

Norton Sound Winter Red King Crab Studies, 2000

by

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INTRODUCTION

Red king crab, *Paralithodes camtschatica*, support both commercial and subsistence harvests in the Norton Sound area. The greatest area of effort for both fisheries is concentrated in the vicinity of Nome. Commercial fisheries occur during the winter and summer months, with the majority of the commercial catch occurring in the summer. Subsistence fisheries occur primarily in winter months and sporadically in summer months. The king crab population is concentrated near to shore from December through April, when shore fast ice allows subsistence fishers easy access. A winter king crab test-fishing project began in February of 1982. Sampling procedures were standardized in 1983. Results of prior studies were reported by Schwarz and Lean (1982, 1983, 1984), Lean and Brannian (1987), Lean (1987), Bue and Lean (1990), Knuepfer and Gebhard (1990), Brennan and Anderson (1993), Brennan (1993, 1998, 1999), Brennan and LaFlamme (1995), Rob (1996), and Rob and Fair (1997).

Shorefast and sea ice conditions constantly change during the winter months. From 1982 until 1987, test fishing stations were restricted to a single transect of shorefast ice extending $\frac{1}{2}$ to 2 miles directly offshore from the Nome Post Office. Poor ice conditions precluded any test fishing in 1988. During the 1989 and 1990 seasons, the study area was expanded 6 miles to the west of Nome, in the vicinity of gold dredging activity, and 6 miles to the east of Nome, where less subsistence activity occurs. Test fishing effort was reduced in 1991 and 1993 due to poor ice condition and budget constraints. In 1992 and 1994, test fishing was not funded. Test fishing was expanded in 1996 to the vicinity of Bluff, 50 miles east of Nome. In 1997 the active ice edge was closer to shore, and sea ice conditions were quite rough. Pots were established in more shallow water than in the past, and due to unstable ice, no pots were fished in the vicinity of Bluff. In 1998, 1999, and 2000 traditional ice stations were fished.

The purpose of this study is to collect biological data during the winter months for the purpose of monitoring the nearshore distribution, abundance, and life history of the red king crab population. This is done by catching, measuring, and tagging king crab through established stations in the sea ice offshore of Nome. The winter subsistence and commercial fisheries are also monitored by staff in order to evaluate the abundance available to local users. The winter project data is incorporated into a length-based population model developed to predict population estimates for the red king crab biomass in Norton Sound. The model is especially useful in years when there is no summer trawl survey estimate, therefore improving the management of the red king crab fisheries.

Objectives for the 2000 winter field season were:

1. Enumerate the catch of sublegal and legal male red king crab; determine the shell age of each age class to evaluate recruitment into legal population prior to the summer fishery.
2. Enumerate and describe the subsistence and commercial king crab catch accessible to winter users in the Nome area.
3. Monitor the intensity and distribution of the winter fishing effort in the Nome area.

4. Tag all male new shell red king crab with carapace length $\leq 100\text{mm}$, as part of ongoing studies to estimate the growth and movement of tagged crab recaptured in summer and winter fisheries.
5. Measure and record the size and number of female red king crab captured and estimate egg development and clutch size.
6. Monitor other life history and biological data such as disease, parasitism, and the incidence of competing species.
7. Plot the relative distribution of crab within the winter 2000 study area using catch per unit effort information.

METHODS

Eight test fishing stations were established in an area spanning from approximately 7 miles west of Nome to 5 miles east of Nome (Table 1, Figure 1). All stations but one were located as close as possible to historical sites. Station East 2 had to be located in more shallow water than usual because of ice conditions. Each station was located in water ranging from 35 feet to 50 feet deep and from approximately $\frac{1}{2}$ mile to $1\frac{1}{2}$ miles offshore. Travel to and from stations was by snowmachines towing sleds to carry supplies and equipment.

Station locations were established by locating the approximate historical site with a Garmin GPS (Global Positioning System) 45². A test hole was drilled using a gasoline-powered auger and water depth was checked using a weighted string. When the appropriate water depth was found, a square hole about five feet long on each side was cut in the ice using ice augers. Other tools used include ice chisels or "tuks", axes, shovels, ice picks and long poles. Conical, four foot diameter "Japanese style" king crab pots were baited with chopped herring in two one quart bait containers and one string of 10 whole saffron cod. All pots were covered with 1.5 inch seine web in an effort to standardize the gear since crab size is the primary focus of the winter study. Each pot was deployed and attached to a line tethered at the surface of the ice. Each hole was covered with Styrofoam and plywood to reduce refreezing of the hole. All holes were marked per regulation (5AAC 34.925). The GPS was used to record all station locations.

Once pots were deployed, each pot was checked and rebaited twice per week, (weather permitting). When pots were checked, they were brought to the surface and suspended so that all crab in the pot remained immersed in water. Crab were removed one at a time and legal and biological measurements were made to the nearest millimeter. A legal red king crab is a male crab with a shell width greater than or equal to $4\frac{3}{4}$ inches, approximately 121 mm, across (legal measurement). Biological measurement is the measurement taken from the posterior margin of the right eye orbit of the carapace to the center of the posterior carapace margin. The relationship between legal measurements and biological measurements is good and suggests that minimally legal crab, as defined by the legal measurement, would

² Use of vendor name does not imply endorsement.

theoretically have a biological measurement of 104mm in carapace length. Shell age was determined as new or old shell by observing features such as scarring on the ventral surface, dullness on the dactyl tips and attached barnacle sizes. Egg development and clutch size of female crab was noted. New shell and old shell male crab with a carapace length of 100mm or less were tagged with hog rings with spaghetti tags to estimate growth rates of these mainly sub-legal crab. Any prior injuries on all tagged crab caught were noted. General observations on the condition of the crab are also noted. All crab were released into the same hole that the pot was suspended in. Abundance and condition of other species captured in pots are also noted.

As time and money allow, an aerial survey of the shorefast ice in the Nome area is flown to document fishing effort and distribution. Casual conversation with commercial and subsistence fishers was solicited to get their impressions of the season, any general observations they have as to where the crab are, and how abundant they appear. Subsistence permits are given out to fishers for recording their catches. Commercial fishers must report and turn in fish tickets to the Nome ADF&G office weekly. In this way the commercial harvest can be tracked in season.

