and operated "limit seiner" type vessels.

The fishery opened at noon January 15, 1987 but no deliveries were made until late in the second week of the season as no processors were in the area.(Table 2). The first deliveries indicated fairly good fishing with catch rates averaging 32 crab per pot; better than the 21 crab per pot seen in 1986 (Table 2).

Poor weather, slower fishing, and a lack of nearby markets caused a lull in deliveries until the fourth week of the fishery when eight vessels delivered 88,515 pounds (Table 2). Several of these deliveries were made by vessels that had transferred to Chignik after the January 26 South Peninsula closure. Most of the transferred vessels found fishing very poor in the western portion of the District and quit after making only one delivery. In addition, one of the Chignik boats dropped out of the fishery during the week. At this point the harvest amounted to 147,000 pounds while catch rates had dwindled to 11 crab per pot (Table 2).

For the remainder of the season three local boats and two Kodiak vessel fished the Chignik district. Fishing continued to be slow with catch rates dropping to 9 or 10 crab per pot. Since the harvest was approaching the pre-season projection, catch rates were quite low, and since the Kodiak District was to close completely by February 28, the decision was made to close the Chignik District. At noon, February 18, it was announced that the Chignik District would close by Emergency Order 4-S-06-87 at noon, March 3, 1987.

In summary, 10 vessels made 20 deliveries for a total catch of 195,060 pounds; slightly above the pre-season prediction (Table 1). The greatest portion of the harvest came from the Chignik Bay area (Table 3). At 13 crab per pot, the catch rate

was only slightly better than in the two previous seasons (Table 1). The crab averaged 147.9 mm in carapace width and 2.2 pound apiece (Tables 1-4, Figure 2). The fishermen received between \$2.00 and \$2.50 per pound for their crab for an average of \$2.28 per pound (Table 1). Total ex-vessel value of the catch was \$444,368.25.

#### STOCK STATUS

As mentioned earlier, there was no survey of the Chignik District during the summer of 1986. The last survey was done in 1984 and data gathered then is of little predictive value for future fisheries. During the time that surveys were conducted the data gathered was highly useful and predictions were quite accurate. It is hoped that this program may be reinstated some time in the future when funds are available.

Some fishermen reported finding numbers of small, prerecruit crab in some of the bays. While the reports are encouraging, these reports were limited to just a few bays. There were no similar reports from the offshore area where large catches were once made.

Considering the continued low harvests of the last four seasons, low catch per unit effort, and low average weights, the Department should be very concerned about the future of this fishery.

NOTES

The Department wishes to thank VPSO Ron Bowers of Chignik for his assistance with tank inspections in the Chignik area. His help has been indispensable; a great service to both the Department and to the fishermen. I would also like to thank the fishermen for their help and cooperation during the fishery.

Table 1. Chignik District Tanner crab catch and effort statistics.

Year	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Price Per Lb.
1968	-	-	-	21,100	-	-	-	-
1969	-	-	-	38,100	-	-	-	-
1970	-	-	-	2,800	-	-	-	-
1971	-	-	-	152,300	-	-	-	-
1972	1	-	-	26,500	-	-	-	-
1973	15	56	297,363	747,788	8,080	51	2.5	.16
1974	25	115	1,586,560	4,054,873	28,083	57	2.6	.20
1974-75	25	91	1,438,508	3,649,444	22,675	63	2.5	.14
1975-76	35	288	2,724,509	6,926,161	52,381	52	2.5	.185
1976-77	21	141	2,098,226	5,672,919	40,604	52	2.7	.33
1977-78	32	140	1,725,042	4,693,830	38,414	45	2.8	.42
1978-79	39	126	926,253	2,536,105	28,378	33	2.7	.55
1979-80	42	155	2,340,004	3,517,920	54,627	25	2.6	.54
1980-81	24	112	1,534,847	3,653,723	44,022	35	2.4	.64
1981-82	45	174	1,343,500	3,240,576	47,830	28	2.4	1.21
1983	48	138	1,432,029	3,497,370	60,210	24	2.4	1.12
1984	17	41	269,742	659,043	14,665	18	2.4	1.09
1985	15	27	162,448	375,476	15,708	10	2.3	1.42
1986	6	12	85,697	188,162	7,435	12	2.2	1.97
1987	10	20	89,329	195,060	7,052	13	2.2	2.28

<sup>1</sup> Includes Deadloss.

Table 2. Weekly Tanner crab catch statistics for Chignik District, 1987.

Week	Vssts.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
1/15-1/18	0	0	0	0	0	-	-
1/19-1/25	4	4	22,010	50,044	696	2.3	32
1/26-2/1	0	0	0	0	0	-	-
2/2-2/8	1	1	4,082	8,857	200	2.2	20
2/9-2/15	8	8	41,271	88,515	3,825	2.1	11
2/16-2/22	1	1	850	2,055	75	2.4	11
2/23-3/1	1	1	7,026	14,753	695	2.1	10
3/2-end	5	5	14,090	30,836	1,563	2.2	9
TOTAL	10	20	80,329	195,060	7,052	2.2	13

<sup>1</sup> Includes Deadloss.

Table 3. Chignik Tanner crab catch statistics by major fishing areas, 1987.

Area	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Percent Recruits
Ivanof	4	4	2,255	4,735	705	2.1	3	NS
Mitrofanina	1	1	2,342	4,917	231	2.1	10	NS
Chignik	5	12	72,034	157,919	4,863	2.2	15	92%
Kujulik	2	2	2,597	5,973	235	2.3	11	NS
Offshore	1	1	10,101	21,516	1,020	2.1	10	79%
Total	10	20	89,329	195,060	7,054	2.2	13	90%

<sup>1</sup> Includes Deadloss  
 NS = No Sample

Table 4. Chignik District Tanner crab harvest by statistical area, 1987.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
<u>CHIGNIK SCHOOL:</u>						
575-602	1	10,101	21,516	1,020	2.13	9.9
575-603	1	5,052	11,014	374	2.18	13.5
575-631	2	2,597	5,973	235	2.30	11.1
585-601	10	63,309	139,064	4,114	2.20	15.4
585-602	1	3,673	7,841	375	2.13	9.8
585-603	1	2,048	4,301	231	2.10	10.1
595-531	3	2,048	4,301	455	2.10	4.5
595-532	1	207	434	250	2.10	0.8
SEASON TOTAL 20		89,329	195,060	7,054	2.18	12.7

<sup>1</sup> Includes Deadloss

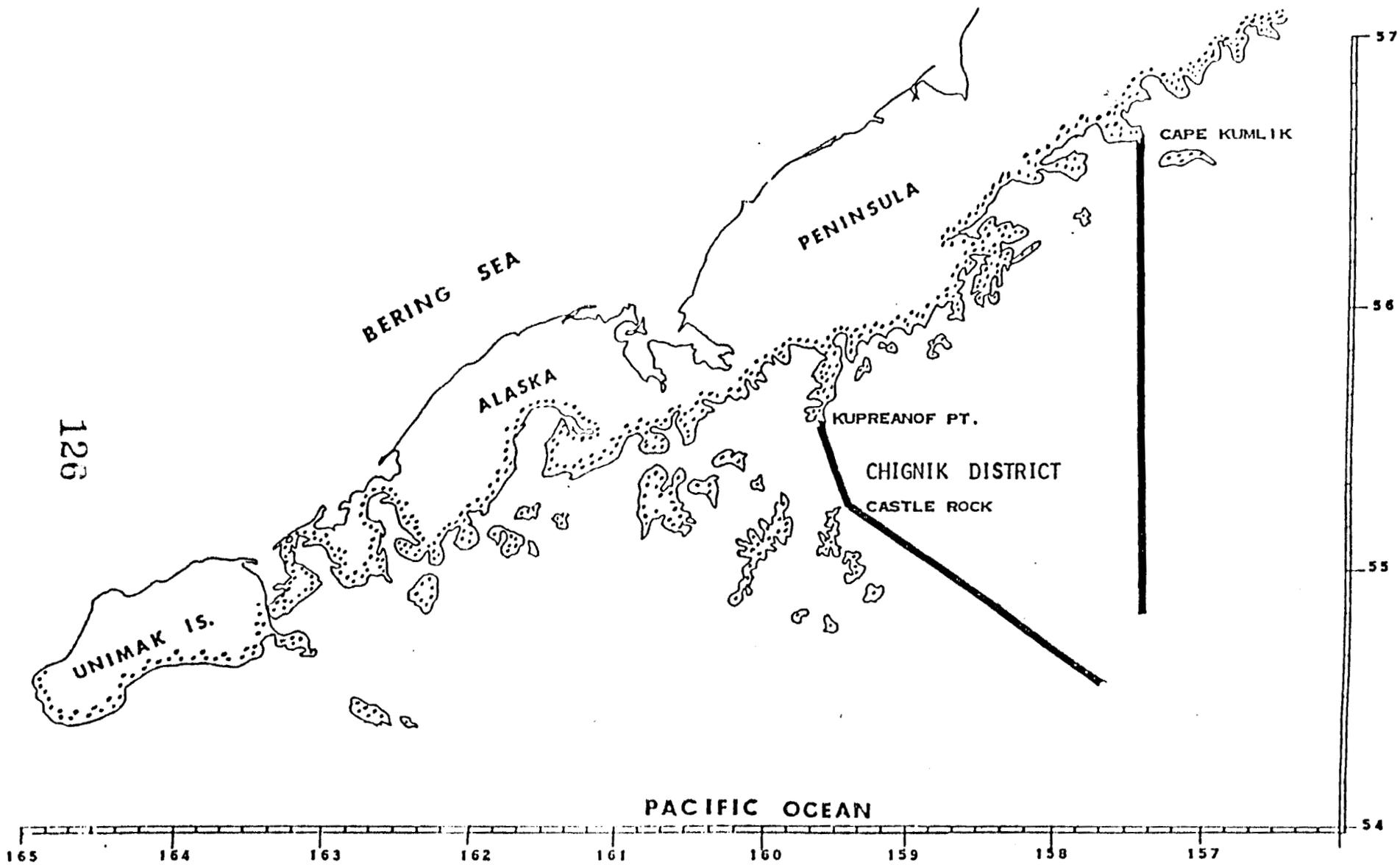


Figure 1. Chignik Tanner crab district.

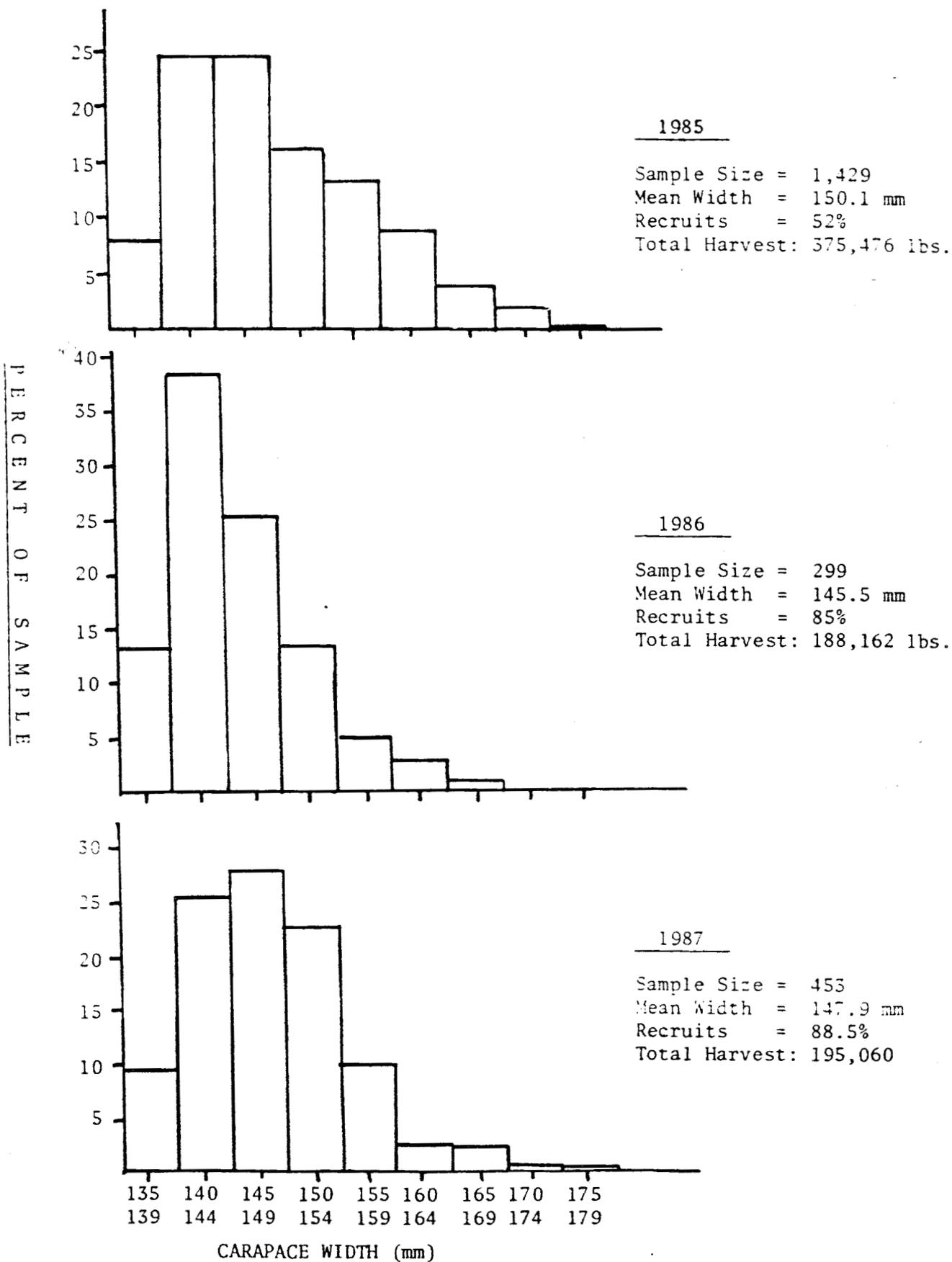


Figure 2. Size frequency distribution of Tanner crab taken from the Chignik District.



CHIGNIK TANNER CRAB  
PRELIMINARY 1988 FISHERY REPORT

INTRODUCTION

The Chignik District of Area J consists of the waters south of the Alaska Peninsula from Cape Kumlik west to Kupreanof Point (Figure 1). Tanner crab were first harvested from the area in 1968 (Table 1). The fishery remained at a relatively low level until 1974 when 25 vessels produced 4.1 million pounds (Table 1). From 1974 through 1983 catches fluctuated between 2.5 and 6.9 million pounds. More recently, catches have been extremely low compared to the period between 1974 and 1983 (Table 1).

Prior to 1981, the Chignik fishery generally became most active in late March as fishermen moved into the area following closures in the Kodiak district. Since 1981, the fleet has commenced fishing on the opening date of the season and has continued until the district was closed. In recent seasons the fleet has consisted of a few locally owned vessels and a small number of boats from Kodiak, Sand Point and other ports.

During the early years of the fishery, a guideline harvest level of 5 to 10 million pounds was based on historical catch and effort. From 1981 to 1984 a trawl survey was used in the district to give the Department the first direct information on the

size of the population. From 1981 through 1985 all harvest forecasts were based on the survey's population estimate. The first trawl survey indicated poor recruitment could be expected after the 1983 fishing season. The prediction was confirmed by the 1983 and 1984 surveys and harvest projections were drastically reduced for the 1984 and 1985 fisheries. As predicted, the commercial harvests dropped sharply beginning in 1984, reaching the lowest level in 15 years in 1986 when only 188,000 pounds were caught despite a four month season (Table 1). Lack of funds have eliminated the Chignik District surveys since 1984 and harvest projections have again been based on the performance of the previous year's fishery.

#### 1988 FISHERY

No survey was conducted in the Chignik District in 1987 and the preseason harvest projection of 200,000 pounds was based on the increase observed between the 1986 and 1987 fisheries. The higher projection was further justified by the better recruitment found in the 1987 South Peninsula and Kodiak surveys.

Registrations and tank inspections for the 1988 Chignik Tanner crab fishery began at noon January 14, 1988. Only two locally owned "limit seiner" type vessels were initially registered for the fishery.

The fishery opened noon January 15, 1988 but no deliveries were made until late in the second week of the season (Table 2).

The first delivery indicated poor fishing with a catch rate of 18 crab per pot; barely half of the 32 crab per pot of the 1987 fishery and less than the 21 crab per pot caught during the similar period in 1986. By the fourth week of the season only two more deliveries had been made. The weather was quite poor during much of this time.

The three deliveries during the fifth week of the fishery were from the four vessels that joined the fishery after the January 26 closure of the South Peninsula district (Table 2). The transferred vessels fought poor weather and very poor fishing in the western portion of the district. One fisherman quit after making one delivery and another caught so few crab that he quit without selling any crab. The catch rate was a very poor seven crab per pot (Table 2).

For the remainder of the season only four vessels worked the Chignik district. Fishing continued to be slow. The western portion of the district was virtually abandoned. Fishermen reported a general decline in catch rates; in some cases as low as 1 or 2 crab per pot in the more commonly fished eastern sections of the district. Catch rates as high as 23 crab per pot were also reported but the overall average was 14 crab per pot (Table 2). The crab in some of the deliveries averaged only 1.9 to 2.1 pounds each, indicating the fleet was mainly harvesting recruit crab. There were a few reports that fishermen were

sorting through many female and small male crab to find the few legal males.

On February 26, the department announced its decision to close the Chignik Tanner crab fishery. Emergency Order 4-S-07-88 was issued to take effect March 10, 1988. The department was not certain whether the pre-season harvest projection would be caught. However, more fishing time would have resulted in excessive handling of the female and sublegal sized crab. The closure was further justified by the abandonment of a large portion of the district, the low and declining catch rates, and the generally poor condition of the Chignik district Tanner crab population.

In summary, 6 vessels made 11 deliveries for a total catch of 183,111 pounds; 17,000 pounds below the preseason projection and the lowest harvest since 1972 (Table 1). Most of the crab came from the Chignik Bay and Kujulik Bay areas (Table 3). The catch rate of 13 crab per pot was the same as in 1987 and only slightly better than 1985 and 1986 (Table 1). The crab averaged 144.5 mm in carapace width and 2.1 pounds apiece (Tables 1-3, Figure 2). The fishermen received between \$2.17 and \$2.40 per pound for their crab for an average of \$2.33 per pound (Table 1). Total ex-vessel value of the catch was \$417,903.66.

## STOCK STATUS

As mentioned previously, there was no survey of the Chignik District during the summer of 1987. The last survey was done in 1984 and data gathered then is of little predictive value for present or future fisheries. During the time that surveys were conducted, the data gathered was very useful and predictions were quite accurate. It is hoped that the trawl survey program will be reinstated when funds are again available.

Some fishermen report finding numbers of small, prerecruit crab in some of the bays. The reports are encouraging, but they are limited to very few bays. Similar reports have been made for several years but no increase in the stocks has been observed.

Considering the extremely low harvests of the last four seasons, low catch per unit effort, and low average weights, the department is concerned about the future of this fishery.

Some fishermen advocate a fishery of no more than 100,000 to 150,000 pounds for a few years until it is determined that the Tanner crab stocks are increasing significantly.

## NOTES

The Department wishes to thank VPSO Ron Bowers of Chignik for his assistance with tank inspections in the Chignik area. His

help has been indispensable; a great service to both the department and to the fishermen. I would also like to thank the fishermen for their help and cooperation during the fishery.

Table 1. Chignik District Tanner crab catch and effort statistics.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Price/Pound <sup>2</sup>	% Recruits <sup>3</sup>
1968	-	-	-	21,100	-	-	-	-	-
1969	-	-	-	38,100	-	-	-	-	-
1970	-	-	-	2,800	-	-	-	-	-
1971	-	-	-	152,300	-	-	-	-	-
1972	1	-	-	26,500	-	-	-	-	-
1973	15	56	297,363	747,788	8,080	2.5	51	.16	-
1974	25	115	1,586,560	4,054,873	28,083	2.6	57	.20	-
1974-75	25	91	1,438,508	3,649,444	22,675	2.5	63	.14	-
1975-76	35	288	2,724,509	6,926,161	52,381	2.5	52	.185	-
1976-77	21	141	2,098,226	5,672,919	40,604	2.7	52	.33	-
1977-78	32	140	1,725,042	4,693,830	38,414	2.8	45	.42	-
1978-79	39	126	926,253	2,536,105	28,378	2.7	33	.55	-
1979-80	42	155	2,340,004	3,517,920	54,627	2.6	25	.54	-
1980-81	24	112	1,534,847	3,653,723	44,022	2.4	35	.64	65.6
1981-82	45	174	1,343,500	3,240,576	47,830	2.4	28	1.21	64.7
1983	48	136	1,432,029	3,497,370	60,210	2.4	24	1.12	65.1
1984	17	41	269,742	659,043	14,665	2.4	18	1.09	33.5
1985	15	27	162,448	375,476	15,708	2.3	10	1.42	51.2
1986	6	12	85,697	188,162	7,435	2.2	12	1.97	85.3
1987	10	20	89,329	195,060	7,052	2.2	13	2.28	90.1
1988	6	11	87,148	183,111	6,544	2.1	13	2.33	91.3

<sup>1</sup> Includes deadloss

<sup>2</sup> Computed only for live poundage where price information was available

<sup>3</sup> Recruits = newshell male crab from 137 to 163 mm carapace width

Table 2. Weekly crab catch statistics for Chignik District, 1988.

Week	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
1/15 - 1/17	-	0	-	-	-	-	-
1/18 - 1/24	1	1	8,898	19,308	500	2.2	18
1/25 - 1/31	1	1	6,981	14,801	250	2.1	28
2/1 - 2/7	1	1	8,873	16,947	500	1.9	18
2/8 - 2/14	3	3	4,807	11,664	698	2.4	7
2/15 -2/21	1	1	16,862	35,747	1,176	2.1	14
‡ 2/22 - 2/28	-	0	-	-	-	-	-
2/29 - 3/6	-	0	-	-	-	-	-
3/7 - end	4	4	40,727	84,644	3,420	2.1	12
Total	6	11	87,148	183,111	6,544	2.1	13

<sup>1</sup> Includes deadloss

Table 3. Chignik Tanner crab catch statistics by major fishing area and statistical area, 1988.

Area	Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
Kujulik	575631	2	33,190	70,598	1,903	2.1	17
Mitrofanina	585531	2	3,268	7,385	413	2.3	8
Chignik	585601	7	42,674	87,332	3,257	2.1	13
Ivanof	595531	1	7,416	16,263	941	2.2	8
	595532	1	600	1,533	30	2.6	20
Season Total		11	87,148	183,111	6,544	2.1	13

<sup>1</sup> Includes deadloss

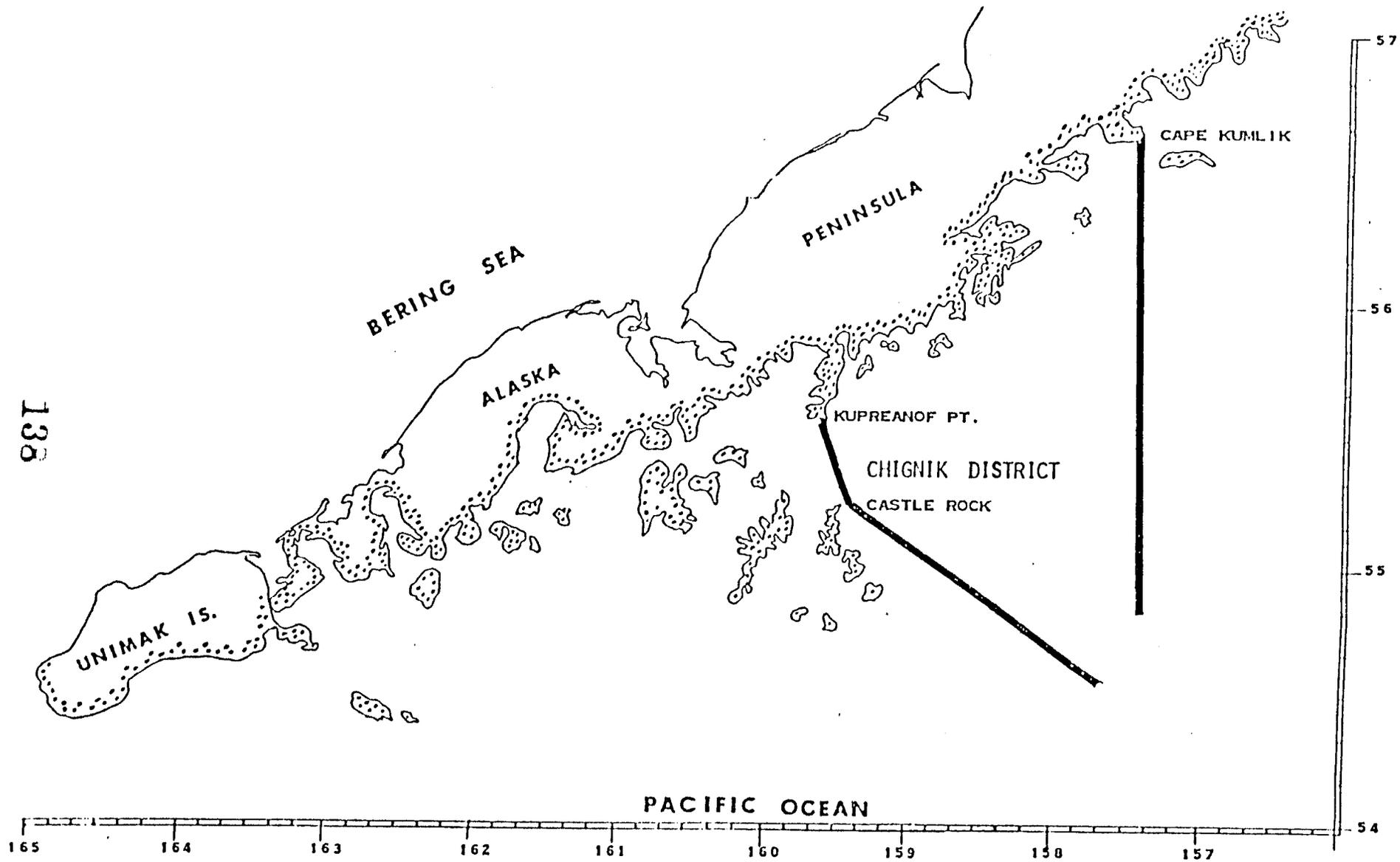


Figure 1. Chignik Tanner crab district.

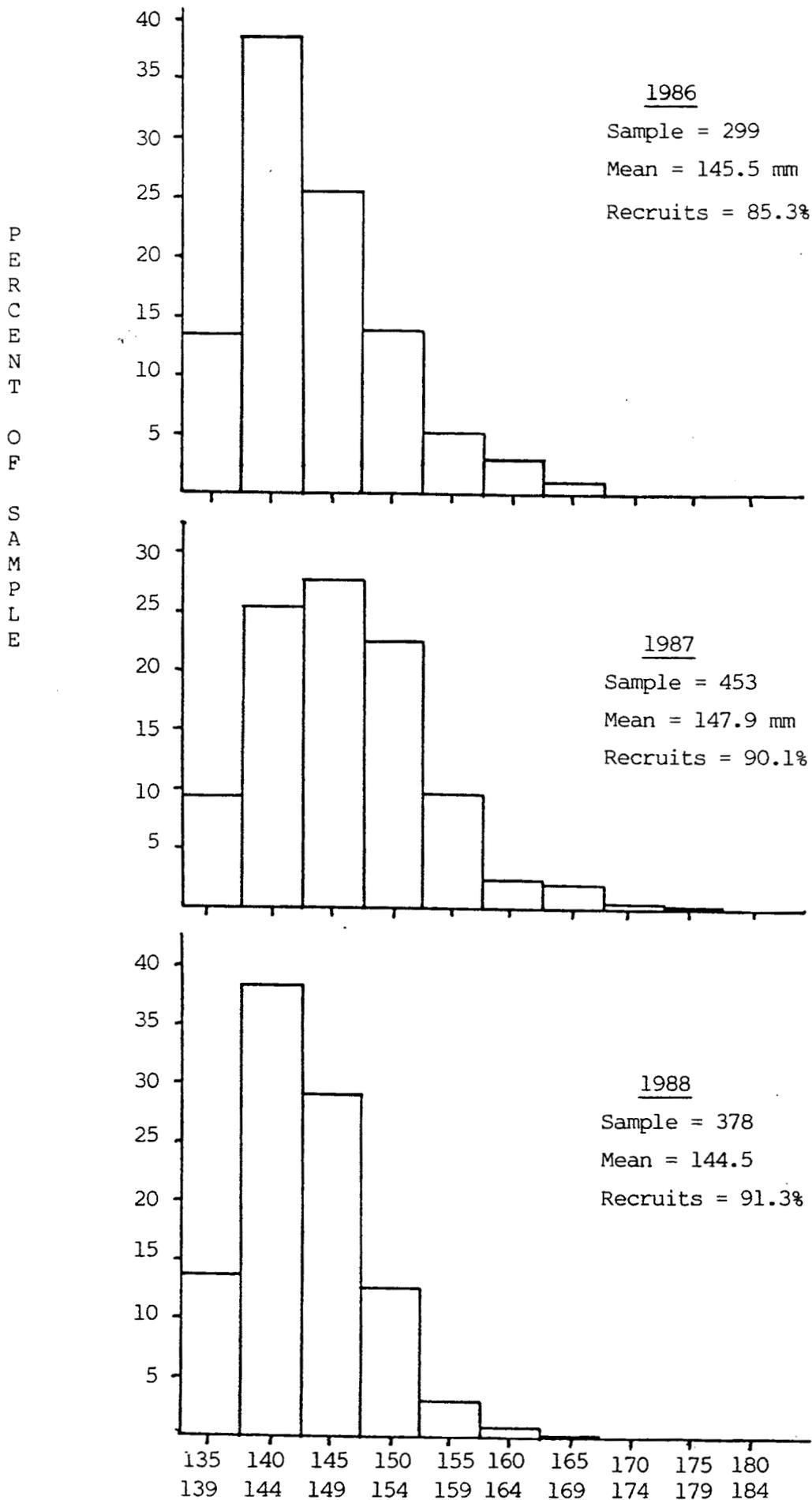


Figure 2. Size frequency distribution of Tanner crab from the Chignik District. Recruits = new shell males 137 - 163 mm carapace width.



## SOUTH PENINSULA TANNER CRAB

### INTRODUCTION

The South Peninsula District of Statistical Area J includes all waters south of the Alaska Peninsula from Kupreanof Point to Scotch Cap Light on Unimak Island (Figure 1). The first harvest of Tanner crab from the area occurred in 1967 when 3,100 pounds were landed. The fishery grew until 1975-76 when the harvest peaked at 11.2 million pounds (Table 1). By 1974 guideline harvest levels were established, and in 1975 seasons were imposed to protect the mating and molting period of the crab. In 1976, the minimum size limit of 5 1/2 inches was established. From 1976-77 to 1978-79, catches dropped to the 6 to 8 million pound range with catch per unit effort (CPUE) averaging 40 crabs per pot. Since 1979-80 the harvest and CPUE declined in response to declining recruitment into the population (Table 1). The population reached its lowest level in 1984 when the fleet only produced 1.8 million pounds (Table 1). Recruitment improved somewhat since 1984 and harvests have been allowed to increase.

### 1987 FISHERY

The 1986 summer survey indicated poor recruitment, low prerecruit abundance and reduced numbers of legal sized crabs in several of the major schools of the area. A harvest guideline of

1.8 to 2 million pounds was set (Table 4). This represents a 2 million pound decrease from the 3.9 million pound guideline set for the 1986 season and about the same as the 1.9 million pound projection of 1985.

Two seasonal dockside samplers were hired to assist with the registrations, inspections, and monitoring of the fishery. Karen St. Jean, a fisheries technician 1 was placed in King Cove and Larry Boyle, a fisheries biologist 1 was stationed in Sand Point. Both worked very hard to gather information crucial to the management of the fishery.

Registrations and tank inspections for the 1987 South Peninsula Tanner crab fishery began at noon January 14, 1987. Thirty-two boats were inspected in Sand Point and 20 boats were inspected in King Cove. Two vessels were registered later in the week bringing the total for the season to 54 vessels and total number of pots to be fished to 8,100. No catcher/processors registered for the fishery and only one floating processor, the Tempest, registered prior to the season. The floating processors Omni Sea and All Alaskan bought South Peninsula Tanner crab during the last few days of the season. Due to funding problems no ADFG personnel were available to monitor deliveries on the floating processors.

In an effort to gather timely catch data and to compensate for the lack of samplers, eight skippers were asked to make daily

catch reports. Several of the fishermen who were asked had large vessels that were capable of fishing the entire season without making a delivery. To achieve a balance, a couple fishermen using smaller boats were also asked to participate. Of the eight only three reported daily, with one skipper reporting nearly every day. The other four fishermen never reported at all. The information gathered from the four vessels was extremely helpful in the management of the fishery.

Fishing began at noon January 15. The weather and the fishing were surprisingly good. By the 18th of January ten vessels had delivered nearly 178,000 pounds with an average catch rate of 42 crab per pot for the whole area (Table 2). There were several reports of catches as high as 60 to 80 crab per pot.

By the 21st of January over a million pounds were estimated to have been caught. One or two boats had made two deliveries and boats were lined up waiting to be unloaded at the processors. Most of the production came from Pavlof Bay and though it was declining rapidly, the catch rate there was still averaging 30 to 40 crab per pot. Fishermen working the Cold Bay area indicated that fishing was poor there and several began moving their gear to new grounds. Reports from other portions of the area were mixed but generally indicated mediocre fishing.

On the 22nd of January the harvest was estimated to be nearly 1.3 million pounds. A few fishermen reported catch rates

as low as 22 crab per pot and there were reports that many fishermen were moving their gear every day to maintain acceptable catch rates. At the same time several fishermen were reportedly moving out of Pavlof Bay and finding good fishing. Therefore, even though it appeared that the 1.8 million pound guideline would soon be caught it was decided that another day or two of catch and delivery information was necessary before any closure decision was made.

Between 1.5 and 1.6 million pounds were estimated to have been caught by January 23. Catch rates had declined to between 11 and 25 crab per pot with occasional reports as low as 5 crab per pot. Most boats had abandoned the Cold Bay grounds and fishing was poor in the Belkofski Bay area. Many of the vessels working Pavlof Bay were forced to look elsewhere for crab. The remaining portions of the District were also reporting poor fishing.

The conditions clearly warranted a closure of the fishery to protect the remaining crab stocks. Emergency Order 4-S-02-87 closing the South Peninsula district Tanner crab fishery was issued at noon January 23. The closure was effective noon, January 26, 1987.

The final catch reports for the week of January 19 to 25 show that 41 vessels delivered almost 1.2 million pounds with the catch rate averaging 29 crab per pot (Table 2). During the last day of the fishery and the subsequent "cleanup" 1.04 million

pounds were delivered (Table 2). The catch rate during the last days averaged 21 crab per pot.

For the entire season, 54 vessels made 106 landings for a total of 2,400,784 pounds (Tables 1,2). The catch rate averaged 25 crab per pot and the crab averaged 2.5 pounds per animal (Tables 1,2,3). The carapace width of the crab averaged 153.9 mm and recruits comprised 56 percent of the catch (Figure 2, Table 3). Pavlof Bay and the nearby waters produced nearly 73 per cent of the entire harvest while the Ikatan/Morzhovoi school provided 16 percent (Table 3).

The 1987 commercial harvest was larger than had been projected by the summer survey. To be more precise, the harvest in Pavlof Bay exceeded the harvest projection by 400,000 to 600,000 pounds (Table 4). The large catch was due in part to the extremely high effort in Pavlof Bay. In addition, the Department may have underestimated the Tanner crab population there. Catches also exceeded the projections in the Ikatan/Morzhovoi, and Beaver/Balboa schools but only by a slight margin (Table 4). Catches from the remaining five schools were below the pre-season projections (Table 4).

The price paid for the crab was \$1.95 at the beginning of the season. After a couple large floating processors came through prices jumped to \$2.00 and then to \$2.05. Prices as high as \$2.50 were paid in Kodiak. The average ex-vessel price was \$2.03 for a

total value of \$4,857,431.35 to the fishermen (Table 1).

The fishery was patrolled by the Fish and Wildlife Protection vessel Trooper. Though hampered by weather and mechanical problems, the crew of the Trooper was able to check some deliveries to the Tempest and to the Peter Pan cannery in King Cove. They also monitored the grounds during the closure. One vessel operator was cited for having baited gear on the grounds after the closure. Though not as well suited to the conditions as the P/V Woldstad, the Trooper was a welcome presence and encouraged a peaceful and orderly fishery.

#### STOCK STATUS

The 1986 pot survey was conducted from July 21 to August 6 in much the same manner as in 1984 and 1985. The major production areas of Ikatan/Morzhovoi, Cold Bay/Belkofski, and Pavlof/Volcano were fished. The Beaver/Balboa area was not fished and the extra time was used in Pavlof Bay and south of the Kennoys Islands. Compared to the 1985 survey, the 1986 catch of legal males was 57% lower; and recruits dropped from 54% of the legals to 37%. The overall catch rate was 10.4 legal males per pot in 1986, 35% lower than the 15.9 seen in the 1985 survey. The survey data was used to generate a 1987 preseason harvest projection of 1.8 million pounds for the South Peninsula district of area J.

A more complete discussion of the 1986 pot survey is

available in the Westward Region Tanner Crab Survey Results published by the Department in December 1986.

As mentioned earlier, the actual harvest exceeded the pre-season projections. It should be noted that the survey as used in the South Peninsula is intended to produce an index of crab abundance and not an estimate of the population size.

Still, it appears that stocks were higher than anticipated in the Pavlof/Volcano school. Reports from fishermen were mixed; with some indicating that they saw good numbers of prerecruit-one sized males during the commercial season. Other fishermen said that they saw numerous prerecruit-two sized males (2 molts away from legal size) but few crab of the prerecruit-one size. Judging from the size frequency data in figure 2, fewer recruits have been entering the fishery during the last two seasons. A strong recruitment will be needed before the next fishery if the Pavlof/Volcano school is to withstand the pressures of recent seasons.

Though the Beaver/Balboa catch was small and virtually identical to that of 1986, there were several fishermen who commented that the prerecruit abundance looked better than it has for several seasons. Overall the school is still depressed and will need several years of strong recruitment to rebuild to the levels seen two, three, or more years ago.

The Ikatan/Morzhovoi school was the only other school to produce more crab than projected. Even so, it was still well below the the harvest levels of 1985 and 1986. The intense fisheries of those years may have depleted the stocks and recruitment has apparently failed to fully replace the crab taken during the fishery. The reduced effort of 1987 may have been a factor in the lower catch and it may have given the area a slight rest (Tables 3, 4). The school has the potential to produce much more however, and efforts should be made to protect that potential.

The Cold Bay/Belkofski school's disappointing catch was not entirely a surprise (table 4). The area has been fished very heavily for the last several years and may have been overharvested slightly. Of major concern is the poor showing of Belkofski Bay. Good catches were made there in 1985 but the area has produced very little ever since. Similarly, Cold Bay was an extremely good producer in 1986 but dropped considerably in 1987. Interview data indicates that few prerecruit crab were seen in the area, suggesting poor crab abundance for the near future.

The low harvest in the Unga school is partially due to the short season. Effort was concentrated in the inner bays and few vessels tried to work the outer areas before the season was closed. However at the time of the closure, the catch rates were already falling in the Unga area, suggesting that crab were not particularly abundant. Major portions of the school area south of

Popof and Unga Islands have produced so poorly in recent seasons that few fishermen are interested in fishing there. Several fishermen have voiced their concern about the numerous prerecruit sized males in the area that never seem to grow to legal size.

The remaining schools of Unimak Bight, Sanak Island, and Stepovak Bay were not fished during the 1987 season nor surveyed in 1986. There is little information to indicate the conditions of the stocks in these areas. However the fact that there were no deliveries indicates that populations are probably very low. At one time these areas produced significant harvests of crab. That such large areas have not produced many crab in recent seasons is a major point of concern.

The trend of good fishing in an area for one or two years followed by several years of poor fishing is causing concern among fishermen as well as biologists. While Cold Bay/ Belkofski may be the most immediate example, Ikatan/Morzhovoi may be showing similar symptoms. The Sanak, Unga, Unimak Bight, and Beaver/Balboa schools may have followed a similar pattern a few years ago. Catches there have still not rebounded. The greatest fear is that Pavlof Bay may follow the same pattern.

#### 1987 SURVEY

A stock assessment survey was conducted in the South Peninsula district from July 22 to August 11, 1987. The major

bays were surveyed in the same manner as they have been since 1984. Unlike the 1986 survey, the experimental stations southwest of Unga Island were excluded and Beaver and Balboa bays were restored to the program.

A total of 434 pots were fished at 145 stations; slightly more than had been fished in the previous two surveys. The catch of male Tanner crab consisted of 5,880 legal sized crab and 1,962 of sublegal size. Recruitment appears to have been good with recruits constituting 78 percent of the legal sized males. Abundance of the prerecruit "ones" (an indicator of future stock size) appears to have declined to make up only 21 percent of the '87 survey versus the 26 to 36 percent seen from the 1984 to 1986 surveys. In addition, 48 juvenile and 1357 adult females were caught.

A harvest guideline of 3.4 million pounds was calculated for the 1988 fishery by multiplying the 1987 commercial harvest by the rate of change between the survey indices of 1986 and 1987. A more complete discussion of the 1987 survey appears in the report "Westward Region Crab Survey Results For 1987" prepared by the Westward Regional Office of the Department in Kodiak.

### ISSUES

The issue between local and non-local vessels and between large and small vessels again threatened to erupt prior to the

1987 fishery. ADFG and Fish and Wildlife Protection worked together to notify the public that gear destruction or other similar illegal activities would not be tolerated by either agency. This unified approach and the threat that the season would be closed if the fishery became too unruly may have calmed the situation.

No complaints were made during the season. In fact, the fishery was quite orderly. Very likely the good weather and fishing kept everybody too busy to allow time for pranks.

4

Since this issue continues to come up, Table 5 was included for historical information.

Notes:

The Department wishes to thank the fleet and processors for their help and cooperation during the fishery.

Table 1. Tanner crab catch and effort statistics for South Peninsula District.

Year	Vssts.	No of Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Price Per Lb.
1967	-	-	-	3,100	-	-	-	\$ -
1968	-	155	36,835	110,610	-	-	3.0	-
1969	-	173	221,946	606,178	-	-	2.7	-
1970	-	-	-	2,093,600	-	-	-	-
1971	17	242	813,610	2,140,585	-	-	2.6	.10
1972	-	-	-	3,618,900	-	-	-	-
1973	36	390	2,213,006	5,615,563	53,573	41	2.5	-
1974	44	386	3,504,668	8,300,578	58,444	60	2.4	-
1974-75	44	131	2,053,530	5,195,800	38,153	54	2.5	.14
1975-76	36	217	4,434,381	11,201,941	59,377	75	2.5	.20
1976-77	28	389	2,524,565	6,773,838	63,143	40	2.7	.32
1977-78	36	374	2,847,948	7,446,270	70,587	40	2.6	.40
1978-79	48	332	3,267,122	8,684,408	82,374	40	2.7	.57
1979-80	61	363	2,581,544	3,961,251	96,989	27	2.7	.54
1980-81	43	268	1,274,539	3,294,106	59,560	21	2.6	.58
1981-82	72	365	1,815,060	4,589,042	81,008	22	2.5	1.05
1983	82	230	1,144,096	2,863,798	70,524	16	2.5	1.20
1984	61	207	775,472	1,789,883	50,726	15	2.3	1.04
1985	52	184	1,097,182	2,549,686	47,465	23	2.3	1.42
1986	74	187	1,589,759	3,781,950	65,078	24	2.4	1.72
1987	54	106	950,300	2,400,784	37,511	25	2.5	2.03

<sup>1</sup> Includes Deadloss

Table 2. South Peninsula Tanner crab deliveries by week, 1987.

Week	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Lifted	Wt.	CPUE
1/15-1/18	10	10	71,927	178,204	1,699	2.5	42
1/19-1/25	41	43	475,510	1,184,590	16,245	2.5	29
1/26-end	52	53	402,863	1,037,990	19,567	2.6	21
Total	54	106	950,300	2,400,784	37,511	2.525	

<sup>1</sup> Includes Deadloss

Table 3. South Peninsula District Tanner crab harvest by statistical area and school, 1987.

School	Stat. Area	No. Lndg	No. <sup>1</sup> Crab	No. <sup>1</sup> Pounds	Pot Lifts	Avg. Wgt.	CPUE	Percent <sup>2</sup> Recruits
BEAVER/ BALBOA	605-506	1	1,086	2,758	176	2.54	6	-
	605-507	1	3,550	8,787	285	2.48	13	-
School Sub-Total:		2	4,636	11,545	461	2.49	10	NS
COLD BAY/ BELKOFSKI	615-432	1	4,341	9,985	180	2.30	24	-
	625-431	2	8,968	20,919	558	2.33	16	-
	625-501	5	18,076	42,358	1,600	2.34	11	-
	625-502	14	56,174	126,862	3,503	2.26	16	-
School Sub-Total:		22	87,559	200,124	5,841	2.29	15	49%
IKATAN/ MORZHOVOI	625-435	2	11,512	28,921	1,040	2.51	11	-
	625-437	5	70,546	176,119	2,327	2.50	30	-
	635-432	4	50,234	120,631	2,181	2.40	23	-
	635-433	1	2,789	6,694	150	2.40	19	-
	635-502	1	21,238	50,450	431	2.38	49	-
School Sub-Total:		13	156,319	382,815	6,129	2.45	26	63%
PAVLOF/ VOLCANO	605-503	1	17,384	46,589	500	2.68	35	-
	615-502	1	5,444	13,517	175	2.48	31	-
	615-503	1	444	1,119	30	2.52	15	-
	615-505	1	11,230	28,604	865	2.55	13	-
	615-508	63	642,120	1,644,786	22,460	2.56	29	-
	615-531	1	4,339	11,292	189	2.60	23	-
School Sub-total:		68	680,961	1,745,907	24,219	2.56	28	58%
UNGA	615-431	5	20,825	60,393	861	2.90	24	NS
School Sub-Total:		1	20,825	60,393	861	2.90	24	NS
SEASON TOTAL:		106	950,300	2,400,784	37,511	2.53	25	56%

<sup>1</sup> Includes Deadloss

<sup>2</sup> Recruits defined as legal newshell crab of 163 mm. carapace width or less.

NS = No Samples

Table 4. Comparison of pre-season harvest projection and actual catch by area for the South Peninsula District, 1987 season.

Area	Pre-Season Projection (lbs.)		Actual <sup>1</sup> Harvest (lbs.)
	(Low)	(High)	
Unimak Bight	-	-	0
Sanak Island	50,000	58,000	0
Ikatan/Morzhovoi	268,000	324,000	382,815
Cold Bay/Belkofski	301,000	306,000	200,124
Pavlof/Volcano	1,114,000	1,322,000	1,745,907
† Beaver/Balboa	6,000	7,000	11,545
Unga	112,000	129,000	60,393
Stepovak	-	-	0
Total	1,851,000	2,146,000	2,400,784

<sup>1</sup> Includes Deadloss

Table 5. Number of vessels fishing and percent of catch for local versus non-local vessels fishing in the Chignik/South Peninsula areas (combined) 1978-79 through 1986 commercial Tanner crab seasons.

