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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

1995 SOUTHERN DISTRICT (KACHEMAK BAY) DUNGENESS CRAB POT SURVEYS



by
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INTRODUCTION

The majority of the commercial harvest of Dungeness crabs (Cancer magister) in the Cook Inlet Management Area has come from the Southern District, which includes Kachemak Bay (Figure 1). The commercial harvest has ranged from no catch, which was the result of recent total closures of the fishery in the Southern District, to 2.1 million pounds taken in 1979. (Table 1).

In 1990, as a result of Alaska Board of Fisheries direction, the department began a pot survey for Dungeness crabs in Kachemak Bay. Since its inception the primary survey goal has evolved from an assessment of softshell incidence to an index of abundance. A summary of the current objectives is as follows:

- 1) Establish an index of abundance of Dungeness crabs.
- 2) Document the percentage of soft-shell Dungeness crabs.
- 3) Document the sex, size, and shellage of all Dungeness crabs and the egg condition of all female Dungeness crabs.
- 4) Identify the annual timing of the molt, or molts, of catchable male and female Dungeness crabs.
- 5) Document the incidental catch of king and Tanner crabs.
- 6) Document the difference in catch between pots with escape rings open and pots with escape rings closed.

Data from the department crab trawl surveys, which began in 1989, have also proven useful in describing the Dungeness stock. The primary goal of the trawl survey was to assess Tanner (Chionoecetes bairdi) and red king crab (Paralithodes camtschaticus) stocks. Ancillary information, such as Dungeness catch, was documented. The initial survey design did not focus on Dungeness, because during likely survey months, June - August (post Tanner and king molt), a portion of the Dungeness stock would not be available to the gear, i.e., they were in waters too shallow to sample with a trawl. Dungeness data presented in this report will allow comparison to the pot survey catches that sample the crabs in shallow water.

METHODS

In 1995 the State chartered the F\V Lion of Judah for the entire survey. Standard Dungeness pots of two distinct weights were used for the survey: pots used east and west of Homer Spit were 60 and 100 pounds, respectively. The gear dimensions reflected those generally used by commercial fishermen. Bait types were squid for the survey east of Homer Spit and razor clams for the survey west of the Spit. These bait types also reflected those commonly used by commercial fishermen. Initial soak time goals were 24 hours east of the Spit and 48 hours west of the Spit. The variation in soak times was the result of both fishermen comments regarding the time necessary for the pots to begin fishing and cost of the charter.

All commercial Dungeness gear are required by regulation to have two 4 3/8 inch diameter circular escape rings. The intent of the escape ring regulation is to permit the egress of female and sublegal male crabs from the pot thereby reducing the handling incidence of these non-target crabs. The escape rings were left open on two-thirds of the survey gear in order to approximate the catches of commercial fishermen. The remaining third of the gear was fished with the escape rings closed. This was done in order to determine the relative magnitude of small crabs that these pots were capable of capturing and retaining.

Selection of survey stations was systematic. Commercial fishermen were interviewed in order to determine specific locations for likely crab capture given the anticipated survey dates. Survey timing was therefore based on fishermen input, historical catch figures, suspected and known molt timing of catchable males, and available funding for the project.

A total of 170 stations were selected, 90 east (Appendix A) and 80 west of Homer Spit (Appendix B). The gear was set east of Homer Spit in three 15 pot strings in the Mud Bay area and 15 three pot springs in the upper bay (Figure 2). Eight 10 pot strings were fished west of Homer Spit (Figure 3). Distance between individual pots within a string was approximately 0.25 nautical miles east of Homer Spit and 0.20 nautical miles west of the Spit.

A Global Positioning System, video plotter, and echo sounder were used to record pot and station information for future reference and replication. Depths were recorded at the time the gear was

set utilizing the vessel's echosounder. Documented depths do not take into consideration the stage of the tide.

Once each pot was pulled, all Dungeness crabs were measured to the nearest millimeter (mm) of carapace width and shellaged. Relative fecundity of all female Dungeness crab was determined. Juvenile female Dungeness were not identified because positive classification would have required destroying the animal. Tanner crabs were counted only. King crabs have never been captured.

Speed was often essential while pulling the pots. Shallow sets coupled with running tides and currents made it necessary to move through the gear with maximum efficiency in order to retrieve all the pots either before the water became too shallow for the vessel, or the current pulled the buoys under. In most instances, therefore, the bycatch species were sampled only to species, count, and sex.

RESULTS

East of Homer Spit

The dates for the 4 surveys east of Homer Spit were: May 23 - 25, June 27 - 29, July 25 - 27, and Aug. 29 - 31. Ninety pots were lifted in each of the 4 surveys. Fishing depths ranged from 0.8 to 8.5 fathoms, averaging 3.7 fathoms. Average soaks varied from 20 to 24 hours with a mean of 23 hours (Table 2).

The 1995 catches were the lowest since the survey was fully implemented in 1991. A total of 98 males and 151 females were caught for the 4 monthly surveys from May through August. Similar to past years, May had the lowest male catch of any survey month. Only 8 males were taken in 90 pot lifts during the May survey. Catches increased in June to 30 males then leveled off at 29 males in July and 31 in August. No females were taken in the May survey. Female numbers varied irregularly from 14 in June to 88 in July, declining to 49 in August (Table 3). There was very little difference among months in the ratio of new to old-shell males (Table 4).

The size range of males was 123 to 190 mm carapace width with a mean of 156 mm. There were no significant changes in the average sizes among surveys (Table 5).

One female was bearing a full clutch of uneyed eggs. The remaining 150 females were non-ovigerous. The size range of females was 116 to 168 mm carapace width with an average of 147 mm. Only 2 of the females were in a soft-shell condition and 87 percent were old shells (Table 6).

No Tanner or king crabs were caught (Table 7).

West of Homer Spit

The two surveys west of the Spit were July 18 - 20 and August 16 - 18. Seventy seven and 74 pots were pulled west of the Spit in

July and August, respectively. Three pots were lost in July and 6 in August. Fishing depths ranged from 16.0 to 47.0 fathoms, averaging 29 fathoms. Mean soak times were 49 hours for the July survey and 48 hours for the August survey (Table 2).

The July survey west of Homer Spit resulted in a catch of 13 males and 31 females. Ten of the males were legal. None were in a soft-shell condition (Table 3). Eleven were old shells (Table 4). Size ranged from 159 to 181 mm with an average of 170 mm (Table 5). None of the 31 females were either ovigerous or soft-shelled (Table 6).

The survey conducted in August resulted in a catch of 59 males, 51 legal and 8 sublegal, as well as 41 females. None of the males were soft shells (Table 3). New shell percentages were 39 (20) and 38 (3) for legal and sublegal, respectively (Table 4). The size range of the males was 151 - 192 mm, averaging 173 mm (Table 5). Of the 41 females, none were ovigerous or soft-shelled (Table 6).