Catch per unit effort (CPUE) was calculated as the catch of crab per pot lift. The relative distribution of crab within the study area was plotted on a map, using catch per unit effort statistics. CPUE is used to compare the relative abundance between seasons and areas that are fished.

Stations were deployed beginning on February 14, 2000. Ice conditions in the Nome area were fair in regard to traveling offshore. Pot locations, distances from Nome, and distance offshore were computed and recorded using the GPS (Table 1).

RESULTS

A total of 575 male and 22 female red king crab were captured and sampled at 8 stations between February 14 and April 10, 2000. A total of 93 pot lifts were made for an overall CPUE of 6.2 male and 0.2 female red king crab (Table 2). The CPUE for all crab captured at each station is presented in Table 2 and Figure 1. Daily catch information is presented in Table 3. Record of each station fished is found in Appendix Table A. A total of 167 male crab were tagged. Other species captured include Arctic Lyre crab *Hyas coarctatus*, Soft crab *Hapalogaster grebnitzkii*, Flatbottom sea star *Asterias*, sea urchins of the genus *Strongylocentrotus*, shrimp *Pandalus* (sp.), Saffron Cod *Eleginus gracilis*, unidentified sculpins and jellyfish.

Carapace length measurements and shell age were taken from 575 male crab. Of the total male crab caught, 210 or 36.5% were prerecruit, 222 or 38.6% were recruit, and 143 or 24.9% postrecruit (Table 4). Prerecruit threes (sublegal crab with carapace length <76mm) comprised 3.0 % of the total male crab catch. Prerecruit twos (sublegal crab with carapace length 76 to 89 mm) accounted for 13.2% of the total male crab catch. Prerecruit ones (sublegal crab with carapace length >89 mm) comprised 20.3% of the total male crab catch (Table 5, Table 11). The average length of all male king crab captured was 105 mm (Table

5). The length distribution of all male crab captured during the winter pot study ranged from 64 mm to 138 mm (Table 5, Figure 2).

Legal male crab accounted for 63.5% of the total male crab catch. The average carapace length of the legal crab caught was 113 mm (Table 6). Legal new shell male crab had an average carapace length of 113 mm and accounted for 86.0% of the legal crab catch. Legal old shell male crab had an average carapace length of 114 mm and accounted for 14.0 % of the legal crab catch. Recruit crab (legal, new shell male crab with carapace length \leq 115 mm) made up 60.8% of the legal male catch and postrecruit crab (legal new shell male crab with carapace length \geq 116 mm and all legal old shell males) made up 39.2 % (Table 6).

Sublegal male crab accounted for 36.5% of the total male crab catch (Table 4). The mean carapace length of the sublegal male crab caught was 90mm. All sublegal crab had new shells. Captured sublegal crab had a mean carapace length of 90 mm. No old shell sublegal male crabs were captured during project operations (Table 7).

A total of 22 female crab were caught, 8 juvenile (carapace length < 72mm, no eggs) and 14 adults. The average carapace length was 66 mm for juvenile female crab, and 76 mm for adult female crab (Table 8). One adult female crab had a full egg clutch, 8 adults had high egg clutches, one adult female had a low egg clutch, and 4 adult female crab had no egg clutches. All female crab with egg clutches were observed with purple or dark brown eggs. This indicates a high likelihood of these females being primiparous females.

A total of 11 tagged crab captured during the 2000 winter fishery were returned by subsistence and commercial fishers to the Nome ADF&G office (Table 14). The returned crab had been tagged during the 1998, 1999 and 2000 winter pot surveys. Five of the 6 returned crab tagged between 1998 and 1999 were used to calculate an average growth per molt of 13.3 mm.

Subsistence fishing effort was concentrated in front of Nome within five miles east and west. The subsistence effort of 99 permits was slightly below the average number of permits issued since 1977 (124), but greater than the previous four winter seasons (Table 9). This increase was primarily due to the good condition of sea ice and greater abundance of crab nearshore. A new regulation to ensure winter subsistence crab fishers had use of the prime fishing area took effect this season. Commercial winter crab fishers are now excluded from a section of sea ice lying between the mouth of the Nome River and Dredge #6, and extending due south. Only subsistence and personal use fishers are allowed to operate in this area, but not confined to the area. Subsistence crab permits are not due back until May 31, therefore subsistence harvest numbers are unavailable at this time.

Commercial fishing effort extended about 20 miles west of town and east toward Cape Nome. Eleven fishers registered for the 2000 winter commercial fishery. This compares to the previous four-year average of 6 fishers (Table 9). Ice conditions were stable throughout the season. As of April 17, commercial fishers harvested 2,325 crab. The harvest was slightly below the average number of crab harvested since 1977. However, the winter harvest is ongoing and this is a preliminary number. No aerial survey of ice conditions was flown during the 2000 season.

Stations East 1, West 2 and Nome 3 (Figure 1) had a high catch rate of starfish and a very low crab catch throughout the study. As in previous studies, stations that catch high numbers of starfish catch no or very few crab. No incidence of parasitism or disease was observed in the crab captured during the study.

DISCUSSION

The red king crab winter pot survey has been conducted in the Nome area during fifteen of the eighteen years since sampling procedures were standardized in 1983. The winter survey has provided opportunities to collect and interpret valuable information on the crab population immediately available to the residents of Nome during the winter subsistence and commercial fisheries. The winter project data is incorporated into a length-based population model developed to predict population estimates for the red king crab biomass in Norton Sound. In this way, the model is especially useful in years when there is no summer trawl survey estimate, therefore improving the management of the red king crab fisheries.

During 2000, the sea ice was relatively stable in the historic study area throughout the season. The active ice edge was approximately 2 miles offshore in most areas. Weather conditions were only severe enough to prevent travel a few times throughout the season. There were no large pressure ridges which have made travel difficult in some years. Travel conditions along the beach line were good all season.

The 2000 winter pot survey had a catch of 575 male king crab compared to an average of 1,057 male crab in the winter surveys 1983 through 1999 (Table 10). Male CPUE (6.2 crab/pot) was below the average of 14.3 crab per pot for the winter surveys since 1983 (Table 10, Figure 3). The total number of female crab caught, 22, was below the average of 42 female crab since 1983. Three of the stations in the 2000 winter survey had very poor catches compared to the other stations, therefore contributing to the lower CPUE. Two of these stations were in different than normal locations because of sea ice conditions. Also, a slightly shorter total fishing time contributed to a lower catch compared to the 1999 study. It is likely that the shorter fishing time and differing locations contributed to a below average catch rather than a low abundance of crab. Subsistence and commercial fishers indicated a good abundance of crab throughout the winter fishing season.