Season	No.	Percent	No.	Percent	Percent of Catch	
	Vessels	Vessels	Vessels	Vessels	LOCAL	NON-LOCAL
	LOCAL		NON-LOCAL			
1978-79	30	38	50	62	45	55
1979-80	41	39	65	61	40	60
1980-81	34	49	35	51	38	62
1981-82	51	46	59	54	47	53
1983	55	48	59	52	33	67
1984	51	71	21	29	69	31
1985	52	85	9	15	84	16
1986	49	63	29	37	62	38
1987	46	85	8	15	74	26

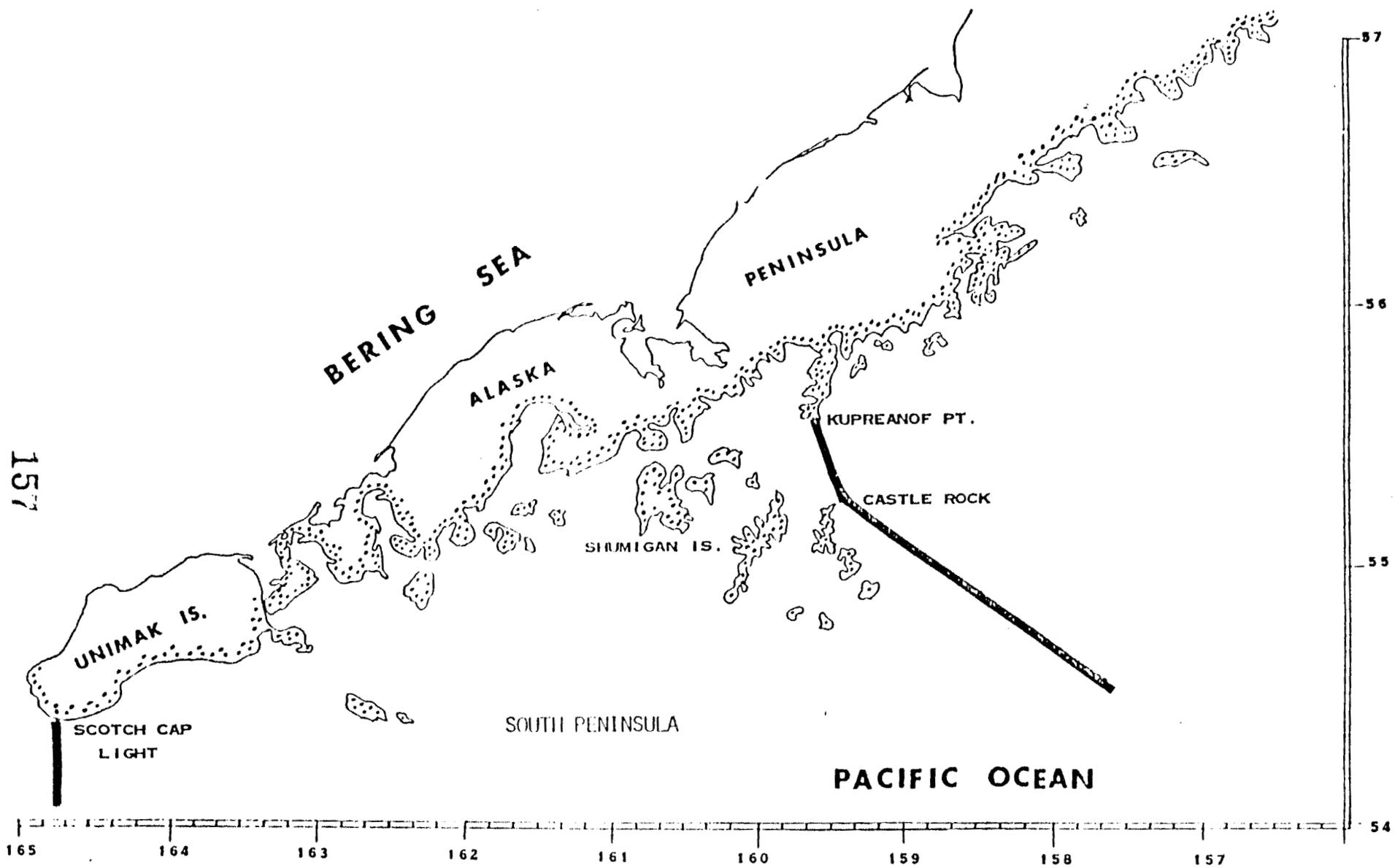


Figure 1. South Peninsula Tanner crab district.

P  
E  
R  
C  
E  
N  
T  
  
O  
F  
  
S  
A  
M  
P  
L  
E

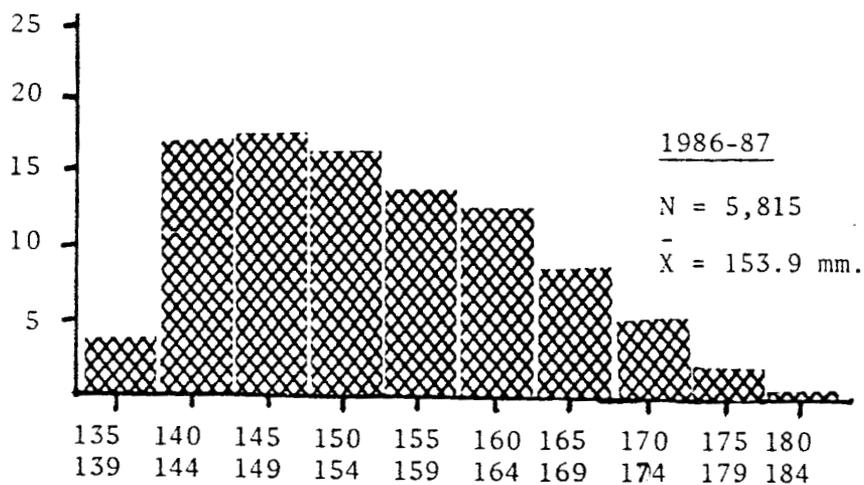
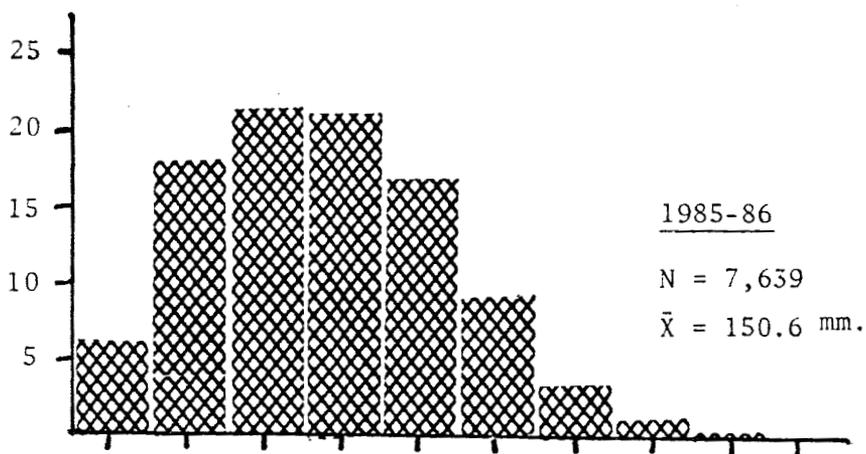
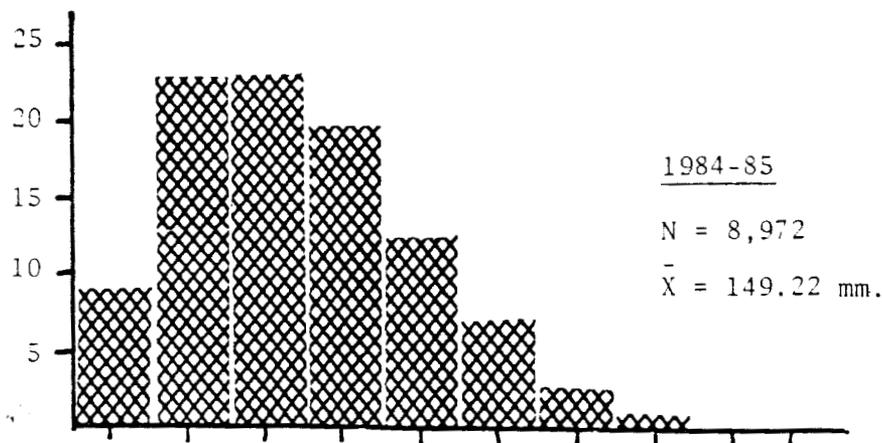


Figure 2. Size frequency distribution of Tanner crab from the South Peninsula District the last three seasons.





4 K88-1  
P. 2

## SOUTH PENINSULA TANNER CRAB

1987/88 Preliminary Report

### Introduction

The South Peninsula District of Area J includes all waters south of the Alaska Peninsula from Kupreanof Point to Scotch Cap Light on Unimak Island (Figure 1). The first harvest of Tanner crab from the area occurred in 1967 when 3,100 pounds were landed. The fishery grew until 1975-76 when the harvest peaked at 11.2 million pounds (Table 1). By 1974, guideline harvest levels were established, and in 1975, seasons were imposed to protect the mating and molting period of the crab. In 1976, the minimum size limit of 5 1/2 inches was established. From 1976-77 to 1978-79, catches dropped to the 6 to 8 million pound range with catch per unit effort (CPUE) averaging 40 crabs per pot. Since 1979-80 the harvest and CPUE declined in response to declining recruitment into the population (Table 1). The population reached its lowest level in 1984 and the fleet captured only 1.8 million pounds (Table 1). Recruitment has improved since 1984 and harvests have been allowed to increase.

### 1988 FISHERY

Compared to the 1986 survey, the 1987 summer survey indicated better recruitment and improved numbers of legal sized crabs in several of the major schools of the area. The preseason harvest projection was 3.4 million pounds (Table 4). This was a 1 to 1.6 million pound increase from the 1.8 to 2 million pound guideline set for the 1987 season and a 500,000 pound

decrease from the projection of 3.9 million pounds for the 1986 fishery.

Three seasonal dockside samplers were hired to assist with the registrations, inspections, and monitoring of the fishery. Larry Boyle, a Fisheries Biologist I was placed in King Cove, Tricia Crandall, a Fisheries Technician III, was aboard the floating processor Alaska Packer, and Anne Wakeford, also a Fisheries Technician III, was stationed in Sand Point. All worked very hard to gather information crucial to the management of the fishery.

Registrations and tank inspections for the 1988 South Peninsula Tanner crab fishery began at noon January 14, 1988. By January 18, 73 vessels, including one catcher/processor had registered; 21 more boats than in 1987 (Table 1). Twenty-four of the boats were longer than 64 feet and had a total hold capacity of nearly 2.4 million pounds. The fleet used more pots too, with 11,688 reported in 1988 versus the 8,100 used in 1987. Only one floating processor, the Alaska Packer, operated in the area.

In an effort to gather timely catch data, nine skippers were asked to make daily catch reports. Most of the fishermen asked to participate had large vessels that were capable of fishing the entire season without making a delivery. To achieve a balance, a couple fishermen using smaller boats were also asked to help. Of the nine, four reported daily and one skipper reported nearly every day. The other four fishermen reported much less frequently. The information gathered from the vessels was extremely helpful for management of the fishery.

Fishing began at noon January 15. The weather and the fishing were quite good and by the 17th of January eight vessels had delivered over 81,000 pounds with an average catch rate of 53 crab per pot (Table 2). While the average is higher than the 42 crab per pot seen during the first days of the 1987 fishery, most fishermen commented that their highest 1988 catch rates ranged from 40 to 50 crab per pot instead of the 60 to 80 of 1987. The increased concentrations of gear, particularly in Pavlof Bay, may have affected the catch rates.

Fishing continued to be good through January 21, when nearly 1.4 million pounds of crab were delivered or were waiting to be delivered. Another 700,000 pounds were estimated to be aboard the vessels that hadn't made deliveries. Catch rates were declining however and fishermen frequently reported catch rates of 30 crab per pot or less. A few fishermen reported catch rates of less than 20 crab per pot. There were several reports of fishermen moving their gear, especially in Pavlof Bay. Several of the larger boats began moving out of Pavlof Bay to find better, less congested areas to fish.

During the next day the total deliveries mounted quickly and the fleet began to move much of their gear. Some boats were reportedly moving out of Cold Bay where the CPUE was said to be declining rapidly. Fishermen in several areas were reporting that they had to sort through many female and sublegal crab to find a few "keepers".

On January 23 an estimated 2.4 million pounds had been caught. There were widespread reports of catch rates declining to 24, 17, 8 and even 3 crab

per pot. Several fishermen were moving out of traditional high production areas to look for better fishing. Eight skippers called to report that they were leaving the area for Kodiak or Dutch Harbor even though some had not filled their holds. This information along with the projection that 3.3 to 3.4 million pounds would be caught by January 26 resulted in the decision to close the fishery. Emergency order 4-S-02-88 was issued at 5:00 PM January 23, 1988 closing the South Peninsula District Tanner crab season noon January 26, 1988.

Total catch for the week of January 18 to 24 was 1.7 million pounds delivered by 56 vessels (Table 2). The catch rate for the week was 31 crab per pot (Table 2). After January 24, 68 vessels delivered another 1.4 million pounds and the catch rate had declined to 21 crab per pot (Table 2).

For the entire season, 73 vessels made 148 landings totaling 3,328,809 pounds (Tables 1,2). The catch rate averaged 26 crab per pot, and the crab averaged 150.8 mm in carapace width (Table 3, Figure 2). Recruits comprised over 78 percent of the catch; much more than the 56 percent of the 1987 fishery. (Table 3). Pavlof Bay and nearby waters produced over 66 percent of the total catch and the Ikatan/Morzhovoi area produced nearly 22 percent (Tables 3,4). The 1988 harvest was a moderate increase over the previous season but well below the catches made between 1973 and 1979 (Table 1).

At the beginning of the season the fishermen received \$2.15 to \$2.17 per pound for the crab sold locally and in Dutch Harbor. As the season progressed, the price was raised to \$2.20 per pound where it remained for the rest of the season. It is unclear exactly when the price was raised but some

processors may have made the price hike retroactive to the beginning of the season. Fishermen delivering in Kodiak received as much as \$2.40 per pound for their catch. The average ex-vessel price was \$2.20 per pound, for a total value of \$6,876,932.99 to the fishermen (Table 1).

The Fish and Wildlife Protection vessels Trooper and Woldstad provided enforcement coverage before, during, and after the fishery. The Woldstad patrolled the more open waters of the district and the crew of the Trooper patrolled some of the bays as well as checking deliveries to the processors. No problems developed and the fishery was very orderly.

#### Issues

I. The issue between local and non-local vessels and between large and small vessels continued in 1988 but not at the level of previous seasons. The problem is that the majority of local boats are less than 58 feet in length and many of the nonlocal vessels are larger than 58 feet. The local fishermen do not like to compete with the larger vessels with their greater capacity for gear and crab as well as their ability to fish in bad weather. This becomes an especially heated issue in seasons when weather is bad and the small boats cannot be fished or are fished at extreme risk to the operators (such as the 1986 season).

The local fishermen generally limit their fishing to the South Peninsula and Chignik districts while the larger vessels can be used in other fisheries such as the Bering Sea opilio fishery. The very short seasons have intensified the competition for the crab and have aggravated the problem

between the groups of fishermen.

Since this issue continues to come up, Table 5 was included for historical information.

Most of the public proposals for the South Peninsula and Chignik districts are efforts to address the issue above.

Table 1. Tanner crab catch and effort statistics for South Peninsula District.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Price/Pound <sup>2</sup>	% Recruits
1967	-	-	-	3,100	-	-	-	-	-
1968	-	155	36,835	110,610	-	3.0	-	-	-
1969	-	173	221,946	606,178	-	2.7	-	-	-
1970	-	-	-	2,093,600	-	-	-	-	-
1971	17	242	813,610	2,140,585	-	2.6	-	.10	-
1972	-	-	-	3,618,900	-	-	-	-	-
1973	36	390	2,213,006	5,615,563	53,573	2.5	41	-	-
1974	44	386	3,504,668	8,300,578	58,444	2.4	60	-	-
1974-75	44	131	2,053,530	5,195,800	38,153	2.5	54	.14	-
1975-76	36	217	4,434,381	11,201,941	59,377	2.5	75	.20	-
1976-77	28	389	2,524,565	6,773,838	63,143	2.7	40	.32	-
1977-78	36	374	2,847,948	7,446,270	70,587	2.6	40	.40	-
1978-79	48	332	3,267,122	8,684,408	82,374	2.7	40	.51	65.8
1979-80	61	363	2,581,544	3,961,251	96,989	2.7	27	.54	39.5
1980-81	43	268	1,274,539	3,294,106	59,560	2.6	21	.58	34.7
1981-82	72	365	1,815,060	4,589,042	81,008	2.5	22	1.05	50.2

-Continued-

Table 1. (page 2 of 2)

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Price/Pound <sup>2</sup>	% Recruits
1983	82	230	1,144,096	2,863,798	70,524	2.5	16	1.20	55.4
1984	61	207	775,472	1,789,883	50,726	2.3	15	1.04	29.6
1985	52	184	1,097,182	2,549,686	47,465	2.3	23	1.42	73.0
1986	74	187	1,589,759	3,781,950	65,078	2.4	24	1.72	72.9
1987	54	106	950,300	2,400,784	37,511	2.5	25	2.03	56.1
1988	73	148	1,359,371	3,328,809	52,516	2.5	26	2.20	78.6

<sup>1</sup>Deadloss included.

<sup>2</sup>Computed for live crab only.

Table 2. South Peninsula Tanner crab deliveries by week, 1988.

Week	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
01/15-01/17	7	8	33,713	81,463	635	2.42	53
01/18-01/24	56	70	731,643	1,785,453	23,745	2.44	31
01/24-End	68	70	594,015	1,461,893	28,136	2.46	21

<sup>1</sup>Deadloss included.

Table 3. South Peninsula Tanner crab harvest by statistical area and school 1988.

School	Stat Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	% Recruit <sup>2</sup>
Beaver/Balboa	605505	1	2,351	5853	100	2.49	24	-
	605507	1	4,442	10,706	450	2.41	10	-
	605533	2	6,823	14,057	305	2.06	22	-
Sub Total		4	13,616	30,616	855	2.25	16	80
Cold Bay/Belkofski	625431	2	4,218	9,687	390	2.30	11	-
	625501	3	9,361	21,836	585	2.33	16	-
	625502	30	119,867	279,739	4,871	2.33	25	-
Sub Total		35	133,446	311,262	5,846	2.33	23	90
Ikatan/Morzhovoi	625435	3	21,615	51,408	617	2.38	35	-
	625437	6	90,532	210,957	2,795	2.33	32	-
	635432	9	149,652	353,770	5,036	2.36	30	-
	635433	1	2,902	7,836	75	2.70	39	-
	635435	1	29,676	68,255	900	2.30	33	-
	635502	2	15,124	35,887	1,110	2.37	14	-
Sub Total		22	309,501	728,113	10,533	2.35	29	84

-Continued-

Table 3. (page 2 of 3)

School	Stat Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	% Recruit <sup>2</sup>
Pavlof/Volcano	615501	1	13,096	32,313	648	2.47	20	-
	615502	1	14,131	38,098	468	2.70	30	-
	615503	1	26,140	69,081	809	2.64	32	-
	615504	1	33,430	84,610	1,144	2.53	29	-
	615505	2	33,757	88,640	1,040	2.63	33	-
	615506	2	14,430	37,035	602	2.57	24	-
	615507	1	3,702	9,587	200	2.59	19	-
	615508	72	723,534	1,798,513	29,143	2.49	25	-
	615531	1	20,220	50,665	523	2.51	39	-
Sub Total		82	882,440	2,208,541	34,577	2.50	26	73
Sanak Island	625435	1	272	653	15	2.40	18	-
Sub Total		1	272	653	15	2.40	18	N/S
Unga	605431	1	4,039	10,057	200	2.49	20	-
	615431	1	13,179	32,659	400	2.48	33	-

-Continued-

Table 3. (page 3 of 3)

School	Stat Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	% Recruit <sup>2</sup>
Unga (cont.)	615504	1	1,439	3,454	45	2.40	32	-
	615505	1	1,439	3,454	45	2.40	32	-
	Sub Total	4	20,096	49,624	690	2.47	29	58
	SEASON TOTAL	148	1,359,371	3,328,809	52,516	2.45	26	79

<sup>1</sup>Deadloss included.

<sup>2</sup>Recruits are new shell legal crab less than or equal to 163 mm in carapace width.

N/S - No sample.

Table 4. Comparison of preseason project and actual catch by area for the South Peninsula District, 1988 season.

Area	Preseason Projection (Lbs)	Actual Harvest (Lbs) <sup>1</sup>
Unimak Bight	-	Ø
Sanak Island	-	653
Ikatan/Morzhovoi	647,000	728,113
Cold Bay/Belkofski	218,000	311,262
Pavlof/Volcano	2,566,000	2,208,541
Beaver/Balboa	-	30,616
Unga	-	49,624
Stepovak	-	Ø
TOTAL	3,431,000	3,328,809

<sup>1</sup>Deadloss included.

Table 5. Number of vessels fishing and percent of catch for local versus non-local vessels fishing in the Chignik/South Peninsula areas (combined), 1978-79 through 1988 commercial Tanner crab seasons.

Season	LOCAL		NON-LOCAL		Percent of Catch	
	No. Vessels	Percent Vessels	No. Vessels	Percent Vessels	LOCAL	NON-LOCAL
1978-79	30	38	50	62	45	55
1979-80	41	39	65	61	40	60
1980-81	34	49	35	51	38	62
1981-82	51	46	59	54	47	53
1983	55	48	59	52	33	67
1984	51	71	21	29	69	31
1985	52	85	9	15	84	16
1986	49	63	29	37	62	38
1987	46	85	8	15	74	26
1988	54	72	21	28	63	37

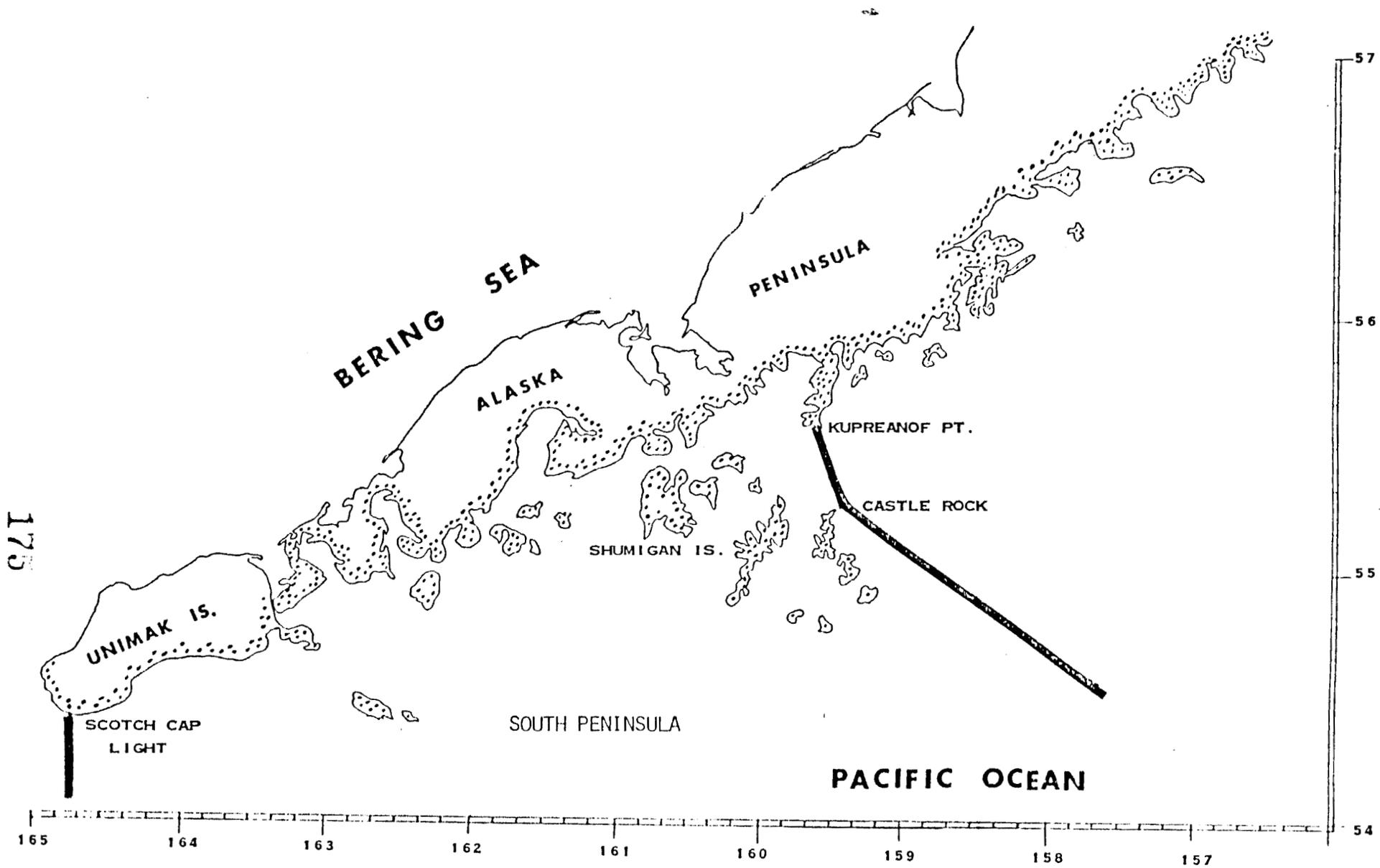


Figure 1. South Peninsula Tanner crab district.

P  
E  
R  
C  
E  
N  
T  
  
O  
F  
  
S  
A  
M  
P  
L  
E

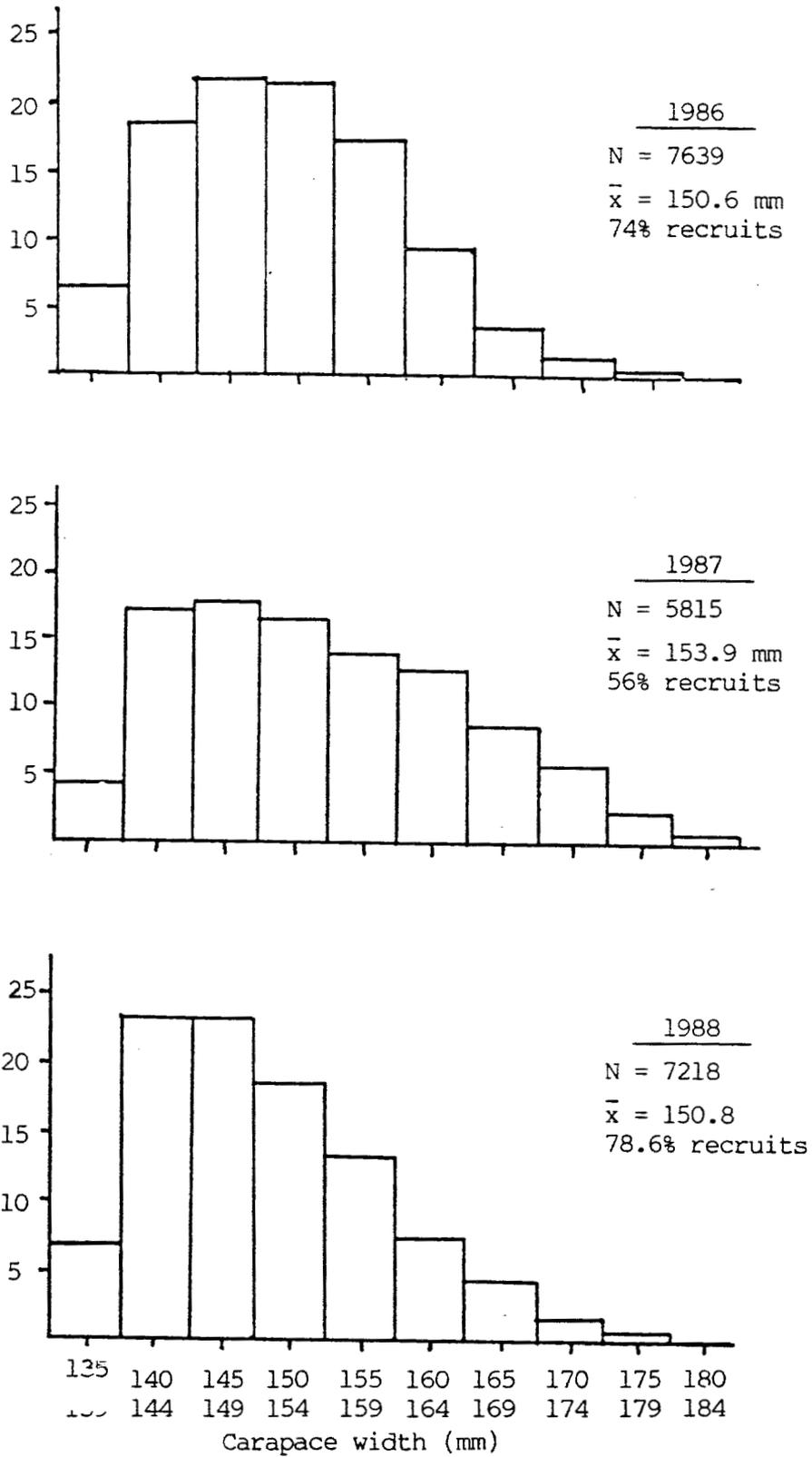


Figure 2. Size frequency distribution of Tanner crab from the South Peninsula District for the last three seasons.





## ALASKA PENINSULA DUNGENESS CRAB

### INTRODUCTION

The Alaska Peninsula District is described as all waters of Statistical Area J west of the longitude of Cape Kumlik (157° 27' W. long.) and east of the longitude of Scotch Cap Light (164° 44' W. long.) (Figure 1).

Historically, Dungeness catches from the district have been sporadic with the highest catch recorded in 1968 when 1.26 million pounds were landed (Table 1). Subsequent effort and catches remained low for many years due to low prices and better prospects in other fisheries. During the early 1980's, the decline in king crab stocks and a stronger market for Dungeness generated a renewed interest in the fishery. Effort grew so quickly that the Board of Fisheries made the Alaska Peninsula District a superexclusive registration district in 1983. The superexclusive regulation may have reduced effort in the district.

Management of the Alaska Peninsula District Dungeness fishery has been by sex, size and season or the "3-S system". Only males greater than 6.5 inches in carapace width may be harvested from May 1 until January 1 or February 1 (the exact closing date has varied over the years). No research or abundance surveys have ever been done on the Dungeness of the

area. Management activity has been limited to monitoring the deliveries and recording the harvest. With the recent revival of the fishery and the poor condition of other crab fisheries, Department biologists have begun to scrutinize the current management strategy. However, data collected so far has not been adequate to generate any proposals to change the present "3-S" system.

### 1987-88 Fishery

For ease of discussion, the Alaska Peninsula District is divided into two areas, Chignik, and South Peninsula (Figure 1).

#### Chignik:

The 1987 Dungeness fishery opened by regulation on May 1. Two vessels were registered at the time of opening, another was registered in early June and a fourth boat registered in August. No actual fishing was done until mid-June although one skipper set his gear very early in the season to secure a favored fishing spot. The greatest effort and catch occurred in the months of August and September resulting in the delivery of over 70,000 pounds and 41,000 pounds respectively (Table 2). Effort dwindled in October and the last delivery was made in early November (Table 2). The fishermen appear to have quit because of poor weather and poor fishing.

The total catch of 167,334 pounds is well above the 55,000 to 59,000 pounds of the previous two seasons but lower than the catches of the 1982-83 to 1984-85 fisheries (Table 4). Nearly 77 percent of the entire catch came out of Ivanof Bay; a very small part of the whole area. The catch rate of 4 crab per pot is better than it was in 1986-87 and seems to indicate that there was a slight increase in the abundance of legal sized crab in 1987-88 (Table 6). However catch rates have been quite erratic throughout the history of the fishery and are so dependent upon soak time of the pots that it is not the best abundance indicator for this fishery (Table 4). The one sample taken of the commercial catch indicated that recruits made up as much as 96 percent of the harvest (Figure 2).

#### South Peninsula

As in Chignik, the South Peninsula area opened to Dungeness fishing on May 1. No boats registered to fish until mid-August and no deliveries were made until September 13 (Table 3). The two boats really only fished in September delivering 11,366 pounds. The October delivery came from the retrieval of one fisherman's last boat load of pots (Table 3). The increased catch per unit effort (CPUE) resulted from the very long soak period of that gear and does not indicate improved fishing.

The Dungeness fishery in the South Peninsula produced only 15,372 pounds from five deliveries made by two boats (Table 3).

As shown in Table 5 the harvest was far below that of the previous six seasons.

For the entire Alaska Peninsula District, six vessels made 21 landings for a total of 182,706 pounds (Table 1). The crab averaged approximately 2.1 pounds each and the catch rate averaged 4 crab per pot (Table 1). Though no fishing was done after early November, the season closed by regulation on January 1, 1988; fourteen days prior to the opening of the commercial Tanner crab season.

#### Stock Status

The Department has not conducted abundance surveys on Dungeness crab. The small amount of data on the population size and structure in the Alaska Peninsula district is derived from the limited skipper interviews and commercial catch sampling.

The increased harvest in Chignik appears to be solely dependent upon strong recruitment in one small portion of one bay in the area. Considering that no significant catch came from any other portion of the area (though they were tried), it appears that the population of legal sized male Dungeness in the Chignik area remain at relatively low levels.

The Chignik fishery appears to have become a recruit fishery as nearly 96 percent of the 1987-88 catch and 76 percent

of the 1986-87 catch were recruit crab. (Recruits are assumed to be new-shell legal males less than 194 mm carapace width.) Unfortunately the very small samples taken during the last few seasons make it difficult to draw any firm conclusions about the age and size structure of the Chignik Dungeness population.

During the four seasons from 1982-83 to 1985-86 the relatively stable harvest was assumed to indicate a stable Dungeness population in the South Peninsula area (Table 5). The drastic declines of the 1986-87 and 1987-88 harvests may indicate a loss of stability and a significant decline in the population of Dungeness (Table 5). The fishing pressure of the last few seasons may have caused the decline by reducing the numbers of older legal-sized crabs that may have accumulated when there was little interest in the fishery. Though no samples were taken in 1987-88, the 491 crab sampled in 1986-87 showed that 75 percent of the harvest was made up of recruit crab. Therefore, as in Chignik, the South Peninsula Dungeness harvest now appears to be entirely dependent upon yearly recruitment.

Some fishermen are blaming sea otters for the declining catch, particularly in the South Peninsula area. One fisherman commented that there seem to be increasingly large numbers of otters in Pavlof and Canoe Bays where much of the Dungeness harvest normally occurs. The Department has no data on sea otter predation on Dungeness crab in the Alaska Peninsula district, but the animals are certainly abundant in the area. There is a report

that implicates sea otters with the decline of a Dungeness population in the Prince William sound area (Kimker, 1985). Research on this question would be helpful.

Since the Department does not survey the Dungeness population there is no way to predict harvests or recruitment for the 1988-89 fishery. Dramatic cycles of low and high abundance have been observed in other Dungeness fisheries. Continuous effort and "3 S" management appears to be revealing and/or causing a similar phenomenon in the Alaska Peninsula District.

#### Issues

Critics often point out that "3-S" management typically results in a recruit fishery; one dependent upon the number of available legal-sized animals each year. Such fisheries often result in wide variations in catch from year to year. In king and Tanner crab fisheries, the Department has established multiple age class management systems.

While the research data does not make it clear whether a multiple age class management system is appropriate to the Dungeness fisheries, it has shown that there are problems with the "season" portion of the "3-S system" as currently implemented. The data show that the present May 1 opening may be detrimental to the Dungeness stocks by allowing fishing to occur on molting and mating crab. Research in the west coast states,

Southeastern Alaska, Prince William Sound, and Kodiak indicates that male crab molt during the spring and summer. Female Dungeness generally molt and mate during the summer or early fall. In Kodiak, recent research found a majority of the males to be soft shelled in July and August (Hicks, personal comm.). While year to year consistency of the timing of molting and mating is as yet unknown, local fishermen have confirmed that soft shelled crab are often seen from May, through July or August. One or two fishermen have commented that they have found grasping pairs in August and September with an occasional pair found as late as October.

The crab are fragile and more easily killed during their molting period. They may be more susceptible to cannibalism by their own species at this time, particularly if trapped in a pot. Soft crab are more sensitive to sorting and handling by fishermen and have been known to float and die when returned to the water. The handling of grasping pairs may disrupt the breeding success of the crabs. Research in the Kodiak area also indicates that the May Dungeness fishery could cause handling damage to juvenile king and Tanner crabs, and damage to adult female king crabs.

As the Area Shellfish Management Biologist, I support the establishment of a season that is more appropriate to the life history of the species. The Department is trying to gather data that will indicate when the fishery should occur.

## SPECIAL NOTES

The Department would like to thank Village Public Safety Officer Ron Bowers of Chignik, for his assistance during the 1987-88 Alaska peninsula Dungeness fishery. Mr. Bowers has been very helpful in providing tank inspections and general information to the Chignik fishermen that the Department is otherwise able to serve.

## REFERENCES

- HICKS, D. 1987. Kodiak Dungeness and king crab survey. Technical data report (No. 204). Alaska Department of Fish and Game, Kodiak, Alaska.
- KIMKER, A. 1985. A Recent History of the Orca Inlet, Prince William Sound Dungeness Crab Fishery, with Specific Reference to Sea Otter Predation. pp 231-241. In: Proceedings of the symposium on Dungeness crab biology and management. Alaska Sea Grant Report 85-3, 244 pp.
- University of Alaska, 1985. Proceedings of the symposium on Dungeness crab biology and management. Alaska Sea Grant Report 85-3, 424 pp.

Table 1. Dungeness crab harvest statistics, Alaska Peninsula District.

Year	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Price Wt. Per Lb.
1968			434,142	1,259,013			2.9
1969			411,000	1,056,000			
1970			4,200	13,000			
1971			3,900	11,000			
1972			29,400	65,000			
1973	2	9	86,671	194,448	3,434	25	2.2 \$ .49
1974				NO EFFORT			
1975				NO EFFORT			
1976				NO EFFORT			
1977				NO EFFORT			
1978				NO EFFORT			
1979	2	6	42,816	102,320	7,525	6	2.4 \$ .68
1980				NO FISHING			
1981-82	1	7	22,995	42,296	7,150	3	1.8 \$ .65
1982-83	16	79	357,955	779,600	59,265	6	2.2 \$ .75
1983-84	18	132	565,430	1,207,128	113,061	5	2.1 \$ .97
1984-85	13	99	294,191	647,497	106,056	3	2.1 \$ 1.38
1985-86	7	31	239,202	488,107	52,117	5	2.0 \$ 1.26
1986-87	6	28	87,925	180,261	30,280	3	2.0 \$ 1.05
1987-88	6	21	88,744	182,706	22,588	4	2.1 \$ 1.11

<sup>1</sup> Includes deadloss.

Table 2. Dungeness harvest by month, Chignik Area 1987-88 Season.

Month	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt. CPUE	Avg. <sup>2</sup> Price/Lb.
May			N O	F I S H I N G			
June			N O	F I S H I N G			
July	1	3	15,841	32,996	4,095	2.1 4	\$ 1.00
Aug.	2	5	34,063	70,254	7,370	2.1 5	\$ 1.06
Sept.	3	5	21,039	41,766	5,220	2.0 4	\$ 1.19
Oct.	1	1	5,877	12,289	1,379	2.1 4	\$ 1.20
Nov.	1	2	4,573	10,029	1,828	2.2 3	\$ 1.20
Dec.			N O	F I S H I N G			
Total	4	16	81,393	167,334	19,892	2.1 4	\$ 1.10

<sup>1</sup> Includes Deadloss

<sup>2</sup> Computed for live poundage only

Table 3. Dungeness harvest by month, South Peninsula Area 1987-88 Season.

Month	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Avg. <sup>2</sup> Price/Lb.
May			NO	FISHING				
June			NO	FISHING				
July			NO	FISHING				
Aug.			NO	FISHING				
Sept.	2	4	5,430	11,366	2,366	2.1	2	\$ 1.20
Oct.	1	1	1,921	4,006	330	2.1	6	\$ 1.20
Nov.			NO	FISHING				
Dec.			NO	FISHING				
Total	2	5	7,351	15,372	2,696	2.1	3	\$ 1.20

<sup>1</sup> Includes Deadloss

<sup>2</sup> Computed for live poundage only

Table 4. Recent dungeness harvest, Chignik area.

Season	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
1981-82	NA	NA	NA	1,062	NA	NA	NA
1982-83	7	26	106,635	243,503	11,740	2.3	9
1983-84	16	91	297,707	665,238	64,550	2.2	5
1984-85	6	48	126,176	264,741	54,399	2.2	2
1985	2	5	28,731	59,481	6,200	2.1	5
1986	2	9	25,688	55,181	10,360	2.1	2
1987	4	16	81,393	167,334	19,829	2.1	4

Table 5. Recent dungeness harvest, South Peninsula area.

Season	Vssls.	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
1981-82	NA	NA	NA	1,062	NA	NA	NA
1982-83	13	53	251,320	536,097	47,525	2.1	5
1983-84	8	41	267,723	541,890	48,511	2.0	6
1984-85	13	44	199,790	394,187	56,007	2.0	4
1985	6	26	210,471	428,686	45,917	2.0	5
1986	5	19	62,237	125,080	19,920	2.0	3
1987	2	5	7,351	15,372	2,696	2.1	3

NA = Not Available  
<sup>1</sup> Includes Deadloss

Table 6. Dungeness catch by statistical area for the Chignik Area, 1987 Season.

School	Stat Area	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
<u>CHIGNIK</u>							
	585603	3	19,688	39,320	3,203	2.0	6
	595531	13	61,705	128,014	16,689	2.1	4
Season Total		16	81,393	167,334	19,892	2.1	4

<sup>1</sup> Includes deadloss

Table 7. Dungeness catch by statistical area for the South Peninsula Area, 1987 Season.

School	Stat Area	Lnds.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
<u>SOUTH PENINSULA</u>							
	615508	4	4,913	10,189	1,446	2.1	3
	615531	1	1,771	3,755	850	2.1	2
	615532	1	667	1,428	400	2.1	2
Season Total		6	7,351	15,372	2,696	2.1	3

<sup>1</sup> Includes deadloss

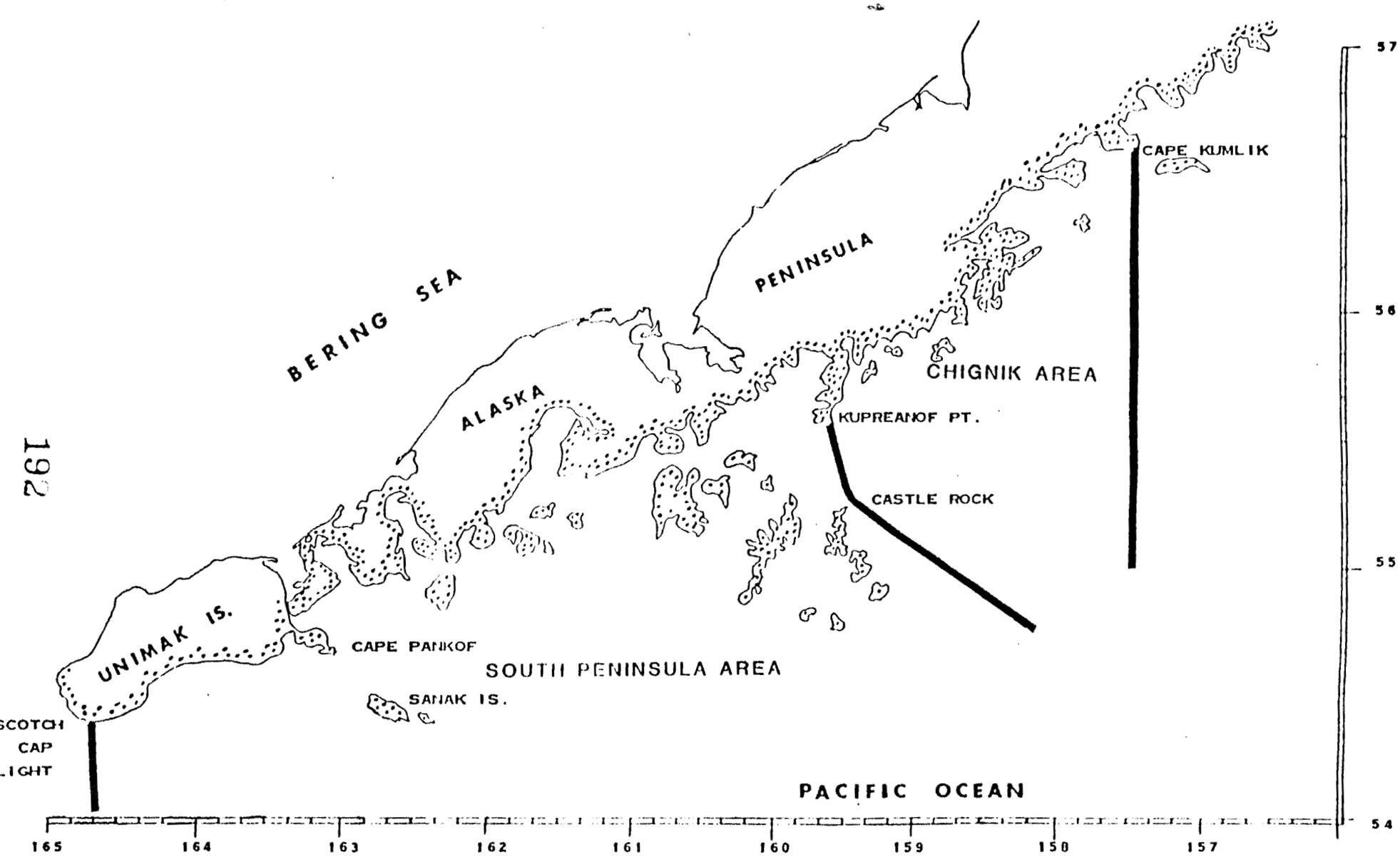
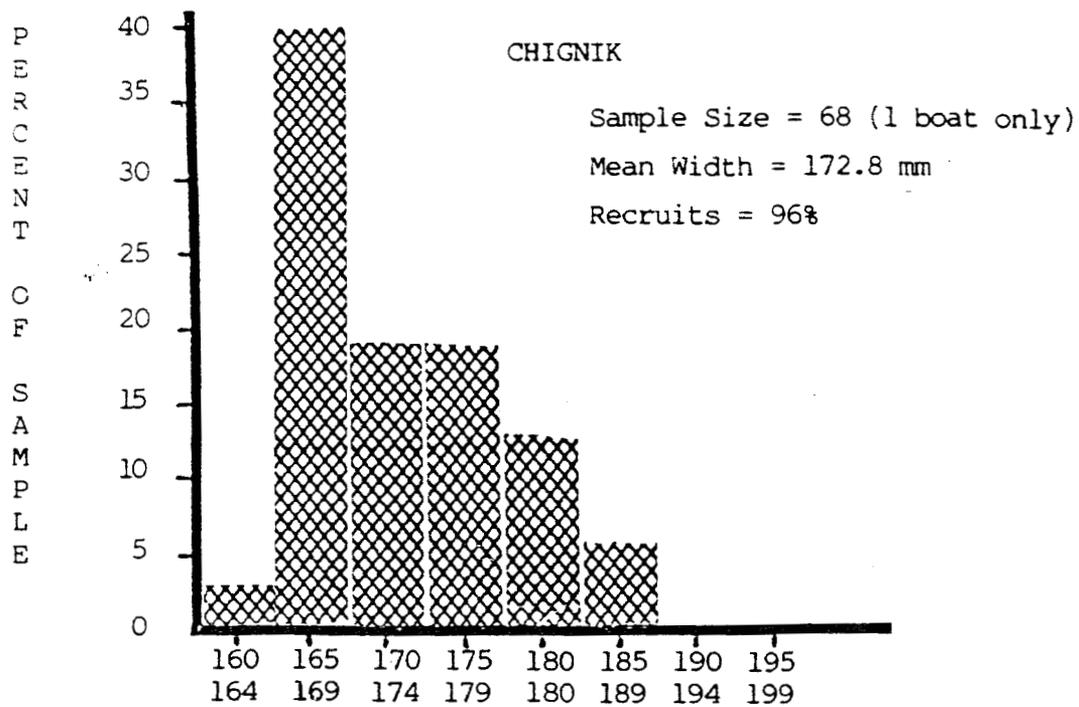


Figure 1. ALASKA PENINSULA DUNGENESS DISTRICT



Carapace width in mm

Recruits - new shell legal males < 194 mm  
Carapace width

SOUTH PENINSULA

No samples taken in 1987

Figure 2. Size frequency of Dungeness crab sampled from the Alaska Peninsula commercial harvest in 1987.



## ALASKA PENINSULA SHRIMP

### INTRODUCTION:

Shrimp fishing in the Alaska Peninsula began in 1968 when 5.9 million pounds were landed (Figure 1, Table 1). Catch levels remained relatively low until the 1972-73 season when 19.6 million pounds were harvested (Table 1). The historic high catch was reached in 1977-78 with 71.5 million pounds. Catches declined rapidly until all South Peninsula sections were closed in 1980. Although the Sutwik Island section and all offshore waters of the Chignik District remained open in 1981-82, only 70,948 pounds of shrimp were landed from the area.

### 1987-88 SEASON SUMMARY:

During the 1987-88 season, none of the inshore shrimp sections were opened to fishing in either the Chignik or South Peninsula districts. No vessels were registered and no deliveries were made from the offshore sections that remained open to fishing.