Tanner crab catch in the July survey totaled 22 males and 37 females. Twenty two males and 62 females were caught in August. No king crabs of either sex were captured (Table 7).

Escape rings

This is the fourth year that retention of male Dungeness in pots with escape rings closed was compared to retention in pots with

rings open. Sublegal catch per pot was 0.54 for pots with rings closed and 0.18 for pots with rings open. Catch rates for legal crabs were 0.11 for rings closed and 0.26 for rings open (Table 8).

1995 trawl survey

The trawl survey was conducted July 5 through 10, 1995. Male and female Dungeness catches from the 1995 trawl survey were 159 and 125 crabs, respectively. Eight percent (10) of the females were ovigerous, 9 with uneyed eggs and 1 with eyed eggs (Table 9). Legals accounted for 6 percent (10 crabs) of males. Soft shells comprised 14 percent (22) of the total male catch and 10 percent (13) of the female catch (Table 10). Mean carapace width for males was 138 mm with a range of 104 to 186 mm (Figure 4). Mean carapace width of females was 139 mm within a range of 107 to 170 mm (Figure 5).

DISCUSSION

The 1995 pot survey data demonstrated a continuing decline in the catchable portion of the Dungeness stock. All sizes and shell ages of males caught in the survey east of Homer Spit were down considerably from the comparable monthly survey catches in 1991 through 1994 (Table 4 and Figure 6).

Although the survey catches west of Homer Spit increased from 1994, they remain at a very low level. Personal use fisherman reported very few Dungeness west of the Spit.

The 1995 trawl survey data indicated an increase in recruitment into the adult segment of the Dungeness stock. A total of 136 of 159 males caught were in the 100 to 149 mm size range. Only one of these animals was a skipmolt. The actual magnitude of this event is difficult to quantify with any degree of confidence because the trawl survey is not able to sample the entire adult male Dungeness stock. For the purposes of comparison, 3 males were caught in this size group during the 1994 survey and 14 were caught in the 1993 survey. Catch was greater only in 1990 when 281 animals were taken in this size group.

The pot survey did not identify a large percentage of soft shells again in 1995. The percentages were comparable to the proportions found in the 1990 through 1994 surveys (Table 3).

Softshell percentages from the trawl survey increased over the low levels identified by the 1994 survey. This was due to the increase of newly mature Dungeness crabs found by the 1995 survey (Table 10).

Trawl and pot surveys are scheduled for 1996. The small crabs found in the 1995 trawl survey should have passed through another molt cycle, therefore, becoming catchable in the 1996 pot survey particularly in those pots with escape rings closed.

Table 1. Dungeness crab catch (pounds) by year, Cook Inlet Management Area, 1961-1995.

Year	Southern district catch	Other districts catch	Total catch	No. of vessels	No. of landings
1961	193,683	0	193,683	12	189
1962	530,770	0	530,770	15	269
1963	1,665,599	11,605	1,677,204	50	1,360
1964	417,005	6,036	423,041	22	341
1965	74,211	0	74,211	14	105
1966	12,523	117,037	129,560	5	28
1967	7,168	0	7,168	2	13
1968	484,452	3,407	487,859	7	224
1969	49,894	0	49,894	9	41
1970	209,819	0	209,819	10	50
1971	97,161	0	97,161	22	136
1972	38,930	0	38,930	24	206
1973	308,777	1,271	310,048	54	625
1974	718,729	2,514	721,243	38	619
1975	361,893	922	362,815	34	402
1976	118,903	395	119,298	19	123
1977	74,195	510	74,705	18	94
1978	1,212,571	3,208	1,215,779	49	668
1979	2,130,963	0	2,130,963	72	1,485
1980	1,875,281	0	1,875,281	54	1,183
1981	1,850,977	0	1,850,977	88	2,047
1982	818,380	505	818,885	108	2,310
1983	746,585	834	747,419	71	1,194
1984	799,638	570	800,208	102	1,687
1985	1,389,891	12,511	1,402,402	106	1,768
1986	550,968	12,894	563,862	83	1,069
1987	761,423	21,753	783,176	100	1,377
1988	677,334	41,941	719,275	84	1,305
1989	170,266	7,798	178,064	43	455
1990	28,938	564	29,502	23	112
1991	Season closed	0	0	0	0
1992	Season closed	7,108	7,108	1	1
1993	Season closed	9,652	9,652	1	1
1994	Season closed	CONFIDENTIAL	CONFIDENTIAL		
1995	Season closed	CONFIDENTIAL	CONFIDENTIAL		

Note: Average catch 1978-1990 = 1.01 million pounds per year.

Table 2. Station descriptive data, Kachemak Bay Dungeness crab pot survey, 1995.

Date	Location	Station	No. pots pulled	Depth range (fms)	Avg. (fms)	Avg. soak (hrs.)
5/23	East of Spit	Upper Bay	45	2.3 - 5.5	3.4	24
5/24		Mud Bay	45	2.3 - 6.7	4.1	20
6/27		Upper Bay	45	0.8 - 5.0	2.3	24
6/28		Mud Bay	45	2.5 - 7.0	4.2	22
7/25		Upper Bay	45	2.0 - 4.8	3.2	23
7/26		Mud Bay	45	2.8 - 8.0	4.6	21
8/29		Upper Bay	45	1.7 - 5.0	2.9	23
8/30		Upper Bay	45	2.8 - 8.5	4.6	23
7/18	West of Spit		77	16.0-43.0	28.8	49
8/16			74	16.5-47.0	29.1	48

1 Date gear was set.

2 Depths calculated from vessels sounder at time gear was set. Not calculated from mean lower low water as used on navigational charts.

Table 3. Dungeness crab catch, in numbers, Southern District Dungeness pot surveys, 1990-95.

Year	Dates	Location	Pots pulled	Females	Sublegal males	Legal males	Total males	Soft-shell males (%)
1990	5/15-17	East of Spit	90	53	47	17	64	8 (13)
	6/19-21		90	54	65	23	88	9 (10)
1991	6/04-06	East of Spit	89	6	116	110	226	21 (9)
	7/09-11		90	21	388	263	651	36 (6)
	8/06-08		90	85	625	475	1,100	47 (4)
	9/12-14		90	30	615	492	1,107	5 (<1)
	7/02-06	West of Spit	82	9	6	5	11	2 (18)
	8/14-16		95	9	7	11	18	0 (0)
1992	5/31-6/04	East of Spit	89	27	276	180	456	2 (1)
	6/30-7/2		89	76	583	578	1,161	31 (3)
	7/27-29		90	65	621	531	1,152	50 (4)
	8/11-13		90	47	849	792	1,641	14 (1)
	8/25-27		88	47	853	737	1,590	24 (2)
	9/10-12		89	47	621	749	1,370	4 (<1)
	10/07-09		90	19	516	349	865	2 (<1)
	7/05-07	West of Spit	96	30	7	14	21	1 (5)
	8/05-07		78	59	49	59	108	0
	1993	5/17-19	East of Spit	90	18	105	120	225
6/15-17		90		60	226	203	429	5 (1)
7/20-22		90		95	297	448	745	25 (3)
8/16-23		90		84	352	555	907	35 (4)
9/22-24		86		78	148	280	428	5 (1)

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Table 3. Continued.