The 2000 sublegal catch proportion, 36.5 % of the total male catch, was below the average, 52 % (Table 11). Prerecruit threes and twos combined made up 13.2 %. This is well below the average of 23% prerecruit threes and twos since 1983. Prerecruit ones made up 20.3 % of all male crab sampled. This was below the 1983-1999 average of 30.1 %. The legal crab catch proportion of 63.5 % was the highest since 1995. This compares to the average of 48 % for the years 1983 to 1999. Recruit crab made up 38.6% of all male crab captured. This is the second highest recruitment seen in the pot survey since it was begun in 1983. Postrecruit crab made up 24.9% of all male crab captured. This was more than two times greater than the 1999 proportion and the largest percent of postrecruits since 1996. Subsistence and commercial fishers in the Nome area also reported this trend of increasing recruit and postrecruit age crab.

The composition of the male catch of red king crab in the 1999 and 2000 pot survey changed dramatically from the 1998 survey (Table 11). Only 18% of the 1998 male catch were legal

compared to 50 % in 1999 and 64% in 2000. In 1998, 82% of the total catch were sublegal male, compared to 50% in 1999 and 37% in 2000. Comparisons of the length frequency distribution of all male red king crab captured during the winter and summer pot and trawl surveys between 1995 and 1999 are presented in Figure 4. The large proportion of prerecruit crab in 1998 molted and became the large recruit proportion observed during the 1999 and 2000 study. The 1999 Norton Sound trawl survey estimated an all-time high prerecruit-1 male abundance. This also indicates that the legal component will continue to expand at least one more year. Conversely, the exceptionally weak prerecruit-2 abundance estimate from the 1999 trawl survey suggests that in the wake of this abundance of newly legal crab is at least one year of weak recruitment. The 2000 winter data also indicates this trend of increased legal crab abundance for the 2000 season and weakened recruitment in the near future.

With an expected legal male crab abundance of 4.2 million pounds, the 2000 summer commercial crab fishery will be managed for a guideline harvest goal of 336,000 pounds. A 336,000 pound harvest equates to an 8% exploitation rate in accordance with the harvest strategy set by the Board of Fish. Management biologists have decided on an exploitation rate of 8% due to the low recruitment expected in the future.

LITERATURE CITED

- Brennan, E.L. 1993. Norton Sound winter red king crab studies, 1993. Regional Information Report No. 3A93-13. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Anchorage.
- Brennan, E.L. 1998. Norton Sound winter red king crab studies, 1998. Regional Information Report No. 3A98-25. Alaska Department of Fish and Game, Commercial Fisheries Division, Anchorage.
- Brennan, E.L. 1999. Norton Sound winter red king crab studies, 1999. Regional Information Report No. 3A99-25. Alaska Department of Fish and Game, Commercial Fisheries Division, Anchorage.
- Brennan, E.L. and R. Anderson 1993. Norton Sound winter red king crab studies, 1991. Regional Information Report No. 3A93-12. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Anchorage.
- Brennan, E.L. and T. R. LaFlamme. 1995. Norton Sound winter red king crab studies, 1995. Regional Information Report No. 3A95-20. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Anchorage.
- Bue, F.J. and C.F. Lean 1990. Norton Sound winter red king crab studies, 1989. Regional Information Report No. 3N90-05. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Nome.
- Knuepfer, G.R. and J.G. Gebhard, 1990. Norton Sound winter red king crab studies, 1990. Regional Information Report No. 3N90-19. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Nome.
- Lean C.F. 1987. Catch rates, size composition and growth of red king crab taken in Norton Sound near Nome during the winter of 1987. AYK Region Shellfish Report #12. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Nome.
- Lean C.F. and L. Brannian 1987. Catch rates, size composition and growth of red king crab taken in Norton Sound near Nome during the winters of 1985 and 1986. AYK Region Shellfish Report #11. Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome.
- Rob, P. J. 1996. Norton Sound Winter Red King Crab Studies, 1996. Regional Information Report No. 3A96-22. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Anchorage.
- Rob, P. J. and L.F. Fair. 1997. Norton Sound Winter Red King Crab Studies, 1997.

Regional Information Report No. 3A97-25. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Anchorage.

LITERATURE CITED (continued)

Schwarz, L. and C.F. Lean, 1982. Nearshore winter king crab study, Norton Sound, February through May, 1982. AYK Region Shellfish Report #10. Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome.

_____. 1983. Nearshore winter king crab study, Norton Sound, January through April, 1983. AYK Region Shellfish Report #6. Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome.

_____. 1984. Nearshore winter king crab study, Norton Sound, January through April, 1984. AYK Region Shellfish Report #8. Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome.

Table 1. Location of test fishing stations for the winter red king crab pot survey, Norton Sound, 2000

Pot	Location from Town (miles)	Longitude	Latitude	Depth (ft)	Historical Station
Nome 2	1.8	N 64°28' 18"	W 165°24' 53"	43 ft	yes
Nome 3	1.3	N 64°28' 47"	W 165°24' 52"	50 ft	yes
West 3	2.5	N 64°29' 20"	W 165°28' 52"	43 ft	yes
West 4	2.5	N 64°29' 14"	W 165°28' 53"	50 ft	yes
West 1	7.1	N 64°30' 51"	W 165°37' 59"	35 ft	yes
West 2	7.4	N 64°30' 17"	W 165°38' 52"	50 ft	yes
East 1	5.1	N 64°27' 46"	W 165°14' 40"	40 ft	yes
East 2	5.3	N 64°27' 44"	W 165°14' 16"	40 ft	no

Table 2. Number of pot lifts and catch, by station, for all stations in the winter red king crab pot survey, Norton Sound, 2000.