### STOCK STATUS:

Two shrimp abundance surveys were conducted in portions of the Chignik and South Peninsula districts. The first was conducted during August in Pavlof, Volcano, and Canoe Bays by the

National Marine Fisheries Service (NMFS) aboard the R/V Alaska. Results of the survey as reported by NMFS indicate that "mean pandalid shrimp abundance in Pavlof Bay showed a decrease over that found in the last annual survey in September 1986." (Cruise Results, Cruise No. AK-87-02 Leg I). The report also said "the biomass estimate of 0.63 million lbs. for pandalid shrimp this year continues to remain well below that of the mid-1970's." (Cruise Results, Cruise No. AK-87-02 Leg I). Apparently recruitment was poor in Pavlof Bay in 1987.

In October the State vessel R/V Resolution was used by the Department for shrimp surveys in Stepovak, Kuiu, Castle, Chignik, and Kujulik Bays. Very few shrimp were caught. Preliminary calculations indicate that all bays were far below the minimum allowable biomass index needed to allow a commercial fishery. (Al Spalinger, personal comm.)

References:

Paul Anderson, Al Sparks, Frank Morado, Allan Kimble; 1987 Cruise Results, Cruise No. AK-87-02 Leg I; NOAA, NMFS, Northwest and Alaska Fisheries Center, Kodiak, Alaska.

Al Spalinger, Biologist ADFG; Kodiak, Alaska.

Table 1. Historic shrimp harvest statistics.

Year	SOUTH PENINSULA				CHIGNIK			
	Vssls.	Lndgs.	No. Pounds	Price/ Pound	Vssls.	Lndgs.	No. Pounds	Price/ Pound
1968	3	123	4,734,596	\$ .-	-	-	1,153,721	\$ .-
1969	2	73	2,657,082	.-	-	-	419,830	.-
1970	4	173	4,398,800	.04	-	-	890,705	.04
1971	3	216	5,262,575	.04	-	27	1,091,711	.04
1972-73	-	-	14,740,801	.07	-	-	4,829,117	.-
1973-74	12	347	19,987,246	.07	33	277	21,673,788	.08
1974-75	22	387	26,145,720	.08	37	323	23,392,352	.08
1975-76	24	326	20,044,112	.09	50	334	24,435,480	.08
1976-77	19	424	37,148,932	.09	48	303	27,232,630	.10
1977-78	48	409	45,003,794	.13	50	271	26,512,791	.13
1978-79	23	108	9,418,276	.16	40	201	23,257,869	.17
1979-80	10	41	3,134,367	.21	35	195	23,722,330	.23
1980-81	-	-	CLOSED	.-	54	148	12,843,270	.29
1981-82	-	-	CLOSED	.-	3	4	70,948	.27
1982-83	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-
1983-84	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-
1984-85	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-
1985-86	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-
1986-87	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-
1987-88	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-

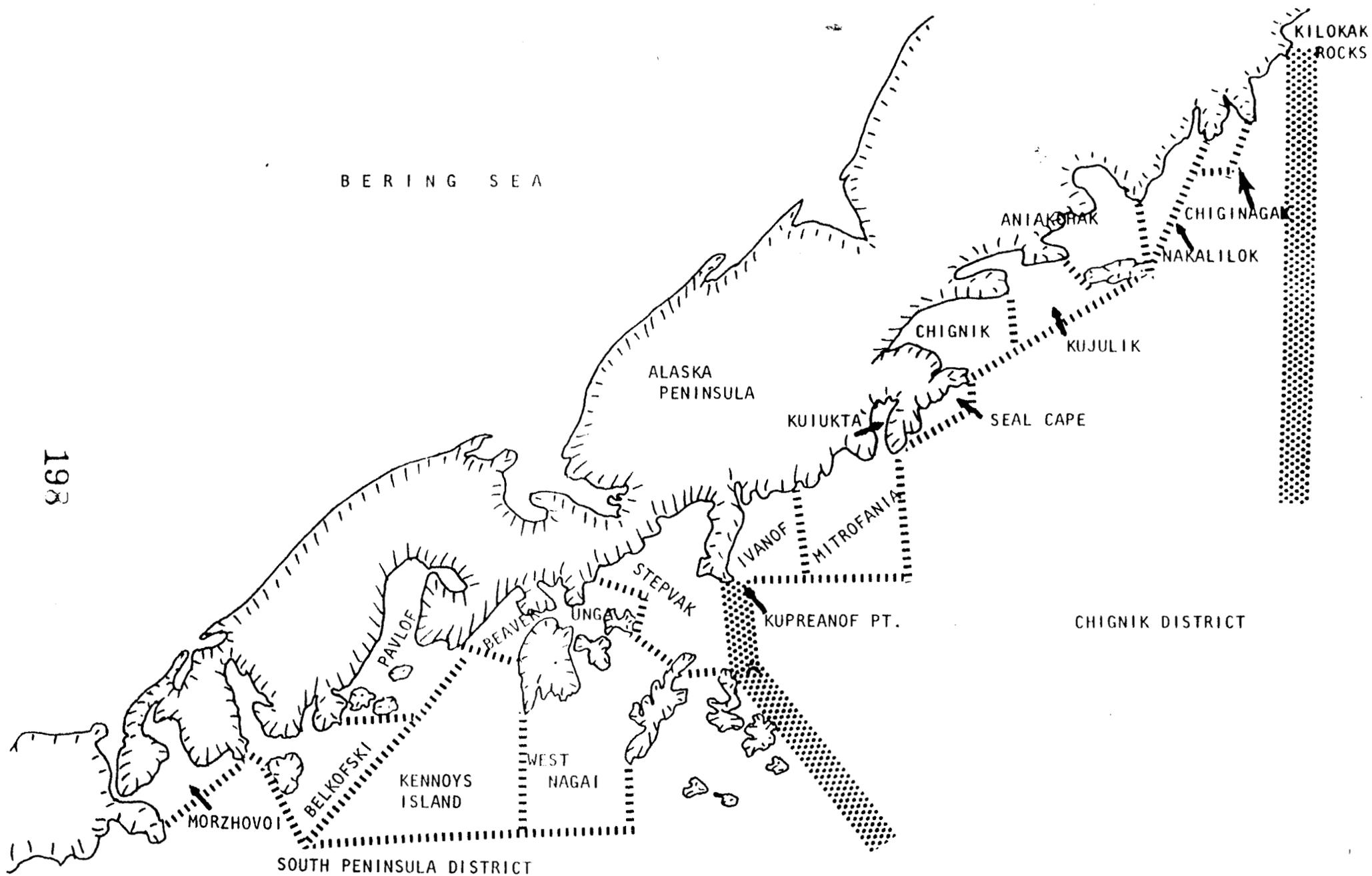


Figure 1. South Peninsula and Chignik shrimp sections.





## ALASKA PENINSULA SCALLOPS

### INTRODUCTION

The Alaska Peninsula scallop fishery has been a relatively recent development. Effort has primarily occurred in the Chignik area. Peak effort and harvest in both districts was seen in 1982. In Chignik six vessels landed 172,333 pounds of product, while in the South Peninsula three vessels accounted for a total of 33,358 pounds (Table 1).

The offshore areas of Unimak Bight, and all nearshore waters of the South Peninsula District have been closed to scallop fishing for several years in order to protect crab stocks and lessen the possibility of gear conflicts. The severely low crab stock situation in the Chignik District prompted the closure in 1984, of the Mitrofanina Island area since it is believed to a crab mating and molting area.

### 1987 Season Summary:

Generally, the South Peninsula waters open to scallop dredging are not known to contain populations large enough to support a commercial fishery. No vessels were registered to fish in the South Peninsula or Chignik districts in 1987.

Fish and Wildlife Protection officers patrolling the June salmon fishery in Unimak Bight discovered a catcher/processor

operating in closed waters. After an investigation the vessel was seized and its operators cited for fishing in closed waters and for misreporting their catch. Records gathered in the seizure indicate that approximately 18,392 pounds of scallop meats were taken from the waters of Unimak Bight (Table 1). The incident is more fully discussed in the report on 1987 Eastern Aleutian District scallop fishery. Similar activities had been suspected in 1986 but could not be confirmed.

Table 1. Scallop harvest statistics for South Peninsula and Chignik.

Year	SOUTH PENINSULA				CHIGNIK			
	Vssls.	Lndgs.	No. Pounds*	Price/ Pound	Vssls.	Lndgs.	No. Pounds*	Price/ Pound
1975			2,508				NO FISHING	
1975			NO FISHING				NO FISHING	
1977			NO FISHING				NO FISHING	
1978			NO FISHING				NO FISHING	
1979			NO FISHING				NO FISHING	
1980			NO FISHING				NO FISHING	
1981			NO FISHING		1	1	17,007	\$ 4.42
1982	3	6	33,358	\$ 3.35	6	14	172,333	\$ 3.35
1983	1	3	20,581	\$ 5.65	1	2	23,182	\$ 4.23
1984			NO FISHING				NO FISHING	
1985	1	1	14,515	\$ 3.75	1	2	305	\$ 4.50
1986			NO FISHING				NO FISHING	
1987	1	1	18,392 <sup>1</sup>				NO FISHING	

\* Meat of scallop only.

<sup>1</sup> Taken illegally



## ALASKA PENINSULA MISCELLANEOUS SPECIES

Over the years, fishermen have occasionally fished for snails, pot shrimp, octopus, and hair crab in the waters south of the Alaska Peninsula. However, during 1987 no deliveries were reported for any of these species. One fisherman registered to fish for octopus but never put his gear in the water. A more thorough discussion of these fisheries appears in previous years' issues of the "Westward Region Shellfish Report to the Alaska Board of Fisheries", Alaska Department of Fish and Game, Kodiak, Alaska.

### OCTOPUS

Octopus, the most regularly harvested of the "miscellaneous species", are often taken incidentally during the Tanner crab fishery. Processors that buy octopus usually freeze it for resale as halibut bait. Tables 1 and 2 show the historical delivery records of octopus in the districts of the Alaska Peninsula. The tables do not include the octopus caught and retained by fishermen for their own use as food or bait.

Table 1. Historical deliveries of octopus in the Chignik District.

Year	Vssls.	Lndgs.	Number	Pounds	Pots Lifted	CPUE	Avg. Wt.	Price
1980	1	1	-	183	-	-	-	\$ .70
1981	1	1	-	400	-	-	-	.70
1982	1	2	-	250	-	-	-	.70
1983				N O	F I S H I N G			
1984				N O	F I S H I N G			
1985	1	1	21	421	110	<1	20.2	.50
1986				N O	F I S H I N G			
1987				N O	F I S H I N G			

Table 2. Historical deliveries of octopus in the South Peninsula District.

Year	Vssls.	Lndgs.	Number	Pounds	Pots Lifted	CPUE	Avg. Wt.	Price
1980				N O	F I S H I N G			
1981				N O	F I S H I N G			
1982	1	2	-	3,980	-	-	-	\$ .50
1983	2	2	-	1,242	-	-	-	.80
1984				N O	F I S H I N G			
1985	1	1	18	352	155	<1	19.6	.50
1986				N O	F I S H I N G			
1987				N O	F I S H I N G			

4



EASTERN ALEUTIANS MANAGEMENT AREA  
SHELLFISH MANAGEMENT REPORT  
TO  
ALASKA BOARD OF FISHERIES

APRIL 1988

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST  
DAN URBAN - FISHERY BIOLOGIST

Dutch Harbor Area Office  
P. O. Box 308  
Dutch Harbor, Alaska 99692  
(907) 581-1239



## DUTCH HARBOR RED KING CRAB

### Introduction

The Dutch Harbor area or statistical Area "0", has as its eastern boundary the longitude of Scotch Cap light on Unimak Island, and as its western boundary 171° West longitude. The 800 fathom depth contours are the seaward boundaries. Area "0" is further broken down into five fishing districts (Figure 1). Although red king crab is the primary target species, brown king crab production is on the increase.

### Historical Background

The Area "0" red king crab fishery began in 1961 and rapidly became one of the State's major production areas. During the development years of the fishery, the catch peaked at an all-time high of 32.9 million pounds in 1966-67 (Table 1).

Since 1966-67, the fishery has fluctuated widely. A sharp decline characterized the fishery between 1967 and 1970 (Table 1). After the low 1969-70 catch of 8.9 million pounds, the fishery gradually rebuilt to a peak of 15.9 million pounds during the 1975-76 season (Table 1). The increase appeared to be largely a result of improved catches in the Egg Island District, and expansion into new grounds of the Western District.

For the second time in the history of the fishery, a sharp

decline followed several years of increasing harvests, and the 1977-78 season marked a new low in the Area "0" fishery (Table 1). The decline was area wide, and all districts suffered poor catches.

By 1980-81 catches had reached the highest level in 13 years; and although populations had rebuilt somewhat in several of the districts, the bulk of the increase was due to the exploitation of previously unfished populations in the Unalaska and Western districts (Table 1). In 1980-81 nearly 39 percent of the catch came from areas only lightly fished during previous seasons.

#### 1987 FISHERY

Emergency Order number 4-S-18-87 issued at Dutch Harbor on September 18, closed the area to commercial red crab fishing.

#### STOCK STATUS

The Department began its annual pot survey on August 12, and continued until August 19. The survey, due to its time constraints, was limited to only a portion of the same areas surveyed in the past.

The data collected indicates that the fishery should not be opened to commercial fishing in 1987 for the following reasons:

1. The catch of legal males averaged .46 crab per pot (83 out of 180), during the 1987 survey and is only a slight increase from the .37 crab per pot average from the 1986 survey, and .33 crab per pot from the 1985 survey.

2. The 1987 survey found only 14 percent (12 out of 83) of the legal males to be recruits. This is compared to 17 percent for 1986 and 22 percent for the 1985 survey. The continued downward trend indicates that fewer males are recruiting into the already low legal male population.

3. The catch of juvenile females during the 1987 survey was only 3 crab, compared to 19 in 1986 and 79 crab in 1985. With this extremely low number of juveniles present, current reproduction problems of the Dutch Harbor area stocks will be continuing into the future.

4. Fewer adult females were caught during the 1987 survey (154 crab), and it appears that there may be a significant decrease in the total adult female population, although only 21 percent of the females captured during the 1987 survey had less than 60 percent clutch size, compared to over 75 percent having less than 60 percent clutch size in 1986. This decrease can probably be attributed to the fact that no females were captured in traditional areas that have produced high catches during past surveys. There still appears to be a significant reproductive

problem in the area, suggesting that older adult females may have died off and there are insufficient numbers of males to complete mating with younger females.

Based on the results of the 1987 survey, the Dutch Harbor Area "0" king crab stocks are severely depressed with no increase in low male populations, and a female king crab population that is declining in number.

Table 1. Dutch Harbor, Area "0", historic red king crab catch.

Season	Opened	Closed	Vssls.	Lndgs.	No. Crab	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Min. Size	Avg. Price/Pound
1968-69	1/1 <sup>2</sup>	3/15	NA	NA	NA	13,600,000	NA	NA	NA	7"	NA
1969-70	9/15	2/15	41	375	NA	8,950,000	72,683	NA	NA	7"	NA
1970-71	9/15	1/10	32	268	NA	9,652,000	56,198	NA	NA	7"	NA
1971-72	9/15	10/23	32	210	1,447,692	9,391,615	31,531	6.5	46	6.5"	NA
1972-73	10/1	10/24	51	291	1,500,904	10,450,380	34,037	7.0	44	6.5"	NA
1973-74	11/1	11/24	56	290	1,780,673	12,722,696	41,840	7.1	43	6.5"	\$ .65
1974-75	11/1	1/14	87	372	1,812,647	13,991,129	71,821	7.7	25	6.5"	\$ .37
1975-76	11/1	1/10	79	369	2,147,350	15,906,666	86,874	7.4	25	6.5"	\$ .42
1976-77	11/1	12/7	72	226	1,273,298	9,367,965	65,796	7.4	10	6.5"	\$ .64
	12/13	1/13	38	61	86,619	830,458	17,298	9.6	5	8"	\$ .79
1977-78	9/15	12/8	33	227	539,656	3,658,860	46,617	6.8	12	6.5"	\$ .99
	12/8	1/5	6	7	3,096	25,557	812	8.3	4	7.5"	\$1.35
1978-79	9/10	11/20	60	300	1,233,758	6,824,793	51,783	5.5	24	6.5"	\$1.35
1979-80	9/10	1/10	104	542	2,551,116	15,010,874	120,554	5.9	21	6.5"	\$ .90
1980-81	11/1	1/12	114	830	2,772,287	17,660,642	231,607	6.4	12	6.5"	\$1.02
	1/15	2/15	54	120	182,349	1,392,923	30,000	7.6	6	7.5"	\$1.03
1981-82	11/1	2/15	92	683	741,966	5,155,345	220,087	6.9	3	6.5"	\$2.30
21982-83	11/1	1/15	81	278	64,380	431,179	72,924	6.7	1	6.5"	\$3.43
1983-84					C L O S E D						
1984-85					C L O S E D						
1985-86					C L O S E D						
1986-87					C L O S E D						
1987-88					C L O S E D						

<sup>1</sup> Includes deadloss

<sup>2</sup> Prior to 1968-69 fishery was open 12 months/year. 1968-69 season ran 1/1/68 to 3/15/69

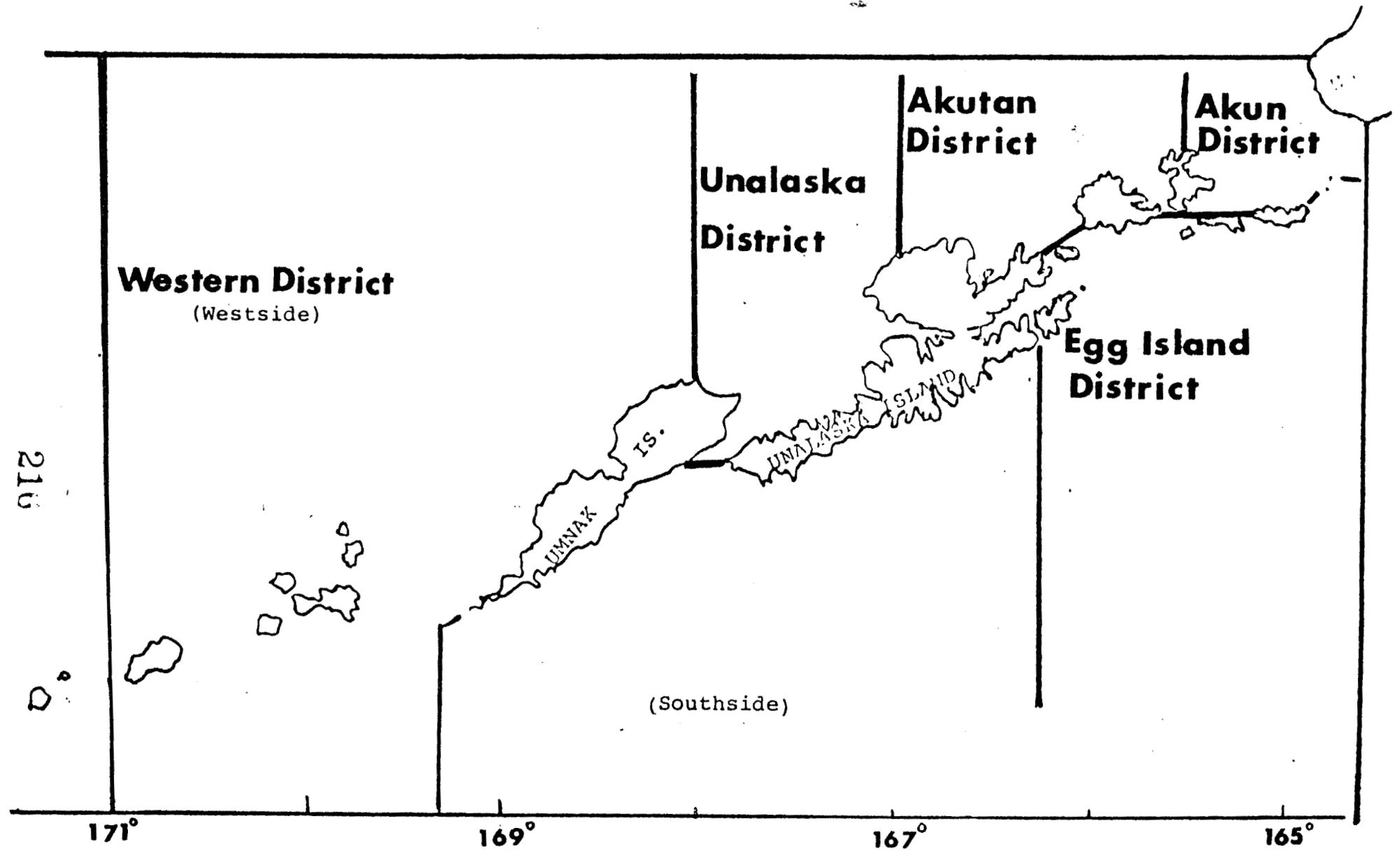


Figure 1. Dutch Harbor Statistical Area "0" and Districts.



40

41

## DUTCH HARBOR BROWN KING CRAB

### HISTORICAL BACKGROUND

Historically, Dutch Harbor brown king crab have been taken incidental to red king crab. Due to few brown king crab being landed, no landings were recorded prior to the 1981-82 season.

During the 1981-82 season, six vessels landed over 115,000 pounds during the ongoing red king crab season. Only one landing occurred during January, 1982, and the season closed along with the area red king crab season on January 15, (Tables 1 and 2).

Interest in the fishery continued to grow and during the 1982 and 83 seasons, 49 vessels landed over 1.1 million pounds in the areas first directed brown king crab fishery, (Table 1). As red king crab stocks continued to decline, effort and interest continued into the 1983-84 season, and 1.8 million pounds was landed by 47 vessels, (Table 1).

In 1984, the Board of Fisheries adopted staff proposals to lower the brown king crab size limit from 6 1/2 inches to 6 inches and established the area as a permit fishery to allow the fishery to expand into other areas outside the historical fishing grounds. During the 1984 permit season, prices and effort dropped, but 13 vessels managed to land 1.5 million pounds, (Tables 1 and 2). Since the permit system was implemented, the

fishery has managed to average over 1.6 million pounds per year. All landings from the historical grounds developed during the 1982-83 season.

### 1987 PERMIT SEASON

The 1987 Dutch Harbor brown king crab permit season opened on July 1, with 14 vessels registering, four of which were catcher/processors. The projected harvest for the season was 1.2 to 1.8 million pounds.

The fishery concentrated on historical grounds at the western boundary of the registration area. With the closure of the Bering Sea C. opilio fishery in late June, more vessels were able to enter the fishery and by the time of the closure in early September, 22 vessels had landed crab. In early August, reports of low quality, soft shell crab were being reported and on August 10, the only floating processor left the grounds and returned to Dutch Harbor. The floater reported as much as 50 percent soft shell and stated that he would not be returning to the grounds.

On August 20, Department biologists in Dutch Harbor found most of the crab being sampled were double skinned and soft shelled and showed signs of molting. At the same time, increased deadloss was also noted, most of which were molting crab.

On August 24, the Department issued an Emergency Order closing the entire Dutch Harbor area to the taking of brown king crab due to soft shell and molting crab. As of this writing, there have been no formal requests to reopen the fishery.

The fishery produced 1.4 million pounds during the two month season. Until the problems encountered in August, most of the crab were in good shape, averaging 4.6 pounds each, a little smaller than the previous year. Catch per pot decreased from 11 in 1986 to 7 crab per pot in 1987, (Table 1).

#### Stock Status

The existing stock status of the areas brown king crab stocks is still unknown but appear to remain healthy based on each years commercial fishery.

Table 1. Historic brown king crab catch in Dutch Harbor statistical Area "0".

Season	Vssls.	Lndgs.	No. Crab	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Percent Oldshell	Avg. Wt.	Avg. Length	Pounds Deadloss
1981-82	6	16	22,666	115,715	2,906	8	3.8	5.1	158.1	8,752
1982-83	49	136	227,471	1,184,971	29,369		8	5.2	158.1	47,479
1983-84	47	132	328,353	1,810,973	29,595	11	NA	5.5	NA	45,268
1984 <sup>2</sup>	13	67	327,440	1,521,142	24,044	14	NA	4.6	161.2	70,362
1985	13	67	410,977	1,968,213	34,287	12	16	4.7	155.7	38,663
1986	17	71	400,389	1,869,180	37,585	11	-	4.7	-	9,510
1987	22	77	299,734	1,383,198	43,017	7	25	4.6	138.6	24,210

<sup>1</sup> Includes deadloss

<sup>2</sup> Six inch permit season opened July 1

Table 2. Brown king crab harvest composition, Area "0", Dutch Harbor.

Season	Season Opened	Season Closed	No. Pounds <sup>1</sup>	Size Limit	Price/ Pound
1981-82	11/1	1/15	115,715	6-1/2"	\$ 2.05
1982-83	11/1	2/15	1,284,971	6-1/2"	\$ 3.00
1983-84	11/10	2/15	1,810,973	6-1/2"	\$ 3.05
1984 <sup>2</sup>	7/01	12/31	1,521,142	6"	\$ 1.35
1985	1/1	2/15	177,995	6"	\$ 1.70
	7/1	10/31	1,799,656	6"	\$ 2.00
1986 <sup>2</sup>	7/1	12/31	1,869,180	6"	\$ 2.85
1987	7/1	9/2	1,383,198	6"	\$ 2.85

<sup>1</sup> Deadloss included

<sup>2</sup> Partial closure 9/27 west of 169° 30'

Table 3. Dutch Harbor brown king crab catch, by month, for the 1987 six inch permit season.

Month	Vssls.	Lndgs.	Nb. Crab <sup>1</sup>	Nb. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
July	17	31	129,063	594,043	15,186	4.60	8	21,100
August	18	38	149,831	656,380	23,054	4.63	6	3,110
Sept.	8	8	29,027	132,775	4,777	4.57	6	0
Season Total	22	77	299,734	1,383,198	43,017	4.61	7	24,210

<sup>1</sup> Deadloss included

Table 4. Dutch Harbor brown king crab catch by statistical area for the 1987 permit season.

Stat. Area	Lndgs.	No. Crab	No. Pounds <sup>1</sup>	Pots Lifted	Wt.	CPUE	Pounds Deadloss
685304	5	4,613	21,757	968	4.72	5	0
695200	1	571	2,960	430	5.18	1	0
695232	1	3,616	16,165	640	4.47	6	0
695234	3	8,398	35,700	1,806	4.25	5	1,000
695301	9	26,018	117,579	4,452	4.52	6	0
695302	5	9,525	44,220	789	4.64	12	0
705200	25	128,306	586,095	15,617	4.57	8	14,010
705230	22	88,836	421,958	13,674	4.75	6	9,200
705300	6	24,798	113,014	3,791	4.56	6	0
Season Total	76	299,734	1,383,198	43,017	4.61	7	24,210

<sup>1</sup> Deadloss included

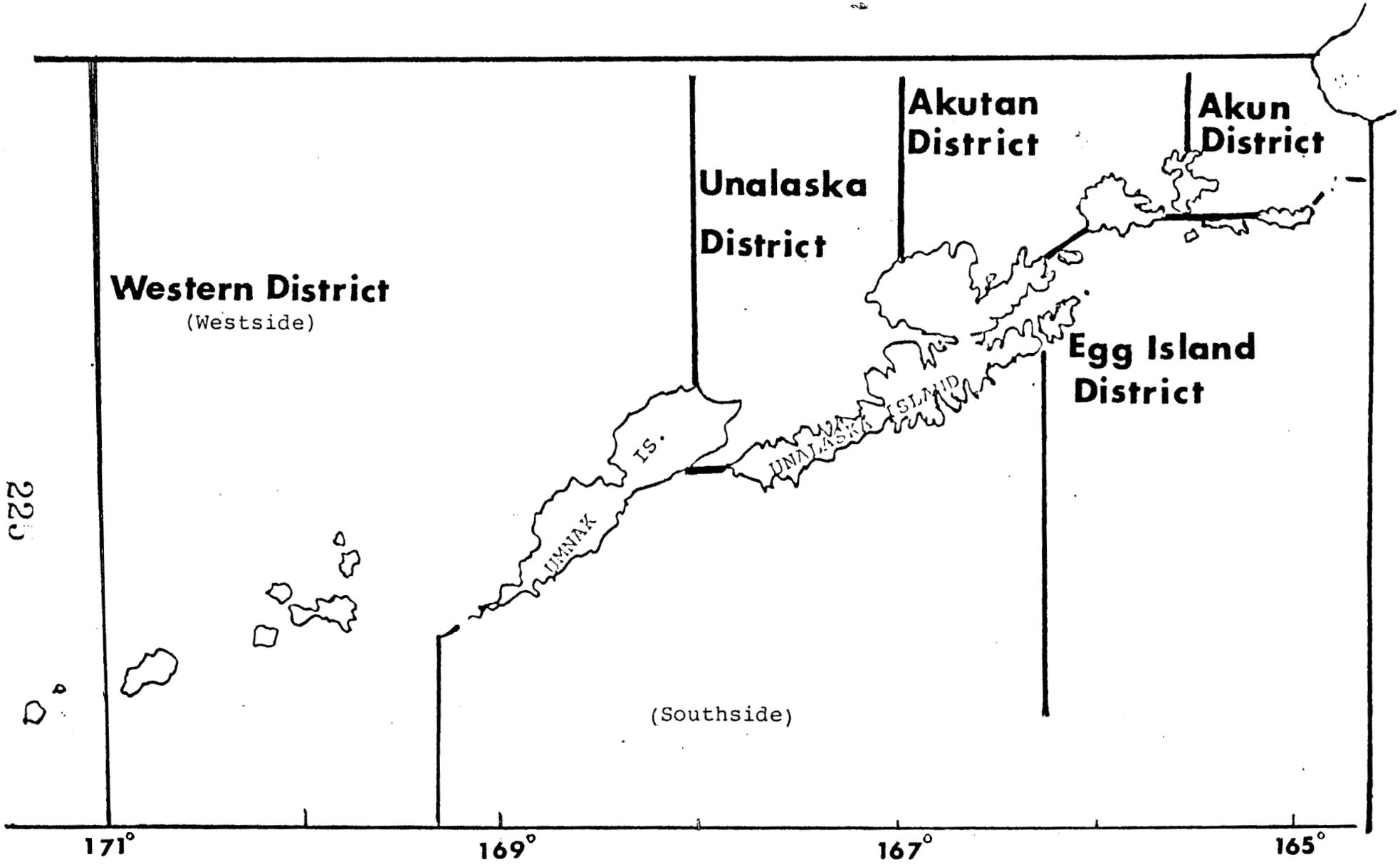


Figure 1. Dutch Harbor Statistical Area "0" and Districts.

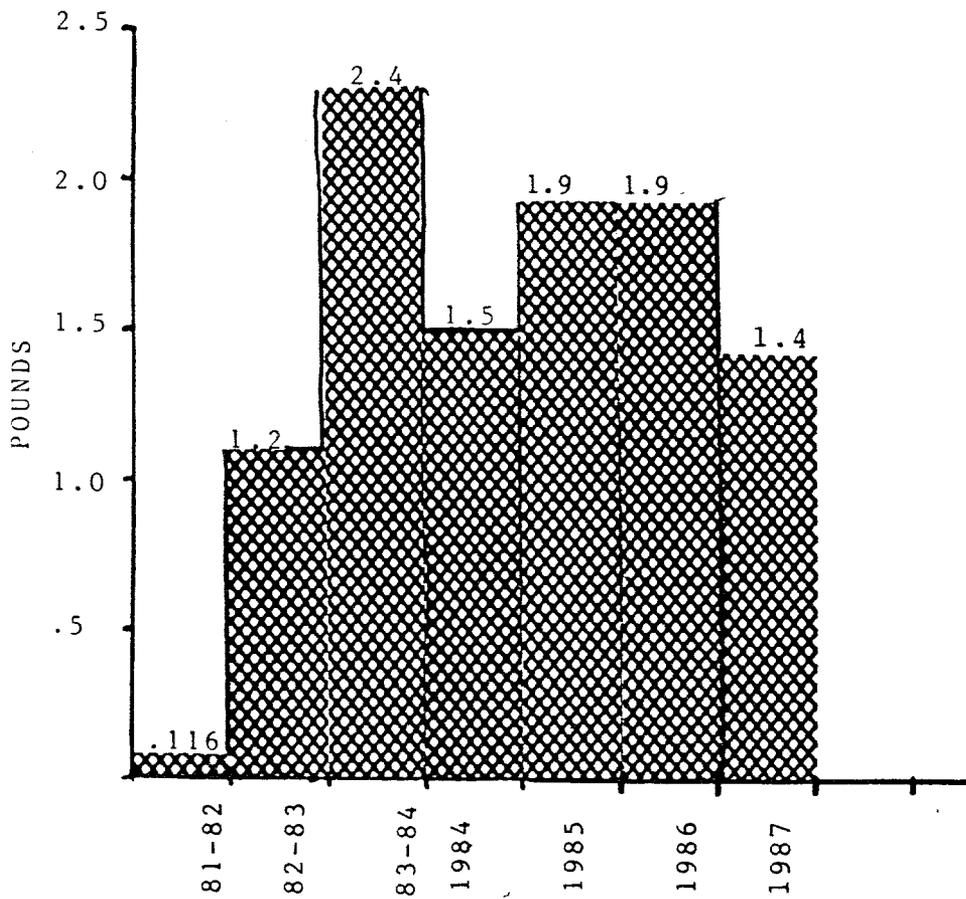


Figure 2. Historic Dutch Harbor brown king crab catch by season.

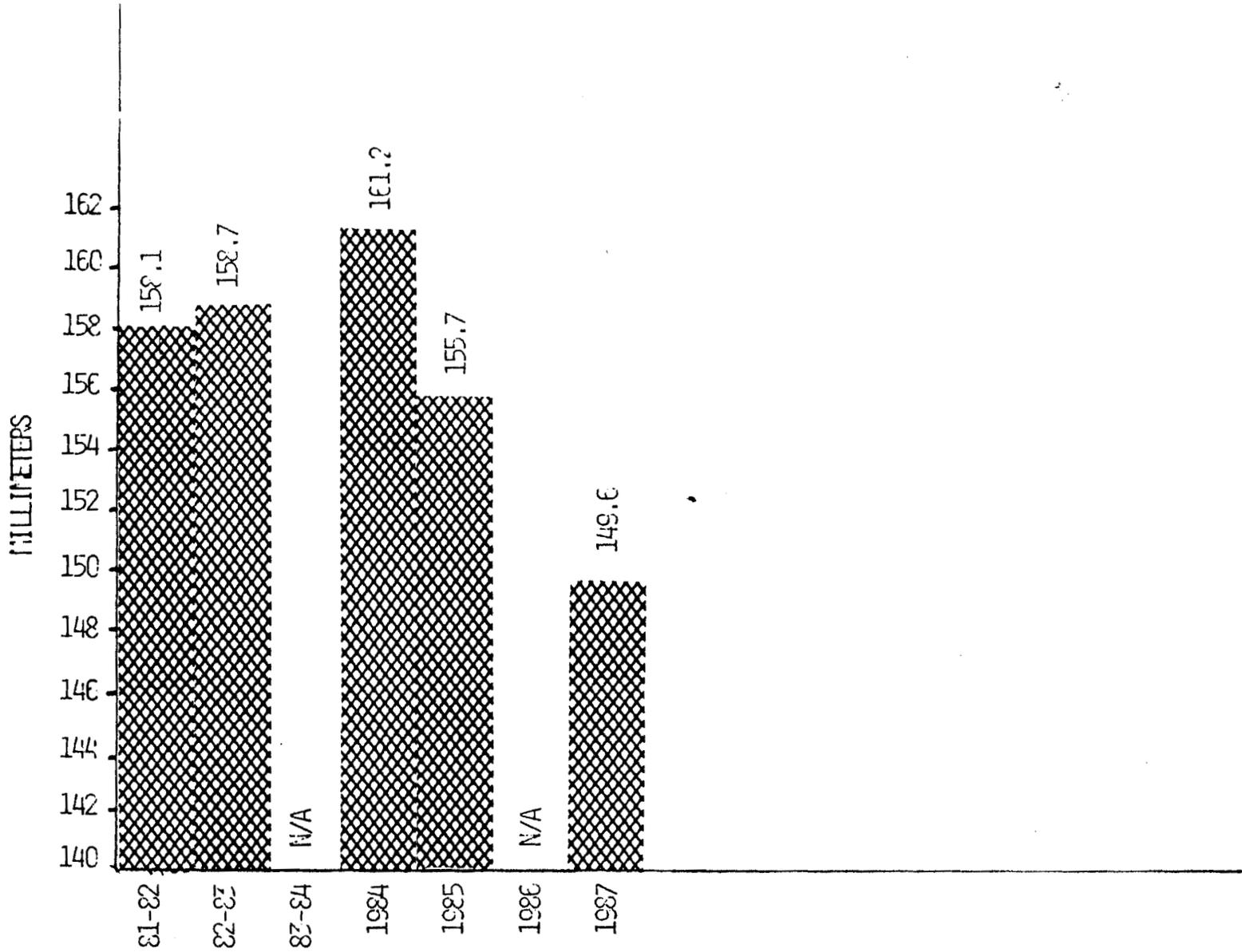


FIGURE 3. HISTORIC DUTCH HARBOR BROWN KING CRAB LENGTH FREQUENCIES.



## EASTERN ALEUTIANS TANNER CRAB

### Introduction

The Eastern Aleutians District is apparently a marginal habitat for Chionoecetes bairdi, as the crab are only found in commercial quantities in a few of the major bays and inlets. The fishery is rather small and although the 1977-78 season produced a record 2.4 million pounds, the seasonal catches have been less than one million pounds (Table 1). The fishery began with vessels fishing the waters of Akutan and Unalaska Bays, but has since expanded to include nearly all areas known to be inhabited by tanner crab.

### 1987 Fishery

The area opened to fishing at 12:00 noon on January 15. Most effort this year was concentrated in Unalaska Bay, primarily from local boats based in Unalaska/Dutch Harbor. Several larger vessels fished other traditional areas such as; Beaver Ilet, Makushin Bay and Akutan Bay, but did not stay in the area and move their gear to the Bering Sea C. opilio fishery, (Table 3).

A total of 160,292 pounds was harvested by seven vessels, of which 53 percent, 85,232 pounds, came from Unalaska Bay, (Table 3). After the larger vessels left in late February, catches began to decline and by late May, there was no effort in the

district at all, (Table 2). Average weight decreased slightly, but catch per pot almost doubled from the previous season, (Table 1).

#### Stock Status

The status of the Eastern Aleutian Tanner crab stocks are unknown, but appear to remain stable based on commercial catch and survey results. Effort is expected to remain stable with smaller, local vessels producing the most catch out of Unalaska Bay.

Table 1. Historic Chionoecetes bairdi, 5 1/2 inches, fishery statistics from the Eastern Aleutians district.

Season	Opened	Closed	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Avg. Lngth.	Price/Pound
1973-74	10/1	7/31	6	14	210,539	498,836	NR <sup>2</sup>	2.4	60	NR	\$ .NR
1974-75	1/18/75	10/15	2	3	34,712	77,164	856	2.2	41	NR	.102
1975-76	1/20/76	10/15	8	13	219,166	534,295	4,646	2.4	47	156.2	.196
1976-77	11/7	6/15	12	35	544,755	1,239,569	9,640	2.3	57	NR	.30
1977-78	11/1	6/15	15	198	1,104,631	2,494,631	2,494,488	29,523	1.3	37	NR.38
1978-79	11/1	6/15	20	174	542,081	1,280,115	18,618	2.4	20	NR	.52
1979-80	11/1	6/15	18	107	352,819	886,487	18,040	2.4	20	NR	.52
1981	1/15	6/15	29	119	264,238	654,514	21,771	2.4	12	151.8	.58
1982	2/15	6/15	31	138	332,260	739,694	30,109	2.2	11	147.5	1.25
1983	2/15	6/15	23	107	250,774	547,830	22,168	2.1	11	148.2	1.20
1984	2/15	6/15	16	91	104,761	239,585	11,069	2.3	9	147.8	.98
1985	1/15	6/15	6	56	71,918	165,529	5,620	2.3	13	N/A	1.30
1986	1/15	6/15	9	37	73,187	167,339	10,244	2.3	7	N/A	1/50
1987	1/15	6/15	7	63	71,338	160,292	5,294	2.2	13	N/A	2.0

<sup>1</sup> Deadloss included beginning 1980

<sup>2</sup> No record

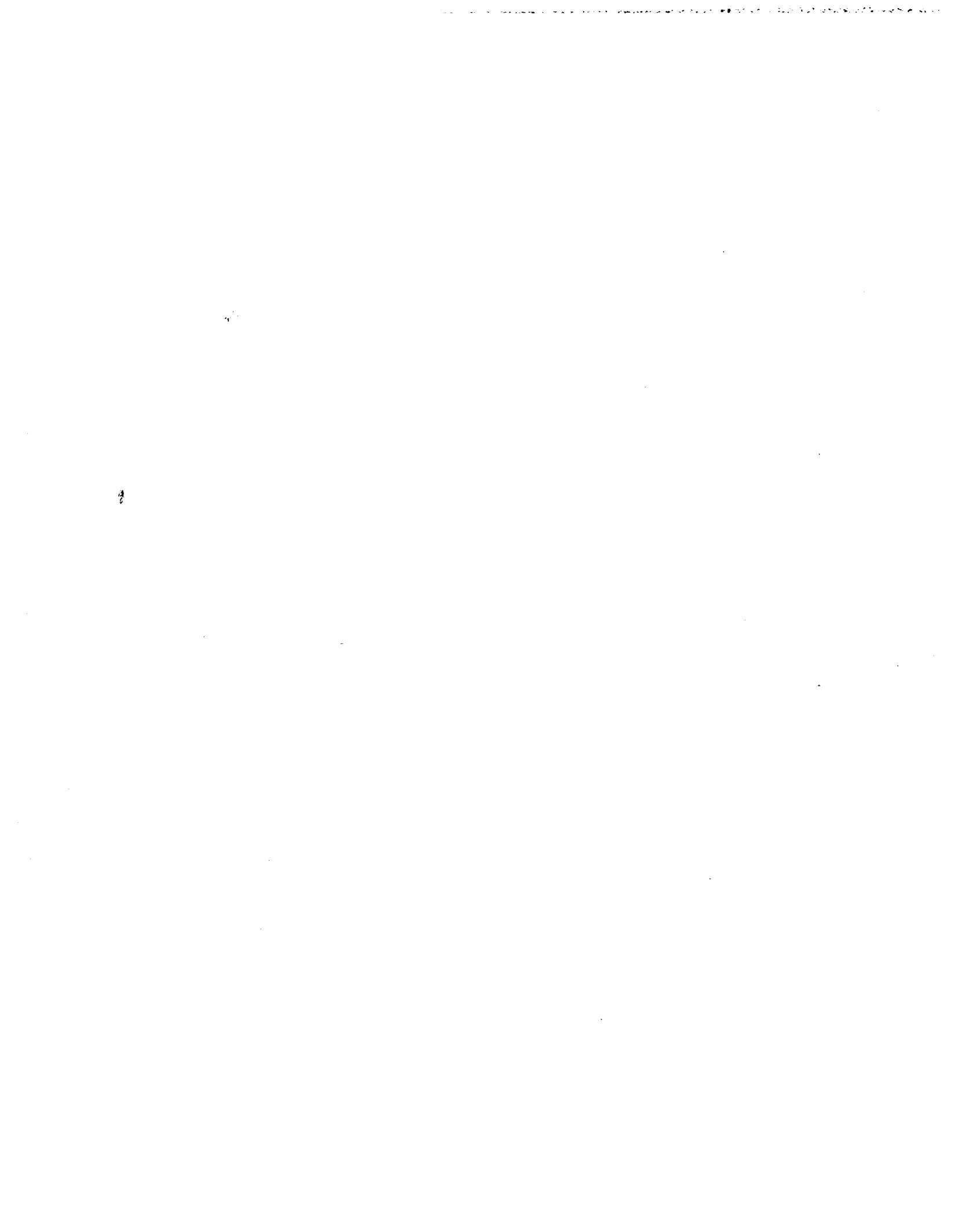
Table 2. Chionoecetes bairdi catch by month for the Eastern Aleutian District for 1987 season.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Dead-Loss	
January	4	8	14,022	30,485	550	2.17	25	0	
February	6	24	30,493	68,289	2,190	2.24	14	40	
March	5	15	19,535	45,289	1,656	2.31	12	75	
April	3	11	6,318	14,082	629	2.22	10	0	
May	4	5	967	2,150	269	2.22	4	0	
June	NO FISHING								
TOTAL	7	63	71,338	160,292	5,294	2.25	13	115	

Table 3. Chionoecetes bairdi catch by Statistical area for the Eastern Aleutian district.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Dead-Loss
655 406	1	353	883	50	2.5	7	0
665 332	3	5,677	13,025	246	2.3	23	0
665 333	5	5,039	11,238	316	2.2	16	0
665 334	2	1,487	3,069	95	2.1	16	0
665 335	44	39,158	85,232	3,249	2.2	12	115
665 336	1	1,210	2,530	72	2.1	17	0
675 332	3	4,473	10,890	390	2.4	11	0
675 332	4	13,941	33,425	876	2.4	16	0
TOTAL	63	71,338	160,292	5,294	2.25	13	115

<sup>1</sup> Includes deadloss





## ALEUTIAN DUNGENESS CRAB

### Introduction

The Aleutian District includes all waters of statistical Area "J" west of the longitude of Cape Sarichef and encompasses all the Aleutian Islands.

The islands in the Aleutian chain are separated from each other by deep passes and swift currents and are closely bordered on the north and south by deep trenches. Red and brown king crab are found in the deep waters adjacent to the "Chain", but the Dungeness crabs prefer the shallower bays. The shallow areas suitable to Dungeness populations are few and far between; explaining the low-key Dungeness fishery in the district.

### Historical Background

The Aleutian District fishery is primarily a small vessel, summer fishery occurring in the vicinity of Unalaska/Akutan islands.

Interest and activity in the fishery has been very erratic from year to year, with the first reliable reports made in 1970. The greatest catch reported prior to the 1984-85 fishery was 60,517 pounds (Table 1). Since 1974, deliveries have ranged from zero in 1976, 1977, and 1980 and 1981 to 36,034 pounds in 1982 (Table 1).

## 1987 Fishery

The Eastern Aleutian fishery opened by regulation on May 1, but no effort occurred until July, (Table 2). A total of five local vessels participated in the fishery with the entire catch being taken from Unalaska Bay.

With more vessel effort this year, the catch more than doubled the 10,900 pounds taken in 1986 and totaled 26,627 pounds. Average weight decreased 0.2 of a pound and catch per pot remained the same at 4 crab, (Table 1).

Increased effort from the smaller vessels (under 32 feet) can be expected in the future. Little is known about the existing stocks, but they appear to be supportive of a small fishery.

Table 1. Historic Dungeness crab catch in the Aleutian District.

Year	Season	Vssls.	Lndgs.	No. Crab	No. Pounds-	Pots Lifted	Avg. Wt.	CPUE	Price/Pound
1974	1/1-12/31	3	12	24,459	60,517	3,399	4.5	7	NR
1875	1/1-12/31	1	3	1,495	4,408	924	3.0	2	\$ .25
1976	5/1-12/31			N O	C A T C H				
1977	5/1-12/31			N O	C A T C H				
1978	5/1-12/31	2	9	7,987	18,034	2,312	2.2	3	\$ .50- \$1.00
1979	5/1-12/31	1	4	471	1,101	116	2.3	4	\$ .50- \$ .65
1980	5/1-12/31			N O	C A T C H				
1981	5/1-2/1			N O	C A T C H				
1982-83	5/1-2/1	2	9	13,526	36,034	3,940	2.7	3	\$ .60- \$ .70
1983-84	5/1-2/1	2	14	4,221	8,975	790	2.1	5	\$ .90- \$1.05
1984-85	5/1-2/1	4	50	40,128	91,739	13,555	2.3	3	\$1.15- \$1.50
1985	5/1-12/31	3	19	8,590	17,830	1,706	2.1	5	\$ .70
1986	5/1-12/31	2	9	4,851	10,897	1,095	2.2	4	\$ .90
1987	5/1-12/31	5	152	13,247	26,627	2,987	2.0	4	\$ .95

Table 2. 1987 Aleutian District Dungeness catch by month.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
May							
June							
July	2	12	4,077	8,100	784	2.0	5
Aug.	4	14	5,467	11,056	974	2.0	6
Sept.	5	10	1,440	2,941	544	2.0	5
Oct.	3	6	2,058	4,120	585	2.0	3
Nov.	1	1	205	410	100	2.2	2
Dec.			NO FISHING				
TOTAL	5	152	13,247	26,627	2,987	2.0	4

<sup>1</sup> Deadloss included

Table 3. 1987 Aleutian District Dungeness catch by statistical area.