Year	Dates	Location	Pots pulled	Females	Sublegal males	Legal males	Total males	Soft-shell males (%)
	7/13-15	West of Spit	70	11	6	3	9	0
	8/09-11		80	25	9	34	43	0
1994	5/23-25	East of Spit	90	18	9	7	16	1 (6)
	6/21-23		90	119	28	48	76	0
	7/19-21		90	113	39	93	132	0
	8/22-24		88	37	58	119	177	3 (2)
	7/12-14	West of Spit	70	17	0	3	3	0
	8/16-18		77	13	3	8	11	0
1995	5/23-25	East of Spit	90	0	5	3	8	0
	6/27-29		90	14	22	8	30	0
	7/25-27		90	88	20	9	29	0
	8/29-31		90	49	18	13	31	2
	7/18-20	West of Spit	77	31	3	10	13	0
	8/16-18		74	41	8	51	59	0

33% of escape rings closed, 1992-95.

Table 4. Shell age of male Dungeness crabs from the Southern District Dungeness pot survey, 1990-95.

Year	Dates	Location	Shell age														
			Number sublegals					Number legal					All males				
			New	(%)	Old	(%)	Total	New	(%)	Old	(%)	Total	New	(%)	Old	(%)	Total
1990	5/15-5/17	East of Spit	30	(64)	17	(36)	47	7	(41)	10	(59)	17	37	(58)	27	(42)	64
	6/19-6/21		52	(80)	13	(20)	65	17	(74)	6	(26)	23	69	(78)	19	(22)	88
1991	6/04-6/06	East of Spit	89	(77)	27	(23)	116	101	(92)	9	(8)	110	190	(84)	36	(16)	226
	7/09-7/11		368	(95)	20	(5)	388	262	(99)	1	(1)	263	630	(97)	21	(3)	651
	8/06-8/08		607	(97)	18	(3)	625	470	(99)	5	(1)	475	1,077	(98)	23	(2)	1,100
	9/12-9/14		596	(97)	19	(3)	615	486	(99)	6	(1)	492	1,082	(98)	25	(2)	1,107
1991	7/02-7/06	West of Spit	2	(33)	4	(67)	6	4	(80)	1	(20)	5	6	(55)	5	(45)	11
	8/14-8/16		6	(86)	1	(14)	7	7	(64)	4	(36)	11	13	(72)	5	(28)	18
1992	5/31-6/02	East of Spit	37	(13)	239	(87)	276	44	(24)	136	(76)	180	81	(18)	375	(82)	456
	6/30-7/02		153	(26)	430	(74)	583	261	(45)	317	(55)	578	414	(38)	747	(62)	1,161
	7/27-7/29		210	(34)	411	(66)	621	268	(51)	263	(49)	531	478	(41)	674	(59)	1,152
	8/11-8/13		272	(32)	577	(68)	849	328	(41)	464	(59)	792	600	(37)	1,041	(53)	1,641
	8/25-8/27		363	(43)	490	(57)	853	430	(58)	307	(42)	737	793	(50)	797	(50)	1,590
	9/10-9/12		254	(41)	367	(59)	621	436	(58)	313	(42)	749	690	(50)	680	(50)	1,370
	10/07-10/09		171	(49)	178	(51)	349	375	(73)	141	(27)	516	546	(63)	319	(37)	864
	7/05-7/07		West of Spit	3	(43)	4	(57)	7	5	(36)	9	(64)	14	8	(38)	13	(62)
8/05-8/07	33	(67)		16	(33)	49	40	(68)	19	(32)	59	73	(68)	35	(32)	108	
1993	5/15-5/19	East of Spit	7	(7)	98	(93)	105	28	(23)	92	(77)	120	35	(16)	190	(84)	225
	6/15-6/17		22	(10)	204	(90)	226	43	(21)	160	(79)	203	65	(15)	364	(85)	429
	7/20-7/22		95	(32)	202	(68)	297	208	(46)	240	(54)	448	303	(41)	442	(59)	745
	8/16-8/23		154	(44)	198	(56)	352	306	(55)	249	(45)	555	460	(51)	447	(49)	907
	9/22-9/24		52	(35)	96	(65)	148	132	(47)	148	(53)	280	184	(43)	244	(57)	428
1993	7/13-7/15	West of Spit	3	(50)	3	(50)	6	1	(33)	2	(66)	3	4	(44)	5	(56)	9
	8/09-8/11		3	(33)	6	(66)	9	23	(68)	11	(32)	34	26	(60)	17	(40)	43

- Continued -

Table 4. Continued.

Year	Dates	Location	Shell age															
			Number sublegals						Number legal						All males			
			New (%)	Old (%)	Total (%)	New (%)	Old (%)	Total (%)	New (%)	Old (%)	Total (%)	New (%)	Old (%)	Total (%)				
1994	5/23-5/25	East of Spit	1 (11)	8 (89)	9	0	7 (100)	7	1 (6)	15 (94)	16	5 (23)	37 (77)	48	16 (21)	60 (79)	76	
	6/21-6/23		5 (18)	23 (82)	28	11	(23)	37	51 (39)	81 (61)	132	33 (35)	60 (65)	93	51 (39)	81 (61)	132	
	7/19-7/21		18 (46)	21 (54)	39	33	(61)	46	119	105 (59)	72 (41)	177	73 (61)	46 (39)	119	105 (59)	72 (41)	177
	8/22-8/24		32 (55)	26 (45)	58	73												
1995	7/12-7/14	West of Spit	0 (0)	3 (100)	3	3	3 (100)	3	0	3 (100)	3	3 (38)	5 (62)	8	3 (27)	8 (73)	11	
	8/16-8/18		3 (60)	2 (40)	5	0												
	5/23-5/25		16 (73)	6 (27)	22	0												
	6/27-6/29		14 (70)	6 (30)	20	0												
1995	7/25-7/27	East of Spit	11 (61)	7 (39)	18	1	(8)	12 (92)	13	14 (48)	15 (52)	29	9	14 (48)	15 (52)	29		
	8/29-8/31		3 (38)	5 (62)	8	2	(20)	8 (80)	10	2 (15)	11 (85)	13	20 (39)	31 (61)	51	23 (39)	36 (61)	59
	7/18-7/20		0	3 (100)	3	2												
	8/16-8/18		3 (38)	5 (62)	8	20												

33% of escape rings closed 1992-95.

Table 5. Male Dungeness crab size data, Southern District Dungeness pot surveys, 1990-95.