Station	Dates Fished	Number of Pot Lifts	Number of Male Red King Crab Caught	CPUE for Male Red King Crab	Number of Female Red King Crab Caught	CPUE for Female Red King Crab
Nome 2	2/14 - 4/10	13	188	14.5	3	0.2
Nome 3	2/14 - 4/10	13	10	0.8	0	0.0
West 1	2/24 - 4/10	10	44	4.4	0	0.0
West 2	2/23 - 4/7	8	1	0.1	0	0.0
West 3	2/15 - 4/10	13	108	8.3	4	0.3
West 4	2/15 - 4/10	13	130	10.0	3	0.2
East 1	2/16 - 4/10	12	94	7.8	12	1.0
East 2	2/17 - 4/6	11	0	0.0	0	0.0
Total		93	575	6.2	22	0.2

Table 3. Daily catch of red king crab for all stations in the winter pot survey, Norton Sound, 2000.

Date	Stations	# of Pots Lifted	# of	Male CPUE	Cumulative # of Males Captured	# of Females Captured
			Males Captured			
16-Feb	Nome 2, Nome 3	2	2	1.0	2	0
22-Feb	Nome 2, Nome 3, East 1, East 2, West 3, West 4	6	47	7.8	49	2
24-Feb	West 3, West 4	2	5	2.5	54	0
25-Feb	Nome 2, Nome 3, East 1, East 2	4	19	4.8	73	0
28-Feb	West 1, West 2, West 3, West 4	4	26	6.5	99	1
1-Mar	Nome 2, Nome 3, East 1, East 2	4	41	10.3	140	0
2-Mar	West 1, West 2, West 3, West 4	4	11	2.8	151	0
3-Mar	Nome 2, Nome 3, East 1, East 2	4	21	5.3	172	0
6-Mar	Nome 2, Nome 3, East 1, East 2	4	14	3.5	186	1
7-Mar	West 1, West 2, West 3, West 4	4	34	8.5	220	0
9-Mar	Nome 2, Nome 3, East 1, East 2	4	28	7.0	248	1
10-Mar	West 1, West 2, West 3, West 4	4	19	4.8	267	1
13-Mar	Nome 2, Nome 3, East 1, East 2	4	34	8.5	301	4
14-Mar	West 1, West 2, West 3, West 4	4	31	7.8	332	2
16-Mar	East 1, East 2	2	3	1.5	335	0
17-Mar	Nome 2, Nome 3, West 3, West 4	4	51	12.8	386	1
23-Mar	West 1, West 2, West 3, West 4	4	64	16.0	450	1
24-Mar	Nome 2, Nome 3, East 1, East 2	4	33	8.3	483	2
28-Mar	West 3, West 4	2	16	8.0	499	0
29-Mar	West 1, West 2	2	2	1.0	501	0
30-Mar	Nome 2, Nome 3, East 1, East 2	4	24	6.0	525	3
31-Mar	West 1, West 2, West 3, West 4 Nome 2, Nome 3, East 1, East 2	4	16	4.0	541	1
6-Apr	West 3, West 4.	6	26	4.3	567	0
7-Apr	West 1, West 2 Nome 2, Nome 3, East 1, West 1.	2	0	0.0	567	0
10-Apr	West 3, West 4.	6	8	1.3	575	2
		94	575	6.1		22

Table 4. Summary of male red king crab data from the winter pot survey, Norton Sound, 2000.

	Number	Percent	Mean Length (mm)
Sublegal Male Crab			90
New Shell	210	36.5%	
Old Shell	0	0.0%	
Legal Male Crab			113
New Shell	314	54.6%	
Old Shell	51	8.9%	
Totals	575	100%	
Prerecruit Males	210	36.5%	
Recruit Males	222	38.6%	
Postrecruit Males	143	24.9%	
Total	575	100.0%	

Prerecruits are sublegal crab with a carapace length ≤ 115 mm.

Recruit crab are new shell, legal crab with a carapace length ≤ 115 mm.

Postrecruit crab are legal crab with a carapace length ≥ 116 mm.

Table 5. Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 2000.

Carapace Length (mm)	Pterocruita		Recruits		Postrecruits		Totals	%
	Number	Percent	Number	Percent	Number	Percent		
58	0	0.0%					0	0.0%
59	0	0.0%					0	0.0%
60	0	0.0%					0	0.0%
61	0	0.0%					0	0.0%
62	0	0.0%					0	0.0%
63	0	0.0%					0	0.0%
64	1	0.2%					1	0.2%
65	1	0.2%					1	0.2%
66	1	0.2%					1	0.2%
67	0	0.0%					0	0.0%
68	0	0.0%					0	0.0%
69	1	0.2%					1	0.2%
70	2	0.3%					2	0.3%
71	0	0.0%					0	0.0%
72	1	0.2%					1	0.2%
73	3	0.5%					3	0.5%
74	3	0.5%					3	0.5%
75	4	0.7%					4	0.7%
76	3	0.5%					3	0.5%
77	6	1.0%					6	1.0%
78	6	1.0%					6	1.0%
79	4	0.7%					4	0.7%
80	9	1.6%					9	1.6%
81	3	0.5%					3	0.5%
82	7	1.2%					7	1.2%
83	5	0.9%					5	0.9%
84	5	0.9%					5	0.9%
85	7	1.2%					7	1.2%
86	4	0.7%					4	0.7%
87	5	0.9%					5	0.9%
88	4	0.7%					4	0.7%
89	8	1.4%					8	1.4%
90	3	0.5%					3	0.5%
91	7	1.2%					7	1.2%
92	11	1.9%					11	1.9%
93	6	1.0%					6	1.0%
94	6	1.0%					6	1.0%
95	10	1.7%					10	1.7%
96	7	1.2%					7	1.2%
97	11	1.9%					11	1.9%
98	8	1.4%					8	1.4%
99	2	0.3%					2	0.3%
100	10	1.7%	0	0.0%			10	1.7%
101	8	1.4%	0	0.0%			8	1.4%
102	19	3.3%	1	0.2%	0	0.0%	20	3.5%
103	7	1.2%	4	0.7%	1	0.2%	12	2.1%
104	2	0.3%	11	1.9%	2	0.3%	15	2.6%
105	0	0.0%	15	2.6%	3	0.5%	18	3.1%
106	0	0.0%	16	2.8%	3	0.5%	19	3.3%
107	0	0.0%	21	3.7%	1	0.2%	22	3.8%
108	0	0.0%	22	3.8%	3	0.5%	25	4.3%
109	0	0.0%	19	3.3%	4	0.7%	23	4.0%
110	0	0.0%	24	4.2%	4	0.7%	28	4.9%
111			19	3.3%	0	0.0%	19	3.3%
112			24	4.2%	5	0.9%	29	5.0%
113			16	2.8%	4	0.7%	20	3.5%
114			17	3.0%	4	0.7%	21	3.7%
115			13	2.3%	1	0.2%	14	2.4%
116					11	1.9%	11	1.9%
117					21	3.7%	21	3.7%
118					12	2.1%	12	2.1%
119					8	1.4%	8	1.4%
120					6	1.0%	6	1.0%
Totals	210	36.5%	222	38.6%	(continued)			