Stat. Area	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE
665335	5	152	13,247	26,627	2,987	2.0	4

<sup>1</sup> Deadloss included





## EASTERN ALEUTIAN SHRIMP

### Introduction

The Aleutian shrimp district of Area "J" includes all waters west of the longitude of Cape Sarichef. The Aleutian District includes four separate sections: Unalaska Bay, Makushin Bay, Usof Bay and Beaver Inlet.

### Historical Background

Shrimp has been fished in the Aleutian District since 1972, when two vessels first explored the area and delivered 94,627 pounds (Table 1). Catch and effort increased in subsequent years to a peak of 6.8 million pounds in 1977-78 (Table 1). Since 1978 the Aleutian shrimp fishery has suffered sharp declines in catches and reduced seasons (Tables 1 and 2).

### 1987 Fishery

There was no active fishery during 1987, although most of the unquoted area were open.

### Stock Status

Though there have been no surveys in the Aleutian District since October 1983, shrimp stocks probably remain in a severely depleted condition.

Table 1. Historical trawl shrimp fishery statistics for the Aleutian District.

Season <sup>1</sup>	Opened	Closed	Vssls.	Lndgs.	Tows	No. Pounds	Average Price/Lb.
1972	1/72	12/72	2	6	11	94,627	NR
1973	1/73	12/73	1	8	8	456,179	NR
1974	1/74	12/74	7	88	721	5,749,407	NR
1975	1/75	12/75	3	14	129	893,567	\$ .065
1976	1/76	12/76	8	66	689	3,670,609	\$ .072
1977-78	2/77	3/78	7	93	1,372	6,800,393	\$ .12
1978-79	4/78	3/79	7	74	1,007	4,946,350	\$ .15
1979-80	4/79	2/80	7	68	799	3,292,049	\$ .20
1980	3/80	12/80	4	60	711	2,454,829	\$ .23
1981	3/81	12/81	6	45	551	2,185,326	\$ .22
1982-83	5/82	6/83 <sup>2</sup>	2	12	202	341,551	\$ .20
1983			NO	FISHING			
1984			NO	FISHING			
1985			NO	FISHING			
1986			NO	FISHING			
1987			NO	FISHING			

<sup>1</sup> Season years: 1972 to 1976 by calendar year. 1977-78 ran February 77 to March 78. 1978-79 and 1979-80 April to March. 1980-81 hence March to February.

<sup>2</sup> Catch occurred May and June 1982.

Table 2. Aleutian shrimp catch in pounds by month for the years 1977-1986.

Month	1979	1980	1981	1982	1983 <sup>2</sup>	1984 <sup>2</sup>	1985 <sup>2</sup>	1986 <sup>2</sup>	1987 <sup>2</sup>
January	193,805	113,758	NF	NF	-	-	-	-	-
February	141,501	128,845	NF	NF	-	-	-	-	-
March	150,069	496,689	155,810	NF	-	-	-	-	-
April	186,362	371,080	428,793	NF	-	-	-	-	-
May	320,488	145,813	849,779	189,048	-	-	-	-	-
June	159,526	NF	495,103	152,503	-	-	-	-	-
July	605,689	NF	NF	NF	-	-	-	-	-
August	668,297	NF	NF	NF	-	-	-	-	-
Sept.	298,100	NF	NF	NF	-	-	-	-	-
October	NF	NF	NF	NF	-	-	-	-	-
November	358,573	240,986	55,080	NF	-	-	-	-	-
December	452,411	520,644	200,761	NF	-	-	-	-	-
Total	3,534,821	2,017,815	2,185,326	341,551	-	-	-	-	-

<sup>1</sup> No fishing

<sup>2</sup> Quotaed areas closed



## 1987 EASTERN ALEUTIANS SCALLOPS

### 1987 FISHERY

This is the third season for the Eastern Aleutians developing scallop fishery. Only two vessels, and a catcher processor, participated in the fishery compared to last year's five vessels, two of which were catcher-processors, (Table 1).

The 1987 catch of 192,312 pounds was less than half of the previous season and riddled with thousands of pounds of misreporting and fishing closed waters during the months of April, May and June.

With the closure of some productive grounds to bottom trawling in 1986, much of the area fished in 1985 was unavailable to the fleet. New grounds south of Unimak Pass had been developed during 1986, but produced smaller scallops and apparently could not support continued fishing by two vessels. In late January, the first reported catches from the Bering Sea just north of Unimak Island were made.

As the catches continued to decline in the area south of Unimak Pass, a catcher/processor began to "explore" new grounds. During the months of April, May and June, this vessel misreported 26,150 pounds of scallops; 18,392 pounds of which were taken in the closed waters of Unimak Bight, 1,773 pounds

taken in the Eastern Aleutians reported as Bering Sea; and 3,372 pounds taken in the Bering Sea and reported as the Eastern Aleutians, (Tables 1 and 2).

During routine surveillance by Fish and Wildlife officers flying the False Pass salmon fishery in June, the catcher/processor was seen in the closed waters of Unimak Bight, south of Unimak Island. With further investigation, enough evidence was gathered to get a search warrant. In June, the vessel was boarded by FWP officers and subsequently seized for fishing in closed waters and misreporting catch. The vessel was taken to Kodiak and since its release, has not re-entered the scallop fishery in this area.

A total catch of 209,105 pounds was reportedly taken from the Eastern Aleutians, but with the misreporting documented through the vessels logs, a total of only 192,312 pounds was actually taken from the Eastern Aleutians, (Table 2).

Catches appear to be declining in this area after producing only 1.1 million pounds over a three year period. Other grounds may be available to the fleet, but to date it appears that catches will continue to decline in 1988.

TABLE 2. 1987 EASTERN ALEUTIAN SCALLOP CATCH BY MONTH

MONTH	VESSELS	LANDINGS	NO. POUNDS	NO. DRAGS
JANUARY		NO FISHING		
FEBRUARY	1	1	15,083	430
MARCH	1	1	23,627	643
APRIL			3,372	No Catch Reported <sup>1/</sup>
MAY	2	3	35,915	(40,860 <sup>2/</sup> )
JUNE			No Actual Catch	(15,220 <sup>3/</sup> )
JULY	2	2	40,810	552
AUGUST	1	1	16,150	240
SEPTEMBER	1	1	20,250	240
OCTOBER	1	1	16,500	200
NOVEMBER	1	1	12,840	240
DECEMBER	1	1	7,765	140
TOTAL	2	13	192,312	(209,105) <sup>4/</sup> 3,569

1/ 3,372 Pounds misreported as Bering Sea

2/ 4,945 Pounds misreported to Eastern Aleutians: (1,773 from the Bering Sea; 3,172 from the South Peninsula

3/ Total catch came from South Peninsula but reported as Eastern Aleutians

4/ Total over-reported by a net poundage of 16,793 pounds; (3,372 Reported as Bering Sea; 1,773 to Bering Sea; 18,392 to South Peninsula

Table 1. Historical scallop fishery statistics for the Eastern Aleutian District.

Season	No. Vssls.	No. Lndgs.	No. Pounds	No. Drags	Avg. Lbs/Drag	Avg. Price/Lb
1985	2	23	547,164	4,218	130	\$ 3.50
1986	5	37	406,642	8,754	46	\$ 3.50
1987	2	13	192,312 (209,105) <sup>1/</sup>	3,569	58	\$ 4.00

<sup>1/</sup> 192,312 lbs. actual catch with an additional (net total of 16,793 lbs. misreported catch (3,372 lbs. misreported as Bering Sea; 1,773 lbs. from the Bering Sea, 18,392 lbs. from South Peninsula).

## EASTERN ALEUTIANS MISCELLANEOUS SPECIES

Small amounts of sea urchins, hair crab and octopus were landed from the Eastern Aleutians during 1987, mostly by small locally based vessels.

The total catch from all miscellaneous species from the district was 4,399 pounds, of which 2,140 was Octopus, 1,799 was sea urchins, and 460 was hair crab. Effort is sporadic and is based on marketability of the species sought.

Effort is expected to remain small and to date there have been no permits issued for the district in 1988.



WESTERN ALEUTIANS MANAGEMENT AREA  
SHELLFISH MANAGEMENT REPORT  
TO  
ALASKA BOARD OF FISHERIES

APRIL 1988

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST  
DAN URBAN - FISHERY BIOLOGIST

Dutch Harbor Area Office  
P. O. Box 308  
Dutch Harbor, Alaska 99692  
(907) 581-1239



## ADAK BROWN KING CRAB

### Historical Background

The Adak (Area "R") brown king crab fishery began during the 1975-76 season when 25,000 pounds were caught. Occurring incidentally to the red king crab fishery, catches of brown crab were low during the 1975-76 to 1980-81 seasons (Table 1).

Fishermen began to target on brown king crab for the first time during the 1981-82 season when 14 vessels made 76 landings totaling 1.2 million pounds (Table 1). When the fishery first began, most of the catch came from the North Amlia and Petrel Bank districts, and lately the Western Aleutian District has become a significant producer as well. Lacking the large inter-island passes where brown king crab are most numerous, the other three districts in Area "R" produce much lower catches. In July 1985, the size limit was reduced from 6.5 to 6 inches.

### 1986-87 Fishery

The season opened by regulation on November 1, concurrent with the red king and Tanner crab fisheries. During registration, vessel operators were asked if they planned to target on brown king crab, with approximately 50 vessels indicating they were.

Catch prior to the holiday season produced over 2 million pounds,

comparable to the same period during the 1985-86 season. Although most vessels actually stopped fishing during the holidays, gear was left on the grounds and when the vessels returned in mid-January, 769,000 pounds was landed for the month, (Table 2). With the exceptions of January and August, when the fishery closed, effort and catch remained consistent throughout the entire 9 1/2 month season, producing 12.8 million pounds, 1.8 million pounds more than the 85-86 season (Table 1, Figure 2). Average catch per pot dropped from 12 legal crab during the 85-86 season to only 7 crab during the 86-87 season, (Table 1). Average weights and average lengths also decreased during the 86-87 fishery, (Table 1 and Figure 1).

A total of 62 vessels landed brown king crab from Adak during the season, of which 15 were catcher/processors. A total of four floater processors were on the grounds to buy crab, but only one floater returned to the area after the opening of the Bering Sea Tanner crab season in January 1987. Both the Departments of Fish and Game and Public Safety were unable to monitor the Adak fishery on the grounds to either department's satisfaction.

On August 6 a News Release was issued requesting vessels fishing Adak to be in Dutch Harbor prior to 48 hours after the Adak closure (Figure 4). The fishery closed by regulation at midnight August 15 which meant vessels were to be in Dutch Harbor no later than midnight August 17, 1987. On August 12 an Emergency Regulation was issued which required all vessels fishing Adak king crab as of 4:00 pm, August 12 to report to Dutch Harbor in the same manner as requested by the August 6 News Release (Figure 5).

A cooperative effort by three State agencies, the Alaska Department of

Fish and Game, Department of Public Safety, Division of Fish and Wildlife Protection, and Department of Environmental Conservation was made to examine these catcher/processor vessels once they arrived in Dutch Harbor. Catcher/processors were of particular interest to each of these departments due to public concern over their activities.

All six catcher/processors and two fishing vessels that reported to Dutch Harbor were boarded and checked. The catcher/processor boarding typically took place with one or two ADF&G biologists, one DEC officer and three to five FWP officers. Not all personnel attended every contact with the vessels. Several of the inspections were also attended by a member of the Attorney General's office who was in close contact with biologists and officers on all boardings. All vessels and crew were checked for license requirements, and DEC regulations governing processing. Also checked was the crab aboard (live or frozen). The frozen product was inspected usually at time of offloading. This typically was accomplished by removing several cases of crab off each pallet load as it was removed from the freezers. These cases would be opened, inspected, and rebanded, usually prior to the next pallet leaving the freezer. Additionally, boxes would be removed from the next pallet and replaced with inspected boxes. This routine did not allow the processed frozen crab sections to be out of the freezer for more than two to three minutes.

Of the seven catcher/processors boarded two had live crab aboard. One of these vessels was cited for 6.1% undersize crab when these crab were measured. The crew was unable to produce a measuring stick when requested. The vessel received a \$3500 fine and forfeiture of \$1440 (value of the

undersize crab). The undersize percentage forfeiture was applied to live crab only and not to the frozen product aboard.

The other catcher/processor with live crab aboard submitted a fish ticket for crab which indicated only 60% of what was actually in possession. These crab were never processed due to diesel fuel contamination in the fish hold. A \$750 fine was levied with a suspended imposition of sentence.

Four other catcher/processors boarded had only frozen, processed crab aboard. These crab were checked to determine compliance with regulations. Two of these vessels had 0.6% -1.3% illegal crab of the sectioned crab inspected. No citations were issued for these crab due to the small percentage observed. In the frozen product of the vessel cited for undersized crab, 0.5% illegal crab also was observed, with no citation issued due to small percentage.

Gear violations were found on two of the five catcher/processors with no biodegradable escape panel in their pots as required by 5AAC 39.145. Both vessels received a \$2500 fine with all seized gear returned.

DEC cited two of these catcher/processors for not having a permit from DEC to operate. Citations were also issued for illegal discharge of sewage in state waters as well as discharge of processing waste without a permit.

This look at the catcher/processor vessels does indicate that problems do exist with this segment of the industry. It also showed that not all catcher/processors are violating state regulations and this should be

considered when restrictions are adopted. These boardings also yielded insight into violations concerning raw fish tax. To date several catcher/processor names have been reported to the Department of Revenue for possible violations of the state's raw fish tax regulations. The violation being investigated is processing in state waters, while possessing a permit for outside of state waters, and therefore, claiming no raw fish tax is due.

#### 1987-88 Fishery Preliminary Report

The fishery opened on November 1 and to date approximately 46 vessels have registered to fish brown king crab in Area R; of these 10 were catcher/processors. Preliminary figures indicate a drastic decline in catch, with only 2.7 million pounds landed through February. Most effort stopped during the holiday season, and was reduced to 10 vessels as effort shifted to the Bering Sea Tanner crab fishery.

Table 1. Historic brown king crab catch in Adak, Area "R".

Season	Opened	Closed	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Percent Newshell	Avg. Length	Min. Size	Price/Pound	Deadloss
1975-76	11/01	12/18	1	1	4,420	25,490	285	5.8	16	N/A	N/A	6.5"	N/A	N/A
1976-77	01/07	04/15	2	2	466	2,285	110	4.9	4	N/A	N/A	6.5"	\$ .75	N/A
1977-78	02/20	03/20	1	1	9,358	47,445	1,200	5.1	8	N/A	N/A	6.5"	\$1.30	N/A
1978-79	02/21	10/01	0	0	0	0	0	-	-	-	-	6.5"	-	0
1979-80	01/15	04/01	1	1	4,536	23,485	325	5.2	14	N/A	N/A	6.5"	\$ .65	N/A
1980-81	01/15	03/28	4	4	11,523	58,914	700	5.1	17	97.6	158.4	6.5"	\$ .90	5,000
1981-82	11/01	06/15	14	76	217,700	1,194,046	24,627	5.5	9	90.5	159.6	6.5"	\$2.06	22,064
1982-83	11/01	04/15	99	501	1,509,001	8,006,274	150,103	5.3	10	92.4	158.2	6.5"	\$3.01	220,743
1983-84	11/10	04/15	157	1,002	1,534,909	8,128,029	226,798	5.3	7	87.8	N/A	6.5"	\$2.92	171,021
1984-85	11/10	07/08	38	85	643,597	3,180,095	64,777	4.9	10	87.5	156.7	6.5"	-	125,073
1985-86 <sup>2</sup>	11/01	08/15	49	386	2,452,048	11,024,759	202,401	4.5	12	86.3	151.3	6.0"	-	5,304
1986-87	11/01	08/15	62	525	2,923,947	12,798,004	392,185	4.4	7	69.1	149.5	6.0"	\$3.00	276,736
1987-88 <sup>3</sup>	11/01		46			2,107,196								

<sup>1</sup> Deadloss included.  
<sup>2</sup> Size limit reduced to six inches.  
<sup>3</sup> Season in progress.

250

Table 2. 1986-87 Adak, Area "R", brown crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	37	57	263,068	1,191,140	31,134	4.5	8	4,014
December	36	48	253,547	1,167,772	30,607	4.6	8	41,460
January	25	31	169,367	769,268	19,410	4.5	9	45,400
February	32	67	333,171	1,462,365	41,762	4.4	8	22,992
March	34	57	343,296	1,485,903	33,080	4.2	10	33,900
April	32	52	335,707	1,437,588	44,037	4.3	8	28,600
May	32	57	403,272	1,716,646	64,692	4.2	6	20,292
June	31	60	353,316	1,542,729	60,689	4.4	6	47,650
July	23	51	308,118	1,328,535	41,859	4.3	7	28,900
August	21	45	171,746	739,275	26,801	4.2	6	3,528
Total	62	525	2,923,947	12,798,004	392,185	4.4	7	276,736

<sup>1</sup> Deadloss included.

Table 3. Preliminary 1987-88 Adak Area "R" brown king crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	41	75	273,838	1,154,413	39,068	4.21	7	12,500
December	42	63	227,379	1,007,977	30,398	4.43	7	7,100
January	16	21	91,237	383,039	11,995	4.20	8	25,500
February	10	8	51,145	221,058	7,297	4.29	7	2,075
Total <sup>2</sup>	50	167	643,599	2,766,487	88,758	4.30	7	47,175

<sup>1</sup> Deadloss included.

<sup>2</sup> Preliminary figures.

Table 4. 1986-87 Adak brown king crab catch by statistical area.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Dead/loss
715201	4	26,026	114,358	3,191	4.39	8	900
715202	44	285,414	1,300,176	30,402	4.55	9	12,083
715231	30	184,415	789,720	23,515	4.28	9	9,100
715232	11	85,380	383,202	7,924	4.49	11	24,983
715300	1	3,747	22,485	3,800	6.00	1	0
725130	2	796	3,580	200	4.50	4	0
725201	31	160,969	722,983	20,868	4.49	8	600
725203	6	15,024	67,440	1,518	4.49	10	0
725230	6	59,679	263,484	5,660	4.41	10	1,000
735130	3	21,179	95,310	5,557	4.50	4	1,800
735201	8	42,694	194,417	10,470	4.55	4	5,200
735230	4	17,487	76,845	3,550	4.39	5	650
745204	2	23,336	105,010	2,400	4.50	10	4,800
745206	2	2,055	9,250	200	4.50	9	0
755132	2	8,713	36,160	1,250	4.13	7	100
755201	2	8,768	38,735	750	4.18	12	700
765100	2	11,133	45,200	1,700	4.06	6	5,100
765132	2	7,573	31,550	3,250	4.17	2	100
765203	1	8,611	38,750	600	4.50	14	300
775131	19	60,662	246,871	9,840	4.07	6	1,800
775133	1	4,366	22,077	450	5.06	10	0
775134	1	4,044	20,648	500	5.10	8	0
775135	1	4,044	20,648	500	5.10	8	0
775136	2	7,670	35,516	1,100	4.63	7	0
785101	1	10,684	46,230	1,750	4.32	6	3,250
785102	1	17,284	83,864	1,486	4.85	12	11,000
785103	1	186	800	60	4.30	3	0
785131	10	84,402	398,910	10,301	4.73	10	20,650
785132	1	5,838	30,355	700	5.20	8	0
785134	1	1,400	6,351	200	4.54	7	0
785135	5	15,415	69,950	7,230	4.54	2	7,000
785430	1	851	3,830	120	4.50	7	100
795101	1	186	799	60	4.30	3	0
795102	2	14,963	68,598	824	4.58	18	0
795131	3	33,175	142,200	2,700	4.29	12	16,900
795132	9	77,254	333,561	9,353	4.32	8	23,525
795135	1	186	799	60			0
795200	9	24,204	108,781	6,597	4.49	4	3,766
795230	6	22,308	111,540	3,326	5.00	7	0
795400	3	11,089	46,030	2,202	4.15	5	100
805101	3	6,396	24,464	873	3.82	7	0
805102	2	8,738	37,466	1,100	4.29	8	0
805103	10	70,509	291,217	5,266	4.13	13	13,715
805131	6	19,281	87,590	2,017	4.54	9	0
805132	43	272,486	1,206,055	21,361	4.43	13	4,399

-continued-

Table 4. (page 2 of 2)

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
805133	3	13,612	52,902	1,507	3.89	9	0
805201	36	154,756	666,994	24,347	4.31	6	7,625
805202	1	5,342	24,775	880	4.64	6	0
805230	1	10,071	47,965	1,913	4.76	5	0
805400	4	20,394	88,468	2,160	4.33	9	0
815100	3	12,264	56,686	1,608	4.62	8	1,000
815131	9	48,058	239,478	5,475	4.98	9	700
815132	1	8,066	32,105	642	3.98	12	0
815134	6	33,795	158,776	4,220	4.70	8	11,000
815201	2	18,036	74,495	2,000	4.13	9	6,000
825132	1	5,058	26,131	670	5.17	7	
825133	2	7,929	40,120	1,250	5.06	6	350
825201	10	53,687	235,400	6,555	4.38	8	300
825202	1	2,024	7,690	200	3.80	10	0
825203	11	45,658	189,081	5,403	4.14	8	0
835130	9	50,517	212,496	5,436	4.21	9	1,130
835200	28	160,916	663,288	23,250	4.54	6	5,700
845130	5	29,412	117,574	2,833	4.00	10	7,350
845201	7	30,306	123,882	4,390	4.09	7	4,600
845202	18	117,362	459,597	15,854	3.92	7	13,443
855200	13	94,014	373,924	11,195	3.98	8	18,000
855231	2	8,350	33,603	77	4.02	11	0
855234	1	1,135	5,152	900	4.54	1	100
865203	14	67,113	289,006	13,485	4.31	5	14,175
865231	1	6,999	27,613	2,900	3.94	2	100
865233	1	4,862	18,280	500	3.76	10	0
865235	1	8,384	32,492	1,010	3.87	8	700
865301	3	22,201	95,175	3,594	4.29	6	500
875200	1	4,046	17,645	300	4.36	13	200
875231	1	1,752	8,320	1,500	4.75	1	250
875232	14	68,379	290,172	11,046	4.24	6	6,400
875233	1	600	2,584	300	4.31	2	0
875301	1	6,590	38,420	3,000	5.83	2	0
885230	2	17,862	93,010	7,190	5.21	2	2,600
885300	2	15,645	79,097	5,000	5.05	3	892
895230	3	7,730	33,550	1,314	4.34	6	0
895300	1	10,402	58,253	800	5.60	13	0
Season Total:	526	2,923,947	12,798,004	392,185	4.38	7	276,736

<sup>1</sup> Deadloss included.

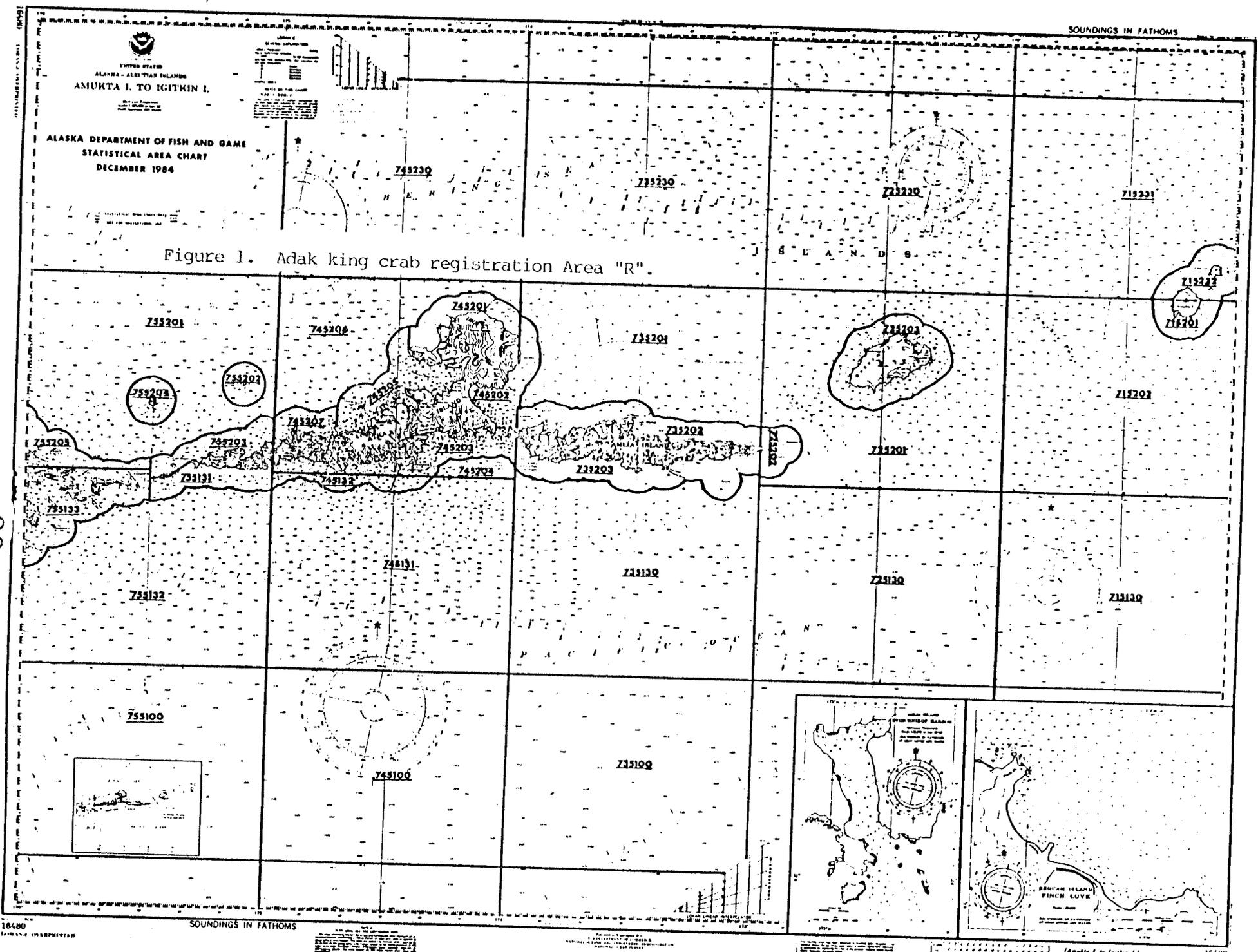


Figure 1. Adak king crab registration Area "R".

26

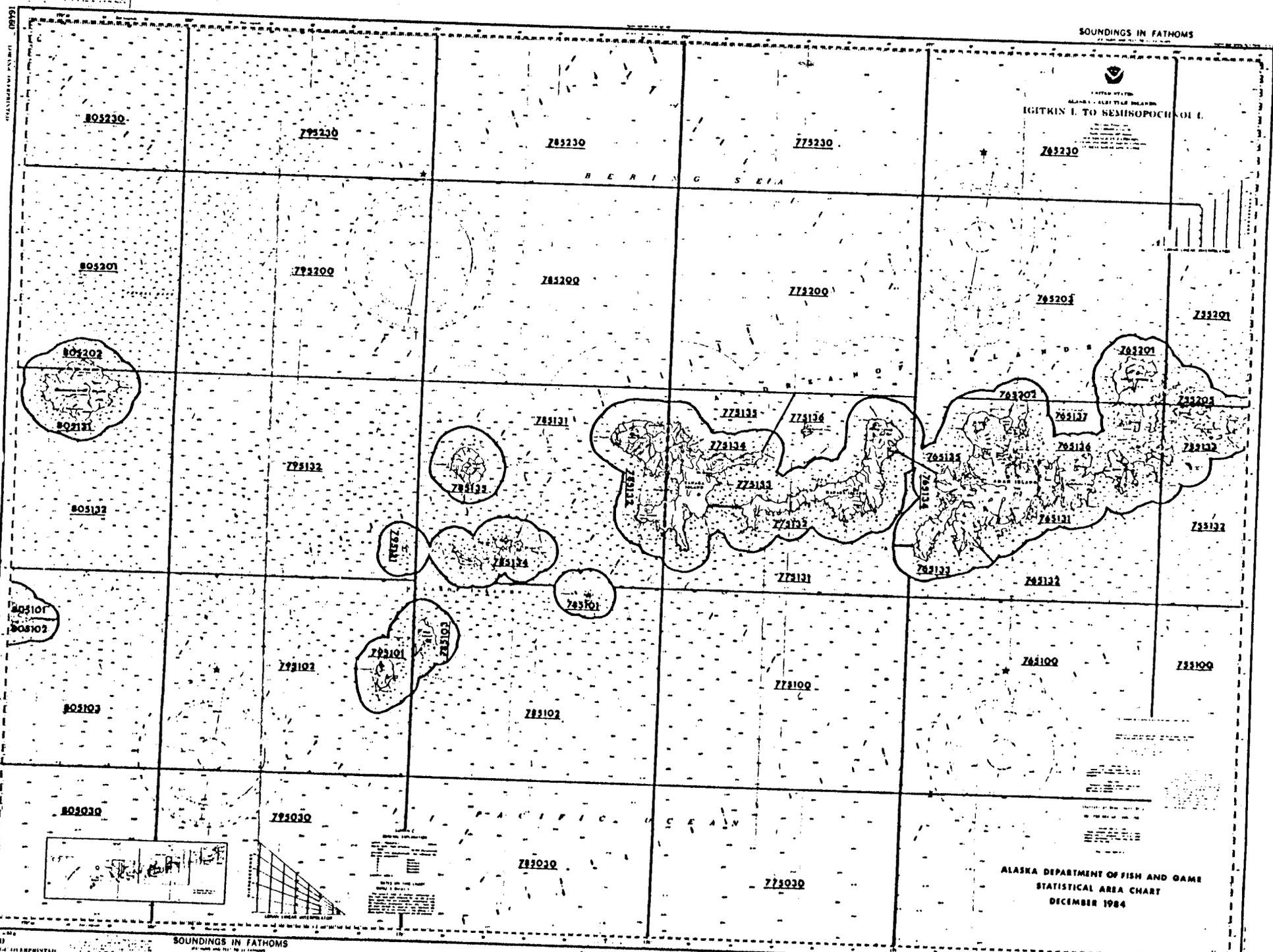
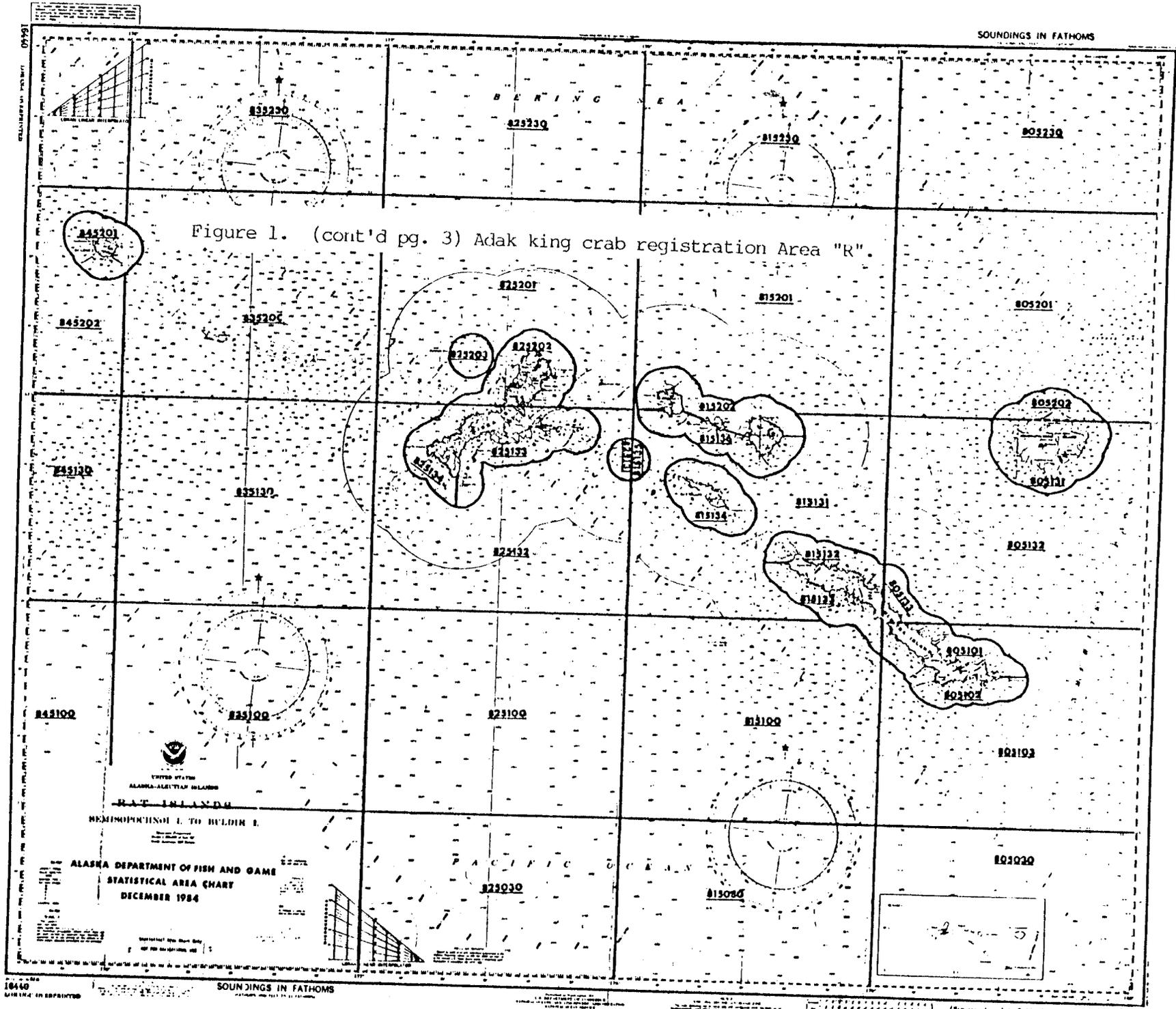
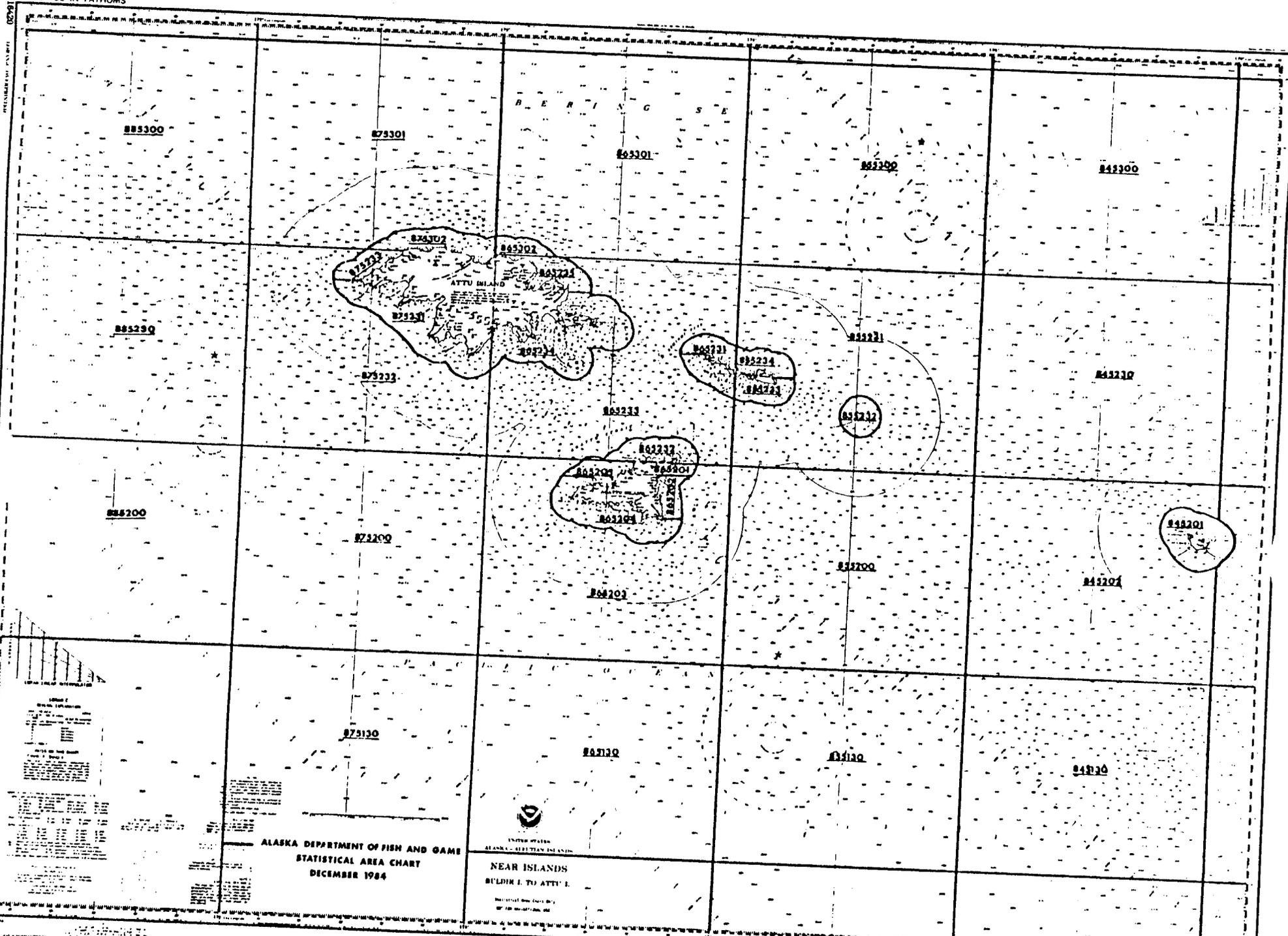


Figure 1. (con't pg. 2) Adak king crab registration Area "R".

Figure 1. (cont'd pg. 3) Adak king crab registration Area "R"

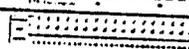


264



263

Figure 1. (con't. pg. 4) Adak king crab registration Area "R"



(Buldir Island to Attu Island)

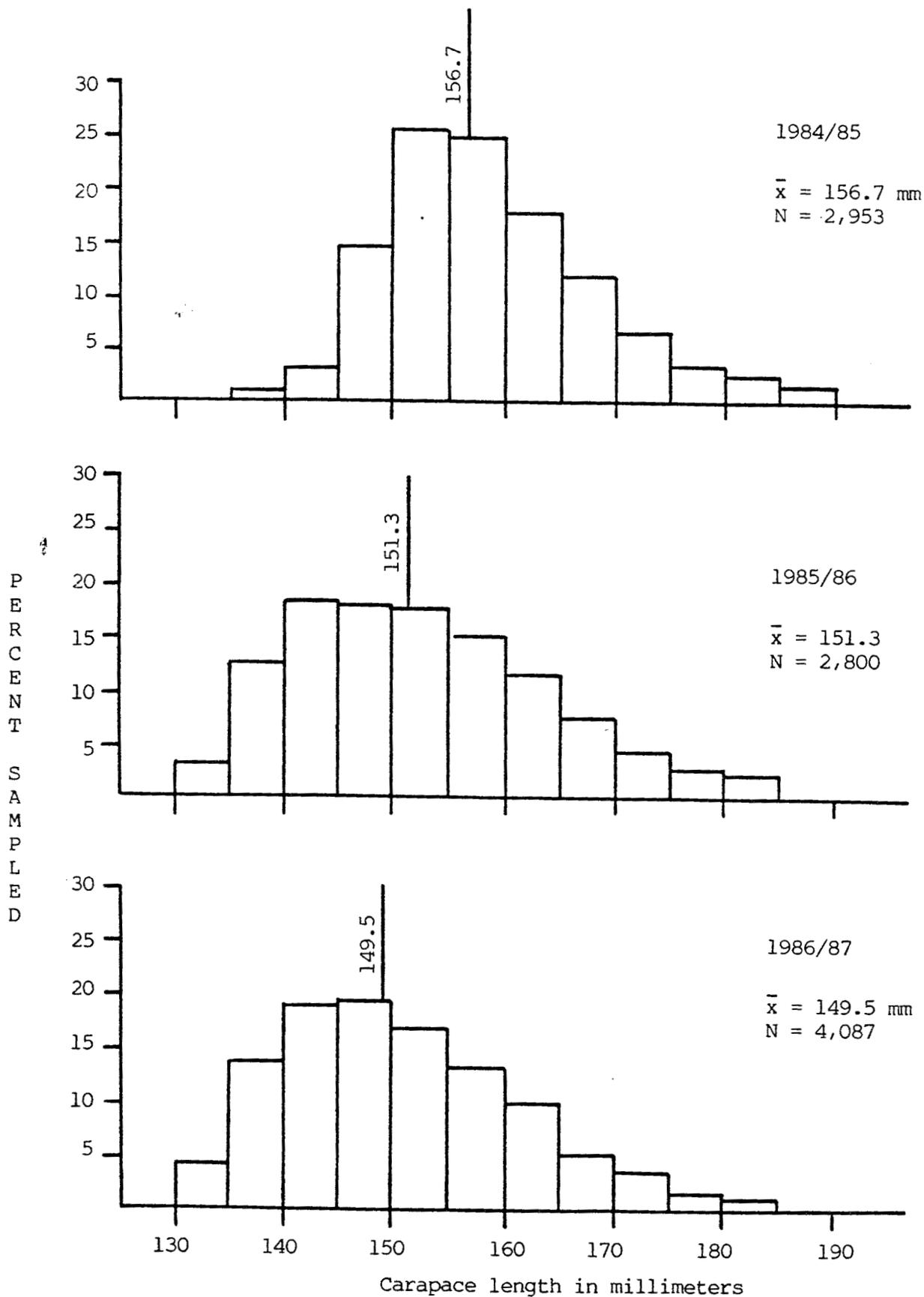


Figure 2. Adak, Area "R", brown king crab length frequency distribution.

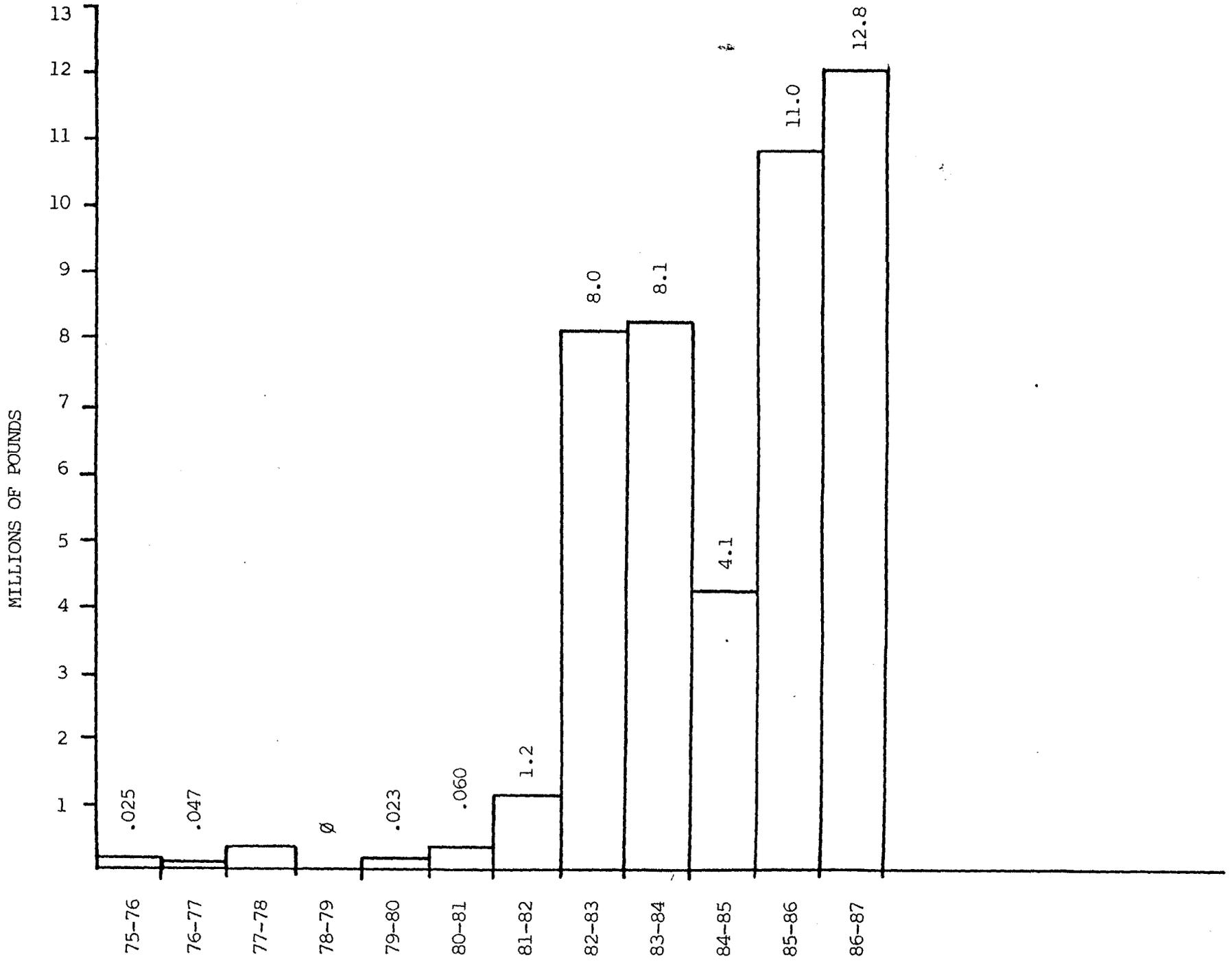


Figure 3. Historic Adak Area R brown king crab harvest.

# COMMERCIAL FISHERIES



## NEWS RELEASE

ALASKA DEPARTMENT  
OF FISH & GAME



STATE OF ALASKA  
Department of Fish and Game  
Don W. Collinsworth, Commissioner

Westward Region  
211 Mission Road  
Kodiak, AK 99615-9988

Ken Parker, Director  
Division of Commercial Fisheries

Contact: William E. Nippes  
Acting Reg. Shellfish  
Mgmt. Biologist

IMMEDIATE RELEASE

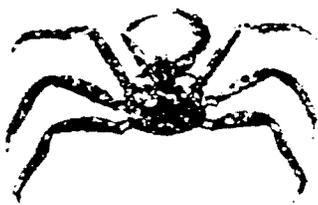
Date: August 6, 1987

### ATTENTION ADAK KING CRAB FISHERMEN

The Adak regulation area closes to brown king crab fishing on August 15, 1987 at 12:00 midnight. In order to provide for an orderly closure of the Adak king crab fishery, all vessels registered to fish the Adak registration area must be in Dutch Harbor no later than 48 hours after the closure (by 12:00 midnight on August 17, 1987). Once in Dutch Harbor, vessels must notify the Department of Fish and Game of their arrival and their delivery intentions. Vessels wishing to deliver to Akutan or other ports east of Dutch Harbor will be given permission to proceed to those ports to deliver their crab. Contact the Department of Fish and Game in Dutch Harbor on SSB Channel 6, or by telephone at 581-1239.

In addition, crab pots with bait and bait containers removed and doors tied open are permitted to be stored in the water for seven (7) days following the closure.

# COMMERCIAL FISHERIES



## NEWS RELEASE

ALASKA DEPARTMENT  
OF FISH & GAME



STATE OF ALASKA  
Department of Fish and Game  
Don W. Collinsworth, Commissioner

Westward Region  
211 Mission Road  
Kodiak, AK 99615-9988

Ken Parker, Director  
Division of Commercial Fisheries

Contact: William E. Nippes  
Acting Reg. Shellfish  
Mgmt. Biologist

IMMEDIATE RELEASE

Date: August 12, 1987

### ATTENTION ADAK KING CRAB FISHERMEN

The Adak regulation area closes to brown king crab fishing on August 15, 1987 at 12:00 midnight. An Emergency Regulation issued today requires vessels fishing the Adak Registration Area to report to Dutch Harbor after the closure in the same manner as instructed in an August 6, 1987 News Release.

The Emergency Regulation reads as follows:

5 AAC 34.037. ADAK REGISTRATION AREA CLOSURE AND INSPECTION. Every fishing vessel including catcher/processors registered for the Adak registration area and engaged in brown king crab fishing activities as of 4:00 p.m., Wednesday, August 12, 1987, in the Adak registration area shall report to the Dutch Harbor inspection point within 48 hours after the close of the Adak registration area brown king crab season (which closure is at midnight on August 15, 1987). Once in Dutch Harbor each vessel operator shall notify the Department representative in Dutch Harbor of the vessel's arrival and of their delivery intentions. The Department representative will, in his or her discretion, authorize extended possession of brown king crab for deliveries to other ports.

Vessel operators can contact the Department of Fish and Game in Dutch Harbor on VHF Channel 6, or by telephone at 581-1239.