Year	Date	Location	Average width (mm)	Range
1990	5/15-5/17	East of Spit	155	101-190
	6/19-6/21		154	102-189
1991	6/04-6/06	East of Spit	164	135-187
	7/09-7/11		163	114-182
	8/06-8/08		164	129-185
	9/12-9/14		164	127-189
	7/02-7/06	West of Spit	164	158-174
	8/14-8/16		172	158-197
1992	5/31-6/02	East of Spit	163	136-190
	6/30-7/02		165	137-191
	7/27-7/29		165	139-194
	8/11-8/13		165	142-196
	8/25-8/27		164	126-194
	9/10-9/12		166	139-193
	10/7-10/9		167	139-192
	7/05-7/07	West of Spit	171	156-202
	8/05-8/07		167	145-204
	1993	5/17-5/19	East of Spit	166
6/15-6/17		165		143-195
7/20-7/22		167		148-193
8/16-8/23		168		146-190
9/22-9/24		168		145-192
7/13-7/15		West of Spit	164	156-180
8/09-8/11			170	153-186
1994		5/23-5/25	East of Spit	162
	6/21-6/23	168		152-192
	7/19-7/22	169		153-187
	8/22-8/24	168		100-197
	7/12-7/14	West of Spit	169	166-173
	8/16-8/18		171	153-187

- Continued -

Table 5. Continued.

Year	Date	Location	Average width (mm)	Range
1995	5/23-5/25	East of Spit	155	129-184
	6/27-6/29		155	128-184
	7/25-7/27		156	123-183
	8/29-8/31		158	132-190
	7/18-7/20	West of Spit	170	159-181
	8/16-8/18		173	151-192

Table 6. Female Dungeness crab catch, Southern District Dungeness pot surveys, 1990-95.

Year	Dates	Location	Total females	Egg development (No.)		Avg. size (mm)	Size range	Soft-shells (no.)	Shellage new	no. old
				w/eggs	w/o eggs					
1990	5/15-5/17	East of Spit	53	3	50	149	113-165	6	45	8
	6/19-6/21		54	0	54	153	106-171	8	44	10
1991	6/04-6/06	East of Spit	6	0	6	152	120-163	0	4	2
	7/09-7/11		21	2	19	149	119-165	0	16	5
	8/06-8/08		85	0	85	150	116-173	0	66	19
	9/12-9/14		30	0	30	149	128-170	0	23	7
	7/02-7/06	West of Spit	9	0	9	155	135-163	0	3	6
	8/14-8/16		9	0	9	155	148-175	0	9	0
1992	5/31-6/02	East of Spit	27	2	25	143	126-164	0	14	13
	6/30-7/02		76	0	76	145	126-164	0	32	44
	7/27-7/29		652	0	65	144	115-172	0	32	33
	8/11-8/13		47	0	47	148	126-170	0	19	28
	8/25-8/27		47	0	47	145	126-167	0	16	31
	9/10-9/12		47	0	47	143	129-171	0	30	17
	10/7-10/9		19	0	19	147	126-169	2	10	9
	7/05-7/07	West of Spit	30	0	30	154	139-168	1	20	10
	8/05-8/07		59	0	59	156	141-167	0	50	9
	1993	5/17-5/19	East of Spit	18	1	17	151	136-169	0	16
6/15-6/17		60		0	60	142	123-158	0	40	20
7/20-7/22		95		0	95	146	125-175	0	27	68
8/16-8/23		84		1	83	146	128-165	0	29	55
9/22-9/24		78		0	78	146	129-160	3	22	53
7/13-7/15		West of Spit	11	0	11	151	139-165	0	7	4
8/09-8/11			25	0	25	156	141-168	0	19	6

- Continued -

Table 6. Continued.

Year	Dates	Location	Total females	Egg development (No.)		Avg. size (mm)	Size range	Soft-shells (no.)	Shellage	
				w/eggs	w/o eggs				new	old
1994	5/23-5/25	East of spit	18	0	18	138	72-154	1	3	15
	6/21-6/23		119	0	119	147	118-181	1	10	109
	7/19-7/21		113	0	113	143	123-169	0	16	97
	8/22-8/24		37	0	37	149	133-164	1	4	33
	7/12-7/14	West of Spit	17	0	17	152	138-163	0	15	2
	8/16-8/18		13	0	13	153	137-169	0	11	2
1995	5/23-5/25	East of Spit	0							
	6/27-6/29		14	1	13	155	144-168		0	4
	7/25-7/27		88	0	88	147	131-167		0	83
	8/29-8/31		49	0	49	143	116-160		2	44
	7/18-7/20	West of Spit	31	0	31	155	146-169		0	15
	8/16-8/18		41	0	41	153	136-163		0	14

1 Barren adults not distinguished from juveniles.

Table 7. Tanner and king crab bycatch from the Southern District
Dungeness crab pot survey, 1990-1995.

Year	Dates	Location	Tanner crabs		King crabs	
			males	females	males	females
1990	5/15-5/17	East of Spit	1	0	0	0
	6/19-6/21		0	1	0	0
1991	6/04-6/06	East of Spit	101	14	2	2
	7/09-7/11		8	0	0	0
	8/06-8/08		13	0	0	0
	9/12-9/14		2	0	0	0
1991	7/02-7/06	West of Spit	76	31	0	0
	8/14-8/16		33	29	0	0
1992	5/31-6/02	East of spit	21	0	0	0
	6/30-7/02		0	0	0	0
	7/27-7/29		0	0	0	0
	8/11-8/13		0	0	0	0
	8/25-8/27		0	0	0	0
	9/10-9/12		0	0	0	0
	10/7-10/9		0	0	0	0
	7/05-7/07	West of Spit	35	4	0	0
	8/05-8/07		40	4	0	0
	1993	5/17-5/19	East of Spit	1	0	0
6/15-6/17		0		0	0	0
7/20-7/22		0		0	0	0
8/16-8/23		0		0	0	0
9/22-9/24		0		0	0	0
7/13-7/15		West of Spit	27	17	0	0
8/09-8/11			32	33	0	0

- Continued -

Table 7. Continued.

Year	Dates	Location	Tanner crabs		King crabs	
			males	females	males	females
1994	5/23-5/25	East of Spit	0	0	0	0
	6/21-6/23		0	0	0	0
	7/19-7/21		0	0	0	0
	8/22-8/24		0	0	0	0
	7/12-7/14	West of Spit	13	22	0	0
	8/16-8/18		13	5	0	0
1995	5/23-5/25	East of Spit	0	0	0	0
	6/27-6/29		0	0	0	0
	7/25-7/27		0	0	0	0
	8/29-8/31		0	0	0	0
	7/18-7/20	West of Spit	22	37	0	0
	8/16-8/18		22	62	0	0

Table 8. Average catch per pot of male Dungeness crab in pots with and without escape rings, east of Homer Spit, 1995 Southern District Dungeness crab pot survey.