Postrecruits (continued)				
Carapace Length (mm)	Number	Percent	Totals	%
121	5	0.9%	5	0.9%
122	10	1.7%	10	1.7%
123	6	1.0%	6	1.0%
124	8	1.4%	8	1.4%
125	2	0.3%	2	0.3%
126	4	0.7%	4	0.7%
127	4	0.7%	4	0.7%
128	2	0.3%	2	0.3%
129	3	0.5%	3	0.5%
130	1	0.2%	1	0.2%
131	0	0.0%	0	0.0%
132	1	0.2%	1	0.2%
133	2	0.3%	2	0.3%
134	1	0.2%	1	0.2%
135	0	0.0%	0	0.0%
136	0	0.0%	0	0.0%
137	0	0.0%	0	0.0%
138	1	0.2%	1	0.2%
139	0	0.0%	0	0.0%
140	0	0.0%	0	0.0%
141	0	0.0%	0	0.0%
142	0	0.0%	0	0.0%
143	0	0.0%	0	0.0%
144	0	0.0%	0	0.0%
145	0	0.0%	0	0.0%
146	0	0.0%	0	0.0%
147	0	0.0%	0	0.0%
148	0	0.0%	0	0.0%
149	0	0.0%	0	0.0%
150	0	0.0%	0	0.0%
151	0	0.0%	0	0.0%
152	0	0.0%	0	0.0%
153	0	0.0%	0	0.0%
154	0	0.0%	0	0.0%
155	0	0.0%	0	0.0%
156	0	0.0%	0	0.0%
157	0	0.0%	0	0.0%
158	0	0.0%	0	0.0%
159	0	0.0%	0	0.0%
160	0	0.0%	0	0.0%
Totals	143	24.9%	575	100.0%

Number of Pterocruit threes (< 76mm)	17	3.0%
Number of Pterocruit twos (76 to 89 mm)	76	13.2%
Number of pterocruit ones (> 89mm)	117	20.3%
		36.5%
Average Length of all male crab captured =		105 mm

Table 6. Length frequencies by shell age of all legal male red king crab captured in the winter pot survey, Norton Sound, 2000.

Carapace Length (mm)	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
	Number	Percent	Number	Percent	Number	Percent
100	0	0.0%	0	0.0%	0	0.0%
101	0	0.0%	0	0.0%	0	0.0%
102	1	0.3%	0	0.0%	1	0.3%
103	4	1.1%	1	0.3%	5	1.4%
104	11	3.0%	2	0.5%	13	3.6%
105	15	4.1%	3	0.8%	18	4.9%
106	16	4.4%	3	0.8%	19	5.2%
107	21	5.8%	1	0.3%	22	6.0%
108	22	6.0%	3	0.8%	25	6.8%
109	19	5.2%	4	1.1%	23	6.3%
110	24	6.6%	4	1.1%	28	7.7%
111	19	5.2%	0	0.0%	19	5.2%
112	24	6.6%	5	1.4%	29	7.9%
113	16	4.4%	4	1.1%	20	5.5%
114	17	4.7%	4	1.1%	21	5.8%
115	13	3.6%	1	0.3%	14	3.8%
116	11	3.0%	0	0.0%	11	3.0%
117	18	4.9%	3	0.8%	21	5.8%
118	10	2.7%	2	0.5%	12	3.3%
119	7	1.9%	1	0.3%	8	2.2%
120	6	1.6%	0	0.0%	6	1.6%
121	5	1.4%	0	0.0%	5	1.4%
122	9	2.5%	1	0.3%	10	2.7%
123	5	1.4%	1	0.3%	6	1.6%
124	8	2.2%	0	0.0%	8	2.2%
125	1	0.3%	1	0.3%	2	0.5%
126	4	1.1%	0	0.0%	4	1.1%
127	4	1.1%	0	0.0%	4	1.1%
128	1	0.3%	1	0.3%	2	0.5%
129	1	0.3%	2	0.5%	3	0.8%
130	0	0.0%	1	0.3%	1	0.3%
131	0	0.0%	0	0.0%	0	0.0%
132	0	0.0%	1	0.3%	1	0.3%
133	1	0.3%	1	0.3%	2	0.5%
134	1	0.3%	0	0.0%	1	0.3%
135	0	0.0%	0	0.0%	0	0.0%
136	0	0.0%	0	0.0%	0	0.0%
137	0	0.0%	0	0.0%	0	0.0%
138	0	0.0%	1	0.3%	1	0.3%
139	0	0.0%	0	0.0%	0	0.0%
140	0	0.0%	0	0.0%	0	0.0%
141	0	0.0%	0	0.0%	0	0.0%
142	0	0.0%	0	0.0%	0	0.0%
143	0	0.0%	0	0.0%	0	0.0%
144	0	0.0%	0	0.0%	0	0.0%
145	0	0.0%	0	0.0%	0	0.0%
146	0	0.0%	0	0.0%	0	0.0%
147	0	0.0%	0	0.0%	0	0.0%
148	0	0.0%	0	0.0%	0	0.0%
149	0	0.0%	0	0.0%	0	0.0%
150	0	0.0%	0	0.0%	0	0.0%
151	0	0.0%	0	0.0%	0	0.0%
152	0	0.0%	0	0.0%	0	0.0%
153	0	0.0%	0	0.0%	0	0.0%
154	0	0.0%	0	0.0%	0	0.0%
155	0	0.0%	0	0.0%	0	0.0%
156	0	0.0%	0	0.0%	0	0.0%
157	0	0.0%	0	0.0%	0	0.0%
158	0	0.0%	0	0.0%	0	0.0%
159	0	0.0%	0	0.0%	0	0.0%
160	0	0.0%	0	0.0%	0	0.0%
Totals	314	86.0%	51	14.0%	365	100.0%
Average Lengths	113		114		113	
		Total Recruits=	222	60.8%		
		Total Postrecruits=	143	39.2%		

Table 7. Length frequencies by shell age of all sublegal male red king crab captured in the winter pot survey, Norton Sound, 2000.