## ADAK RED KING CRAB

### Introduction

Adak, Area "R", is comprised of all continental shelf waters west of 171° W. longitude and east of the U.S. - U.S.S.R. Convention Line.

### Historical Background

The Adak red king crab fishery began in 1961 when four vessels harvested two million pounds. As the fleet exploited the virgin populations, catches increased rapidly to a peak of 21 million pounds by the 1964-65 season. For a short time the expanding Dutch Harbor king crab fishery diverted effort, and Area "R" catches dropped to 5.9 million pounds by the 1966-67 season.

From 1967-68 to the 1972-73 seasons, catches were relatively stable at 14 - 18 million pounds. The large catches were maintained by several years of very strong recruitment, and by the exploitation of populations discovered east of Adak Island. In addition to the eastward exploration, some vessels moved into the waters of the Petrel Banks, Amchitka Islands and other westward islands creating the separate Western Aleutians, Area "S", fishery in 1967-68. The catch in Area "S" was not large and in 1978 management was simplified by eliminating Area "S" to form the Petrel Bank and Western Aleutian districts of Area "R".

After the 1972-73 season, the harvest fell off so sharply that the Board of Fisheries did not open the 1976-77 season. Catches made since 1976-77

have been extremely low compared to those of previous seasons, and any indications of recovery have been slight (Table 1, Figure 1). ADF&G research surveys conducted in 1975, 76, and 77 concluded that several years of poor recruitment were the cause of the decline. A shell disease and unusually high natural mortality in the North Amlia District was also blamed for the decreased populations.

In recent years, fleet effort increased because of high ex-vessel prices paid for red king crab and the growth of the Adak brown king crab fishery (Table 1). With the increased effort on brown king crab stocks, fewer vessels are concentrating on the less abundant red king crab. With the implementation of longlining pots for brown king crab and not for red king crab, gear type has separated effort for both species. In the past, before longlining, vessels were able to fish for both species with the same gear but on different grounds.

#### 1986-87 Fishery

The fishery opened by regulation on November 1, 1986. Tank inspections and registrations were conducted in Dutch Harbor with 45 vessels registering for king crab, all of which did not intend to fish only red king crab. The most effort occurred during November when 27 vessels landed over 573,000 pounds of red king crab (Table 3). With most vessels targeting in deeper waters for brown king crab, the catch and effort on red king crab diminished to a few vessels fishing a few traditional areas. By mid-December, vessels began to leave the grounds for the holidays and 14 vessels landed 116,000 pounds for the month. There was no crab catch reported in January and only

22,000 pounds reported before the regulatory closure on February 15 (Table 3).

A total of 712,000 pounds was delivered for the season, the lowest catch in seven years, (Table 1). The lower harvest can probably be attributed to the effort shifting to brown king crab rather than stock condition, as the 1987-88 preliminary catch now exceeds one million pounds (Table 4).

#### 1987-88 Fishery (Preliminary Report)

The fishery opened by regulation on November 1 concurrent with the brown king and Tanner crab seasons. Most catches occurring in November and December were from vessels fishing for both brown and red king crab, although a few vessels targeted on red king crab stocks near Semisopchnoi Island. With low catch per pot and reports from processors of poor quality crab coming from an area west of the island, vessels moved to the more lucrative brown king crab fishery or actually left the Adak grounds, tied up their vessels and left for the holidays, (Table 4).

Some effort continued in the area of Seguam Pass over the holidays, but with the opening of the Bering Sea Tanner crab season in mid-January, all but a few vessels left the fishery to go to the Bering Sea.

Preliminary catches indicate 1,213,933 pounds of red king crab was harvested from the Adak area during the 1987-88 fishery that closed by regulation on February 15, 1988 (Tables 1 and 4).

Table 1. Adak, Area "R", historical red king crab catch.<sup>1</sup>

Season	Vssls.	Lndgs.	No. Crab <sup>2</sup>	No. Pounds <sup>2</sup>	Pots Lifted	CPUE	Avg. Wt.	Percent Recruits	Avg. Length	Min. Size	Pounds Deadloss
1960-61	4	41	N/A	2,074,000	N/A	N/A	8.8	N/A	N/A	-	N/A
1961-62	8	218	N/A	6,114,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1962-63	9	248	N/A	8,006,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1963-64	11	527	N/A	17,904,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1964-65	18	442	N/A	21,193,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1965-66	10	431	N/A	12,915,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1966-67	10	90	N/A	5,883,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1967-68 <sup>3</sup>	22	505	N/A	14,131,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1968-69	30		N/A	16,100,000	N/A	N/A	N/A	N/A	N/A	7 "	N/A
1969-70	33	435	N/A	18,016,000	115,929	N/A	6.5	N/A	N/A	7 "	N/A
1970-71	35	378	N/A	16,057,000	124,235	N/A	N/A	N/A	N/A	7 "	N/A
1971-72	40	166	N/A	15,475,924	46,011	N/A	N/A	N/A	N/A	6.5"	N/A
1972-73 <sup>4</sup>	43	313	3,461,025	18,724,144	81,133	43	5.4	50.9	N/A	6.5"	N/A
1973-74	41	239	1,844,974	9,741,464	70,059	26	5.3	48.5	148.6	6.5"	N/A
1974-75	36	97	532,298	2,774,963	32,620	16	5.2	48.6	148.6	6.5"	N/A
1975-76	20	25	79,977	411,583	8,331	10	5.2	67.5	147.2	6.5"	N/A
1976-77											
----- C L O S E D -----											
1977-78	12	18	160,343	905,527	7,269	22	5.7	43.9	152.2	6.5"	N/A
1978-79 <sup>5</sup>	13	27	149,491	807,195	13,948	11	5.4	56.7	N/A	6.5"	1,170
1979-80	18	23	82,250	467,229	9,757	8	5.7	42.8	152.0	6.5"	24,850
1980-81	17	52	254,390	1,419,513	20,914	12	5.6	65.2	149.0	6.5"	54,360
1981-82	46	106	291,311	1,648,926	40,697	7	5.7	55.5	148.3	6.5"	8,759
1982-83	72	191	284,787	1,701,818	66,893	4	6.0	49.9	150.8	6.5"	7,855
1983-84	106	248	298,948	1,981,579	60,840	5	6.6	30.4	157.3	6.5"	3,833
1984-85	64	113	206,751	1,367,672	50,685	4	6.6	31.4	155.1	6.5"	0
1985-86	35	89	162,271	906,293	32,478	5	5.6	40.0	152.2	6.5"	6,120
1986-87	33	69	126,146	712,243	29,189	4	5.6	N/A	N/A	6.5"	500
1987-88 <sup>6</sup>	47			1,213,933							

<sup>1</sup>Includes catch from former Area "S" now Western Aleutians District of "R".

<sup>2</sup>Includes deadloss.

<sup>3</sup>Area "S" fishery began.

<sup>4</sup>Area "S" continued until June.

<sup>5</sup>Area "S" eliminated - added to Area "R".

<sup>6</sup>Preliminary.

Table 2. Adak Area "R" red king crab harvest composition by fishing season.<sup>1</sup>

Season	Season		No. Pounds <sup>2</sup>	Size Limit	Price Per Lb.
	Opened	Closed			
1960-61	01/01	12/31	2,074,000	-	N/A
1961-62	01/01	12/31	6,114,000	-	N/A
1962-63	01/01	12/31	8,006,000	-	N/A
1963-64	01/01	12/31	17,904,000	-	N/A
1964-65	01/01	12/31	21,193,000	-	N/A
1965-66	01/01	12/31	12,915,000	6.5"	N/A
1966-67	01/01	12/31	5,883,000	6.5"	N/A
1967-68 <sup>3</sup>	01/01	12/31	14,131,000	6.5"	N/A
1968-69		03/15	16,100,000	7 "	N/A
1969-70	09/15	01/15	18,016,000	7 "	N/A
1970-71	11/01	03/31	16,057,000	7 "	N/A
1971-72	11/01	12/16	15,475,924	6.5"	N/A
1972-73 <sup>4</sup>	11/01	02/17	18,724,144	6.5"	N/A
1973-74	11/01	02/26	9,741,464	6.5"	N/A
1974-75	01/10	03/05	2,774,963	6.5"	.35
1975-76	11/01	12/18	411,583	6.5"	.38
1976-77		- - - - -	- - - C L O S E D - - - - -		
1977-78	02/20	03/20	905,527	6.5"	1.36
1978-79 <sup>5</sup>	02/21	03/29	807,195	6.5"	1.23
1979-80	01/15	04/01	467,229	6.5"	.68
1980-81	01/15	03/28	1,419,513	6.5"	.92
1981-82	11/01	02/15	1,648,926	6.5"	2.01
1982-83	11/01	01/15	1,701,818	6.5"	3.44
1983-84	11/10	12/16	1,981,579	6.5"	3.43
1984-85	11/10	02/15	1,367,672	6.5"	2.10
1985-86	11/01	02/15	906,293	6.5"	2.15
1986-87	11/01	02/15	712,243	6.5"	3.85
1987-88 <sup>6</sup>	11/01	02/15	1,213,933	6.5"	4.00

<sup>1</sup>Includes catch from former Area "S" now Western Aleutians District of Area "R".

<sup>2</sup>Includes deadloss.

<sup>3</sup>Area "S" fishery began.

<sup>4</sup>Area "S" continued until June.

<sup>5</sup>Area "S" eliminated - added to Area "R".

<sup>6</sup>Preliminary figures.

Table 3. 1986-87 Adak, Area "R", red king crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	27	46	102,013	573,762	20,396	5.6	5	0
December	14	18	19,978	116,300	7,414	5.8	3	500
January			NONE	REPORTED				
February	2	5	4,155	22,181	1,379	5.1	3	0
Season Total <sup>2</sup>	33	69	126,146	712,243	29,189	5.6	4	500

<sup>1</sup>Deadloss included.

<sup>2</sup>Preliminary figures.

Table 4. 1987-88 Adak, Area "R", red king crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	43	68	124,224	712,329	28,721	5.73	4	900
December	22	29	53,132	312,676	11,289	5.88	6	0
January	3	3	19,989	107,777	2,060	5.39	10	0
February	3	3	14,367	81,150	1,363	5.62	10	6,000
Season Total <sup>2</sup>	47	103	211,712	1,213,932	43,433	5.73	5	6,900

<sup>1</sup>Deadloss included.

<sup>2</sup>Preliminary figures.

Table 5. 1986-87 Adak red king crab catch by statistical area.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
735201	1	2,245	13,470	253	6.00	9	0
745201	3	1,988	10,910	1,916	5.49	1	0
745202	1	31	178	160	5.74	<1	0
745205	4	231	1,272	1,347	5.51	<1	0
755201	1	82	500	100	6.09	<1	0
755132	1	1,411	10,246	650	7.26	2	0
775100	1	1,074	7,253	361	6.75	3	0
775133	1	91	520	1,200	5.71	<1	0
785132	1	351	2,000	200	5.70	1	0
795200	7	14,041	77,353	2,456	5.72	5	0
805132	2	1,663	9,674	680	5.82	2	0
805201	28	82,919	464,284	13,915	5.60	6	500
805202	9	10,648	59,919	2,556	5.63	4	0
845201	2	3,703	19,236	735	6.08	5	0
865233	3	1,781	10,822	410	6.08	4	0
875231	2	1,231	8,260	1,700	6.71	<1	0
875233	1	1,121	6,725	175	6.00	6	0
875302	1	1,545	9,621	375	6.23	4	0
Season Total:	69	126,146	712,243	29,189	5.64	4	500

<sup>1</sup> Deadloss included.

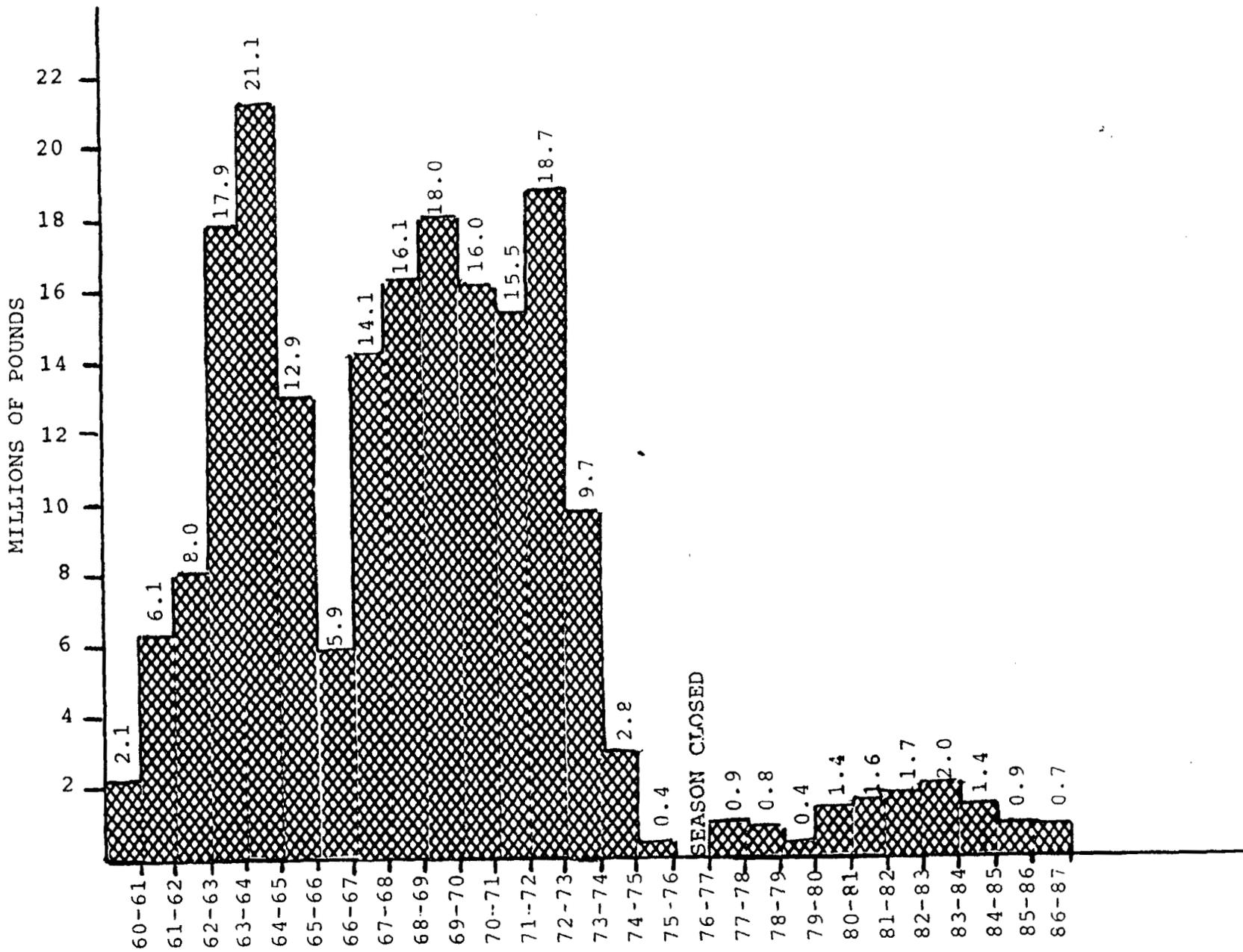


Figure 1. Adak red king crab harvest by season.





## WESTERN ALEUTIAN TANNER CRAB

### Introduction

The Western Aleutians District of Statistical Area "J" includes all water west of 172° W. longitude and south of 54° 36' N. latitude.

### Historical Background

Tanner crab (Chionoecetes bairdi) from the Western Aleutians have generally been harvested in conjunction with the red king crab fishery in the area.

### 1986-87 Fishery

The fishery opened concurrently to the Adak red and brown king crab fisheries on November 1. The 1986-87 harvest of only 42,800 pounds is the lowest recorded catch in over 10 years, and can probably be attributed to the shift from the traditional red king crab/Tanner crab grounds to the deeper brown king crab grounds, (Table 1).

Over 80 percent of the total catch, 35,000 pounds, was taken in November during the red king crab fishery. During November and December, some poor quality crab was taken and processors stopped purchasing Tanner crab from the area. Landings from January through June were from catcher/processor's incidental catch.

Table 1. Historic Tanner crab fishery statistics from the Western Aleutians District.

Year	Opened	Closed	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Min. Size	Avg. Price Pound
1973-74	11/01	10/15	7	12	31,079	71,887	2,390	2.3	13	.0	N/A
1974-75	11/01	10/15	1	1	1,216	3,350	25	2.8	49	.0	\$ .12
1975-76	11/01	10/15	2	2	24,977	62,180	671	2.5	37	.0	\$ .19
1976-77	11/01	10/15			- - - - - N O F I S H I N G - - - - -						
1977-78	11/01	06/15	6	7	103,190	237,512	2,700	2.3	38	5.5"	\$ .38
1978-79	11/01	06/15	6	9	84,129	197,244	4,730	2.3	18	5.5"	\$ .53
1979-80	11/01	06/15	10	12	147,843	337,297	5,952	2.3	25	5.5"	\$ .52
1980-81	01/15	06/15	9	23	95,102	220,716	7,327	2.3	13	5.5"	\$ .54
1981-82	01/15	06/15	17	43	364,164	838,697	21,910	2.3	17	5.5"	\$1.30
1982-83	11/01	06/15	61	125	225,491	488,399	40,450	2.2	6	5.5"	\$1.27
1983-84	11/10	06/15	31	86	171,576	384,146	20,739	2.2	8	5.5"	\$ .95
1984-85	11/10	06/15	31	41	75,009	163,460	13,416	2.2	6	5.5"	\$1.30
1985-86	11/01	06/15	15	30	98,089	206,814	7,999	2.1	12	5.5"	\$1.40
1986-87	11/01	06/15	8	24	19,874	42,761	10,878	2.1	2	5.5"	\$1.50

<sup>1</sup>Deadloss included.

287

Table 2. Chionoecetes bairdi catch by month for the Western Aleutian District, 1986-87 season.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	4	6	16,481	35,217	3,480	2.14	5	0
December	3	3	1,156	2,556	498	2.21	2	200
January	1	1	222	490	500	2.21	<1	0
February	1	1	560	1,295	6,000	2.31	<1	0
March	1	1	485	1,066	104	2.20	2	0
April	1	1	382	842	120	2.60	2	0
May	1	1	412	907	112	2.75	2	0
June	1	1	176	388	64	2.20	2	0
Total	8	24	19,874	42,761	10,878	2.15	2	200

<sup>1</sup> Deadloss included.

Table 3. Preliminary Chionoecetes bairdi catch by month for the Western Aleutian District, 1987-88 season.<sup>1</sup>

Month	Vssls.	Lndgs.	No. Crab <sup>2</sup>	No. Pounds <sup>2</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	7	9	34,482	75,414	2,462	2.2	14	0
December	7	8	20,733	44,892	2,020	2.2	10	0
January	3	7	1,732	4,141	2,392	2.4	<1	0
February			- - - - - NONE REPORTED - - - - -					
Season Total <sup>1</sup>	13	24	56,947	124,447	6,874	2.2	8	0

<sup>1</sup> Season in progress.

<sup>2</sup> Deadloss included.

Table 4. Chionoecetes bairdi catch by statistical area for the Western Aleutians District, 1986-87 season.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
745201	1	4,004	8,810	1,100	2.20	4	0
745202	3	8,123	16,757	1,800	2.06	4	0
745205	3	2,742	5,829	577	2.12	4	200
755201	1	2,498	5,770	300	2.31	8	0
765135	6	802	1,765	192	2.20	4	0
765136	7	653	1,438	208	2.20	3	0
775133	2	782	1,785	6,500	2.28	<1	0
865233	1	270	607	201	2.25	1	0
Season Total:	24	19,874	42,761	10,878	2.15	2	200

<sup>1</sup> Deadloss included.





BERING SEA AREA  
SHELLFISH MANAGEMENT REPORT  
TO  
ALASKA BOARD OF FISHERIES

APRIL 1988

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST  
DAN URBAN - FISHERY BIOLOGIST

Dutch Harbor Area Office  
P. O. Box 308  
Dutch Harbor, Alaska 99692  
(907) 581-1239



## BERING SEA DISTRICT TANNER CRAB

### Introduction

The Bering Sea District of statistical Area "J" includes all waters of the Bering Sea north of the latitude of Cape Sarichef and east of the U.S. Russian Convention Line of 1867. This district has three subdistricts; the Southeastern, Pribilof and Northern which also includes the Norton Sound section and the General section. Two Tanner crab species Chionoecetes bairdi, and opilio, are commercially harvested in the Bering Sea District.

### Historic Background

The first reported domestic Tanner crab catches were made in 1968 incidental to the king crab fishery. In 1974 a directed Tanner crab fishery began with the target species, C. bairdi. In the 1977-78 season, an incidental catch of C. opilio was reported. During the fall Board of Fisheries meeting in 1978, the National Marine Fisheries Service (NMFS) reported that as much as a 50 percent decline in C. bairdi stocks could be expected to occur during the 1978-79 fishing season, and the decline would continue for several years. As predicted, the C. bairdi stocks showed the sharp decline. Catches decreased from 29.7 million pounds during the 1981 fishery to 5.3 million pounds for the 1983 fishery to a total closure of the C. bairdi fishing

in 1986 (Table 1, Figure 1). As the catches have declined in the C. bairdi fishery, effort has increased in the C. opilio fishery (Table 2 and 3, Figure 2).

Although prices have remained high for C. bairdi, fishing effort has decreased as the stock abundance decreased. With the decline in the C. bairdi stocks, which were primarily harvested from the Southeastern subdistrict, industry and markets have turned to the smaller, more abundant, but less valuable C. opilio stocks to fill demands for Tanner crab. Historic C. bairdi catch by season is depicted on tables 4 and 5. Figure 3 shows historic average size.

#### 1987 Fishery

The 1987 Tanner crab fishery in the Bering Sea district opened on January 15, concurrent to the other districts in the Westward Region. In early December 1986, preseason harvest guidelines for four inch C. opilio crab were released for the three subdistricts. These harvest guidelines were: Southeastern - 8.6 million pounds; Pribilof- 32.1 million pounds and the Northern- 15.7 million pounds, for a total projected harvest of 56.4 million pounds, plus or minus 17.6 million pounds. Due to the decline in both pre-recruits and legal male, C. bairdi Tanner crab, all waters east of 165° West longitude were closed to fishing for C. bairdi. Due to reporting problems in the past and

overlapping stocks at 168° W. long., the Department elected to manage the Southeastern and Pribilof subdistricts as one stock and combined the harvest guidelines for these areas.

Unlike previous Bering Sea Tanner crab seasons, fishing effort in the district started as soon as the season opened and as other districts in the Westward Region reached their harvest guidelines and closed, more effort entered the Bering Sea. By the end of January over 50 vessels were fishing.

Although the price for the smaller C. opilio started at 55 cents a pound, it soon rose to 62 cents and by late February was up to 70 cents per pound, making the fishery very valuable and attracted even more vessels. By the end of February, over 19 million pounds had been landed, of which 16 million pounds had come from the Pribilof subdistrict, (Table 6). Effort and catch continued to increase in March and by the end of the month, catches were being reported from the Northern subdistrict (waters north of 58° N. lat.), the earliest fishing ever reported from the subdistrict, (Figure 4a). Average catch per pot began to decline in the areas south of 58° N. lat. in March, and late in the month an Emergency Order closing all waters south of 58° N. lat. was issued for mid-April, about thirty days earlier than the 1986 season. By mid-April, over 53 million pounds of C. Opilio Tanner crab had been landed from the area south of 58° N. long. More effort had moved into the Northern area and high catches were being reported. Although the area south of 58° N. lat. was

closed on April 12 to C. opilio, illegal fishing continued in the area for several more weeks. As the reports circulated back to Seattle, one fishing organization had member vessels dispatched to the area and subsequently the illegal fishing stopped. By mid-April the price per pound had risen to 80 cents, with more than 5 million pounds of product being landed every week.

By mid-May, 88 vessels fishing the Northern subdistrict harvested an estimated 16 million pounds from the traditional area covered by the NMFS summer survey. The department and NMFS staffs, based on current catch per pot data, revised the Northern subdistrict harvest guideline from 19.6 million to 22 million pounds and estimated that this would be obtained by June 1. Since the revised estimate was only for the area surveyed, the department closed the area south of 60° 30' N. latitude and east of 178° W. longitude. The closed area allowed the fleet to move into other areas west of 178° W. Long. that during the 1986 fishery indicated a high abundance of crab. Due to political problems between the Soviet Union and the United States over the jurisdiction of these waters, there was no continued effort in this area during 1986. The problem was resolved during the summer and fall of 1986 allowing both countries to have directed fisheries in the disputed area.

The catch for the entire northern subdistrict in May was 18.8 million pounds with a total season harvest of 26.1 million pounds. As of May, only 2.7 million pounds had been reported

from the unsurveyed area (Figure 4b). Average catch per pot declined slightly in May and as department observers reached the fishing grounds onboard floating processors, reports of soft and molting crab in certain areas were documented. As processors brought this to the attention of the fleet, vessels were able to move out of these areas and into deeper water which at this time had not experienced pre-molting crab.

With better weather, both the fishing and processing fleet were able to continue northerly movement and by late May floater processors were buying product at St. Matthew Island. As effort moved into deeper waters, ADF&G interviews indicated good catches, but the crab were moving into shallower water where pre-molting and grasping pairs of C. opilio had already been documented earlier. It became apparent that the entire population would soon be in some stage of molting and the department placed more observers onboard fishing vessels for on the grounds observations. Interviews and observations of deadloss in Dutch Harbor indicated approximately 50 percent of the dead crab were double-skinned, a pre-molt condition. The onboard observers found the molting condition throughout the fishery, although amounts varied by depth and area.

Without an historic data base concerning pre-molting and molting time intervals on the Bering Sea C. opilio stocks, the department assumed that these crab cycles would be similar to those of C. bairdi. Pre-molting C. bairdi stocks in the Kodiak

area have been observed to initially occur on a sporadic basis, then become more acute and widespread in a relatively short time interval. Handling molting crab and disrupting their reproductive behavior is not desirable due to potential damage of the stocks and on June 9, an emergency order closing the remaining portion of the Northern subdistrict on June 22 was issued in Kodiak.

On June 15 a news release from the Kodiak office announced that vessels fishing Tanner crab in the Bering Sea district would have 36 hours after the closure on June 22 to be at an unloading facility or checked out of the Bering Sea district. Most vessels landed their crab to floaters on the grounds and returned to the fishing grounds for their gear.

The total Bering Sea district catch of C. opilio was 101.9 million pounds, almost 4 million pounds more than the previous seasons catch of 98 million pounds (Table 7). The 1987 harvest was taken three months sooner than the 1986 harvest, (Table 2). Even though only 4 inch and larger crab were still being purchased in 1987, the average weights and average width in all subdistricts declined from the 1986 season, (Tables 7, Figures 4 and 5). Average catch per pot increased in all areas except the Northern subdistrict, (Tables 7). The 1987 C. opilio catch by statistical area is listed in Table 8 with distribution shown in Figures 6a and 6b.

STOCK STATUS:

According to the 1987 NMFS Report to Industry, combining all districts, the abundance of large male crab larger than four inches increased by 60 percent from the 1986 estimate. Most of the increase was in the Northern sub-district. Small crab, less than four inches, increased 260 percent, but are several years from reaching exploitable sizes. Recruitment trends indicate that the abundance of large crab may increase in 1988.

Table 1. Historic Bering Sea *C. bairdi* catch statistics by season.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Avg. Width(mm)	% New Shell	Pounds Deadloss
1968		7	6,400	17,900	1,400	5	2.8	-	-	NA
1969		131	353,300	1,008,900	29,800	12	2.9	-	-	NA
1970		66	482,300	1,014,700	16,400	29	2.1	-	-	NA
1971		22	61,300	166,100	7,300	8	2.7	-	-	NA
1972		14	42,061	107,761	4,260	10	2.6	-	-	NA
1973		44	93,595	231,668	15,730	6	2.5	-	-	NA
1974		69	2,531,825	5,044,197	22,014	115	2.0	-	-	NA
1975	28	80	2,773,770	7,284,378	38,462	72	2.5	-	-	NA
1976	66	305	8,949,886	22,341,475	141,179	63	2.5	-	-	NA
1976-77	83	541	20,251,508	51,455,221	297,171	68	2.5	-	-	NA
1977-78	120	861	26,350,688	66,648,954	516,350	51	2.5	152.8	88.0	218,099
1978-79	144	817	16,726,518	42,547,174	402,697	42	2.5	152.7	95.0	76,000
1979-80	152	804	14,685,611	36,614,315	488,434	30	2.5	151.4	90.0	56,446
1981	165	761	11,887,213	29,732,086	559,626	21	2.5	149.4	86.6	101,594
1982	125	791	4,830,980	11,008,779	490,099	10	2.3	148.8	85.4	138,159
1983	108	448	2,286,756	5,273,881	282,006	8	2.3	148.8	70.5	60,029
1984	41	134	516,877	1,208,223	61,357	8	2.3	146.5	40.0	5,025
1985	44	166	1,283,474	3,151,498	104,707	12	2.4	150.0	65.0	14,096
1986	-	-	SEASON	CLOSED	-	-	-	-	-	-
1987	-	-	SEASON	CLOSED	-	-	-	-	-	-

<sup>1</sup> Deadloss included

Table 2. Bering Sea *C. opilio* Tanner crab seasons data.

Season	Opened	Closed	Vssls.	Pounds <sup>1</sup>	Avg. Wt.	CPUE	Price/Pound
1977-78	9/15/77	9/23/78	13	1,716,124	1.4	96	\$ .38
1978-79	11/1/78	9/3/79	134	32,187,039	1.5	115	.30
1979-80	11/1/79	8/15/80 9/3/80 <sup>2</sup>	152	39,572,668	1.6	99	.21
1981	1/15/81	8/1/81 9/1/81 <sup>2</sup>	153	52,750,034	1.5	76	.26
1982	2/15/82	8/1/82	122	29,355,374	1.2	51	.73
1983	2/15/83	5/22/83 6/15/83 <sup>3</sup>	109	26,128,410	1.1	83	.35 <sup>2</sup>
1984	2/15/84 8/1/84	8/1/84 12/31/84 <sup>4</sup>	52	23,940,984 2,872,090	1.1 1.1	147 125	.30
1985	1/15/85 10/9/85	9/22/85 12/31/85 <sup>5</sup>	75	57,446,554 8,552,321	1.2	142	.30
1986	1/15/86	9/24/86 <sup>6</sup>	88	97,984,539	1.3	141	.60
1987	1/15/86	6/22/87	103	101,903,388	1.2	132	2.75

<sup>1</sup> Deadloss included

<sup>2</sup> Varied according to size

<sup>3</sup> Partial Bering Sea closure

<sup>4</sup> North of 58° only

<sup>5</sup> West of 164° opened through 12/31/85

<sup>6</sup> Open only west of 164° W. longitude

Table 3. Historic Bering Sea *C. opilio* catch statistics by season.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	%New- <sup>2</sup> Shell	Avg. Wt.	Avg. <sup>2</sup> Width(mm)	Pounds Deadloss
1977-78	15	38	1,267,546	1,716,124	13,247	96	NA	1.4	NA	0
1978-79	102	490	22,118,498	32,187,039	190,746	115	83.0	1.5	113.1	759,173
1979-80	134	597	25,286,777	39,572,668	255,022	95	90.0	1.6	118.1	228,345
1981	153	867	34,415,322	52,750,034	435,742	79	79.2	1.5	117.0	2,269,979
1982	122	803	24,089,562	29,355,379	469,091	51	78.0	1.2	109.4	1,042,655
1983	109	462	23,838,149	26,128,410	287,127	83	NA	1.1	NA	1,324,466
1984 <sup>3</sup>	52	367	24,009,935	26,813,074	173,591	138	78.0	1.1	105.4	798,744
1985 <sup>4</sup>	75	718	52,903,246	65,998,875	372,045	120	80.0	1.3	108.0	1,064,184
1986 <sup>5</sup>	88	992	76,499,123	97,984,539	543,744	141	73.7	1.3	109.5	1,392,933
1987	103	1038	81,307,659	101,903,388	616,113	132	84.0	1.2	108.9	978,449

<sup>1</sup> Deadloss included

<sup>2</sup> Southeast and Pribilof districts only

<sup>3</sup> North of 58° reopened until 12/31

<sup>4</sup> West of 164° opened through 12/31

<sup>5</sup> Open only west of 164° W. longitude

Table 4. Historic Bering Sea *C. bairdi* catch by season by subdistrict.

Season	Subdistrict	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1974-75	Southeastern		72	2,526,687	6,504,984	32,275	2.6	78	0
	Pribilofs		8	247,083	523,394	3,923	2.1	63	0
	TOTAL	28	80	2,773,770	7,028,378	38,462	2.5	72	NR
1975-76	Southeastern		230	6,682,232	16,643,194	106,445	2.5	63	0
	Pribilofs		74	2,273,804	5,714,913	34,761	2.5	65	0
	TOTAL	66	304	8,956,036	22,358,107	141,206	2.5	63	NR
1976-77	Southeastern		437	16,089,057	41,007,736	233,667	2.6	69	0
	Pribilofs		104	4,162,451	10,447,485	63,804	2.5	65	0
	TOTAL	83	541	20,251,508	51,455,221	297,471	2.5	68	NR
1977-78	Southeastern		706	21,055,527	53,278,012	408,437	2.5	52	0
	Pribilofs		155	5,210,170	13,152,843	107,913	2.5	48	0
	TOTAL	120	861	26,350,688	66,648,954	516,350	2.5	51	218,099
1978-79	Southeastern		758	15,601,891	39,694,205	356,594	2.5	44	75,400
	Pribilofs		59	1,124,627	2,852,969	46,103	2.5	24	600
	TOTAL	144	817	16,726,518	42,547,174	402,697	2.5	42	76,000
1979-80	Southeastern		789	14,329,889	35,724,003	476,410	2.5	30	56,446
	Pribilofs		15	355,722	890,312	12,024	2.5	30	0
	TOTAL	152	804	14,685,611	36,614,315	488,434	2.5	30	56,446
1980-81	Southeastern		674	10,532,007	26,684,956	496,751	2.5	21	97,398
	Pribilofs		87	1,313,951	2,945,536	62,875	2.5	21	4,196
	TOTAL	165	761	11,845,958	29,630,492	599,626	2.5	21	101,594

Table 4. (continued) Historic Bering Sea *C. bairdi* catch by season by subdistrict.

Season	Subdistrict	Vssls.	Ldgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1981-82	Southeastern Pribilofs		539	3,825,433	8,812,302	322,634	2.3	12	69,829
			252	1,005,5453	2,196,477	167,465	2.2	6	68,330
	TOTAL	125	791	4,830,9780	11,008,779	490,099	2.3	10	138,159
1982-83	Northern		10	29,578	48,454	5,950	1.7	5	167
	Southeastern		287	1,984,673	4,633,354	192,538	2.3	10	52,879
	Pribilofs		151	272,505	592,073	83,528	2.2	3	6,983
	TOTAL	108	448	2,286,756	5,273,881	282,006	2.3	8	60,029
1983-84	Southeastern Pribilofs		91	470,181	1,099,142	44,546	2.3	11	4,688
			43	46,759	109,081	16,811	2.3	3	337
	TOTAL	41	134	516,877	1,208,223	61,357	2.3	8	5,025
1985	Southeastern Pribilofs		38	1,278,109	3,139,041	96,976	2.4	13	14,096
			15	5,365	12,457	7,731	2.3	1	0
	TOTAL	44	166	1,283,474	3,151,498	104,707	2.4	12	14,096
1986	SEASON CLOSED	-	-	-	-	-	-	-	-
1987	SEASON CLOSED	-	-	-	-	-	-	-	-

<sup>1</sup> Deadloss included

Table 5. Bering Sea *C. bairdi* Tanner crab seasons.

Season	Opened	Closed	Vssls.	Pounds <sup>1</sup>	Avg. Wt.	CPUE	Price/ Pound
1968 <sup>2</sup>			NA	17.9	2.8	5	NA
1969 <sup>2</sup>			NA	1,008.9	2.9	12	NA
1970 <sup>2</sup>			NA	1,410.7	2.1	29	NA
1971 <sup>2</sup>			NA	166.1	2.7	8	NA
1972 <sup>2</sup>			NA	199.2	2.8	6	NA
1973 <sup>2</sup>			NA	301.9	2.3	8	NA
1974 <sup>2</sup>			NA	5,044.2	2.0	115	NA
1974-75	7/29	6/15	28	7,028.4	2.5	72	\$ .20
1975-76	8/1	7/15	66	22,358.1	2.5	63	.19
1976-77	8/1	7/7	83	51,455.2	2.5	68	.30
1977-78	9/15	6/15	120	66,430.9	2.5	51	.38
1978-79	11/1	5/24	144	42,547.2	2.5	42	.52
1979-80	11/1	5/11	157	36,614.3	2.5	30	.52
1981	1/15	4/15	165	29,630.5	2.5	21	.58
1982	2/15	6/15	125	11,008.8	2.3	10	1.06 1.60
1983 <sup>3</sup>	2/15	5/22 6/15	108	5,273.9	2.3	8	1.20
1984	2/15	6/15	41	1,208.2	2.3	8	.95
1985	1/15	6/15	38	3,151.5	2.4	12	1.40
1986	SEASON CLOSED		-	-	-	-	-
1987	SEASON CLOSED						

<sup>1</sup> Figures given in thousands - deadloss included

<sup>2</sup> Incidental to the king crab fishery

<sup>3</sup> Partial Bering Sea closure

Table 6. 1987 season *C. opilio* catch by district and month for the Eastern Bering Sea.

Subdistrict	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
January								
Southeastern	8	10	464,963	593,294	2,278	1.28	204	500
Pribilof	20	26	1,659,713	2,066,575	8,285	1.26	179	3,080
Total	26	36	2,124,676	2,659,869	10,563			3,590
February								
Southeastern	21	30	2,511,566	3,067,919	13,735	1.22	182	5,000
Pribilof	58	124	11,379,535	14,321,524	63,461	1.26	179	19,100
Total	66	154	13,891,101	17,389,443	77,196			24,100
March								
Southeastern	5	12	626,204	804,411	3,796	1.25	106	3,500
Pribilof	87	190	17,538,547	21,576,567	119,189	1.23	147	236,565
Northern	12	14	824,086	1,028,124	5,562	1.25	147	7,200
Total	88	216	18,988,837	23,409,102	128,547			247,265
April								
Southeastern	7	12	514,045	640,849	4,810	1.25	106	3,500
Pribilof	66	118	8,027,007	9,712,068	70,402	1.29	133	75,580
Northern	65	85	5,078,952	6,319,190	50,149	1.24	101	67,920
Total	94	215	13,620,004	16,672,107	125,361			197,000
May								
Northern	88	205	14,883,267	18,336,409	151,569	1.38	98	171,674
Total	88	205	14,883,267	18,336,409	151,569			171,674
June								
Northern	74	212	17,799,774	23,036,458	122,877	1.19	117	381,430
Total	74	212	17,799,774	23,036,458	122,877	1.19	117	381,430
Subdistrict Total:								
Southeastern	28	64	4,116,778	5,106,473	24,619	1.24	167	15,900
Pribilof	94	458	38,604,802	47,676,734	261,337	1.24	163	334,325
Northern	99	516	38,586,079	49,120,181	330,157	1.27	117	628,224
Season Total	103	1038	81,307,659	101,903,388	616,113	1.25	132	978,449

<sup>1</sup> Deadloss included

Table 7. Historic Bering Sea *C. opilio* catch, by season, by subdistrict.

Subdistrict	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1977-78								
Southeastern		33	1,063,872	1,439,959	11,560	1.4	92	0
Pribilof		5	203,674	276,165	1,687	1.4	121	0
Total	13	38	1,267,546	1,716,124	13,247	1.4	96	0
1978-79								
Southeastern	101	476	21,279,794	31,102,832	184,491	1.5	115	659,137
Pribilof	10	14	838,704	1,084,039	6,225	1.5	134	100,000
Total	102	490	22,118,498	32,187,039	190,746	1.5	115	759,137
1979-80								
Southeastern	133	561	23,199,446	36,406,391	237,375	1.6	97	187,945
Pribilof	19	36	2,087,331	3,166,777	17,727	1.5	116	40,400
Total	134	597	25,286,777	39,572,668	225,102	1.6	99	228,345
1980								
Southeastern		624	24,498,642	37,866,229	309,304	1.6	76	1,475,078
Pribilof		243	9,916,617	14,886,705	126,438	1.5	74	794,901
Total	153	867	34,415,322	52,753,034	435,742	1.5	76	2,269,979
1982								
Southeastern		468	10,207,174	13,079,583	257,193	1.3	40	422,979
Pribilof		335	13,882,388	16,276,421	211,898	1.2	65	
Total	122	803	24,089,562	29,355,374	469,091	1.2	51	1,092,655
1983								
Southeastern		153	3,553,281	4,197,304	94,470	1.2	38	165,298
Pribilof		239	19,076,553	20,514,000	153,458	1.0	124	1,078,643
Northern		69	1,223,813	1,417,106	39,199	1.1	31	80,525
Total	109	461	23,853,647	26,128,410	287,127	1.1	83	1,324,466
1984								
Southeastern		76	3,534,370	3,990,621	33,091	1.1	106	54,678
Pribilof		230	17,909,096	19,727,493	112,078	1.1	160	708,706
Northern		61	2,566,469	3,094,960	28,422	1.2	91	35,411
Total	52	367	24,009,935	26,813,074	173,591	1.1	138	798,795

Table 7. (continued) Historic Bering Sea *C. opilio* catch, by season, by subdistrict.

Subdistrict	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1985								
Southeastern	55	301	21,963,882	27,373,232	158,819	1.4	95	461,001
Pribilof	60	301	24,089,526	29,804,093	142,937	1.2	168	505,146
Northern	24	116	6,849,838	8,821,550	70,289	1.3	97	98,037
Total	139	718	52,903,246	65,998,875	372,045	1.3	120	1,064,184
1986								
Southeastern	47	112	8,491,694	10,957,578	63,889	1.3	132	44,755
Pribilof	80	508	39,851,767	50,525,150	281,337	1.3	142	472,342
Northern	67	372	28,155,662	36,501,811	198,518	1.3	142	861,436
Total	88	992	76,499,123	97,984,539	543,744	1.3	141	1,378,533
1987								
Southeastern	28	64	4,116,778	5,106,473	24,619	1.2	167	24,619
Pribilof	94	458	38,604,802	47,676,734	261,337	1.2	163	261,337
Northern	99	516	38,586,079	49,120,181	330,157	1.2	117	330,157
Total	10	1038	81,307,659	101,903,388	616,113	1.2	132	978,449

<sup>1</sup> Includes deadloss

Table 8. 1987 *C. opilio* catch, by statistical area, for the Bering Sea.

Stat. Area	Lndgs. <sup>2</sup>	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Dead/loss
Southeastern Subdistrict							
665500	1	16,591	19,909	600	1.20	28	0
665530	1	82,805	99,367	350	1.20	236	0
665630	1	75,006	90,760	300	1.21	247	1,000
675500	1	16,591	19,909	600	1.20	28	0
675530	13	896,384	1,112,394	4,695	1.24	190	4,450
675600	37	2,547,239	3,158,159	15,190	1.23	167	10,450
675630	6	415,889	522,471	2,472	1.25	168	0
675700	1	66,273	83,504	412	1.26	161	0
S.E. Total	61	4,116,778	5,106,473	24,619	1.24	167	15,900
Pribilof Subdistrict							
685530	7	340,189	407,152	2,300	1.19	176	750
685600	56	3,948,980	4,902,596	23,678	1.24	166	15,030
685630	12	787,679	957,624	4,923	1.21	159	2,236
685700	5	246,089	315,635	1,414	1.28	173	1,400
695600	2	36,375	44,736	350	1.23	103	0
705600	2	63,536	77,385	920	1.21	69	0
705630	17	893,048	1,128,290	7,383	1.26	120	5,070
705701	1	93,656	128,257	900	1.31	107	1,500
705730	5	354,734	418,327	3,600	1.17	96	9,000
715600	1	79,859	91,039	500	1.14	159	0
715630	39	3,102,149	4,010,218	17,704	1.29	175	54,131
715700	94	7,278,981	8,870,671	52,779	1.21	136	66,090
715730	81	5,883,106	7,031,000	41,919	1.19	136	86,880
725630	38	3,329,666	4,066,015	17,849	1.22	186	7,100
725700	66	5,354,049	6,672,890	35,248	1.24	151	30,798
725730	67	3,912,407	4,883,056	28,710	1.24	134	46,890
735700	17	1,304,664	1,658,710	7,841	1.27	166	3,000
735730	29	1,547,346	1,958,044	12,719	1.26	121	4,450
755730	1	44,289	55,170	600	1.25	73	0
Pribilof Total	450	38,604,802	47,676,734	261,337	1.24	148	334,325
Northern Subdistrict							
705800	1	98,370	120,012	350	1.22	281	0
705830	1	12,137	15,778	800	1.29	14	1,500
705930	1	14,488	17,965	500	1.23	29	0
715800	26	1,450,940	1,730,037	11,891	1.19	117	65,050
715830	5	184,423	221,039	2,220	1.19	83	420
715900	2	193,994	261,028	1,268	1.34	151	3,000
725800	78	4,477,460	5,386,168	39,241	1.20	111	70,575

Table 8. (cont'd) 1987 *C. opilio* catch, by statistical area, for the Bering Sea.