Size (5 mm groups)	Rings Closed	Rings open
Sublegals		
≤139	0.19	0
140-144	0.10	0
145-149	0.07	0.01
150-154	0.08	0.01
155-159	0.07	0.07
160-164	0.04	0.09
Total sublegals	<u>0.54</u>	<u>0.18</u>
Legals		
165-169	0.06	0.08
170-174	0.02	0.08
175-179	0.01	0.01
180-184	0.02	0.08
> 185	0	0.01
Total legals	<u>0.11</u>	<u>0.26</u>

Table 9. Summary of Dungeness crab catch (number), Southern District crab trawl survey, 1989-95.

Date	Stations	Total Dungeness catch	Males	Average width (mm)	Range	Percent softshell	Females	Average width (mm)	Range	Percent softshell	Percent egg bearing
Oct., 1989	11	934	304	118	28-216	11	630	124	24-170	8	1
July, 1990	19	977	317	134	91-181	12	660	129	102-171	11	5
July, 1991	20	710	234	155	111-183	20	476	134	106-173	0	11
July, 1992	18	687	211	157	128-193	24	476	143	116-174	<1	<1
July, 1993	19	670	136	166	136-188	17	534	141	126-169	0	0
July, 1994	20	151	37	167	131-187	3	114	145	128-166	1	0
July, 1995	20	284	159	138	104-186	14	125	139	107-170	10	8

Female softshell percentage is similar to 1989 & 90 when small females were caught.

Table 10. Incidence of soft shelled Dungeness crabs, Southern District crab trawl survey, 1989-1995.

Date	Total males	No. soft	(%)	Legal males	No. soft	(%)	Sublegal males	No. soft	(%)	Females	No. soft	(%)
Oct., 1989	304	33	(11)	23	1	(4)	281	32	(11)	630	48	(8)
July, 1990	317	37	(12)	6	0		311	37	(12)	660	72	(11)
July, 1991	234	47	(20)	46	11	(24)	188	36	(19)	473	0	
July, 1992	211	51	(24)	66	27	(41)	145	24	(17)	476	1	
July, 1993	136	23	(17)	76	15	(20)	60	8	(13)	534	0	
July, 1994	37	1	(3)	25	1	(4)	12	0		114	0	
July, 1995	159	22	(14)	10	2	(20)	149	20	(13)	125	13	(10)

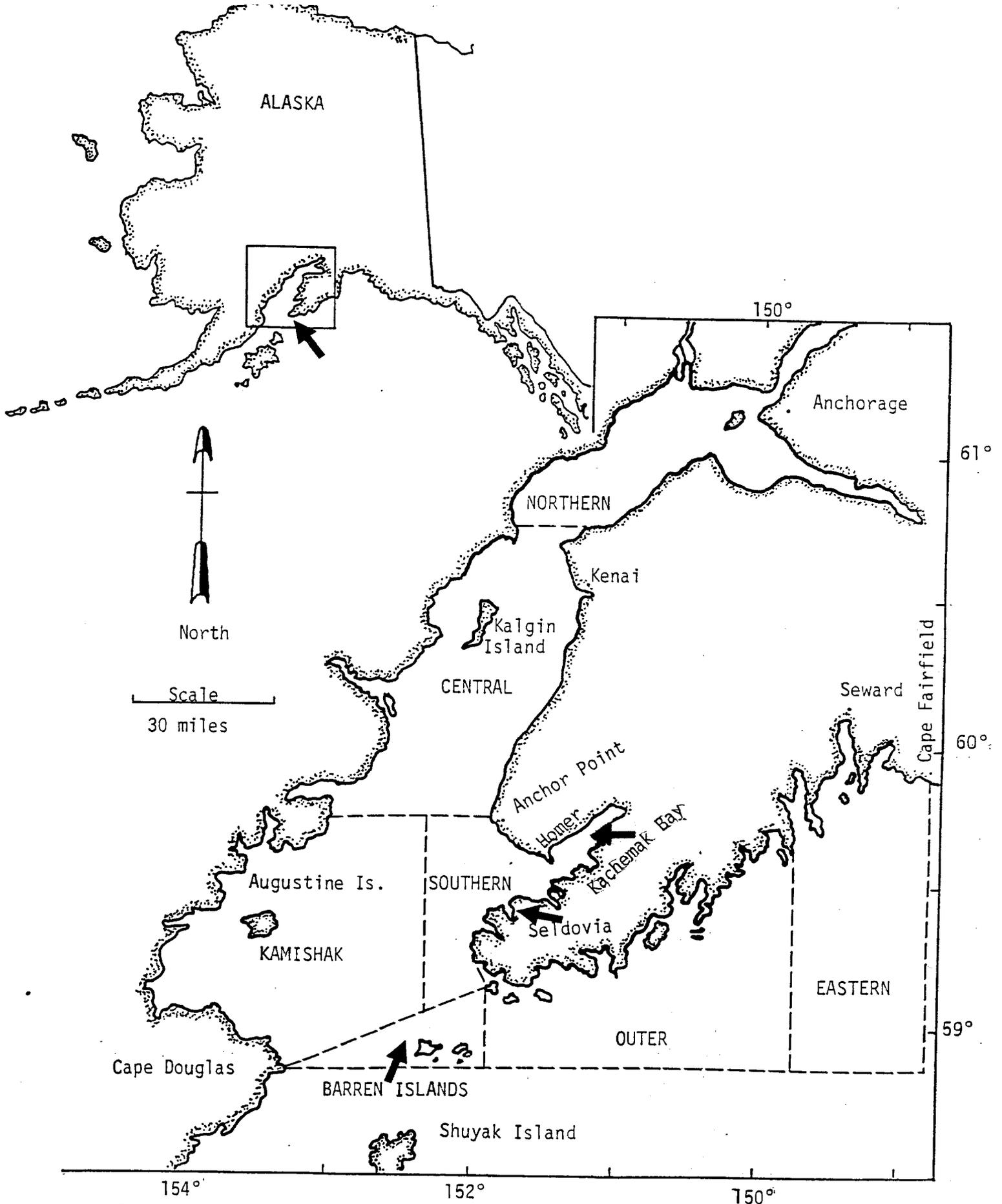


Figure 1. Commercial fishing Districts, Cook Inlet Management Area.