Carapace Length (mm)	Sublegal New Shell Males				Sublegal Old Shell Males				Total Sublegal Males	
	Threes (mm)	Twos (76 to 89 mm)	Ones (>89 mm)	%	Threes (<76 mm)	Twos (76 to 89 mm)	Ones (>89 mm)	%	Total Sublegal Males	%
60	0			0.0%	0			0.0%	0	0.0%
61	0			0.0%	0			0.0%	0	0.0%
62	0			0.0%	0			0.0%	0	0.0%
63	0			0.0%	0			0.0%	0	0.0%
64	1			0.5%	0			0.0%	1	0.5%
65	1			0.5%	0			0.0%	1	0.5%
66	1			0.5%	0			0.0%	1	0.5%
67	0			0.0%	0			0.0%	0	0.0%
68	0			0.0%	0			0.0%	0	0.0%
69	1			0.5%	0			0.0%	1	0.5%
70	2			1.0%	0			0.0%	2	1.0%
71	0			0.0%	0			0.0%	0	0.0%
72	1			0.5%	0			0.0%	1	0.5%
73	3			1.4%	0			0.0%	3	1.4%
74	3			1.4%	0			0.0%	3	1.4%
75	4			1.9%	0			0.0%	4	1.9%
76		3		1.4%		0		0.0%	3	1.4%
77		6		2.9%		0		0.0%	6	2.9%
78		6		2.9%		0		0.0%	6	2.9%
79		4		1.9%		0		0.0%	4	1.9%
80		9		4.3%		0		0.0%	9	4.3%
81		3		1.4%		0		0.0%	3	1.4%
82		7		3.3%		0		0.0%	7	3.3%
83		5		2.4%		0		0.0%	5	2.4%
84		5		2.4%		0		0.0%	5	2.4%
85		7		3.3%		0		0.0%	7	3.3%
86		4		1.9%		0		0.0%	4	1.9%
87		5		2.4%		0		0.0%	5	2.4%
88		4		1.9%		0		0.0%	4	1.9%
89		8		3.8%		0		0.0%	8	3.8%
90			3	1.4%			0	0.0%	3	1.4%
91			7	3.3%			0	0.0%	7	3.3%
92			11	5.2%			0	0.0%	11	5.2%
93			6	2.9%			0	0.0%	6	2.9%
94			6	2.9%			0	0.0%	6	2.9%
95			10	4.8%			0	0.0%	10	4.8%
96			7	3.3%			0	0.0%	7	3.3%
97			11	5.2%			0	0.0%	11	5.2%
98			8	3.8%			0	0.0%	8	3.8%
99			2	1.0%			0	0.0%	2	1.0%
100			10	4.8%			0	0.0%	10	4.8%
101			8	3.8%			0	0.0%	8	3.8%
102			19	9.0%			0	0.0%	19	9.0%
103			7	3.3%			0	0.0%	7	3.3%
104			2	1.0%			0	0.0%	2	1.0%
105			0	0.0%			0	0.0%	0	0.0%
106			0	0.0%			0	0.0%	0	0.0%
107			0	0.0%			0	0.0%	0	0.0%
108			0	0.0%			0	0.0%	0	0.0%
109			0	0.0%			0	0.0%	0	0.0%
110			0	0.0%			0	0.0%	0	0.0%
Totals	17	76	117	100.0%	0	0	0	0.0%	210	100.0%
Average Lengths (mm)	72	83	97		0	0	0		90	
Average Length of all sublegal new shell males =				90	mm		No sublegal old shell males =			

Table 8. Length frequencies and percent ovigerity of all female red king crab captured in the winter pot survey, Norton Sound, 2000.

Carapace Length (mm)	Percent Ovigerity					Juvenile	Total
	Adult						
	Full 90 - 100%	High 60 - 89%	Medium 30 - 59%	Low - 29%	l None 0%		
30	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	2	2
65	0	0	0	0	0	2	2
66	0	0	0	0	0	1	1
67	0	0	0	0	0	1	1
68	0	0	0	0	0	1	1
69	0	0	0	0	0	1	1
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	3	0	0	2	0	5
74	0	1	0	0	0	0	1
75	0	1	0	0	0	0	1
76	0	2	0	0	1	0	3
77	0	0	0	0	0	0	0
78	0	1	0	0	0	0	1
79	0	0	0	1	0	0	1
80	0	0	0	0	0	0	0
81	0	0	0	0	1	0	1
82	1	0	0	0	0	0	1
83	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0
	1	8	0	1	4	8	22

Total number of juvenile females (<72mm) = 8
 Average length of juvenile females (<72mm) = 66 mm
 Average length of adult females (≥72mm) = 76 mm
 Average length of all females = 72 mm

Table 9. Subsistence and commercial king crab permits issued for winter fishing, Norton Sound, 1978 - 2000.

Winter	<u>Subsistence Fishery</u>			<u>Commercial Fishery^a</u>		
	Number of Permits Issued	Number of Crab Harvested	Average Harvest/Fisher	Number of Registered Fishermen	Number of Crab Harvested	Average Harvest/Fisher
1977-1978	290	12,506	84	37	9,625	260
1978-1979	48	224	6	1	221	221
1979-1980	22	213	24	1	22	22
1980-1981	51	360	16	0	0	0
1981-1982	101	1,288	24	1	17	17
1982-1983	172	10,432	123	5	549	110
1983-1984	222	11,220	78	8	856	107
1984-1985	203	8,377	63	9	1,168	130
1985-1986	136	7,052	66	5	2,168	434
1986-1987	138	5,772	59	7	1,040	149
1987-1988	71	2,724	68	10	425	43
1988-1989	139	6,126	65	5	403	81
1989-1990	136	12,152	114	13	3,626	279
1990-1991	119	7,366	93	11	3,800	345
1991-1992	158	11,736	112	13	7,478	575
1992-1993	88	1,097	30	8	1,788	224
1993-1994	118	4,113	58	25	5,753	230
1994-1995	166	5,426	56	42	7,538	179
1995-1996	85	1,679	48	9	1,778	198
1996-1997	38	745	71	3	83	28
1997-1998	93	8,622	135	5	984	197
1998-1999	95	7,508	106	8	2,384	298
1999-2000 ^b	99			11	3,094	281
Average 1977-1999	122	5,761	68	10	2,350	187

^a Before 1985 the winter commercial fishery was open from 1 January through 30 April. After March 1985, the winter commercial fishery was/is open by regulation from 15 November through 15 May.