Stat. Area	Lndgs. <sup>2</sup>	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
725830	13	644,514	786,416	6,514	1.22	98	2,675
725900	6	273,660	315,034	3,210	1.15	85	0
735800	14	475,710	573,853	5,056	1.20	92	7,625
735830	8	335,626	418,313	3,368	1.24	99	1,500
735900	9	474,745	578,408	3,645	1.21	129	6,600
735930	6	472,450	600,076	4,276	1.27	110	2,000
736100	2	218,825	293,555	920	1.34	228	11,550
736230	1	30,325	40,940	475	1.35	64	0
745800	1	1,212	1,527	99	1.25	12	0
745830	10	388,823	542,427	4,171	1.39	93	500
745900	10	505,783	650,418	5,654	1.28	89	4,678
745930	5	201,502	251,535	2,096	1.24	96	750
746000	2	46,433	53,902	820	1.16	57	0
746030	1	88,077	114,500	400	1.29	220	0
746130	1	64,654	84,051	400	1.30	161	450
755830	4	94,552	123,447	603	1.30	157	0
755900	27	1,386,987	1,802,288	12,474	1.29	111	5,915
755930	40	2,273,094	2,950,472	17,689	1.29	128	19,022
756000	11	426,906	575,784	4,403	1.34	94	18,670
756030	5	287,484	215,292	2,053	1.14	91	0
756100	3	271,449	353,958	2,175	1.30	121	9,300
765830	2	59,692	71,630	525	1.20	106	4,700
765900	18	1,189,648	1,455,228	14,391	1.22	81	26,400
765930	34	2,179,935	2,705,022	18,796	1.24	115	20,795
766000	29	1,937,512	2,363,295	13,781	1.21	139	22,955
766030	23	1,146,727	1,448,396	9,323	1.26	120	30,350
766100	6	192,343	238,907	1,259	1.24	152	1,250
766130	1	32,350	42,094	202	1.30	160	0
766200	1	92,001	119,602	450	1.30	203	800
775900	3	16,806	26,337	495	1.56	30	2,400
775930	5	94,460	119,976	2,013	1.27	350	0
776000	43	2,796,295	3,568,444	26,270	1.27	105	57,750
776030	99	5,510,754	7,170,782	46,166	1.30	118	96,697
776100	26	1,266,826	1,656,765	9,834	1.30	127	16,645
776130	13	1,160,545	1,574,968	8,197	1.36	139	24,775
785800	1	50,770	57,878	328	1.14	155	0
786000	4	243,202	327,359	2,800	1.34	81	0
786030	44	2,503,508	3,323,444	18,611	1.32	133	36,437
786100	41	2,718,763	3,636,592	19,185	1.33	140	32,145
786130	2	73,730	102,461	560	1.38	130	1,000
796030	1	25,589	33,778	200	1.32	126	475

## Northern Subdistrict

Total		38,089,352	49,120,181	330,157	1.27	117	628,224
-------	--	------------	------------	---------	------	-----	---------

TOTAL		80,810,932	101,903,388	616,113			978,449
-------	--	------------	-------------	---------	--	--	---------

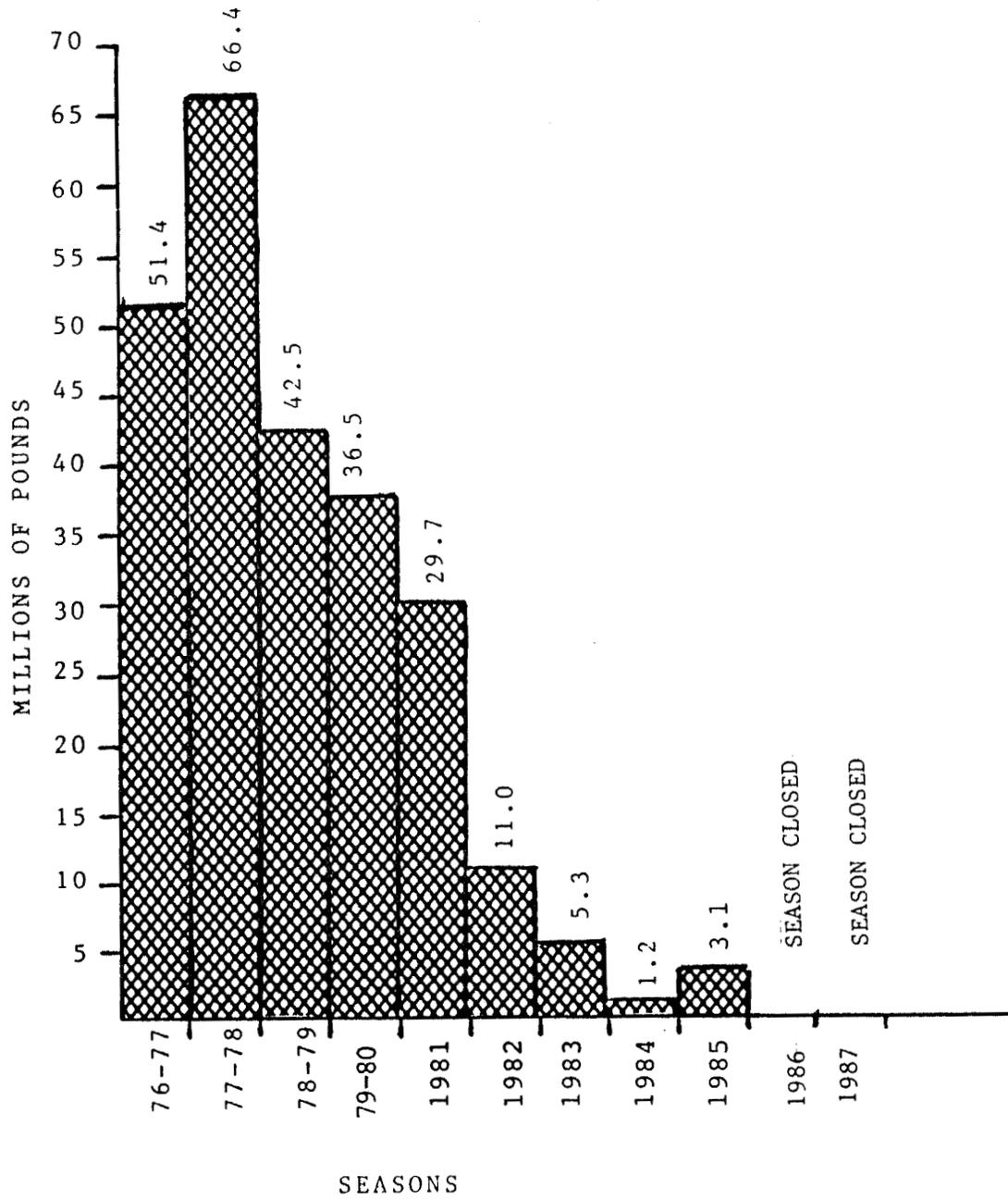


Figure 1. Historic Bering Sea C. bairdi Catch By Season.

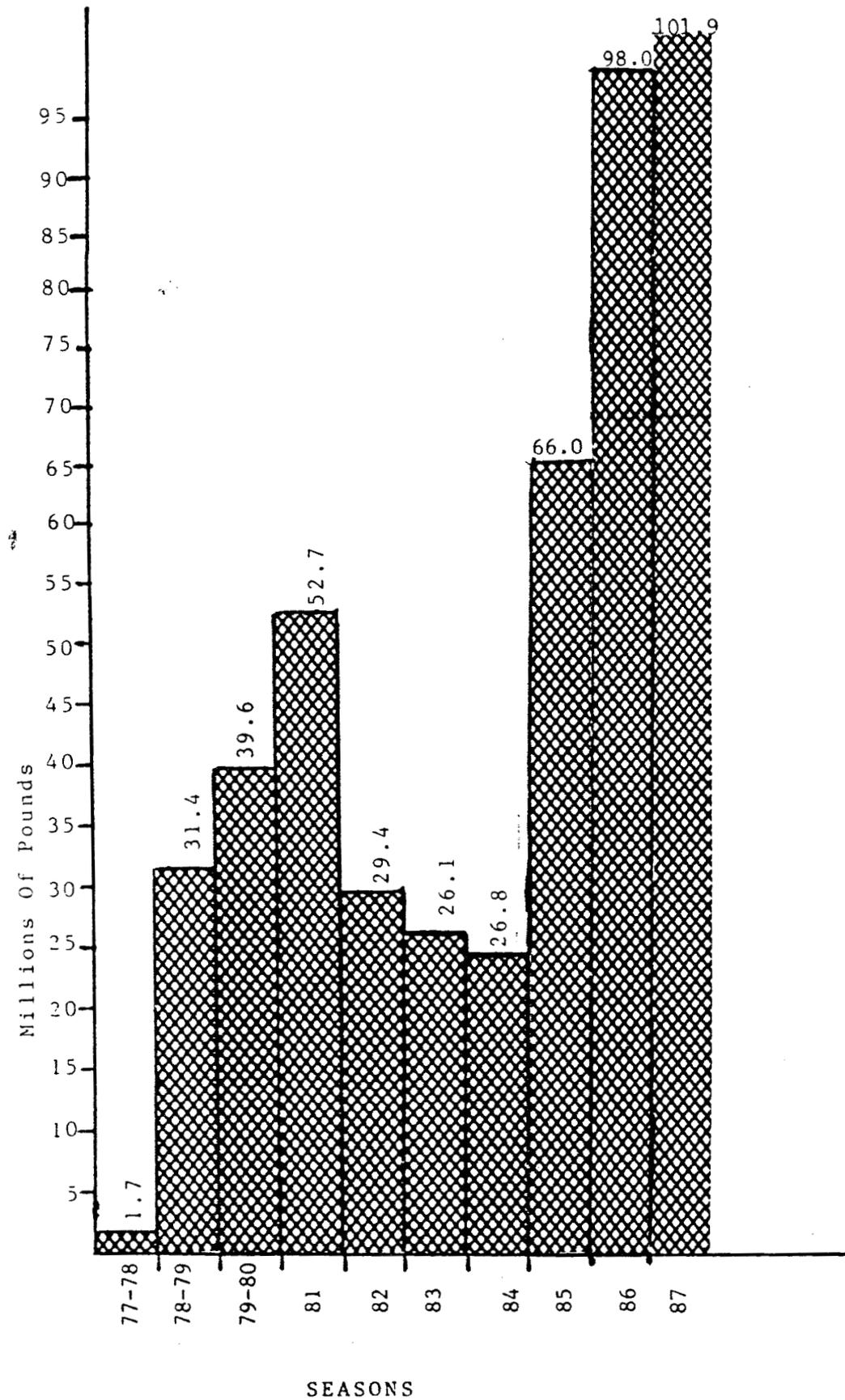


Figure 2. Historic Bering Sea *C. opilio* catch, by season.

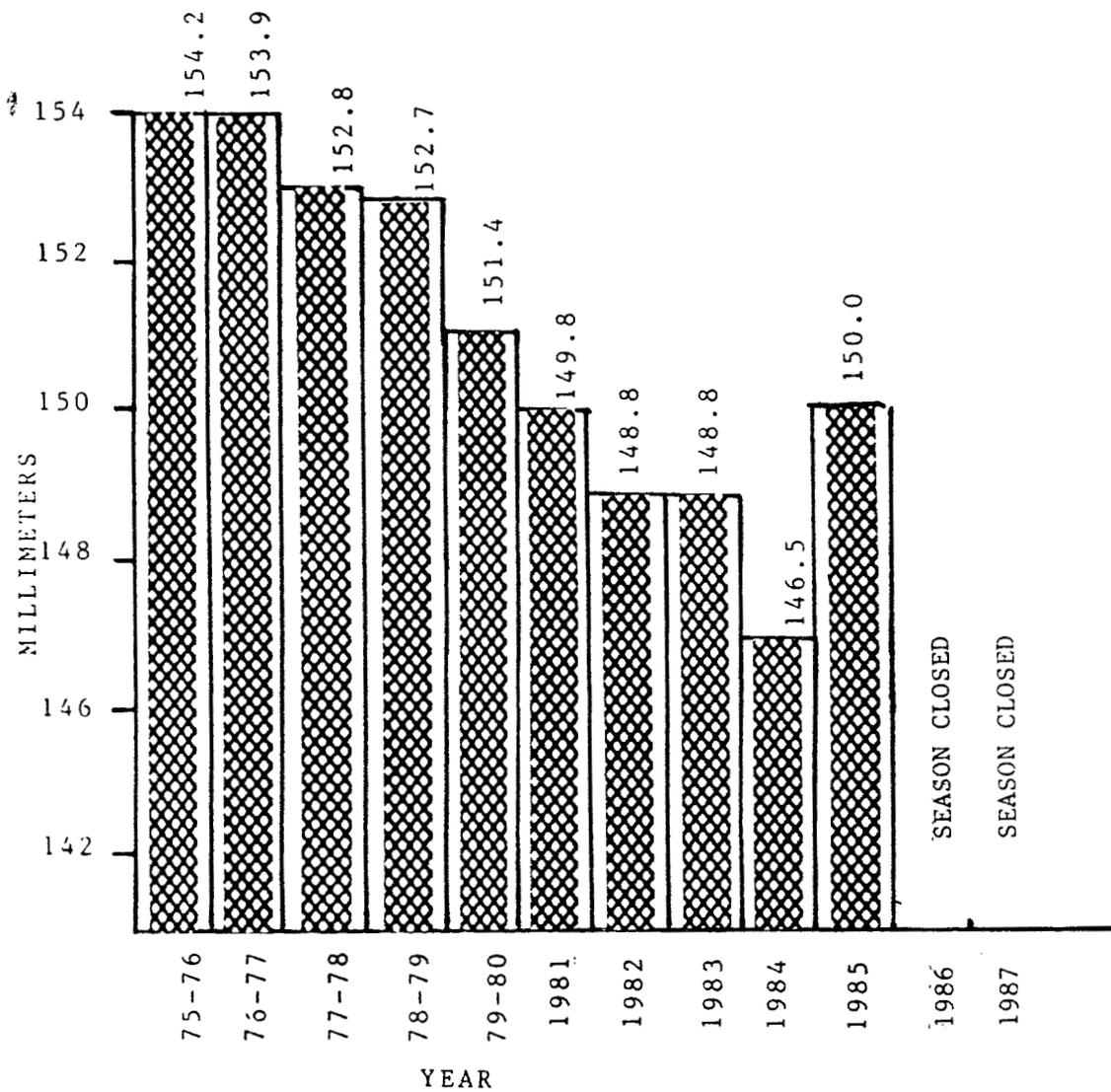


Figure 3. Historic C. bairdi Average Width Frequencies for the Bering Sea District.

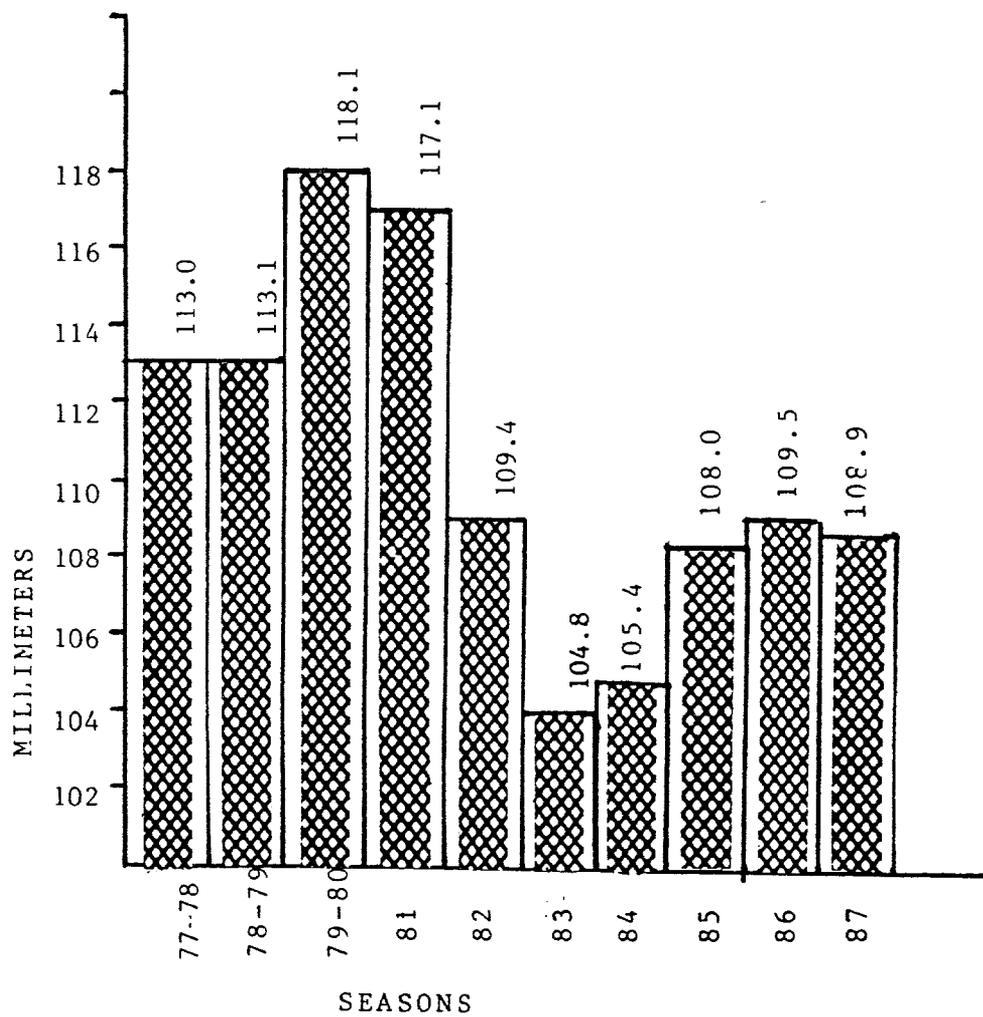


Figure 4. Historic Average Width Frequencies for the Bering Sea District, C. opilio.

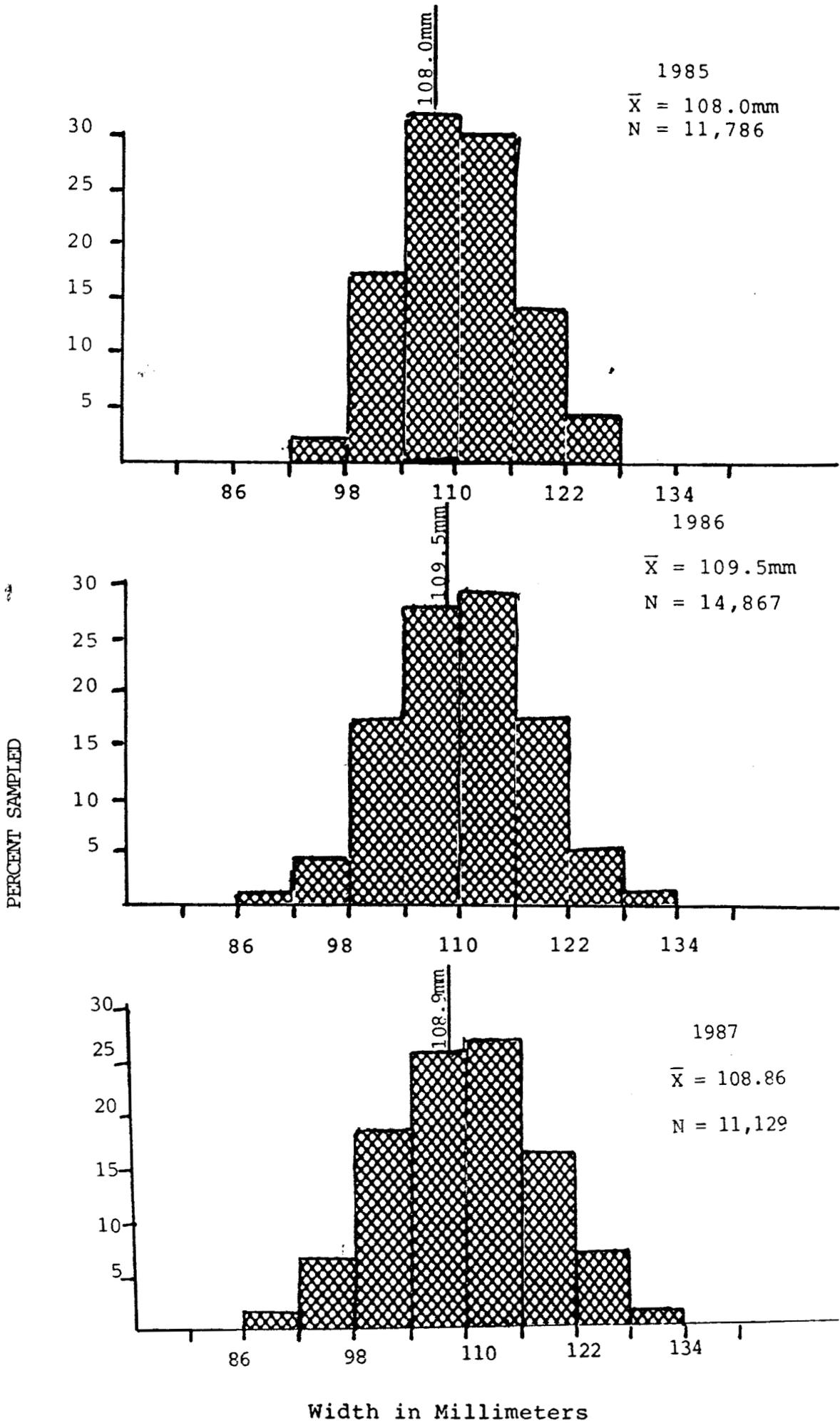
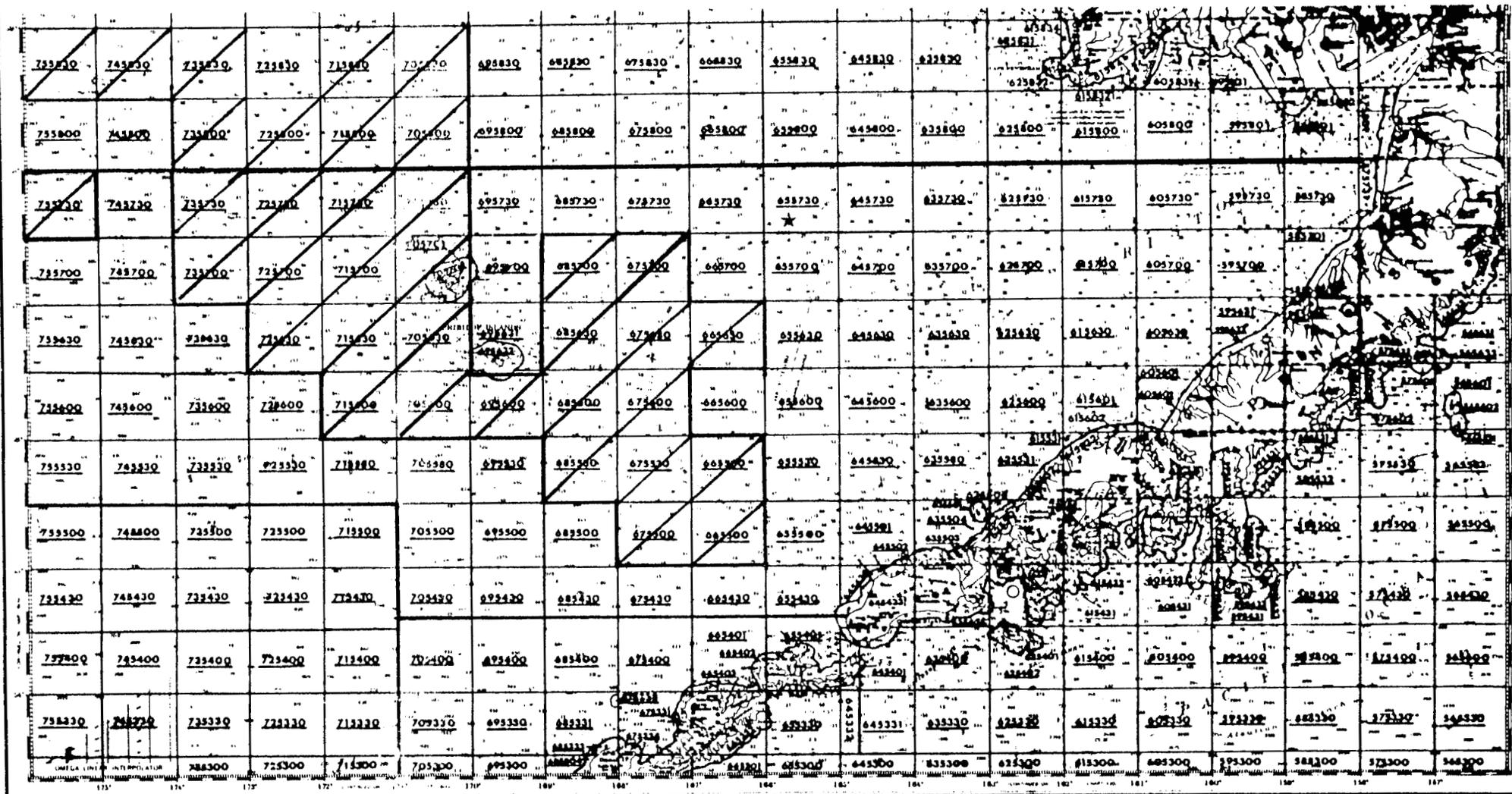


Figure 5. Bering Sea *C. opilio* width frequency distribution.

312



16006  
 OMEGA OVERPRINTED

SOUNDINGS IN FATHOMS  
 For LORAN-C coverage see reverse side

PUBLISHED BY THE  
 U.S. DEPARTMENT OF COMMERCE  
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
 NATIONAL SEA SERVICE

Statistical Area Chart Only  
 NOT FOR NAVIGATIONAL USE

(Bering Sea)  
 OMEGA OVERPRINT

160

Figure 6a. 1987 Bering Sea *C. Opilio* catch distribution.

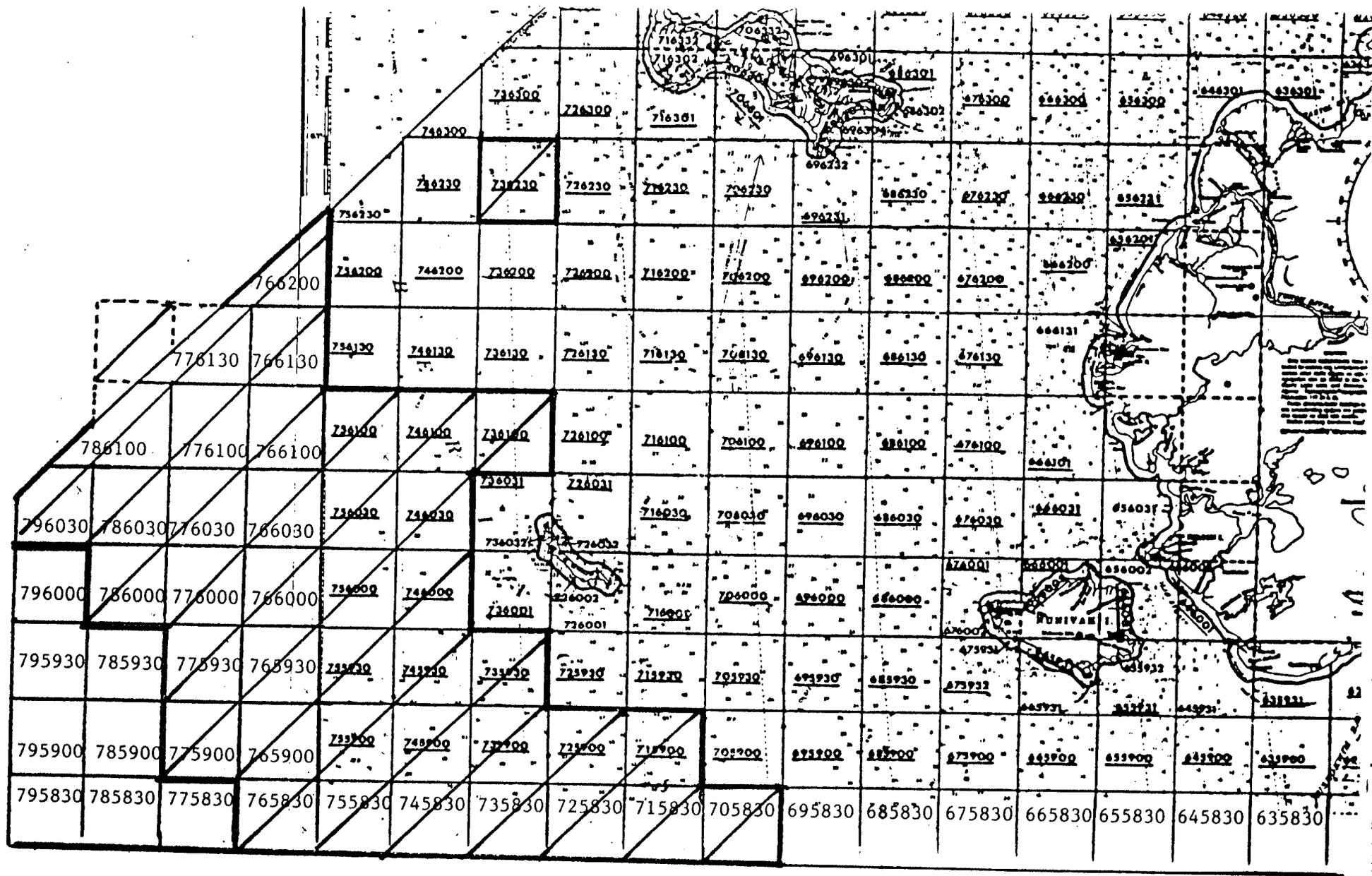


Figure 6b. 1987 Bering Sea *C. Opilio* catch distribution.  
(continuation of Figure 6a)



KING CRAB REGISTRATION AREA "T"  
BRISTOL BAY

Introduction

The Bristol Bay king crab statistical registration Area "T" includes all waters north of Cape Sarichef, east of 168° West longitude and south of the latitude of Cape Newenham and includes all waters of Bristol Bay.

Historical Background

Commercial king crab fishing in the Bering Sea began with the Japanese in 1930 and continued until 1940. They returned to the fishery in 1953 and remained until 1974. The Russian king crab fleet operated in the eastern Bering Sea from 1959 through 1971 (Table 1). U.S. fishermen entered the eastern Bering Sea king crab fishery with trawl gear in 1947. Effort and catches declined in the 1950's with no catch being reported in 1959. A period of fluctuating low catches followed through 1966 before expanding to the current full scale fishery (Table 1).

With the decline of king crab stocks in other areas of the State in 1968, U.S. effort continued to increase in the eastern Bering Sea with a record catch of 129.9 million pounds landed during the 1980 season.

The eastern Bering Sea king crab fishery traditionally takes red king crab from the Bering Sea and Bristol Bay waters north of Unimak Island and the Alaska Peninsula from Cape Sarichef to Port Heiden.

In 1980 the Board of Fisheries made the Southeastern District of the Bering Sea, the major red king crab grounds, an exclusive registration area calling this area Bristol Bay, Registration Area "T". Vessels now registering for and fishing in this area are prohibited from fishing in any other exclusive registration area, leaving only the Bering Sea, Area "Q" and Adak, Area "R", as alternative fishing areas.

The area remained closed during the 1983-84 season due to the lowest ever recorded legal males as well as the lowest ever recorded total king crab population. Small females carrying fewer eggs and the high abundance of predators also contributed to the closure decision.

#### 1987 Fishery

The 1987 Bristol Bay red king crab fishery opened at 12:00 noon on September 25 with a preseason harvest guideline of 8.5 to 17.7 million pounds. Tank inspections were given to 236 vessels by the closure announcement on October 2, the same vessel effort as experienced during the 1979 and 1980 fisheries (Table

1). Department personnel were onboard floater processors at Port Moller and although more observers were available, only one was placed onboard a catcher/processor during the season. Personnel at Port Moller assisted with registration and tank inspections, which were also given in Dutch Harbor, Akutan and King Cove. A total of nine processors at Port Moller, 21 catcher/processors and shore based plants in Dutch Harbor, Akutan, King Cove, Port Moller, Sand Point and Kodiak processed crab from area T.

On September 10, staff members from the Westward Region and Headquarters met with industry representatives in Anchorage to discuss the proposed management strategy for the 1987 Bristol Bay red king crab season. During this meeting, industry voiced concern on catch reporting and that deadloss could be excessive if crab were held by vessels expecting a short season. They asked for a minimum season length. Based on last season's catch rates, but not knowing 1987 effort levels, the staff agreed to have a minimum of 10 days actual fishing time and a minimum of a 72 hour announcement. The staff also announced that daily catch reports would start on September 30 and a closure announcement could be expected anytime after October 2nd.

To facilitate reporting, individual codes were placed on board fishing vessels. With the daily reporting requirements from all the 21 catcher/processors and reports from individual floater processors, daily catches were tabulated. The first

catch reports were received five days after the season opened and indicated an average of approximately 1,000 crab per vessel per day had been harvested for an estimated catch of five to six million pounds. Reports received the next day indicated a decline in catch rates but with the large effort, poundage continued to increase and by October 2, (with an average catch rate of over one million pounds daily), ADF&G estimated that between 12 and 14 million pounds would be harvested by October 6. The staff decided to announce the closure on October 2 for 12:00 noon, October 6. This early announcement would assist vessels with potential weather problems as well as scheduling early delivery dates. Approximately one million pounds had already been landed by 24 vessels to floater/processors at Port Moller by the closure announcement.

On September 30, a News Release from Kodiak announced the adoption of an Emergency Regulation allowing gear to be stored on the grounds for 12 days instead of seven. This action was due to approximately a 45 percent increase in vessel effort over last year, and with this increase, the possibilities of delays for unloading and gear removal could increase.

As stated, 236 vessels including 21 catcher/processors participated in the 1987 fishery, an increase of 77 fishing vessels from the 1986 season (Table 1). Catcher/processors increased by 9 vessels over the 1986 season and caught approximately 19 percent or over 2.3 million pounds, (Table 4).

Catcher only vessels averaged 46,265 pounds each, while catcher/processors averaged over 111,500 pounds each, (Table 4). Appendix A is a comparison of catcher/processor and catcher vessel fishing performance in the 1987 Bering Sea red king crab fishery.

A total of 12.3 million pounds was harvested during the 1987 season. With poorer than average catches and some bad weather during the last few days of the season, catches dropped off to a point where some vessels stopped fishing and left the fishing grounds to take their catches for delivery to other ports. The crab averaged over 5.8 pounds each, almost half a pound more than the previous season, but averaged only nine crab per pot, three less than the 1986 season, (Table 1.). Fishermen were paid \$4.00 per pound and received over \$48 million for their product.

The commercial fishery covered approximately 22,500 square miles with the majority, 65 percent of the catch, coming from only 3 statistical areas, (Table 3 and Figure 1). ADF&G estimated over 63,000 pots, or 267 pots per vessel on the grounds, an increase of over 29,000 pots from the 1986 season.

### STOCK STATUS

Although interviews and samples collected by ADF&G samplers as well as the NMFS summer survey indicated a low, but slowly increasing population of legal males, the population should

still be considered depressed. According to the NMFS survey and confirmed by the commercial fishery, legal males extended 20 to 60 miles farther west than in 1986 and included an area north of Unimak Island where legal crab had not been encountered since the survey of 1980.

Table 1. Historic U.S. Red King Crab catch in the Bristol Bay Registration Area "T" of the Bering Sea, 1966 to 1986.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	Avg. Lngth.	CPUE	Price/Pound	Deadloss
1966	9	15	140,554	997,321	2,720	7.1		52		
1967	20	61	397,307	3,102,443	10,621	7.8		37		
1968	59	261	1,278,592	8,686,546	47,496	6.8		27		
1969	65	377	1,749,022	10,403,283	98,426	5.9		18		
1970	51	309	1,682,591	8,559,178	96,658	5.1		17		
1971	52	394	2,404,681	12,955,776	118,522	5.4		20		
1972	64	611	3,994,356	21,744,924	205,045	5.4		20		
1973	67	441	4,825,963	26,913,636	194,095	5.6		25	\$ .84	N/A
1974	104	605	7,710,317	42,266,274	212,915	5.5		36	\$ .38	N/A
1975	102	592	8,745,294	51,326,259	205,096	5.7		43	\$ .38	1,639,483
1976	141	984	10,603,367	63,919,728	321,010	6.0	147.9	33	\$ .58	875,327
1977	130	1,020	11,733,101	69,967,868	451,273	5.9	147.9	26	\$1.11	730,279
1978	162	926	14,745,709	87,618,320	406,165	5.8	147.0	36	\$1.23	1,273,037
1979	236	889	16,808,605	107,828,057	315,226	6.4	152.3	53	\$1.01	3,555,891
1980	236	1,251	20,845,350	129,948,463	567,292	6.2	151.1	37	\$ .90	1,858,668
1981	177	1,026	5,307,947	33,591,368	542,250	6.3	151.1	10	\$1.50	711,289
1982	90	255	541,006	3,001,210	141,656	5.6	145.2	4	\$3.05	95,834
1983			NO COMMERCIAL FISHERY							
1984	89	137	794,040	4,182,406	112,556	5.2	142.4	7	\$ -	35,601
1985	128	130	796,181	4,174,953	85,003	5.2	142.3	9	\$2.90	6,436
1986	159	230	2,099,576	11,393,934	178,370	5.4	142.2	12	\$4.05	284,127
1987	236	311	2,122,402	12,289,067	220,871	5.8	144.7	9	\$4.00	120,388

<sup>1</sup> Deadloss included

Table 2. Bering Sea red king crab harvest composition by fishing season, 1973 through 1987.

Season	Opened/Closed	Catch <sup>1</sup>	Recruit <sup>2</sup>	Post Recruit <sup>2</sup>	Size Limit	Avg. Price/Pound
1973	6/15 - 09/09	28.2	63	37	6½" 3/1-10/31	-
					6½" 11/1-2/28	\$ .84
1974	7/29 - 10/12	41.9	60	40	6½" 3/1-10/31	-
					6½" 11/1-1/18	\$ .38
1975	8/1 - 11/16	51.3	21	79	6½" 3/1-10/31	-
					6½" 11/1-2/28	\$ .38
1976	8/15 - 12/7	63.9	56	44	6½"	\$ .58
1977	9/15 - 12/8	70.0	67	33	6½"	\$1.11
1978	9/10 - 10/23	87.6	75	25	6½"	\$1.23
1979	9/15 - 10/14	107.8	47	53	6½"	\$1.01
1980	9/10 - 10/20	129.9	44	56	6½"	\$ .90
1981	9/10 - 10/20	32.0	-	-	6½"	-
	10/25- 12/15	1.5	14	86	7"	\$1.50
1982	9/10 - 10/10	2.7	68	32	6½"	\$3.05
1983		NO COMMERCIAL FISHERY				
1984	10/1 - 10/16	4.2	59	41	6½"	\$2.60
1985	9/25 - 10/2	4.1	66	34	6½"	\$2.90
1986	9/25 - 10/7	11.4	65	35	6½"	\$4.05
1987	9/25 - 10/6	12.3	77	23	6½"	\$4.00

<sup>2</sup> Recruits figured at 149 mm - all previous years, 155 mm

<sup>1</sup> Deadloss included

Table 3. 1987 Bristol Bay king crab catch by Statistical Area.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
605534	1	49	281	30	5.73	2	0
605630	1	11,565	71,030	1,275	6.14	7	550
605700	6	21,793	132,249	3,055	6.07	9	4,000
605730	2	14,171	80,268	2,400	5.66	6	1,000
615601	1	4,267	24,750	650	5.80	6	750
615630	21	79,935	461,180	15,551	5.77	5	14,450
615700	8	45,353	268,116	5,683	5.91	10	1,410
625300	1	2,668	16,006	475	6.00	6	0
625531	1	49	282	30	5.75	2	0
625600	29	149,552	865,455	16,710	5.79	10	3,734
625630	49	357,595	2,078,627	34,796	5.81	11	16,941
625700	12	86,500	494,617	10,696	5.72	9	5,000
625730	1	2,743	15,910	400	5.80	7	0
635530	3	8,341	49,474	1,825	5.93	5	420
635600	47	385,146	2,232,581	31,389	5.80	12	23,855
635630	76	640,046	3,714,728	56,203	5.80	12	44,828
635700	22	157,186	899,237	19,786	5.72	10	750
635730	1	3,870	22,127	150	5.72	26	0
645530	1	1,023	4,910	300	4.80	3	0
645600	9	41,854	239,493	5,765	5.72	8	0
645630	8	36,733	212,615	5,046	5.79	11	2,500
645700	3	10,915	60,560	2,559	5.55	6	0
655600	2	4,507	24,517	875	5.44	5	0
655630	3	30,754	175,494	3,222	5.71	8	200
665630	1	12,623	70,690	1,100	5.60	11	0
665730	1	9,510	52,310	600	5.50	16	0
675800	1	3,654	21,560	300	5.90	12	0
Total	311	2,122,402	12,289,067	220,871	5.79	9	120,388

<sup>1</sup>/ Deadloss included

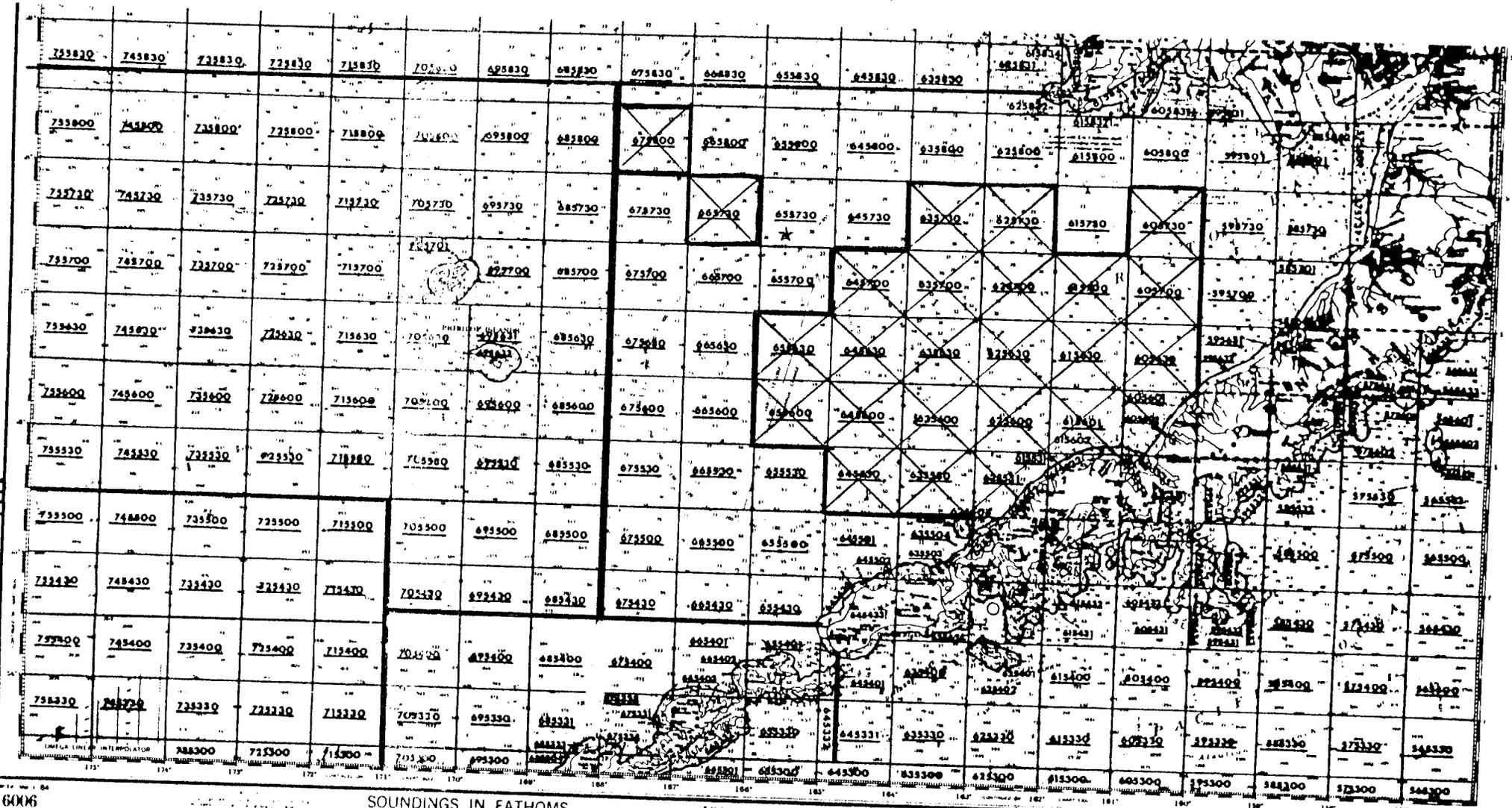
Table 4. Comparative average catches of catcher/processor vs. catcher vessels.

COMPARATIVE AVERAGE CATCHES OF CATCHER/PROCESSOR VS. CATCHER VESSELS

SEASON	1987	1986	1985	1984	1983	1982
NUMBER OF C/P's	21	12	12	10		8
NUMBER OF CATCHERS	215	147	116	79		83
LBS. OF C/P CATCH	2,342,142	1,182,866	820,013	686,302		533,563
% C/P CATCH <sup>1</sup>	19.0	10.4	19.6	16.4		13.0
AVG. C/P CATCH	111,530	93,572	68,334	68,630		66,695
AVG. CATCHER CATCH <sup>2</sup>	46,265	69,463	28,922	44,254		29,730
AVG. CPUE C/P's	13.8	12.1	14.2	7.7		6
AVG. CPUE CATCHERS	8.9	11.7	9	7		4
TOTAL CATCH	12,289,067	11,393,934	4,174,983	4,132,406		3,001,210
AVG. # POTS PULLED C/P	1,376	1,502	898	1,613.5		2,010.2
AVG. # POTS PULLED CATCHER	893	1,091	640	1,220.5		1,512.9
C/P RANGE CATCHES	5300 - 268,750	34,097-179,415	19,865-120,924	10,219-163,346		N/A

<sup>1</sup> C/P total catch divided by Total Catch

<sup>2</sup> Total catch less C/P catch divided by number catcher only vessels



16006 OMEGA OVERPRINTED  
 SOUNDINGS IN FATHOMS  
 Statistical Area Chart Only  
 NOT FOR NAVIGATIONAL USE  
 (Bering Sea) OMEGA OVERPRINT 160

Figure 1. 1987 Red king crab catch distribution in Bristol Bay.

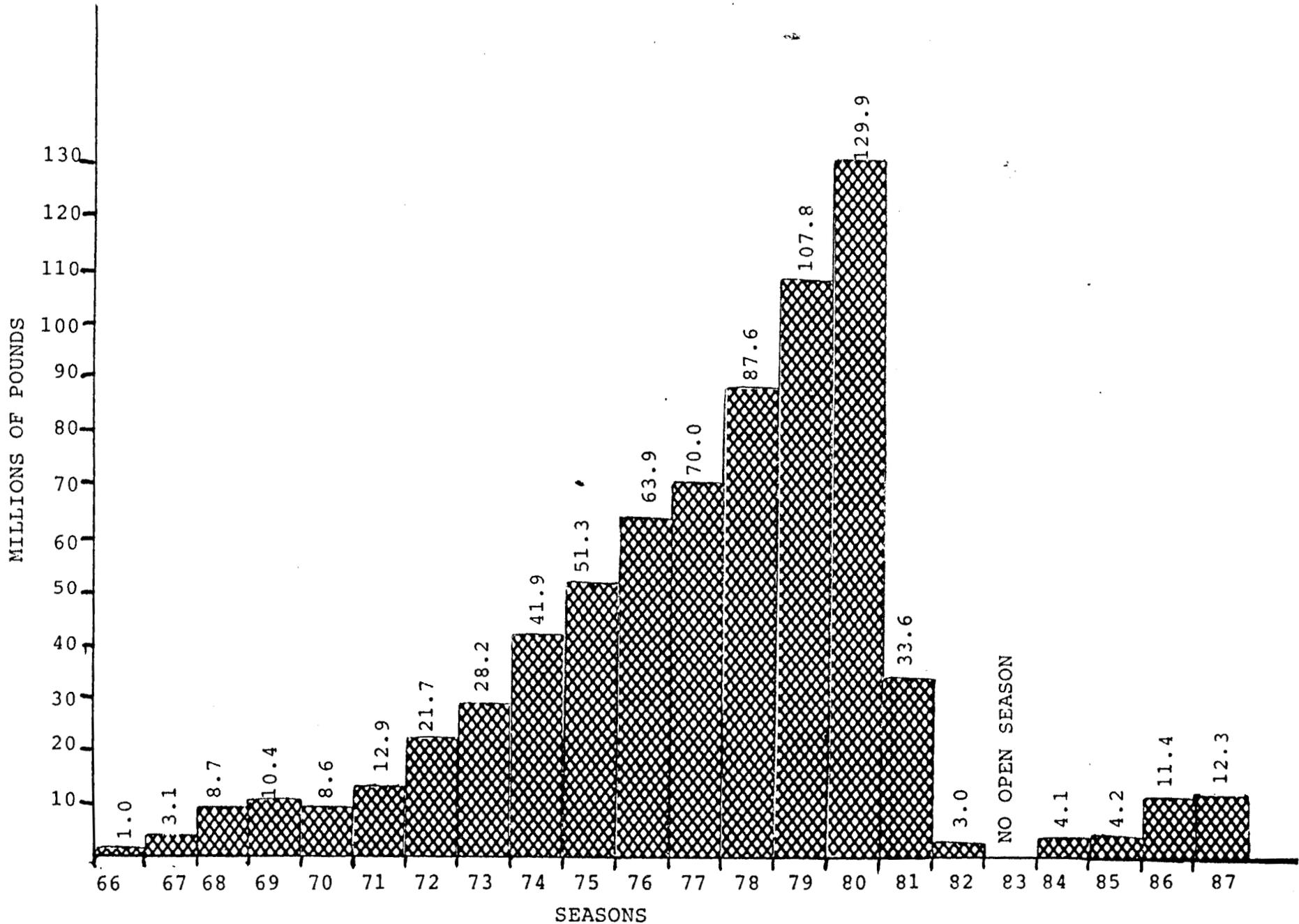


Figure 2. Historic U.S. red king crab catch in the Bristol Bay Registration Area "T" of the Bering Sea.