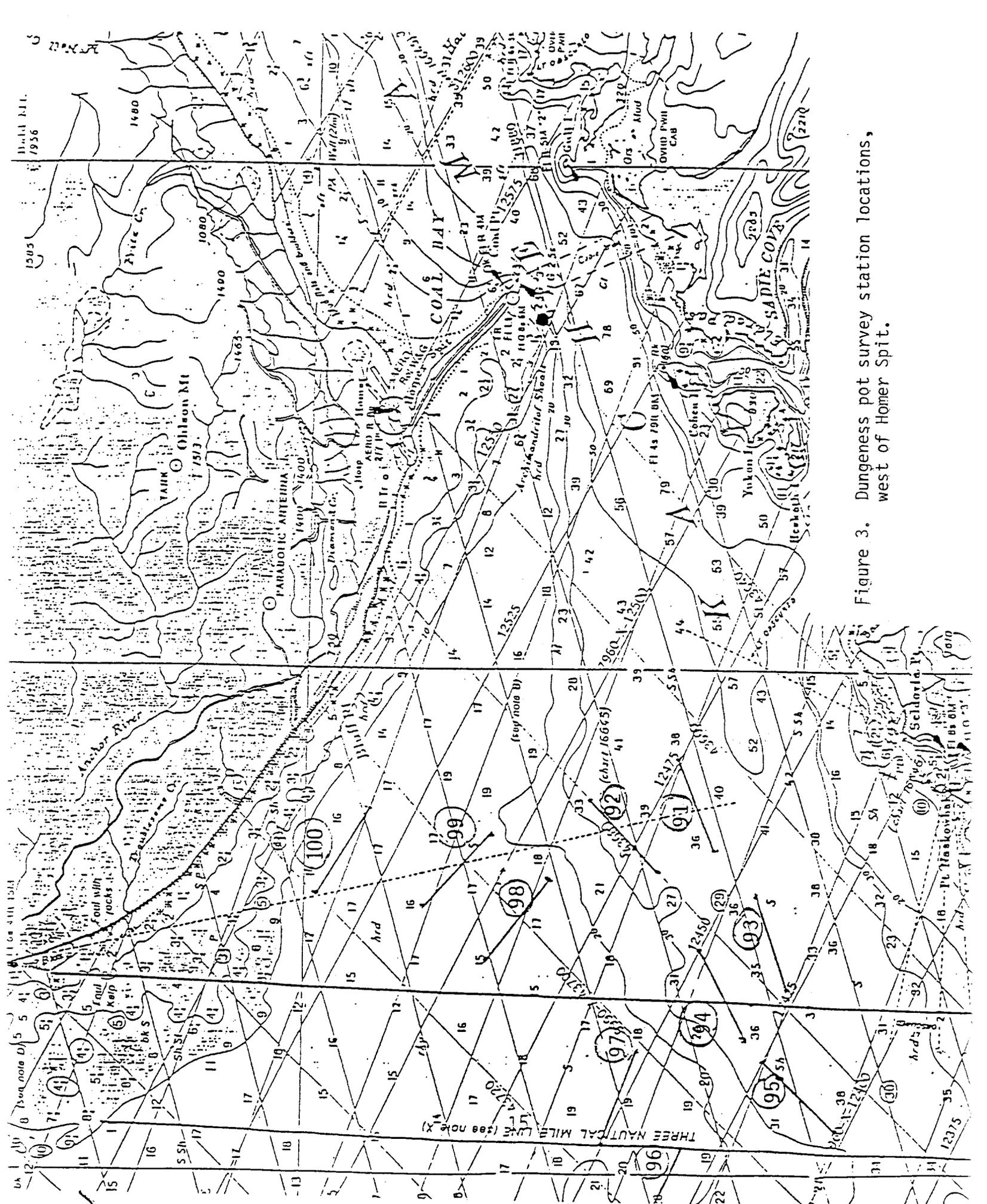


Figure 3. Dungeness pot survey station locations, west of Homer Spit.