^b Commercial and Subsistence seasons still occurring. Numbers are preliminary or not available.

Table 10. Total catch of red king crab during the winter pot surveys, Norton Sound, 1983 - 2000.

Year	# of Pot Lifts	# of Males Captured	Male CPUE	# of Females Captured	Female CPUE
1983	107	2,586	24.2	236	2.2
1984	70	1,677	24.0	78	1.1
1985	31	760	24.5	14	0.5
1986	31	594	19.2	74	2.4
1987	26	151	5.8	6	0.2
1988 ^a					
1989	42	548	13.0	9	0.2
1990	99	2,076	21.0	18	0.2
1991	56	1,283	22.9	8	0.1
1992 ^b					
1993	33	181	5.5	1	0.0
1994 ^b					
1995	126	776	6.2	10	0.1
1996	159	1,582	9.9	26	0.2
1997	140	399	2.9	60	0.4
1998	84	882	10.9	38	0.5
1999	122	1,308	10.7	15	0.1
2000	93	575	6.2	22	0.2
Average 1983-1999	80	1,057	14.3	42	0.6

^a No data collected in 1988 because of unstable ice conditions.

^b The project was not funded.

Table 11. Percent prerecruits, recruits, and postrecruits in the catch of red king crab during the winter pot surveys, 1983 - 2000, Norton Sound.

Year	Sublegal Prerecruits			Subtotal	Legal		Subtotal	Total
	Threes ^{ab}	Twos ^{bc}	Ones ^d		Recruits	Postrecruits		
1983		26.2%	38.0%	64.2%	26.1%	9.6%	35.7%	100%
1984		34.7%	31.0%	65.6%	18.6%	15.8%	34.4%	100%
1985		24.7%	45.1%	69.8%	20.4%	9.8%	30.2%	100%
1986		25.7%	35.0%	60.7%	21.7%	17.7%	39.3%	100%
1987		12.5%	31.3%	43.8%	10.4%	45.8%	56.3%	100%
1988 ^e								
1989		26.8%	15.4%	42.2%	27.3%	30.5%	57.8%	100%
1990		15.9%	33.5%	49.4%	24.7%	26.0%	50.6%	100%
1991	0.2%	4.8%	30.6%	35.6%	33.5%	30.9%	64.4%	100%
1992 ^f								
1993	0.0%	3.3%	8.8%	12.2%	17.1%	70.7%	87.9%	100%
1994 ^f								
1995 ^g	2.1%	9.8%	11.4%	23.3%	32.3%	44.4%	76.7%	100%
1996	9.2%	22.1%	33.1%	64.3%	10.1%	25.5%	35.7%	100%
1997	11.0%	32.3%	20.8%	64.2%	14.3%	21.6%	35.8%	100%
1998	0.8%	36.6%	44.3%	81.7%	8.7%	9.5%	18.3%	100%
1999	0.7%	6.5%	42.4%	49.6%	39.0%	11.3%	50.3%	100%
2000	3.1%	13.2%	20.3%	36.5%	38.6%	24.9%	63.5%	100%
Averages 1983-1999	Average of threes and twos combined =	21.8%	30.1%	51.9%	21.7%	26.4%	48.1%	

^a Prerecruit threes are all sublegal males with carapace length < 76 mm.

^b Prior to 1991 carapace lengths were consolidated in pairs so that prerecruit threes and twos cannot be accurately separated.

^c Prerecruit twos are all sublegal males with carapace length from 76 through 89 mm.

^d Prerecruit ones are all sublegal males with carapace length > 89 mm.

^e No data collected due to unstable ice conditions during the winter of 1988.

^f No data collected due to lack of funds.

^g Includes catch from 12 testfishing stations and from one commercial fisherman catch on 5 April.

Table 12. Average length frequencies of legal male and female red king crab captured during the winter pot surveys. Norton Sound, 1983 - 2000.

Year	Average Length (mm)	
	Legal Male Crab	Female Crab
1983	c	c
1984	c	c
1985	c	79
1986	c	70
1987	c	71
1988	a	
1989	c	79
1990	115	83
1991	114	75
1992	b	
1993	118	93 ^d
1994	b	
1995	117	77
1996	117	71
1997	118	74
1998	113	76
1999	110	72
2000	113	72

^a No data collected in 1988 due to unstable ice conditions.

^b No data collected in 1992 and 1994 due to a lack of funds.

^c Information not available.

^d Only one female crab captured during 1993.

Table 13. Recruit and postrecruit red king crab as a percentage of the legal catch sampled during the winter pot surveys and summer commercial fisheries in the Nome area, Norton Sound, 1983 - 2000.

Year	<u>Winter Study</u>		<u>Summer Commercial</u>	
	Recruits	Postrecruits	Recruits	Postrecruits
1983	73%	27%	55%	45%
1984	54%	46%	59%	41%
1985	68%	32%	45%	55%
1986	55%	45%	48%	52%
1987	20%	80%	22%	78%
1988	^a	^a	25%	75%
1989	47%	53%	23%	77%
1990	49%	51%	21%	79%
1991	52%	48%	^b	^b
1992	^c	^c	28%	72%
1993	20%	80%	31%	69%
1994	^c	^c	14%	86%
1995	42%	58%	36%	64%
1996	28%	72%	30%	70%
1997	40%	60%	49%	51%
1998	48%	52%	32%	68%
1999	78%	22%	42%	^e 58%
2000	62%	38%	^d	^d

^a No data collected in the winter of 1988 due to unstable ice conditions.