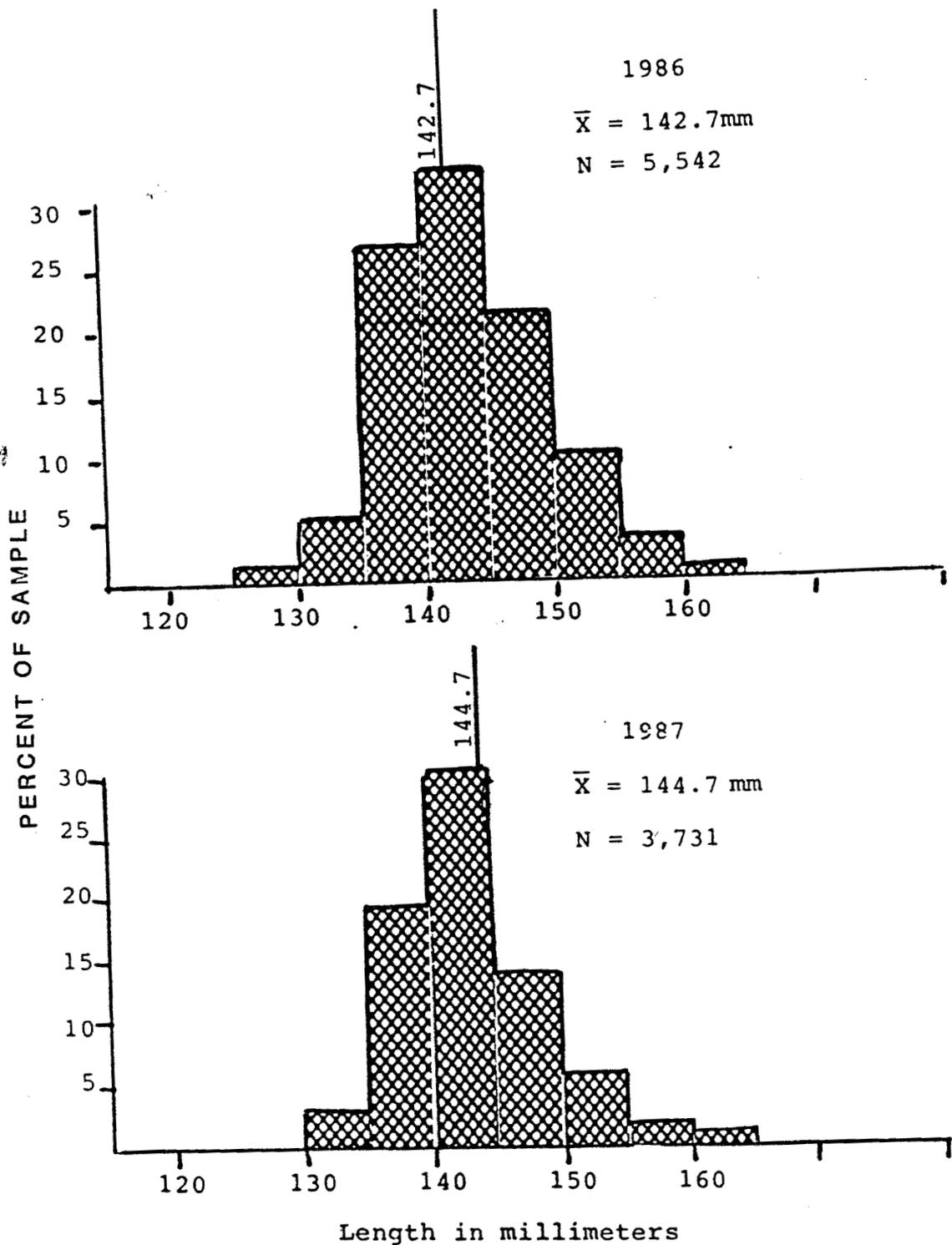


Figure 3. Red King Length Frequency Distribution from the Bristol Bay area.

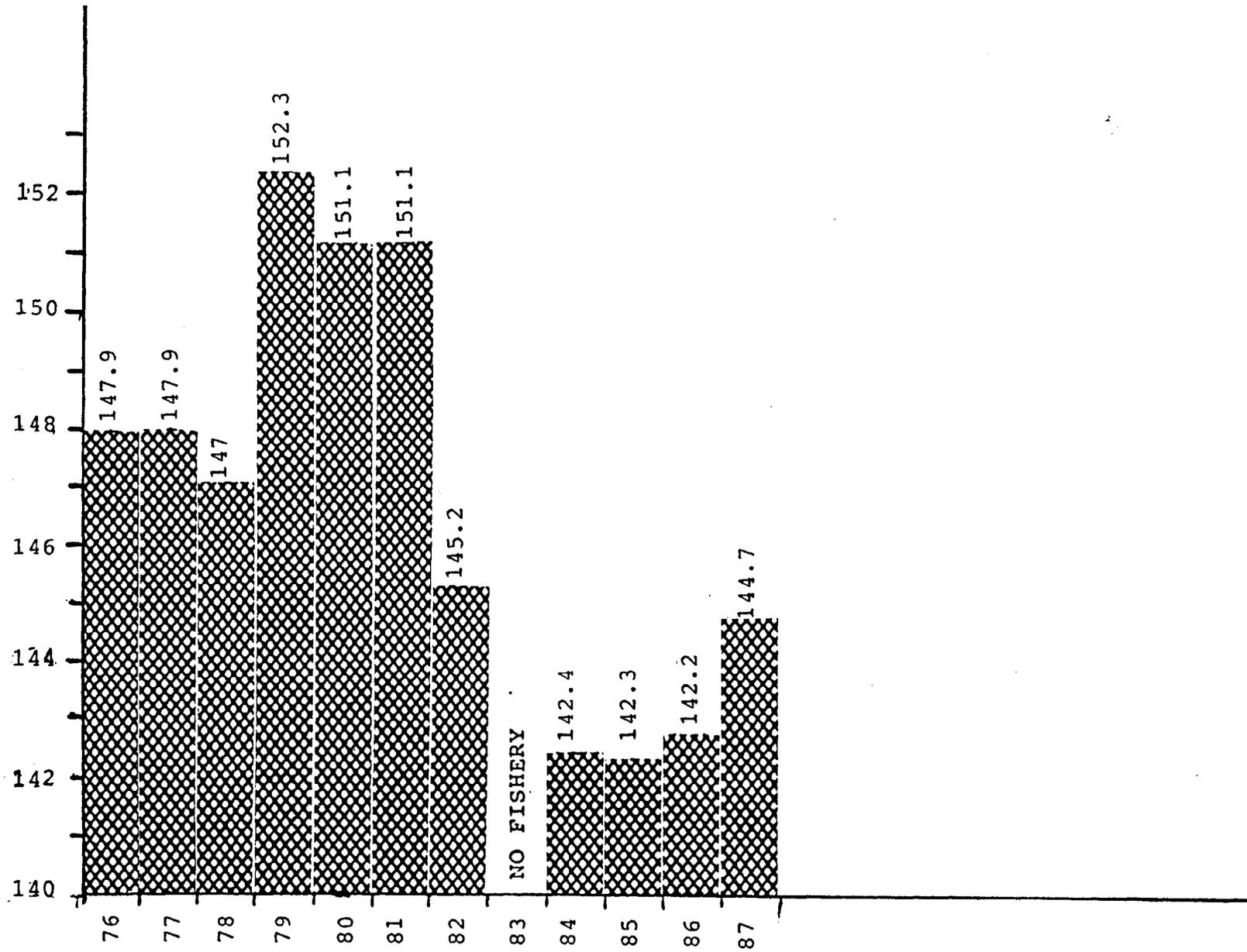


Figure 4. Historic Bristol Bay red king crab average length frequencies.



A Comparison of Catcher-Processor and Catcher Vessel Fishing Performance  
in the 1987 Bering Sea Red King Crab Fishery

by

Dana Schmidt

and

B. Alan Johnson

Regional Information Report<sup>1</sup> No. 4K88-14

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Westward Region  
211 Mission Road  
Kodiak, Alaska 99615

March 1988

---

<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished Divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.



## Abstract

The red king crab fishery in the Bering Sea is fished by a fleet whose composition contains an increased number of catcher-processor vessels in operation. These vessels do not have on-board observers and the opportunity exists for processing undersized crab. We have examined the catch per unit effort (CPUE) for catcher vessels and catcher-processor vessels operating in the Bering Sea, with respect to measurable differences in gear and vessels. The average pounds landed per catcher vessel was approximately 47,000 pounds compared with an average of approximately 111,000 pounds for the catcher-processor vessels. The landing rate was 52 pounds per pot-lift versus 78 pounds per pot-lift, respectively. Because of significant differences in the reported number of pot-lifts between catcher vessels and catcher-processor vessels of similar size, systematic over-reporting of pot-lifts by the catcher-processors is suspected, resulting in a decrease of the actual difference in catch per unit effort. As the average weight of crab caught by catcher-processor vessels could not be cross checked in the field, only the pounds reported were used in the comparisons. This study shows that the distributions of total pounds landed, pounds landed per pot-lift, and pounds landed per number of registered pots of catcher-processor vessels are significantly larger than those of the catcher vessels. All differences examined between the vessel types were highly significant. We did not identify the cause, but the differences observed are not explainable by differences in vessel length, amount of gear registered, or areas fished. Sub-legal landings are a probable explanation of the differences.

## Introduction

Increased numbers of catcher-processor vessels have participated in recent Bering Sea king crab fisheries. During the 1986 Bering Sea red king crab fishery, 11 catcher-processor vessels were registered, while in the 1987 season 21 were registered. The management of Bering Sea crab fisheries is complicated by several characteristics of these vessels.

First, approximately half the vessels are not registered for processing shellfish within the Territorial Seas of the State of Alaska, and are not subject to the State of Alaska raw fish tax. This tax is assessed on the ex-vessel value of fish processed by floating processors at the rate of 5% and shore based processors at a 3% rate. Consequently, the State of Alaska does not generate any revenue from the vessels that are not registered for processing shellfish within the Territorial Seas. However, they are subject to the same regulatory regime as other vessels and floating processors.

Second, the current minimum crab size limit is generally enforced by measurement of crab at delivery sites. However, the carapace is discarded by catcher-processors at sea when the crab are sectioned and processed. This effectively eliminates enforcement of the size (sex) limit for catcher-processor vessels, unless an on-board observer is present at all times.

Finally, because the crab are processed without inspection, under- and over-logging of number of crab landed, number of pot-lifts, and live weights are possible. This makes assessment of actual harvest very difficult. There is potential for limited enforcement of the legal requirement for recording accurate weights by boarding the processor vessels and counting or weighing processed crab. These data can be compared with fish ticket data using processed weight to whole weight conversions for possible enforcement actions, but in practice would be limited to identifying only major errors in reporting. Number of pot-lifts and number of crab landed (which are often estimated from average weights) have no practical method of verification. These data may not be reported accurately and cannot be verified without an on-board observer.

Initial examination of the 1987 fishery data indicated significant differences in average pounds landed per vessel and significant differences in average pounds landed per pot-lift when the catcher-processor vessels were compared with non-processing catcher vessels.

Processing of sub-legal crab are a probable explanation of the differences in the pounds landed, if vessel size, area fished, the number of pots registered, and the number of actual days fished do not account for the observed differences. In such a short duration fishery, as in the case of the 11-day fishery in 1987, most of the vessels made a single delivery. When more than one delivery was made, the pots were continually soaked. Because of these factors, differences in actual days fished were considered insignificant. The number of pots registered was considered to be somewhat imprecise, but there is no apparent reason for a catcher vessel to misreport number of pots registered differently than a catcher-processor vessel. The use of numbers of pots registered provides an alternative method of examining the effective amount of effort of a given vessel. Consequently, we examined the effects of area fished and vessel size as possible explanations of differences observed in landings between catcher-processors and catcher vessels. Catch per unit effort was projected by using the number of vessels, the reported number of pot-lifts, and the number of pots registered as the effort.

Therefore, the objective of this analysis is to determine if the catch per unit effort (CPUE) was significantly different for the catcher-processor vessels in the 11-day fishery held during October 1987. If such differences occur, can these differences be explained by known differences between the two types of vessels. We will also examine the economic implications if observed differences occur.

### Methods

The data used in this analysis were obtained from the fish tickets, the list of vessel type, and vessel registration forms. For catcher-processor vessels, a single fish ticket was usually submitted for the entire season, although on longer fisheries, a fish ticket is completed weekly. For catcher vessels, a ticket is completed at each landing. The basic data from the fish tickets consisted of pounds landed, number of crab landed, number of pot-lifts, and area fished. The basic data from the vessel registration forms consisted of numbers of pots registered and length of vessel. The

data resolution is that of vessel, i.e. multiple fish tickets were combined for a single vessel.

To examine differences in area fished, we graphically plotted the proportion of total effort (pot-lifts) and total pounds landed for the respective vessel type by the reported statistical area.

To determine if the catch per unit effort or pounds landed are abnormally high, two tests and graphical methods of analysis and presentation are used. The tests are the t-test for two independent samples (Snedecor and Cochran 1967) and the non-parametric test for the same, known as the Mann-Whitney or Wilcoxon rank sum test (Conover 1980).

In addition to the t-test and rank sum test to test for differences in the means of the two vessel types, a graphical method was used to locate differences in the sampling distributions of these data. The analysis of distributional differences was necessary because we could easily have had a segment of the catcher-processor fleet that landed crab at normal or sub-normal rates, while another segment of the catcher-processor fleet that experienced very high landing rates. Differences in means may be very minor in this case, while distributional differences could be very large.

We chose to use a graphical method to illustrate the distributional differences. The quantile-quantile plot or Q-Q plot (Chambers et al. 1983, Hoaglin et al. 1983, and Gnanadesikan 1977) can be used to determine if a sample distribution is similar to some other distribution. In addition to differences in the mean, other similarities or dissimilarities are observable. Appendix A provides comparison examples to better illustrate this method for the reader unfamiliar with the technique.

## Results

Graphical techniques were used to identify patterns in average crab weight, catch per unit effort, and other variables in order to identify outliers and errors in the data. After correction of errors, one vessel was removed from the analysis because the extremely high number of registered pots were conical pots and not the type used by the rest of the fishery (Figure 1).

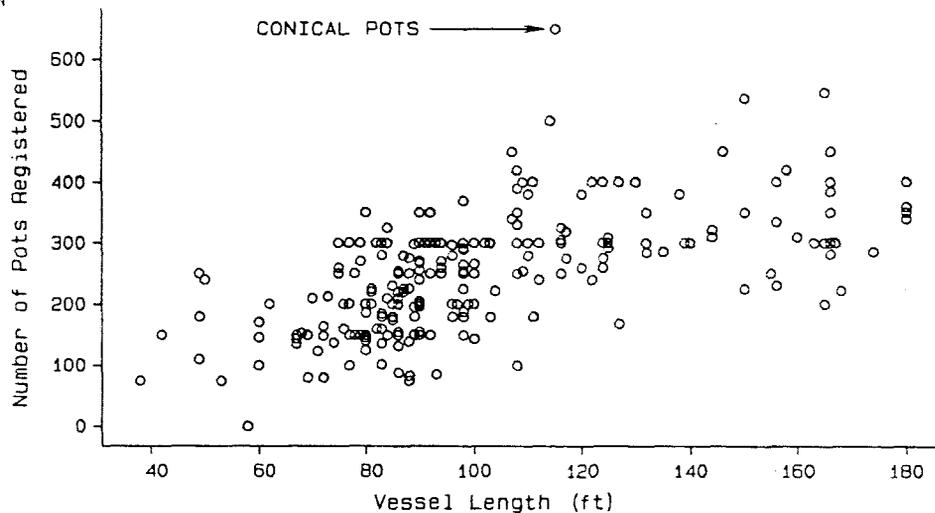


Figure 1. Number of pots registered versus vessel length (N=230).

The difference in means was measured by use of a t-test. This test allowed us to determine if two average numbers are different and allowed us to assign a probability as to the significance of that difference. The first theoretical problem encountered was the normality assumption for the t-test which did not hold in all cases. The Wilcoxon test is robust under violation of this assumption and was used as an alternative and for comparative reasons. For pounds landed, the square root transformation did result in normalized data. The other variables in this study showed similar results after transformation by either natural logarithm or square root transformations. Prior to each test a normality plot was obtained for the transformed and untransformed variables to determine the appropriate transformation.

### Comparison of Pounds Landed and Effort by Area

To determine if differences in pounds landed occurred because the catcher-processors and the catcher vessels fished in different areas, we calculated the proportion of the total catcher-processor effort (pot-lifts) and catcher-processor pounds landed that occurred in each statistical area. These values were compared in Figures 2 and 3 with the equivalent values for the catcher vessels. From these data it is illustrated that the pounds landed and effort from both components of the fleet came from a relatively small area. The difference observed did not appear to be substantial.



## Comparisons of Pounds Landed and CPUE

The means of all of the variables for the catcher-processor vessels are significantly larger than the catcher vessels as indicated by the test statistics (Table 1).

Table 1. Test statistics for difference in mean values between catcher-processor vessel (N=21) and catcher vessel (N=208) (t-test was applied to the appropriate square root or natural log transformed data).

Variable	Mean		Ratio of means	P-Value	
	Catcher vessel	Catcher-processor vessel		Wilcoxon test	t-test
Pounds landed	47,297	110,634	2.35	<.001	<.001
Number of pot-lifts	914	1374	1.50	<.001	<.001
Pounds per pot-lift	52.2	77.6	1.49	.004	<.001
Number of pots registered	238	359	1.50	<.001	<.001
Pounds per pots registered	196.4	293.0	1.49	<.001	<.001
Vessel length (ft)	97	150	1.54	<.001	<.001

The P-values for the two statistical tests indicate the probability of differences in means between the catcher vessels and catcher-processors being caused solely due to chance. The 0.004 value, for example, indicates that there is less than 4 chances in 1000 that the 25.4 difference between the mean values 52.2 and 77.6 pounds per pot-lift is not significantly different from zero.

To illustrate the difference in the distribution of pounds landed, the catcher-processor values (dots) were compared to the catcher vessel distribution (solid line) in the Q-Q plot in Figure 4. If the catcher-processor distribution were the same as the catcher vessel distribution, the dots would occur randomly around the solid line.

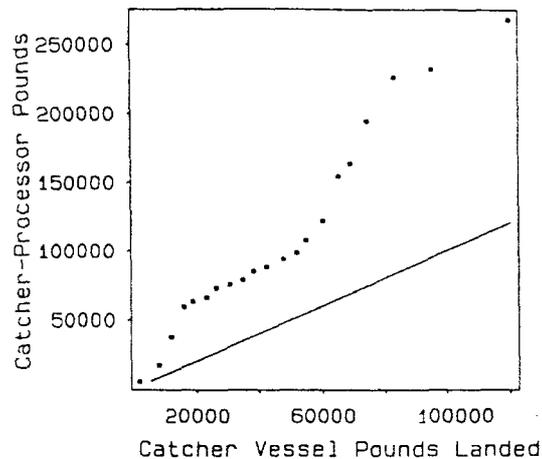


Figure 4. Catcher-processor pounds landed compared to catcher vessel distribution. Each dot represents a catcher-processor vessel.

Notice that in Figure 4 all of the points of the catcher-processor are above the solid line and not fluctuating around that line. A similar pattern was observed for pounds landed per pot-lift. Each dot represents a catcher-processor vessel. The y-axis shows the actual pounds landed and the x-axis shows the pounds landed by an equivalent catcher vessel. Over the period of the fishery, the catcher-processor vessels consistently had greater pounds landed than the catcher vessels. The vertical difference from the solid line to each dot reflects the difference in pounds between an equivalent catcher-processor vessel and catcher vessel. Note that as the magnitude of the pounds landed increased, the greater the difference was between the catcher-processor vessel pounds landed and a comparable catcher vessel pounds landed.

Although the difference in average pounds landed between the two vessel types are highly significant, the pounds landed may be affected by the number of pot-lifts or the size of vessel. As the total of the number of pot-lifts may not be an accurate reflection of effort because of variable soak time, registered number of pots was also used as a comparative basis. All tests resulted in significant differences, but on a ratio basis, the ratio of catcher-processor average pounds landed to catcher vessel average pounds landed was much larger than the ratio of the pounds landed per pot-lift and much larger than the ratio of pounds landed per number of registered pots (Table 1). This suggests pot-lifts may be systematically over-reported by catcher-processor vessels.

Because catcher-processor vessels are much larger vessels, on average, than the catcher vessels, we further examined the data to determine if length of vessel would explain the differences observed.

To provide similar size classes of both catcher-processor and catcher vessels, vessels of size 130-170 feet were selected. This grouping provided sufficient numbers of vessels and low significant difference of length ( $P=.25$ ). In this group were 12 catcher-processors and 20 catcher vessels. The pounds landed were not dependent upon vessel length (Figure 5).

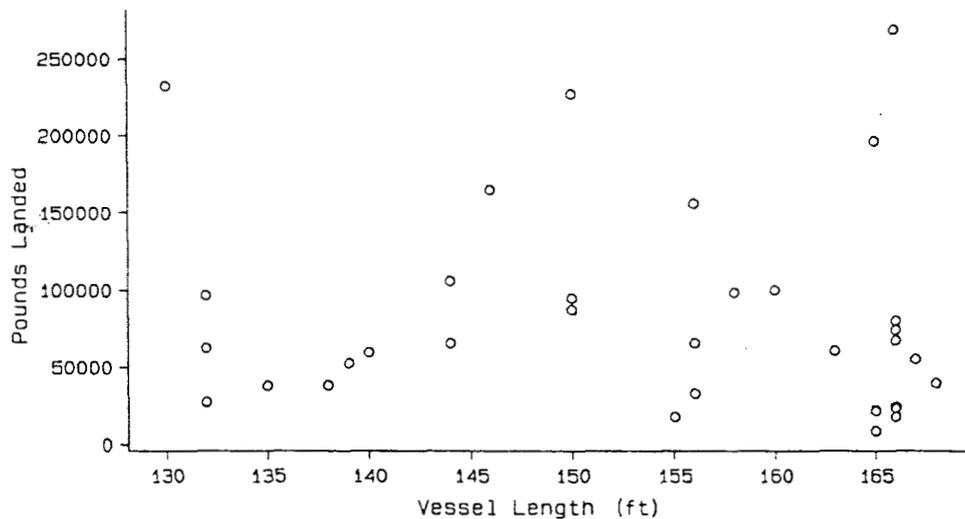


Figure 5. Scatter plot of pounds landed versus vessel length (N=32).

For vessels of size 130-170 feet in length, there is a statistical difference between mean pounds landed and also a significant difference between mean pounds per pot-lift (Table 2). The difference in number of pounds per number of pots registered is also significant. Again, the problem exists that the number of pot-lifts is also significantly greater for the catcher-processor vessels and that these data may be suspect because no verification of actual pot-lifts is possible. When compared with Table 1, clearly vessel size is not the cause for the differences observed between catcher and catcher-processor average pounds landed.

Table 2. Test statistics for difference in mean values between catcher-processor vessel (N=12) and catcher vessel (N=20) with length between 130 ft and 170 ft (t-test were applied to the appropriate square root or natural log transformed data).

Variable	Mean		Ratio of means	P-Value	
	Catcher vessel	Catcher-processor vessel		Wilcoxon test	t-test
Pounds landed	54,844	136,074	2.48	.002	<.001
Number of pot-lifts	1013	1396	1.37	.008	.005
Pounds per pot-lift	58.5	92.4	1.58	.026	.017
Number of pots registered	300	398	1.32	.002	<.001
Pounds per pots registered	183	330	1.80	.011	.004
Vessel length (ft)	152	155	1.01	.268*	.245*

\*Only vessel length is not considered to be significantly different.

In Figure 6, catcher-processor vessels and catcher vessels in the 130 ft to 170 ft keel length are compared. Each dot represents a catcher-processor vessel. The y-axis lists the pounds landed by the catcher-processor vessels while the x-axis represents the pounds landed by an equivalent catcher vessel. By comparing all of the dots relative to the solid line, landings for the catcher-processor vessels are consistently larger than for the catcher vessels. Catcher-processor vessels had landings that were approximately 2-3 times those of the catcher vessels. This same approximate rate difference holds for vessels of all lengths in Figure 4.

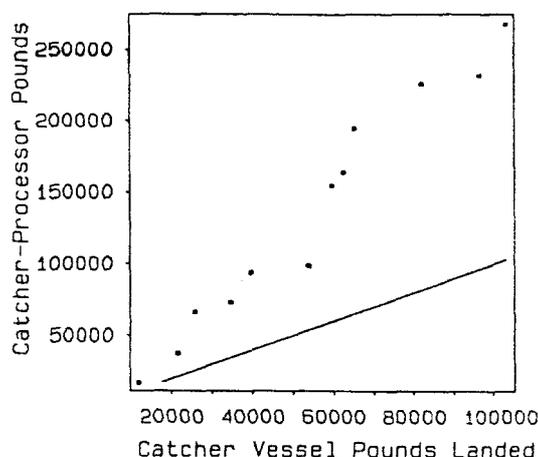


Figure 6. Catcher-processor pounds landed compared to catcher vessel pounds landed for vessels between 130 ft and 170 ft.

### Discussion

In this study we have analyzed the 1987 Bering Sea red king crab fish ticket data in an attempt to account for the disparity in pounds landed between the catcher vessels and the catcher-processor vessels.

We first graphically plotted the percentage of total pounds landed by area from which they were reported, and compared these landings with the effort (pot-lifts) by area. Relatively small differences occurred between catcher vessels and catcher-processors vessels in areas fished, at least at the resolution of statistical area. The effort based on number of pot-lifts generally paralleled landings, with most differences occurring between adjacent statistical areas. The small differences may reflect minor errors in the accuracy of statistical area reporting and were not considered to be meaningful.

Given that there was minimal differences in the area fished, we examined the pounds landed as a function of the number of vessels, the number of pot-lifts, and the number of pots registered to determine if significant differences occurred. Differences in all were highly significant. However, the two groups of vessels were quite different in average length. This

increased average size of the catcher-processor vessels accounts for a substantially larger number of pots registered, particularly for a relatively short duration fishery. By limiting the analysis to catcher-processor vessels and catcher vessels of similar length, we effectively reduced the effect of vessel length from interfering with comparisons between the two vessel types.

The average number of pot-lifts as reported on the fish tickets was significantly larger for the catcher-processor vessels, for vessels of all lengths, and when only vessels of similar size were compared. Because it does not seem plausible that these vessels are either more maneuverable, or in other ways fish gear more rapidly than comparably sized catcher vessels, the alternative explanation is that the catcher-processor vessels systematically over-reported the number of pot-lifts.

Analysis of vessels of all lengths indicated that catcher-processors had an average pounds landed per pot-lift of 1.5 times that of an average catcher vessel. When the vessels compared were vessels of similar keel lengths, average pounds landed per pot-lift by catcher-processor vessels was significantly different with an approximately 1.6 times higher average than that reported by the catcher vessels. If the recorded number of pot-lifts was systematically over-reported by the catcher-processor vessels, these differences would be larger when corrected for over-reporting.

The pounds landed by the catcher-processor were approximately 2.4 times higher than the catcher vessels, when considering vessels of similar length. It is a safe assumption that the pounds landed are relatively free from reporting errors. When comparing the vessels in total, the catcher-processor vessels had landings that were 2.5 times that of the catcher vessels.

The recent increase in recruitment of sub-legal crab, as reflected in the 1987 NMFS survey of red king crab in the Bering Sea (Stevens et al. 1987), has created conditions where a large number of sub-legal-width crab are susceptible to the commercial fisheries. The size frequencies observed in the survey suggest that most of the difference we observed in landing rates could be accounted for by less than accurate sorting of undersized crab by the catcher vessels. Since variables such as vessel length, number of pots registered, and number of pot-lifts cannot account for the observed differences, illegal landings are the most plausible explanation for a major portion of the differences observed.

Because of the significant variability of the data within the two types of vessels, it cannot be inferred, from pounds landed or pounds landed per pot-lift (or number of registered pots), that an individual vessel was fishing illegally. However, when these two types of vessels are examined in aggregate, we cannot envision any variables affecting fishing efficiency, that could account for the differences observed, other than lack of sorting of sub-legal crab. Such non-measurable factors as skipper experience and ability are unlikely to provide this magnitude of difference in landings, unless virtually all "highliners" converted over to the operation of catcher-processors, with very few operating the catcher vessels.

The observed higher rate of average pounds landed by the catcher-processor vessels versus the catcher vessels, as displayed in the Q-Q plots, is what

one would expect if a substantial portion of the catcher-processor fleet increased their landings by taking sub-legal crab.

The approximate 60,000 pound average difference between catcher-processors and catcher vessels would have had a total ex-vessel value of \$5,000,000 at the average prices received during the 1987 Bering Sea red king crab fishery.

Using the 2.35 ratio of difference in average pounds landed between catcher-processors and catcher vessels, we can project the potential impact on shore based landings under different future scenarios, assuming the current trend goes unchecked. The details of the calculations are presented in Appendix B. Table 3 represents the relative change under several different scenarios.

Table 3. Relative impact of different fleet composition on the shore based red king crab landings in Bristol Bay presented as the percent of total pounds landed by catcher-processor vessels. The differential harvest rate of 2.35 based on vessels of all lengths was used for the projections.

Change in number of catcher vessels	Change in number of catcher-processor vessels					
	+100	+80	+60	+40	+20	+0
-100	* 72%	69%	64%	57%	47%	31%
-80	69	* 65	60	53	43	28
-60	66	61	* 56	49	39	25
-40	63	58	53	* 46	36	23
-20	60	56	50	43	* 34	21
0	58	53	48	41	31	** 19%(1987)
+20	55	51	45	38	30	18
+40	53	49	43	37	28	17

\* Estimated catcher-processor landings if catcher vessels are converted to catcher-processors and the fleet stays the same size (230).

\*\* Base of 209 catcher vessels and 21 catcher processor vessels.

Currently 19% of the landings were from catcher-processor vessels, which were 21 of 230 vessels participating in the 1987 fishery. As the economic advantage in average pounds landed is very much in favor of the catcher-processor, we can expect continual increase in these types of vessels and possibly a decrease in vessels that deliver to shore based plants. Currently less than 50% of the catcher-processors pay the raw fish tax. A trend of increased number of catcher processor vessels will provide a comparable decrease in State tax revenues from this fishing industry.

Although this study addresses only the Bristol Bay red king crab fishery, similar problems can be expected in all fisheries in Alaska, where an economic advantage is obtained by processing the crab on-board. In addition to the economic disadvantage to the State, the management of the resource will also suffer, due to no cost-effective means of obtaining reliable catch data. On-board data collection requires an observer for each vessel, where shore based deliveries allow a much more efficient collection of the same data. Without some type of regulatory intervention we can expect a decrease in the quality and quantity of the data necessary to manage these fisheries. Mandatory observer coverage or other effective regulations are clearly needed.

#### References

- Chambers, J. M., W. S. Cleveland, B. Kleiner, and P. A. Tukey. 1983. Graphical methods for data analysis. Wadsworth, California.
- Conover, W. J. 1980. Practical nonparametric statistics. John Wiley, New York.
- Hoaglin, D. C., F. Mosteller, and J. W. Tukey. 1983. Understanding robust and exploratory data analysis. John Wiley, New York.
- Gnanadesikan, R. 1977. Methods for statistical data analysis of multivariate observations. John Wiley, New York.
- Stevens, B. G., R. A. MacIntosh and K. L. Stahl-Johnson. 1987. Report to industry on the 1987 Eastern Bering Sea crab survey. Report 87-18. National Marine Fisheries Service, Northwest and Alaska Fisheries Center, Kodiak, Alaska.
- Snedecor, W. G. and G. W. Cochran. 1967. Statistical methods. Iowa State University Press, Ames, Iowa.

## Appendix A.

### Comparison Example

Figures A.1 through A.8 provide comparisons between two different distributions illustrated by histograms and graphed as Q-Q plots. The figures provide how a Q-Q plot shows the differences between a sample distribution and a comparison empirical distribution. If we wanted to know if a sample distribution was from a normal distribution, the comparison distribution would be the theoretical normal distribution. The discussion is linked to pounds landed to help in the interpretation. The distributions are fictitious.

Figure A.1 illustrates the histograms of a short, spread-out distribution on the right and a tall distribution on the left. The Q-Q plot is provided in Figure A.2 and indicates that the variability is different because if a line is drawn through the points, it is not parallel to the line in the graph. The difference in means is depicted by the average separation between the lines. If we consider the short, spread-out distribution to be catcher-processor vessels, this type of difference illustrates a higher landing rate. This same difference can also be seen in the histograms, because there are enough data to have meaningful plots. When there are not sufficient data, the histogram is not as illustrative.

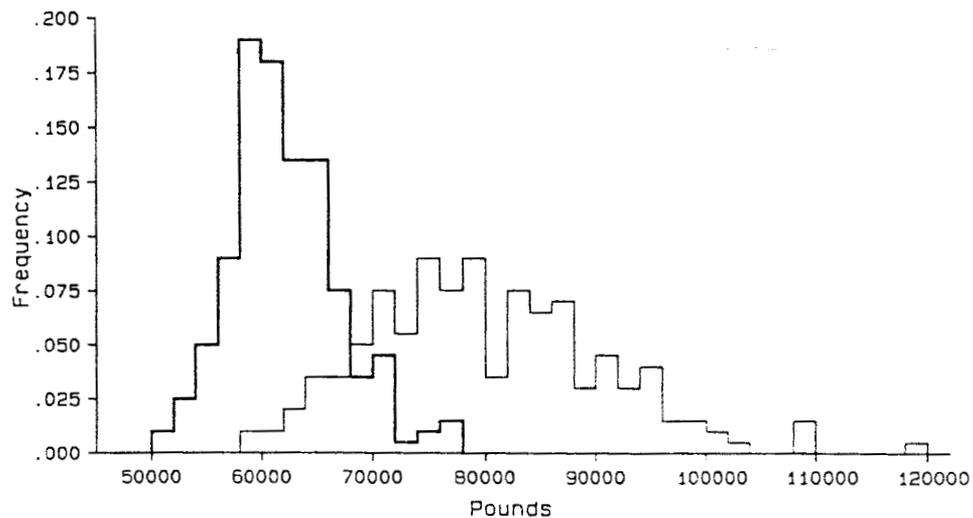


Figure A.1. Frequency histogram of two example distributions with different means and different variances.

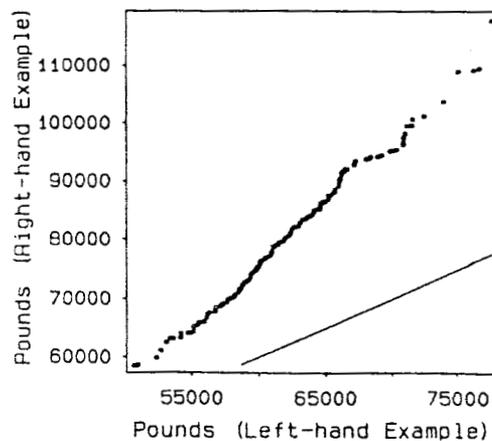


Figure A.2. Q-Q plot of comparison of two example distributions with different means and different variances.

In Figure A.3 and Figure A.4, the means are different but the variability in the data is the same, thus providing parallel Q-Q plot lines if a line was drawn through the dots. If we consider the right-hand histogram to be catcher-processor vessels, this could be interpreted as the catcher-processor pounds landed is some constant value greater than the catcher vessel pounds landed.

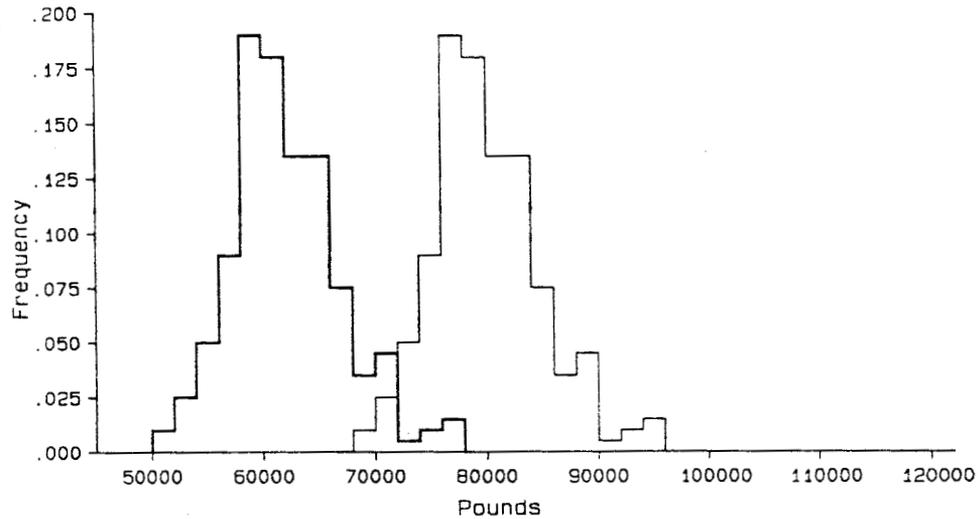


Figure A.3. Frequency histogram of two example distributions with different means and identical variances.

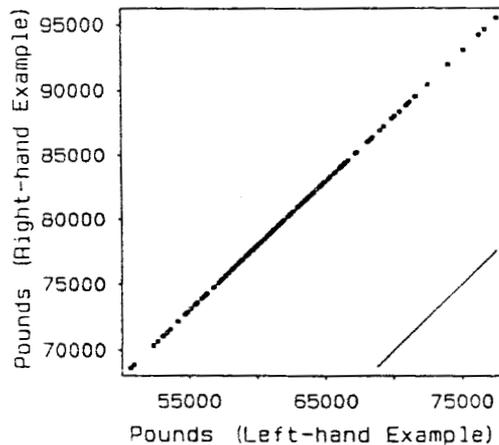


Figure A.4. Q-Q plot of comparison of two example distributions with different means and identical variances.

Figures A.5 and A.6 provide an illustration of two distributions with identical means but different variability. This is recognizable in the Q-Q plot by a line drawn through the dots crossing the solid line in the center, but with different slopes. These are the types of distributions we would expect if there were no advantage in being a catcher-processor, or catcher vessel. Catcher-processor vessels that are uniform in length would be expected to have a more constant catch rate than vessels of varying length.

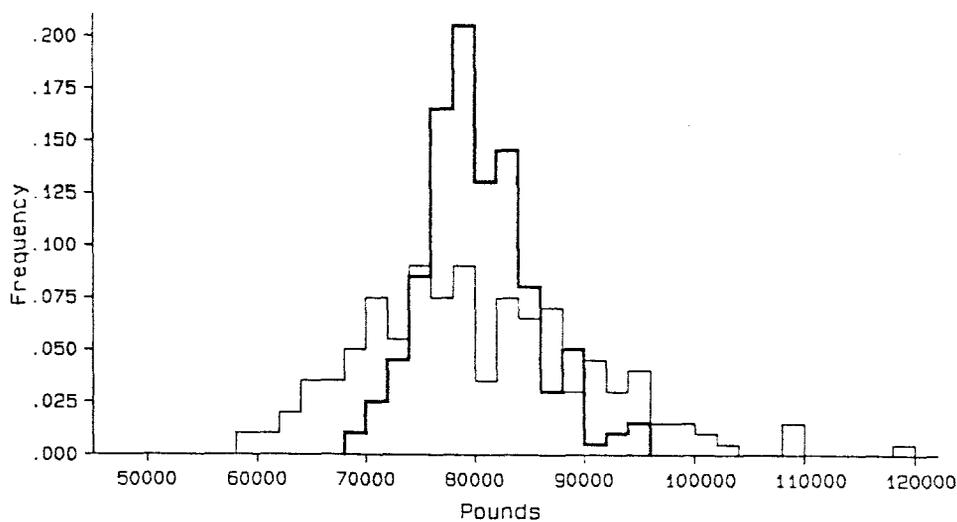


Figure A.5. Frequency histogram of two example distributions with identical means and different variances.

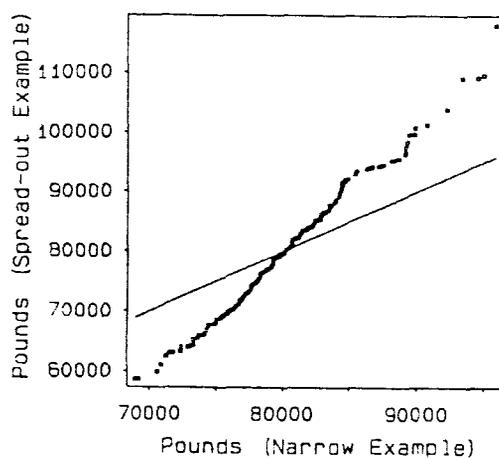
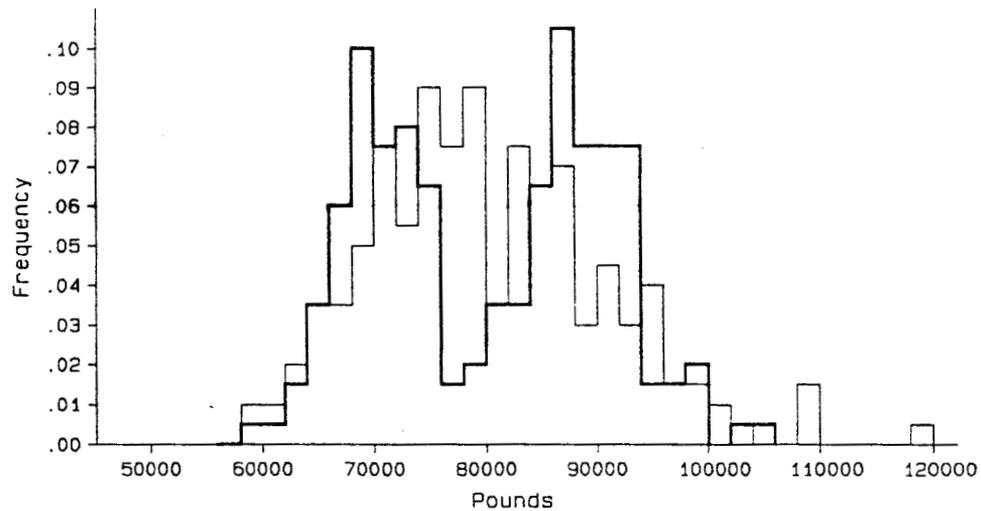
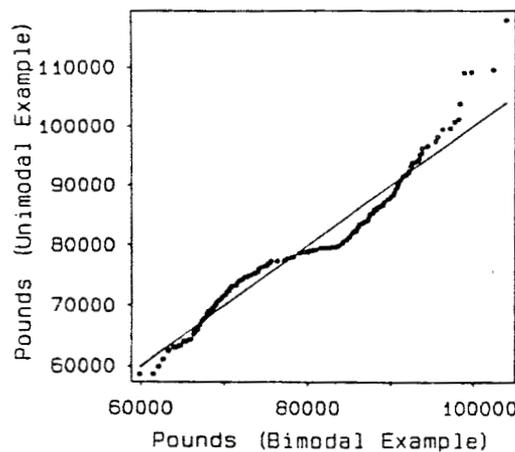


Figure A.6. Q-Q plot of comparison of two example distributions with identical means and different variances.

If we consider the bold histogram to be the catcher-processor vessels, Figures A.7 and A.8 are indicative of a bimodal distribution you would expect if the catcher-processor fleet were made up of half inefficient vessels and half highly efficient. In this case the means between the catcher-processors and the catcher vessels are identical, but the shape of the distributions are not identical.



**Figure A.7.** Frequency histogram of two example distributions with identical means and different variances (a unimodal and bimodal shape).



**Figure A.8.** Q-Q plot of comparison of two example distributions with identical means and different variances (a unimodal and bimodal shape).

## Appendix B.

### Methods Used for the Estimation of Future Shore-based Landing Trends

Let:

$N_p$  = the number of catcher-processor vessels

$N_c$  = the number of catcher vessels

$c = 2.35$  the ratio of the means of pounds landed,  
catcher-processor vessel versus catcher vessel

$$\frac{\text{catcher-processor mean pounds landed}}{\text{catcher vessel mean pounds landed}} = \frac{110634}{47107}$$

then, the percentage composition of pounds landed attributed to catcher-processors is

$$p = \frac{c}{N_c/N_p + c}$$

and the percentage composition of pounds landed attributable to the catcher vessels is

$$q = 1 - p$$

At the current level of fleet composition ( $N_p=21$ ,  $N_c=209$ ), the resultant

values are  $p=0.19$  and  $q=0.81$ . This is to say the catcher-processor vessels contributed 19% of the total landings by weight for the 1987 red king crab fishery. The catcher-processor vessels were 9% of the 1987 fleet.



## ST. MATTHEW ISLAND BLUE KING CRAB

### 1987 Fishery

The season opened at 12:00 noon, September 1, 1987, with a preseason harvest guideline of 600,000 to 1,300,000 pounds. With the suspension of the Federal Tanner Crab Management Plan in late April, the conflict of State and Federal regulation over storage of Tanner crab pots in 30 fathoms or less was eliminated from the Northern District.

Tank inspections and registrations were given on the fishing grounds by ADF&G personnel placed onboard floater processors. A total of 61 vessels received registrations of which 13 were catcher/processors. The vessel effort was a 62 percent increase over the 1986 season and 7 more catcher/processors participated, (Table 1). The average price paid on the grounds was \$2.85 per pound.

Catcher/processors caught a total of 336,500 pounds, or 31.3 percent of the seasons total of 1.1 million pounds. The average catcher/processor caught about 26,000 pounds compared to the 15,400 pounds taken by the average catcher-only vessel, (Table 4).

The Department estimated over 9,370 pots on the grounds in 1987, an increase of over 4,000 pots from 1986. Vessels averaged 8 crab per pot, two less than the previous season's average. The decline can probably be attributed to the increase in effort as the 1987 NMFS survey found a 90

percent increase in the legal population.

Due to the increased fishing effort, the 1987 season lasted only four days, closing on September 5, after a 48 hour announcement. Catches and number of pots pulled, received daily from the catcher/processors and several catcher-only vessels, assisted in the management of the fishery.

The St. Lawrence island section of the Northern District of the Bering Sea opened on August 1, but had no apparent commercial fishing effort. This section was closed on September 5, with the St. Matthew island area.

#### Stock Status

According to the National Marine Fisheries 1987 report to industry, the abundance of legal crab increased some 90 percent, although the performance of the fishery does not substantiate this increased estimate. It does appear that the population is stable and may be on an increase.

Table 1. Historic blue king crab catch in the Northern District of statistical Area "Q" (St. Matthew and St. Lawrence Islands).

Year	Vessels	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Percent Oldshell	Avg. Wt.	Avg. Length	Pounds Deadloss
1977	10	24	281,665	1,202,066	17,370	16	7.0	4.3	130.4	129,148
1978	22	70	436,126	1,984,251	43,754	9	N/A	4.5	132.2	116,037
1979	18	25	52,966	210,819	9,877	5	80.8	4.0	128.8	56,147
1980	2	2	46,906	219,777	2,316	20	N/A	4.7	N/A	75,000
1981	31	119	1,045,619	4,627,761	58,550	18	N/A	4.4	N/A	53,355
1982	96	269	1,935,886	8,844,789	165,618	12	19.6	4.6	135.1	142,973
1983 <sup>2</sup> <sub>3</sub>	164 13	235 13	1,931,990 11,264	9,454,323 52,557	133,944 3,975	14 3	26.7 -	4.8 4.7	137.2 -	828,994 3,500
1984 <sup>2</sup> <sub>3</sub>	90	169	841,017 N O	3,764,592 R E P O R T E D	73,320	11	34 L A N D I N G S	4.5	135.48	31,983
1985 <sup>2</sup> <sub>3</sub>	79	103	484,836 N O	2,427,110 R E P O R T E D	51,606	9	9 L A N D I N G S	5.0	138.98	2,613
1986 <sup>2</sup> <sub>3</sub>	38	43	219,548 N O	1,003,162 R E P O R T E D	22,093	10	10 L A N D I N G S	4.6	134.33	32,560
1987 <sup>2</sup> <sub>3</sub>	61	62	234,521 N O	1,075,179 R E P O R T E D	28,440	8	5 L A N D I N G S	4.6	134.13	400

<sup>1</sup>Deadloss included.

<sup>2</sup>St. Matthew.

<sup>3</sup>St. Lawrence.

Table 2. Northern District, Area "Q" king crab harvest composition by fishing season.

Season	Season			Catch <sup>1</sup>	Size Limit	Price Per Lb.
	Opened	Closed				
1977	June 7	- Aug. 16	Blue	1,202,066	5 1/2"	\$ 1.00
			Red	543,041	5"	
1978	July 15	- Sept. 3	Blue	1,984,251	5 1/2"	.95
	July 15	- Aug. 16	Red	2,007,910	4 3/4"	
1979	July 15	- Aug. 24	Blue	210,819	5 1/2"	.70
	July 15	- Aug. 16	Red	3,024,228	4 3/4"	
1980	July 15	- Sept. 3	Blue	219,777	5 1/2"	.75
	July 15	- July 31	Red <sup>2</sup>	353,683	4 3/4"	
1981	July 15	- Aug. 21	Blue	4,627,761	5 1/2"	.90
	July 15	- Sept. 3	Red <sup>2</sup>	63,983	4 3/4"	
1982	Aug. 1	- Aug. 16	Blue	8,844,789	5 1/2"	2.00
	Aug. 1	- Aug. 16	Red <sup>2</sup>	3,690	4 3/4"	2.00
	May 1	- Aug. 1	Brown	193,507	5 1/2"	2.00
1983 <sup>3</sup>	Aug. 20	- Sept. 6	Blue	9,506,880	5 1/2"	3.00
	Aug. 20	- Sept. 6	Red	1,635	4 3/4"	2.50
	May 1	- Aug. 1	Brown		5 1/2"	-
1984	Aug. 1	- Sept. 8	Blue	3,764,592	5 1/2"	-
	Aug. 1	- Sept. 8	Red <sup>2</sup>	-	4 3/4"	1.50
	May 1	- Dec. 31	Brown <sup>3</sup>	-	5 1/2"	1.50
1985	Sept. 1	- Sept. 6	Blue	2,427,110	5 1/2"	1.60
	Aug. 1	- Sept. 6	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	- Dec. 31	NO CATCH REPORTED		5 1/2"	-
1986	Sept. 1	- Sept. 6	Blue	1,003,162	5 1/2"	3.20
	Aug. 1	- Sept. 6	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	- Dec. 31	NO CATCH REPORTED		5 1/2"	-
1987	Sept. 1	- Sept. 5	Blue	1,075,179	5 1/2"	2.85
	Aug. 1	- Sept. 5	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	- Dec. 31	Brown	424,394	5 1/2"	2.60

<sup>1</sup>Deadloss included.