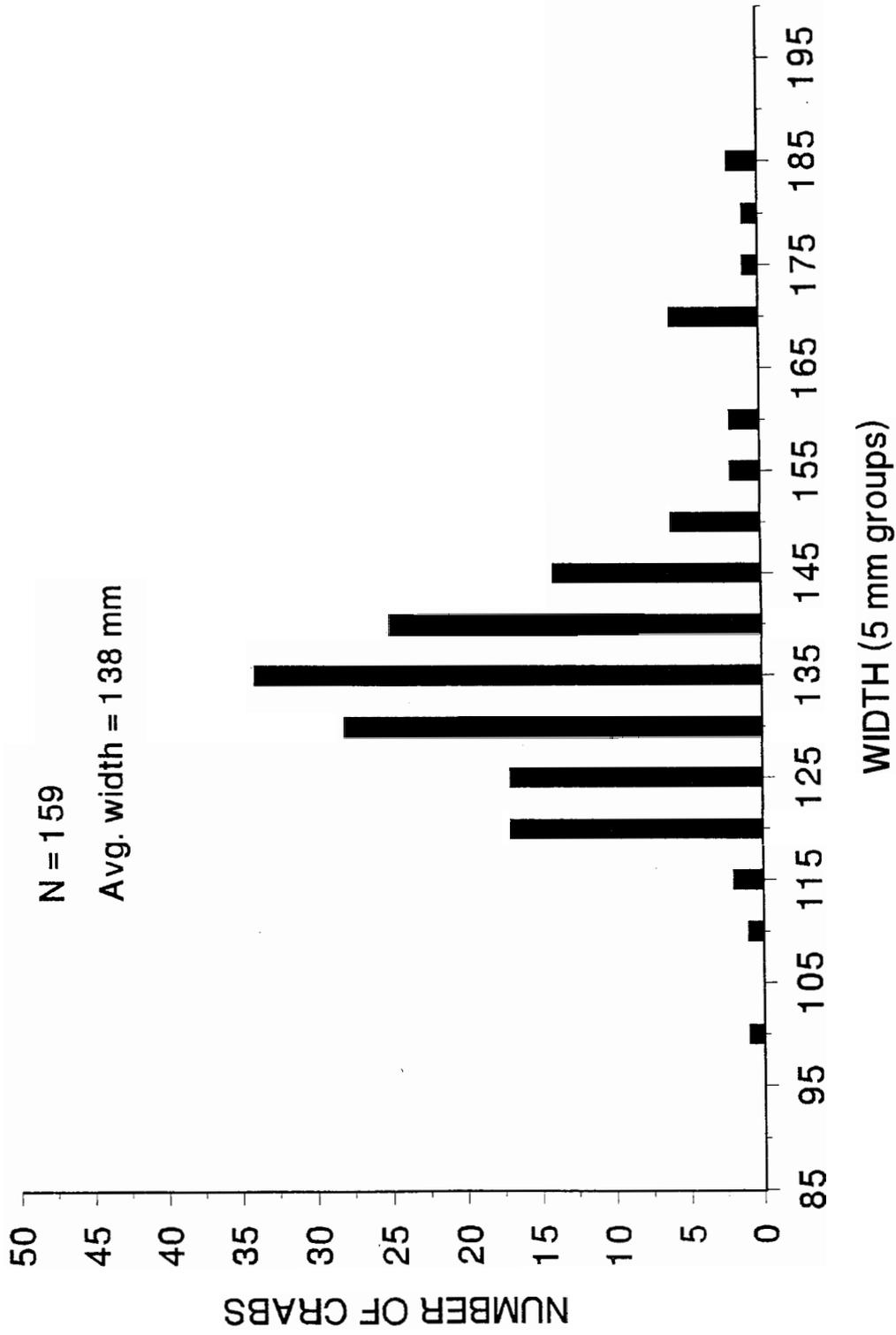


Figure 4. Male Dungeness catch, July, 1995 Southern Distr. crab trawl survey

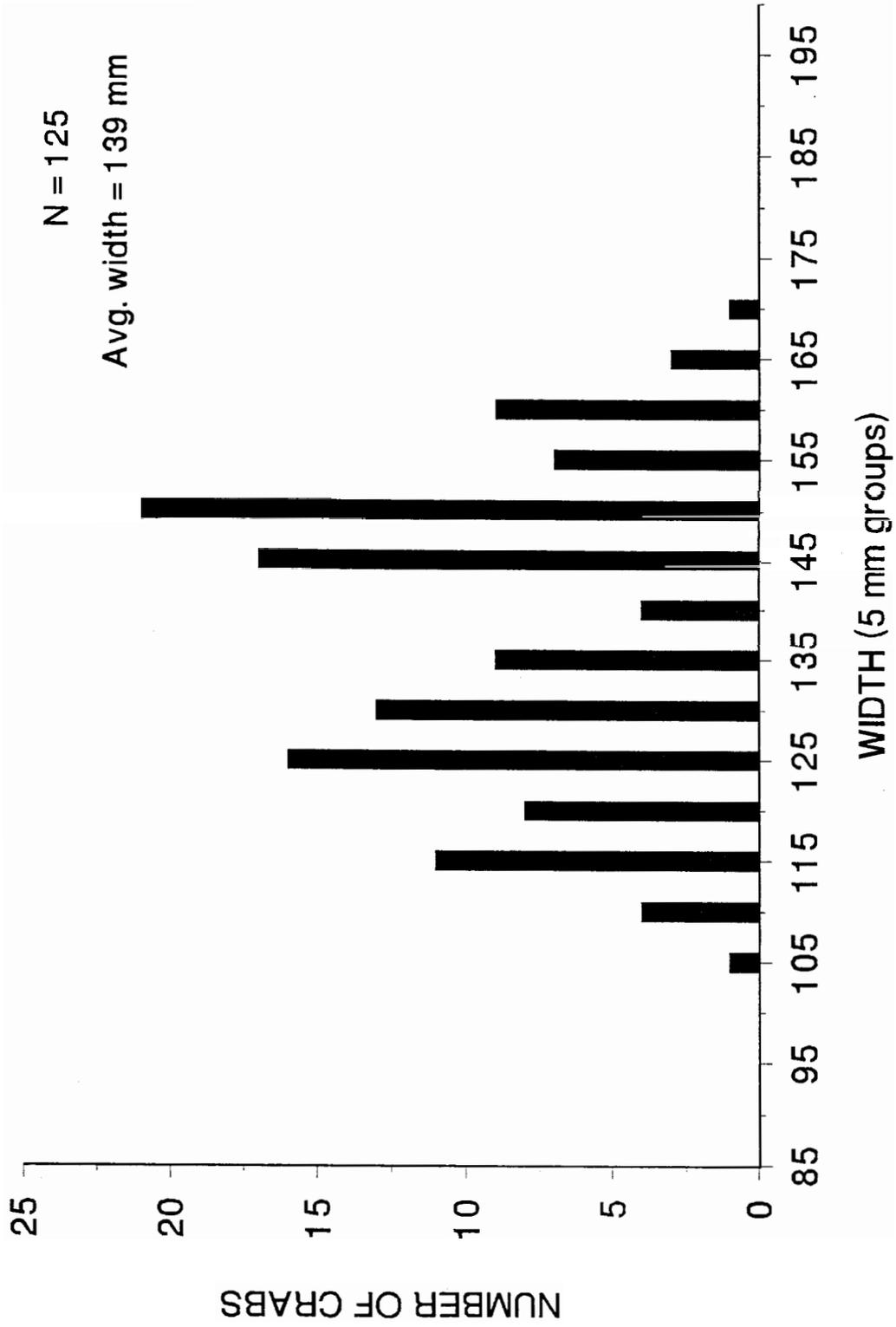


Figure 5. Female Dungeness catch, July, 1995 Southern Distr. crab trawl survey.

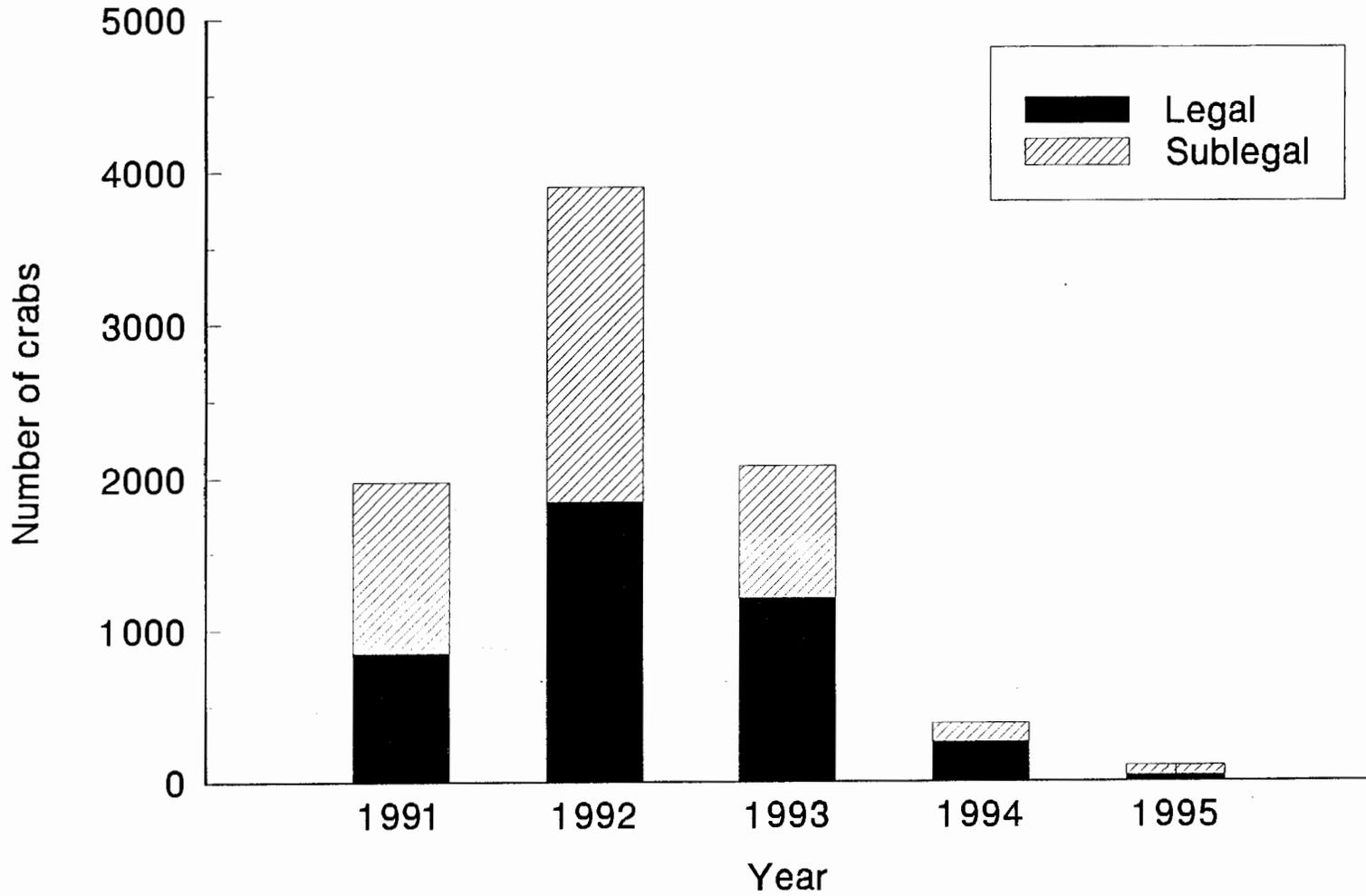


Figure 6. Male Dungeness catch, June through August pot surveys in Kachemak Bay, east of Homer Spit, 1991 - 1995.

Appendix A. Survey station locations, east of Homer Spit,
Southern District Dungeness pot survey, 1995.

Station No.	Latitude	Longitude
1. 59° 36'.94 151° 25'.81	16. 59° 36'.98 151° 25'.28	31. 59° 36'.92 151° 24'.95
2. 59° 37'.19 151° 25'.99	17. 59° 37'.22 151° 25'.45	32. 59° 37'.12 151° 24'.89
3. 59° 37'.41 151° 26'.22	18. 59° 37'.49 151° 25'.48	33. 59° 37'.36 151° 24'.81
4. 59° 37'.63 151° 26'.49	19. 59° 37'.76 151° 25'.66	34. 59° 37'.61 151° 24'.74
5. 59° 37'.85 151° 26'.58	20. 59° 37'.98 151° 25'.79	35. 59° 37'.90 151° 24'.58
6. 59° 38'.08 151° 26'.38	21. 59° 38'.21 151° 25'.58	36. 59° 38'.16 151° 24'.31
7. 59° 38'.34 151° 26'.23	22. 59° 38'.40 151° 25'.24	37. 59° 38'.34 151° 23'.93
8. 59° 38'.54 151° 26'.07	23. 59° 38'.63 151° 25'.02	38. 59° 38'.51 151° 23'.53
9. 59° 38'.75 151° 25'.87	24. 59° 38'.85 151° 24'.73	39. 59° 38'.68 151° 23'.26
10. 59° 38'.91 151° 25'.40	25. 59° 39'.01 151° 24'.50	40. 59° 38'.78 151° 22'.60
11. 59° 39'.10 151° 25'.01	26. 59° 39'.14 151° 24'.08	41. 59° 38'.93 151° 22'.36
12. 59° 39'.24 151° 24'.73	27. 59° 39'.23 151° 23'.57	42. 59° 39'.10 151° 21'.69
13. 59° 39'.45 151° 24'.27	28. 59° 39'.39 151° 23'.09	43. 59° 39'.26 151° 21'.34
14. 59° 39'.63 151° 23'.85	29. 59° 39'.54 151° 22'.63	44. 59° 39'.36 151° 20'.87
15. 59° 39'.73 151° 23'.46	30. 59° 39'.68 151° 22'.32	45. 59° 39'.45 151° 20'.44

Appendix A. Continued.

Station No.	Latitude	Longitude
46. 59° 42'.79 151° 13'.22	58. 59° 42'.58 151° 12'.61	70. 59° 42'.20 151° 11'.93
47. 59° 42'.96 151° 12'.85	59. 59° 42'.71 151° 11'.96	71. 59° 42'.25 151° 11'.46
48. 59° 43'.17 151° 12'.47	60. 59° 42'.92 151° 11'.77	72. 59° 42'.39 151° 11'.11
49. 59° 43'.76 151° 10'.98	61. 59° 43'.45 151° 10'.24	73. 59° 43'.13 151° 09'.47
50. 59° 43'.87 151° 10'.44	62. 59° 43'.63 151° 09'.72	74. 59° 43'.36 151° 09'.10
51. 59° 44'.04 151° 10'.00	63. 59° 43'.85 151° 09'.50	75. 59° 43'.49 151° 08'.80
52. 59° 44'.61 151° 08'.62	64. 59° 44'.43 151° 08'.07	76. 59° 42'.51 151° 10'.89
53. 59° 44'.81 151° 08'.02	65. 59° 44'.50 151° 07'.54	77. 59° 42'.70 151° 10'.42
54. 59° 44'.99 151° 07'.71	66. 59° 44'.70 151° 06'.96	78. 59° 42'.90 151° 10'.15
55. 59° 45'.53 151° 06'.24	67. 59° 45'.30 151° 05'.63	79. 59° 44'.82 151° 05'.67
56. 59° 45'.67 151° 05'.77	68. 59° 45'.45 151° 05'.15	80. 59° 44'.99 151° 05'.12
57. 59° 45'.78 151° 05'.39	69. 59° 45'.69 151° 04'.71	81. 59° 45'.22 151° 04'.62

Appendix A. Continued.

Station No.	Latitude	Longitude
82. 59° 44'.67 151° 05'.17	85. 59° 44'.77 151° 04'.29	88. 59° 44'.78 151° 03'.68
83. 59° 44'.91 151° 04'.62	86. 59° 44'.97 151° 03'.79	89. 59° 44'.72 151° 03'.29
84. 59° 45'.15 151° 04'.16	87. 59° 45'.14 151° 03'.37	90. 59° 44'.71 151° 03'.03

Appendix B. Survey station locations, west of Homer Spit, Southern District Dungeness pot surveys, 1995.

Station No. ¹	Begin (lat., long.)	End (lat., long.)
91	59°32.55 151°43.50	59°31.90 151°47.10
92	59°34.40 151°45.15	59°33.00 151°48.00
93	59°31.00 151°48.80	59°30.40 151°52.70
94	59°32.20 151°51.00	59°31.20 151°54.60
97	59°33.35 151°55.00	59°34.05 151°58.80
98	59°35.10 151°48.30	59°36.35 151°51.50
99	59°36.30 151°46.50	59°37.70 151°49.40
100	59°38.75 151°45.50	59°39.75 151°48.90

¹ Ten pots were set equidistant apart in each station.

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