<sup>2</sup>Does not include Norton Sound.

<sup>3</sup>Some of Northern District open until September 20.

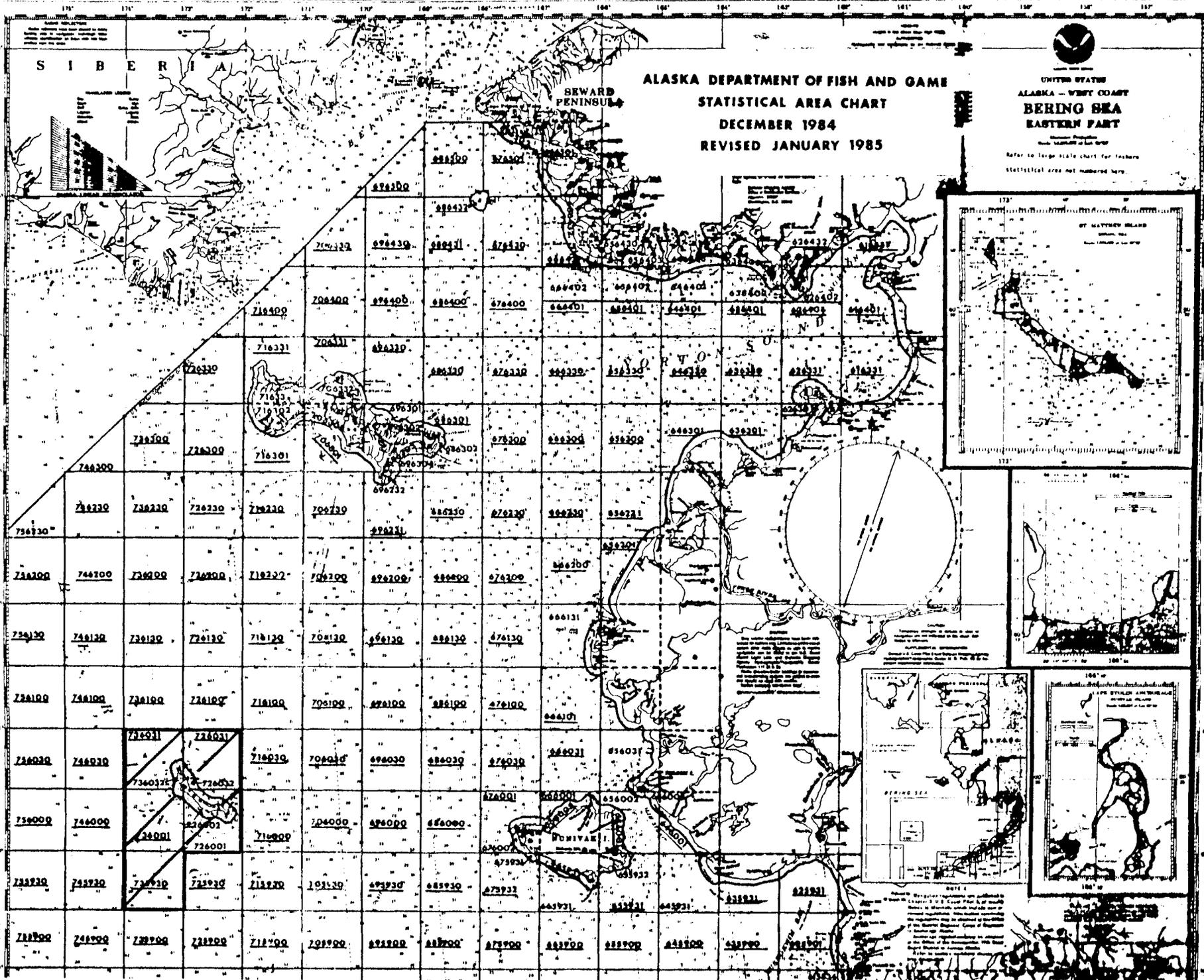
Table 3. Bering Sea (Northern District) blue king crab catch, by statistical area, for the 1987 season, St. Matthew Island.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
726001	21	97,206	441,730	11,127	4.54	9	400
726002	13	35,817	162,904	4,375	4.55	8	0
726031	1	1,750	8,870	300	5.07	6	0
735930	2	5,945	29,560	492	4.97	12	0
736001	23	85,344	396,781	10,402	4.65	8	0
736031	1	4,255	18,473	936	4.34	5	0
736032	1	4,204	16,861	808	4.01	5	0
Season Total:	62	234,521	1,075,179	28,440	4.58	8	400

<sup>1</sup>Deadloss included.

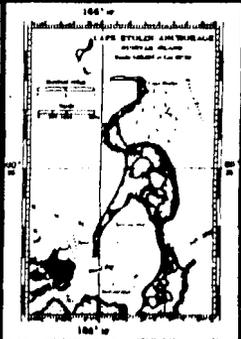
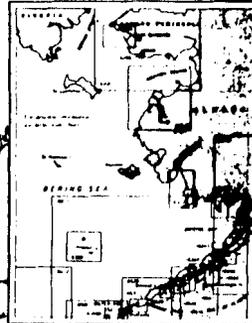
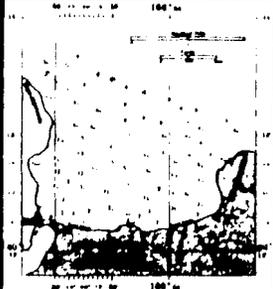
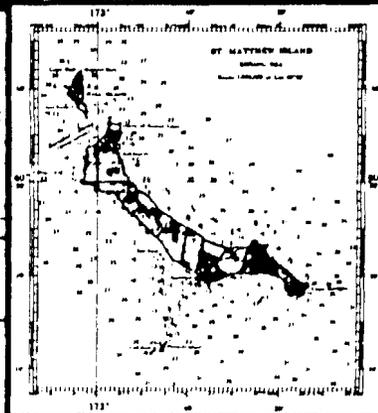
Table 4. Comparative average catches of catcher/processor vs. catcher vessels.

	SEASON			
	1987	1986	1985	1984
Number of C/P's	13	6	10	12
Number of Catchers	48	32	69	78
Lbs. of C/P Catch	336,460	207,745	498,374	471,378
% C/P Catch	31.3	20.7	20.5	12.5
Avg. C/P Catch	25,881	34,624	49,837	39,286
Avg. Catcher Catch	15,390	21,498	27,953	41,174
Avg. CPUE C/P's	10.5	11.8	12.4	11
Avg. CPUE Catchers	7.5	9.5	8.8	11
Total Catch	1,075,179	1,003,162	2,427,110	3,764,592
Avg. # Pots Pulled C/P's	540	625	784.9	834.4
Avg. # Pots Pulled Catcher	446	573	634.0	811.6
C/P Range Catch	15,010 - 50,319	24,651 - 43,007	24,440 - 76,396	



ALASKA DEPARTMENT OF FISH AND GAME  
 STATISTICAL AREA CHART  
 DECEMBER 1984  
 REVISED JANUARY 1985

UNITED STATES  
 ALASKA - WEST COAST  
**BERING SEA  
 EASTERN PART**  
 Refer to large scale chart for features  
 Statistical area not numbered here.



35

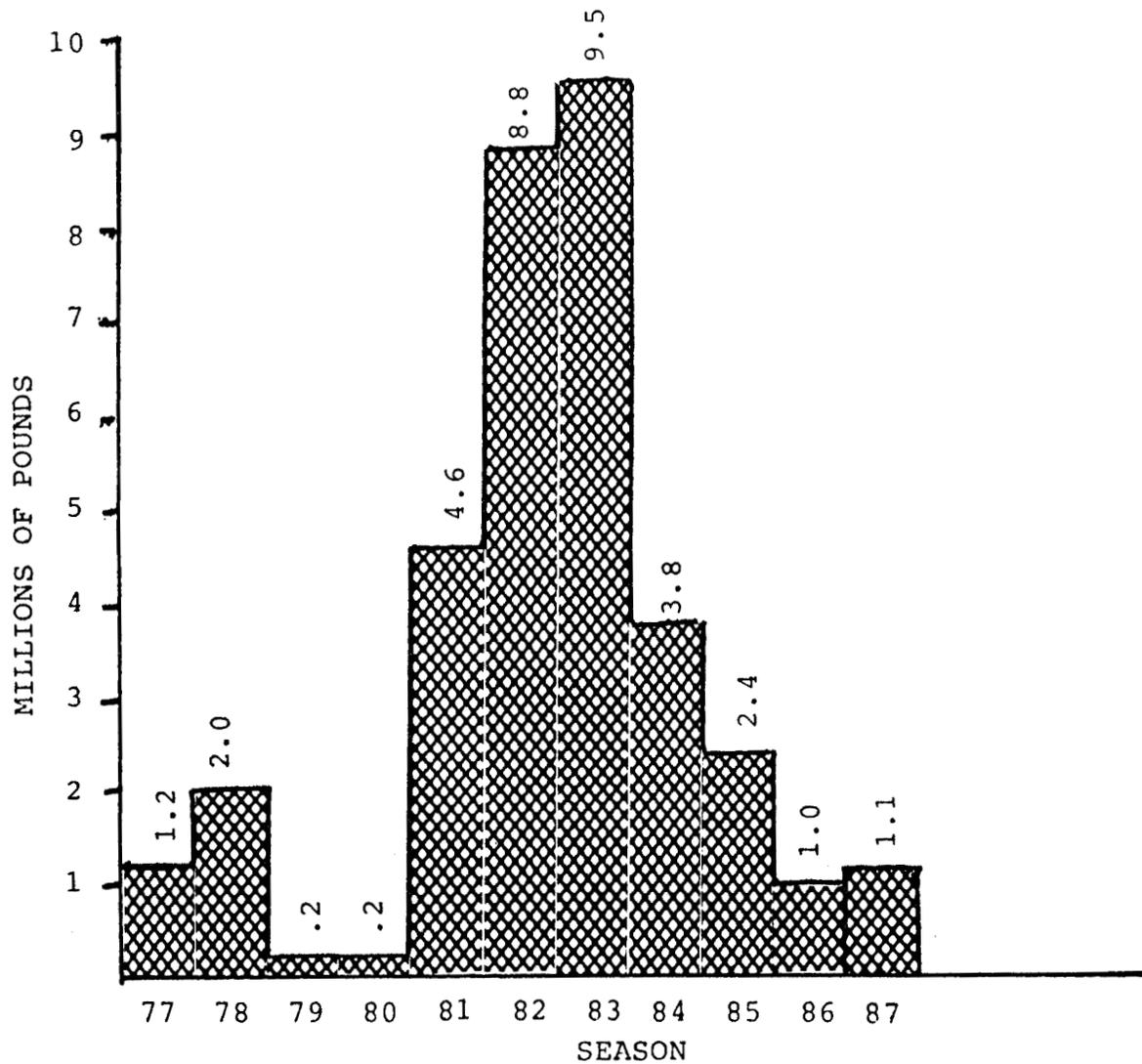


Figure 2. Historic blue king crab catch in the Northern District of registration Area "Q" (St. Matthew and St. Lawrence islands).

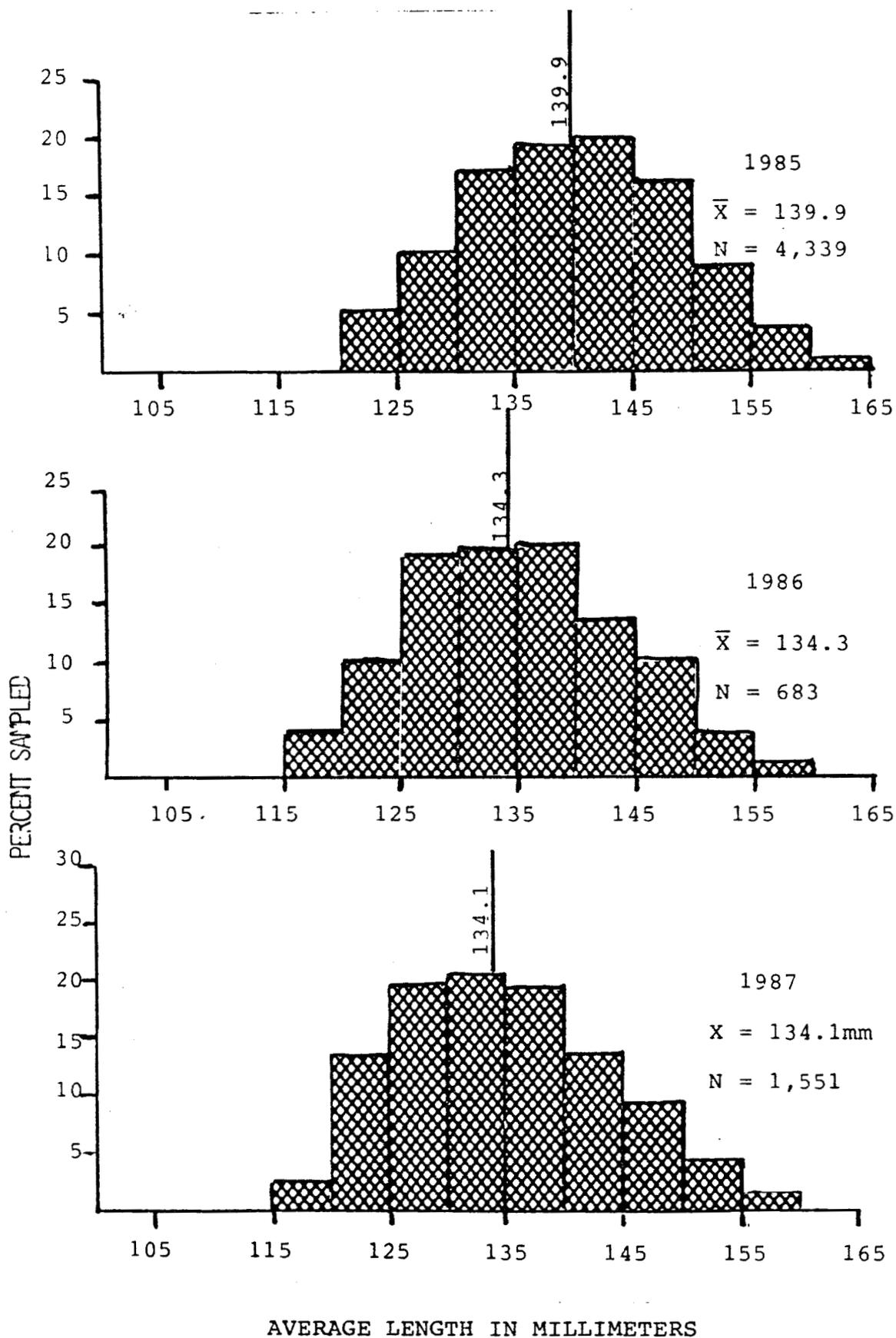


Figure 3. Blue king crab length frequency distribution from the St. Matthew Island section of the Bering Sea.

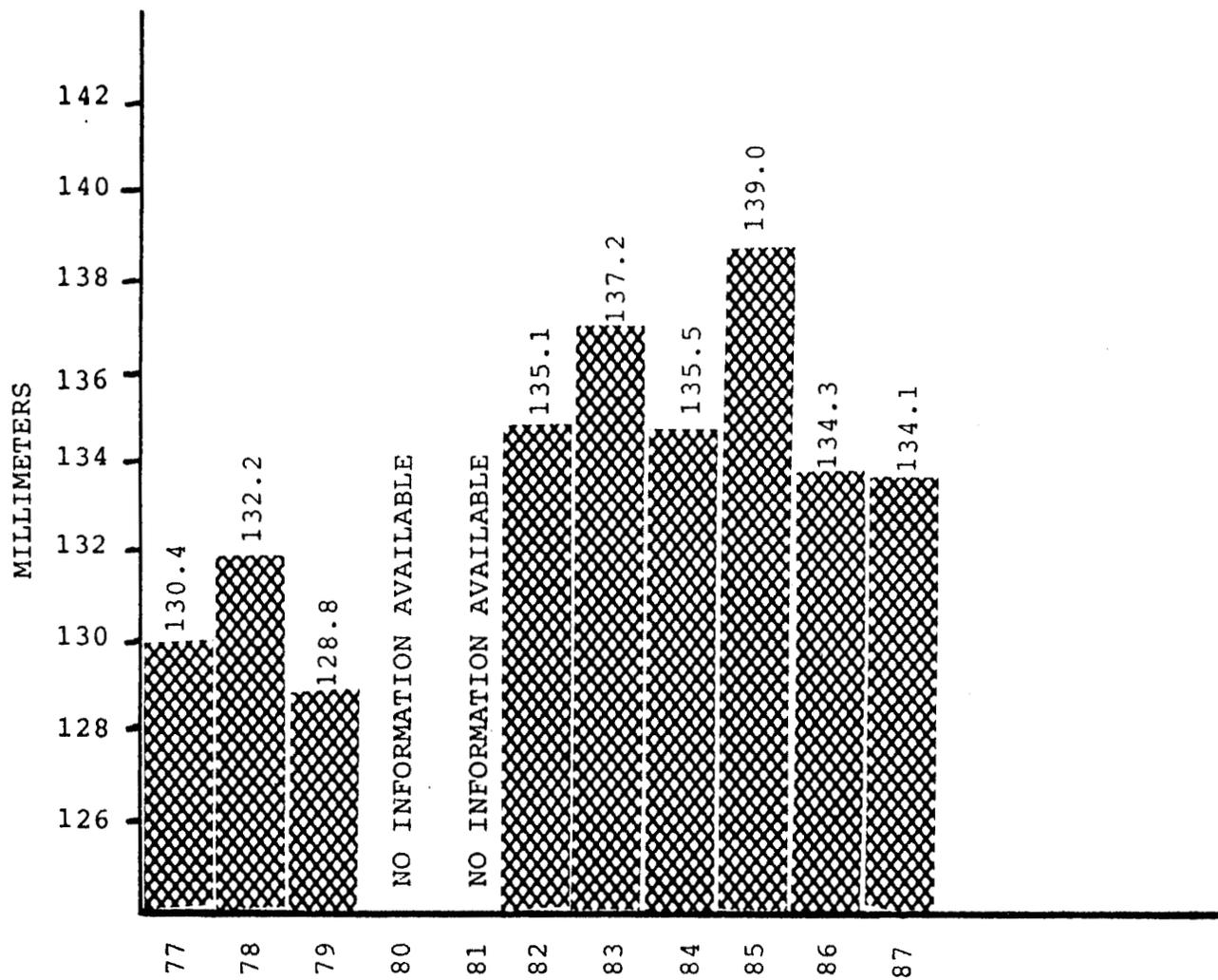


Figure 4. Historic St. Matthew island blue king crab average length frequencies.





## KING CRAB STATISTICAL AREA "Q"

### BERING SEA

#### Description

The Bering Sea king crab area, Statistical Area "Q" includes all waters west of 168° West longitude to the U.S. Russian Convention Line of 1867 and north to the latitude of Cape Newenham at 58°39' North latitude including the waters of the Chukchi Sea. This registration area is separated into the Pribilof and Northern districts. The Northern District is further separated into two sections; the Norton Sound section which includes all waters east of 168° west longitude and north of the latitude of Cape Romanzof, and the General section which includes all waters not described in the Norton Sound section.

#### 1987 PRIBILOF BLUE KING CRAB

#### Historical Background

The blue king crab fishery in the Pribilof's started in 1973 when vessels targeted on blue king crab stocks between St. George and St. Paul Islands during the summer months when the red king crab fishery was closed. The first reported catch was 1.2 million pounds taken by eight vessels between July and October. The crab averaged 7.3 pounds per crab, and the

catch per unit effort (CPUE) was 26 crab per pot. The average weight has remained relatively constant to that of the red king crab stocks, but the CPUE of 26 crab per pot has never again been attained by the fleet averaging only nine crab per pot until the past three seasons when the CPUE dropped to three crab and less per pot (Table 1).

### 1987 Season

The Pribilof District of the Bering Sea opened to fishing at 12:00 noon, September 25, concurrently to the Bristol Bay red king crab fishery. The harvest guidelines for the areas blue king crab was 0.3 to 1.7 million pounds.

Due to increased harvest guidelines in the Bristol Bay area and a poor performance in the Pribilof District during the last four seasons, there was no effort in the area until the Bristol Bay closure in early October, (Tables 2 and 4).

In October, 47 vessels entered the fishery but only 35 actually made landings totalling 284,000 pounds, only 25,000 pounds less than the entire 1986 season, (Tables 1 and 4). Fishing was considered poor and the first crab landed consisted of predominantly skip molt crab, those crab with large barnacles on their shells. Although the recovery on these crab was quite high, industry did not want crab that was covered with barnacles. As the season progressed and effort levels dropped to only 8 vessels in November, some school crab began to show, but only in a small portion of the district. Effort had dropped to 5 vessels in December and with catches dropping these

vessels were starting to bring in their gear as the holiday season approached. With an estimated catch of over 660,000 pounds, the Department announced a closure for the area for December 20, 1987.

The 1987 season produced a catch of over 701,000 pounds, the largest catch reported since 1983 when over 2.1 million pounds was landed. The crab averaged 7.4 pounds each and catch per pot averaged 2, both comparable to the past four seasons catch statistics, (Table 1).

As during past seasons, no floater processors were on the grounds to process crab, but several of the nine catcher/processors in the area purchased crab from fishing vessels.

#### Stock Status

The 1987 NMFS survey states that "the estimated abundance of legal males increased from 1986 to 1987, but is not considered significant due to the imprecision of the estimate. The overall population appears stable".

Table 1. Historic blue king crab catch Bering Sea, Area "Q", Pribilof District.

Year	Vssts.	Lndgs.	No. Crab <sup>1</sup>	No. Pound <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Avg. Lnqth.	Rounds Deadloss
1973-74	8	13	174,420	1,276,533	6,814	26	7.3	N/A	0
1974-75	70	101	908,072	7,107,294	45,518	20	7.8	157.8	0
1975-76	20	54	314,931	2,433,714	16,297	19	7.7	159.1	0
1976-77	47	113	855,505	6,611,084	71,738	12	7.7	158.1	0
1977-78	34	104	807,092	6,456,738	106,983	8	7.9	158.9	159,269
1978-79	58	154	797,364	6,395,512	101,117	8	8.1	159.3	63,140
1979-80	46	115	815,557	5,995,231	83,527	9	7.7	155.9	284,555
1980-81	110	258	1,497,101	10,970,346	167,684	9	7.3	155.7	287,285
1981-82	99	312	1,202,499	9,080,729	176,168	7	7.6	158.2	250,699
1982-83	122	281	587,908	4,405,353	127,728	5	7.5	159.8	51,703
1983-84	126	221	276,364	2,193,395	86,428	3	7.9	159.9	4,562
1984-85	16	25	40,427	306,699	15,147	3	7.6	155.45	0
1985-86	26	49	77,607	532,735	23,483	3	6.9	146.52	7,500
1986-87	16	25	36,988	258,939	15,800	2	7.0	N/A	5,450
1987-88	38	68	95,131	701,337	40,507	2	7.4	152.72	9,910

<sup>1</sup>Deadloss included.

Table 2. Pribilof District, Area "Q", king crab harvest composition by fishing season.

Season	Season		Catch	Average Weight	Size Limit		Price Per Lb.
	Opened	Closed			Season	Season	
1973-74	04/25/73	06/15/74	1.3	7.3	6 1/4" 6 1/2"	03/01-10/31 11/01-02/28	\$ .84
1974-75	07/29/74	10/12/75	7.1	7.8	6 1/4" 6 1/2"	03/01-10/31 11/01-02/28	\$ .38
1975-76	09/15/75	05/20/76	2.4	7.7	6 1/4" 6 1/2"	03/01-10/31 11/01-02/28	\$ .38
1976-77	09/15/76	01/13/77	6.6	7.7	6 1/2"		\$ .58
1977-78	09/15/77	01/20/78	6.4	8.0	6 1/2"		\$ 1.11
1978-79	09/10/78	01/15/79	6.4	8.1	6 1/2"		\$ 1.23
1979-80	09/15/79	12/02/79	6.0	7.7	6 1/2"		\$ 1.01
1980-81	09/15/80	11/15/80	11.0	7.3	6 1/2"		\$ .90
1981-82	09/10/81	10/28/81	Blue	9.1	7.6	6 1/2"	\$ 1.50
	09/15/81	10/28/81	Red	1.3		6 1/2"	\$ 1.50
	05/01/81	08/01/81	Brown	.08		6 1/2"	\$ 2.00
1982-83	09/10/82	09/25/82	Blue	4.4	7.5	6 1/2"	\$ 3.05
	09/20/82	09/25/82	Red	.5		6 1/2"	\$ 3.05
	09/10/82	05/11/83	Brown	.07		6 1/2"	\$ 3.30
1983	10/01/83	10/11/83	Blue	2.2	7.9	6 1/2"	\$ 3.00
	10/01/83	10/11/83	Red	.05		6 1/2"	\$ 3.00
	10/01/83	11/03/83	Brown	.6		5 1/2"	\$ 2.50
1984	10/01/84	10/16/84	Blue	.3		6 1/2"	\$ 2.50
	10/01/84	10/16/84	Red	-		6 1/2"	-
	05/01/84	12/31/84	Brown	-		5 1/2"	\$ 1.50
1985	09/25/85	10/21/85	Blue	.5		6 1/2"	\$ 2.90
	09/25/85	10/21/85	Red	∅		6 1/2"	-
	01/01/85 <sup>1</sup>	12/31/85	Brown	-		5 1/2"	-
1986	09/25/86	11/20/86	Blue	0.26	7.0	6 1/2"	\$ 4.05
	09/25/86	10/07/86	Red	∅		6 1/2"	-
	01/01/86 <sup>1</sup>	12/31/86	Brown	-		5 1/2"	-
1987	09/25/87	12/20/87	Blue	0.7	7.4	6 1/2"	\$ 4.00
	09/25/87	10/06/87	Red	∅		6 1/2"	-
	01/01/87	12/31/87	Brown	0.4	4.2	5 1/2"	\$ 2.60

<sup>1</sup>Permit January 1 through December 31.

Table 3. Bering Sea blue king crab catch, by statistical area, for the 1986-87 season (Pribilof District).

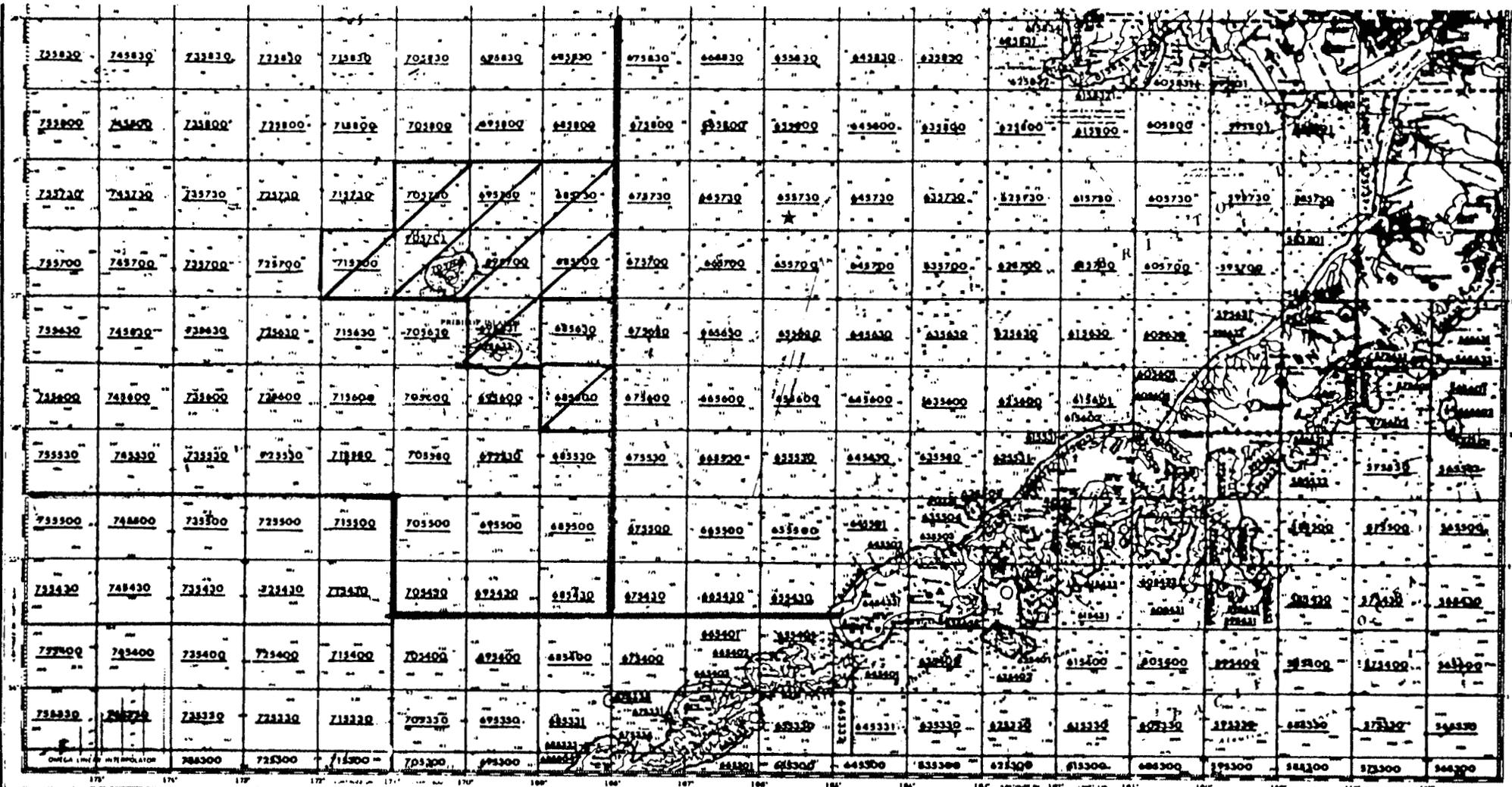
Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
685600	1	2,579	18,310	1,000	7.10	2	0
685700	9	18,227	133,514	7,803	7.59	2	250
685730	3	5,676	42,153	2,275	7.40	2	250
695631	2	2,183	15,025	1,822	6.66	1	0
695700	28	28,379	211,533	13,340	7.37	2	9,410
695730	20	28,560	217,112	11,707	7.60	2	0
705701	2	223	1,874	520	8.27	71	0
705730	2	4,686	34,208	1,140	7.30	3	0
715700	1	4,680	27,608	900	5.90	5	0
Season Total:	68	95,131	701,337	40,507	7.37	2	9,910

<sup>1</sup>Deadloss included.

Table 4. Bering Sea (Pribilof District) blue king crab catch statistics by month, 1986-87 season.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
September			N O	F I S H I N G				
October	35	48	37,508	283,827	20,240	7.57	2	0
November	8	12	42,462	308,361	13,087	7.26	3	9,910
December	5	8	15,161	109,149	7,180	7.20	2	0
Total	38	68	95,131	701,337	40,507	7.37	2	9,910

<sup>1</sup>Deadloss included.



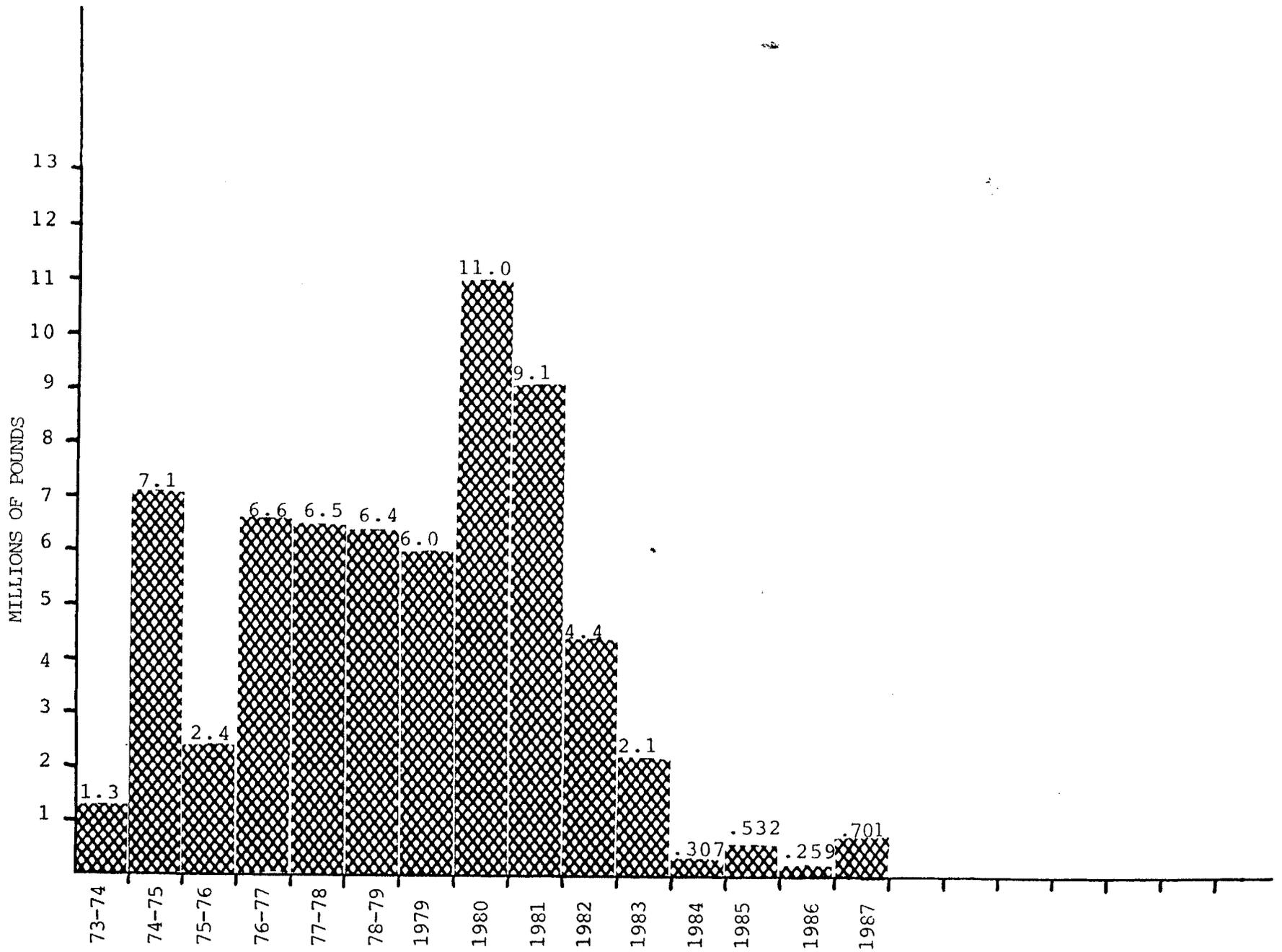


FIGURE 2. PRIBILOF BLUE KING CRAB HISTORICAL CATCH.

178

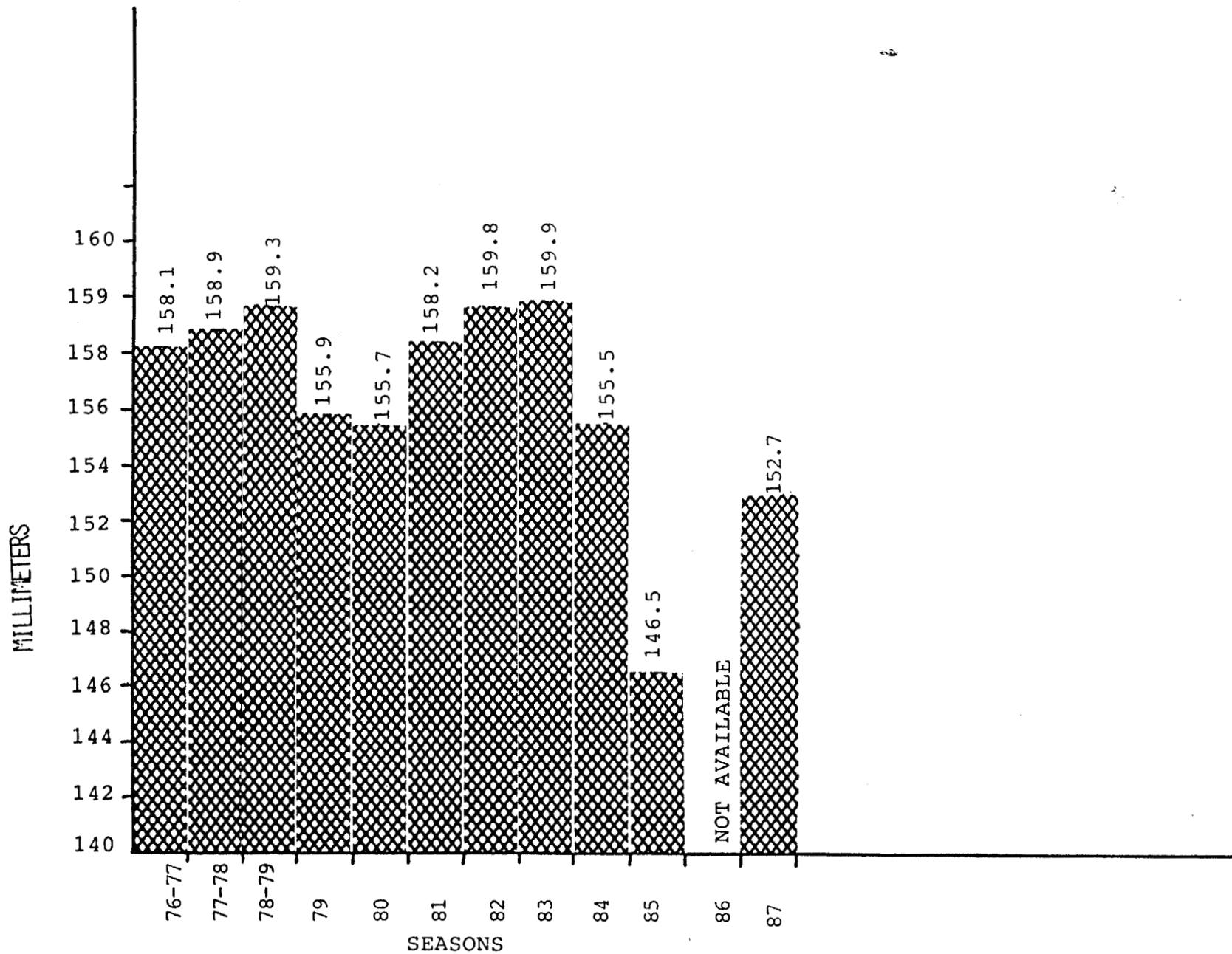


Figure 3. Historic Pribilof District blue king crab average length frequencies.



## 1987 BERING SEA BROWN KING CRAB

### 1987 Permit Fishery - Pribilof District

The 1987 Bering Sea brown king crab permit fishery opened on January 1, 1987, but received no interest until July when one vessel fishing in the Northern District made a split landing from the two areas. There had not been any interest in the area since June 1983, until the summer of 1987.

### Northern District

The Northern District had effort for the first time since the development of this areas brown king crab fishery in 1983. Vessels that had been fishing in the Northern area for C.opilio moved their gear into deeper waters after the Tanner closure, and during July and August landed 417,737 pounds, (Table 3). Landings were made to processing vessels on the grounds near St. Matthew Island. The 5 1/2 inch crab averaged 4.2 pounds, half a pound more than those taken in 1983. Average catch per pot was 7, only one more than 1983, (Table 1). One vessel returned to the grounds in early November for several weeks, but due to weather and poor fishing, made only one landing and returned to participate in the Adak fisheries.

Table 1. Historic brown king crab catch in the Northern District of the Bering Sea, Area "Q".

Year	Vessels	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Avg. Length	Pounds Deadloss
1982-83	22	30	51,714	193,507	7,825	6	3.7	138.2	957
1983-84			N O	R E P O R T E D	L A N D I N G S				
1985			N O	R E P O R T E D	L A N D I N G S				
1986			N O	R E P O R T E D	L A N D I N G S				
1987	112	29	101,618	424,394	14,525	7	4.2	142.2	11,750

<sup>1</sup> Deadloss included.

<sup>2</sup> Number of vessels making landings.

Table 2. Historic brown king crab catch in the Pribilof District of the Bering Sea, Area "Q".

Year	Vessels	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Avg. Length	Pounds Deadloss
1981-82	2	3	1,961	8,301	794	2	4.2	-	0
1982-83 <sup>2</sup>	10	19	15,330	69,970	5,252	3	4.6	150.5	570
1983-84 <sup>3</sup>	50	115	253,162	856,475	26,035	10	3.4	127.3	20,041
1984 <sup>4</sup>			NO REPORTED LANDINGS						
1985	1	1	31	142	350	-	4.6	-	0
1986	1	1	800	3,530	600	1	4.4	N/A	0
1987	1	1	6,457	25,830	800	8	4.0	N/A	0

<sup>1</sup>Deadloss included.

<sup>2</sup>Six and one-half inch season.

<sup>3</sup>Five and one-half inch season.

<sup>4</sup>Permit fishery July through December.

Table 3. Bering Sea brown king crab catch statistics by month for the 1987 season, Northern District.

Month	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt. CPUE	Pounds Deadloss	
July	5	9	44,125	185,731	5,693	4.16	8	11,750
August	7	18	56,079	232,006	7,562	4.14	7	0
September	1	1	600	2,996	570	4.99	1	0
October			NO FISHING					
November	1	1	814	3,661	700	4.50	1	0
December			NO FISHING					
Total	11	29	101,618	424,394	14,525	4.18	7	11,750

<sup>1</sup>Deadloss included.

Table 4. Bering Sea brown king crab catch by statistical area for 1987, Northern District.

Stat. Area	Lndgs.	No. Crab <sup>1</sup>	No. Pounds <sup>1</sup>	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
775930	1	3,940	15,940	400	4.30	10	0
776100	1	1,152	4,840	110	4.20	10	0
776130	2	3,652	14,951	620	4.09	6	0
785900	2	2,565	10,775	975	4.20	3	0
785930	1	2,938	11,750	403	4.00	7	0
786000	5	12,740	52,067	2,785	4.09	5	2,000
766030	6	17,398	70,930	2,195	4.07	9	9,750
786100	1	4,379	18,390	700	4.20	6	0
796030	10	52,854	223,751	6,337	4.23	8	0
Season Total:	29	101,618	424,394	14,525	4.18	7	11,750

<sup>1</sup>Deadloss included.



## BERING SEA KOREAN HAIR CRAB

### Introduction

The Korean hair crab, (Erimacrus isenbeckii) sold commercially as "kegani" by the Japanese, was fished commercially for the first time by the U.S. fleet in 1979. When interest was first expressed by fishermen and processors in this species, the season was opened by emergency order and ran concurrently with the Tanner crab fishery. During the 1980 Board of Fisheries meeting, a year long season was established within a three mile area of the Pribilof Islands to allow a summer fishery for the local residents. There have been no reported landings for the past five years from the Pribilof Islanders, although interest had again been expressed for a 1987 fishery. One landing was made to buyers at the Pribilofs during the summer of 1987.

### 1987 Permit Fishery

The Bering Sea hair crab permit fishery runs from January 1 to December 31. The 1987 fishery produced only 1,399 pounds from two vessels that received permits. Both vessels were in the area of the Pribilof Islands for only a short time and returned to Dutch Harbor.

Although the NMFS survey indicated an increase in the small male population, the large male population decreased.

Table 1. Historical Korean hair crab catch statistics, by season, for the Bering Sea.

Year	Vssls.	Lndgs.	No. Crab <sup>1</sup>	No. Pound <sup>1</sup>	Pots Lifted	CPUE	Avg. Wt.	Avg. Lqth.	Pounds Deadloss
1978-79	11	16	2,457	5,213	9,908	1	2.1	111.8	0
1979-80	9	17	25,417	53,914	14,506	2	2.1	114.5	0
1980-81	67	192	1,127,309	2,439,483	172,695	7	2.2	104.8	265,369
1981-82	48	159	466,560	932,584	117,518	4	2.0	103.1	29,749
1982-83	52	161	575,453	1,211,420	84,346	7	2.1	103.2	122,456
1983-84	19	48	200,670	406,538	20,414	10	2.0	-	28,062
1984 <sup>2</sup>	7	26	197,209	396,630	22,392	9	2.0	-	19,436
1985 <sup>2</sup>	3	9	34,410	66,042	3,905	8	2.0	-	593
1986 <sup>2</sup>	3	7	7,289	14,835	4,720	1	2.0	-	500
1987 <sup>2</sup>	2	2	999	1,399	600	1	1.4	-	0

<sup>1</sup>Deadloss included.

<sup>2</sup>Permit fishery.

Table 2. Bering Sea hair crab harvest composition by fishing season.

Season	Season		Pounds	Avg. Size (mm)	Price/ Pounds
	Opened	Closed			
1979 <sup>1</sup>	04/19	12/31	5,213	111.8	\$ .52-.55
1980 <sup>1</sup>	01/01	08/30	53,914	114.5	.75
1980-81 <sup>2</sup>	11/01	06/30 <sup>3</sup>	2,439,483	104.8	.80
1981-82	11/01	08/15	932,584	103.1	.55
1982-83	10/08	08/01	1,211,420	103.2	.65
1983-84	08/01	06/30	406,538	N/A	1.20
1984 <sup>4</sup>	07/01	12/31	396,630	N/A	1.60
1985 <sup>4</sup>	01/01	12/31	66,042	N/A	1.60
1986 <sup>4</sup>	01/01	12/31	14,835	N/A	1.15
1987 <sup>4</sup>	01/01	12/31	1,399	N/A	3.00

<sup>1</sup>Concurrent to Tanner season.

<sup>2</sup>Season open within three miles year-round.

<sup>3</sup>E.O. reopened within three miles.

<sup>4</sup>Permit fishery.



## BERING SEA SCALLOPS

The first scallop landings from the Bering Sea district were reported in 1987. Two vessels worked the district just north of Unimak Island for six months, although catches were reported for only five months, (Table 1). Both vessels landed mixed trips from this area and the area just south of Avatanak and Tigalda Islands. Throughout the six month period, one vessel, a catcher/processor, was documented to have fished illegally in Unimak Bight, a closed area, and misreported these catches from both the Bering Sea and Eastern Aleutians districts, (see Eastern Aleutian Report).

A total catch of 123,743 pounds was reported from the Bering Sea district, but through logs and pack reports seized by FWP, only 119,531 pounds was actually landed from the area, (See sub-scripts, Table 1.). There has been no effort in the district since July and no scallop vessels have registered for 1988 at the time of this writing.

During June, one of the vessels fishing the district reported high catches of dead scallops, apparently caused by high concentrations of gurry and dead fish present on the bottom. A NMFS survey vessel made several tows in the area, but no documented dead fish were noted.

Table 1. 1987 Bering Sea scallop catch by month.

MONTH	VESSELS	LANDINGS	NO. OF ACTUAL POUNDS	NO. OF DRAGS
Jan.	1	1	11,280	75
Feb.		N O	C A T C H	R E P O R T E D
Mar.	1	2	50,400	396
Apr.	2	2	33,782 (39,767) <sup>1</sup>	941
May			1,773 (NR) <sup>2</sup>	
June	1	1	15,246	190
July	1	1	7,050	150
Aug.		N O	F I S H I N G	
Sept		N O	F I S H I N G	
Oct.		N O	F I S H I N G	
Nov.		N O	F I S H I N G	
Dec.		N O	F I S H I N G	
TOTAL	2	7	119,531 (123,743) <sup>3</sup>	1,752

<sup>1</sup> 5,985 pounds misreported as Bering Sea: (3,372 from the Eastern Aleutians; 2,613 to South Peninsula.

<sup>2</sup> 1,773 pounds misreported as Eastern Aleutians.

<sup>3</sup> Total over-reported by a net poundage of 4,212 pounds; (1,773 Bering Sea pounds reported as Eastern Aleutians; 3,372 pounds should be Eastern Aleutians; 2,613 pounds should be South Peninsula.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington, VA 22203 or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-6077, (TDD) 907-465-3646, or (FAX) 907-465-6078.