^b No data collected in the summer of 1991 due to closed fishery.

^c No data collected due to lack of funding.

^d No data at time of report.

^e Not typical commercial sample group

Table 14. Recaptured crab tag information recovered during the 2000 Norton Sound winter commercial and subsistence red king crab fisheries.

Tag Number	Capture Date	Stat. Area of Capture	Carapace Length (mm)	Shell Age	Tagging Date	Tagging Location ^b	Carapace Length (mm)	Growth (mm) ^c	No. of Molts ^a	Skip Molts	Average Growth per Molt (mm)
NZ03892	2/21/00	656403	111	New	3/16/99	E1	98	13	1	0	13.0
NZ03683	2/25/00	656403	89	New	3/1/99	E1	77	12	1	0	12.0
NZ03073	2/11/00	626403	no info		2/20/98	N2	91				
NZ03576	3/3/00	656403	109	New	4/20/98	E2	83	26	2	0	13.0
NZ04077	3/8/00	656403	78	New	2/28/00	W3	78	0			
NZ04137	3/13/00	656403	96	New	3/9/00	E1	97	-1			
NZ03462	3/13/00	656403	111	New	3/23/98	E2	84	27	2		13.5
NZ04039	3/19/00	656403	96	New	3/1/00	E1	97	-1			
NZ03131	3/15/00	656403	112	Old	2/27/98	E1	97	15	1	1	15.0
NZ04135	4/2/00	656403	91	New	3/9/00	N2	91	0			
NZ04098	4/10/00	656403	95	New	2/22/00	N2	94	1			
										Average Growth	13.3

^a Crab growth of 12 mm (+/- 5mm) per year is thought to be the average growth in one molting period.

^b B1= Bluff area, 45 miles east of Nome.

B4=Bluff area, 50 miles east of Nome.

E1=4.78 miles east of Nome

E2=5.2 miles east of Nome

E3=7.9 miles east of Nome.

E4=9.5 miles east of Nome.

N2=0.85 miles south of Nome.

N3=1.34 miles south of Nome.

W1=6.83 miles west of Nome

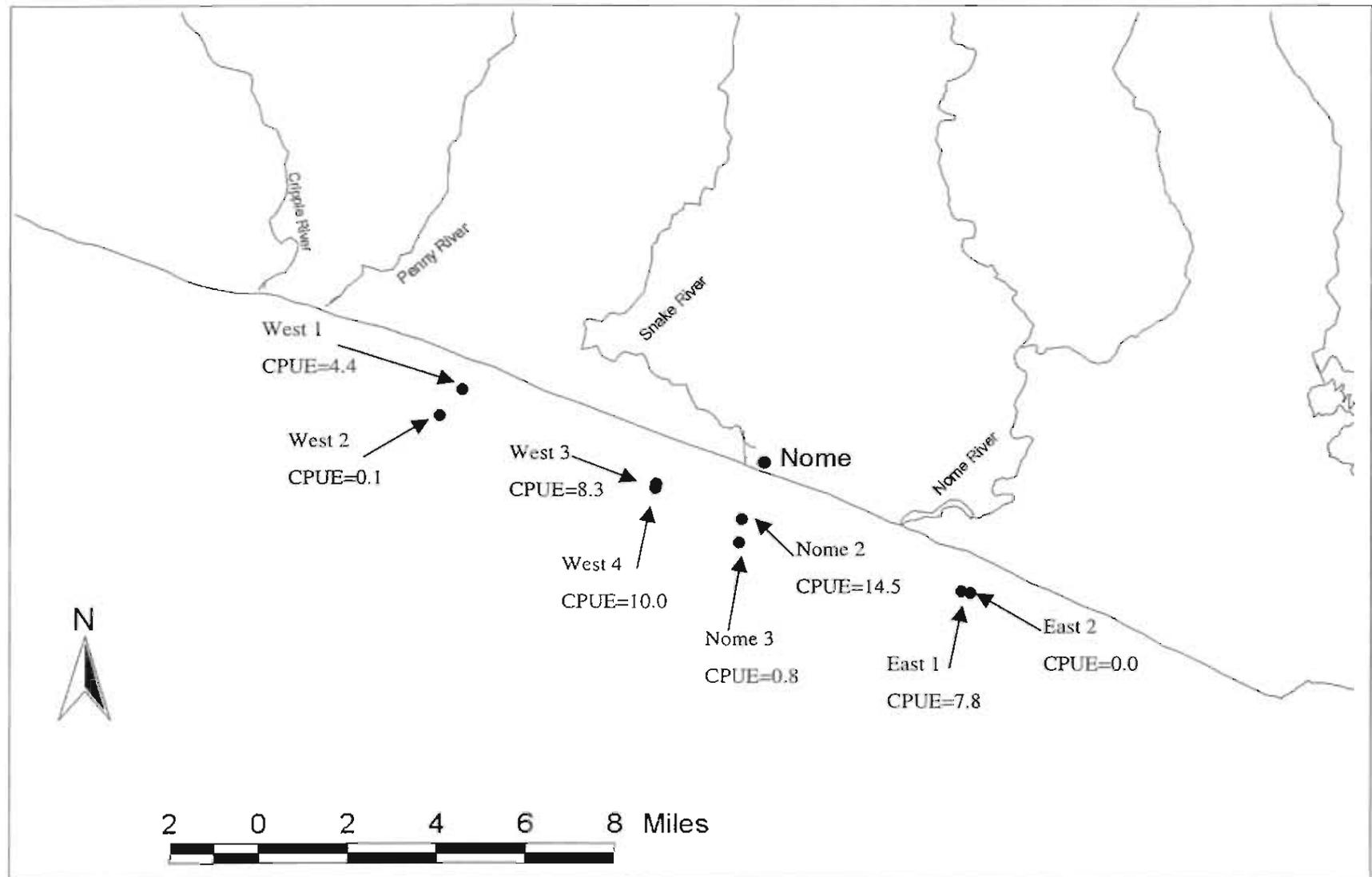
W2=6.78 miles west of Nome

W3=2.8 miles west of Nome

W4=2.8 miles west of Nome.

^c Growth of + or - 5 mm are considered errors in measurement.

Figure 1. Area location map and CPUE for the red king crab winter pot survey, Norton Sound, 2000.



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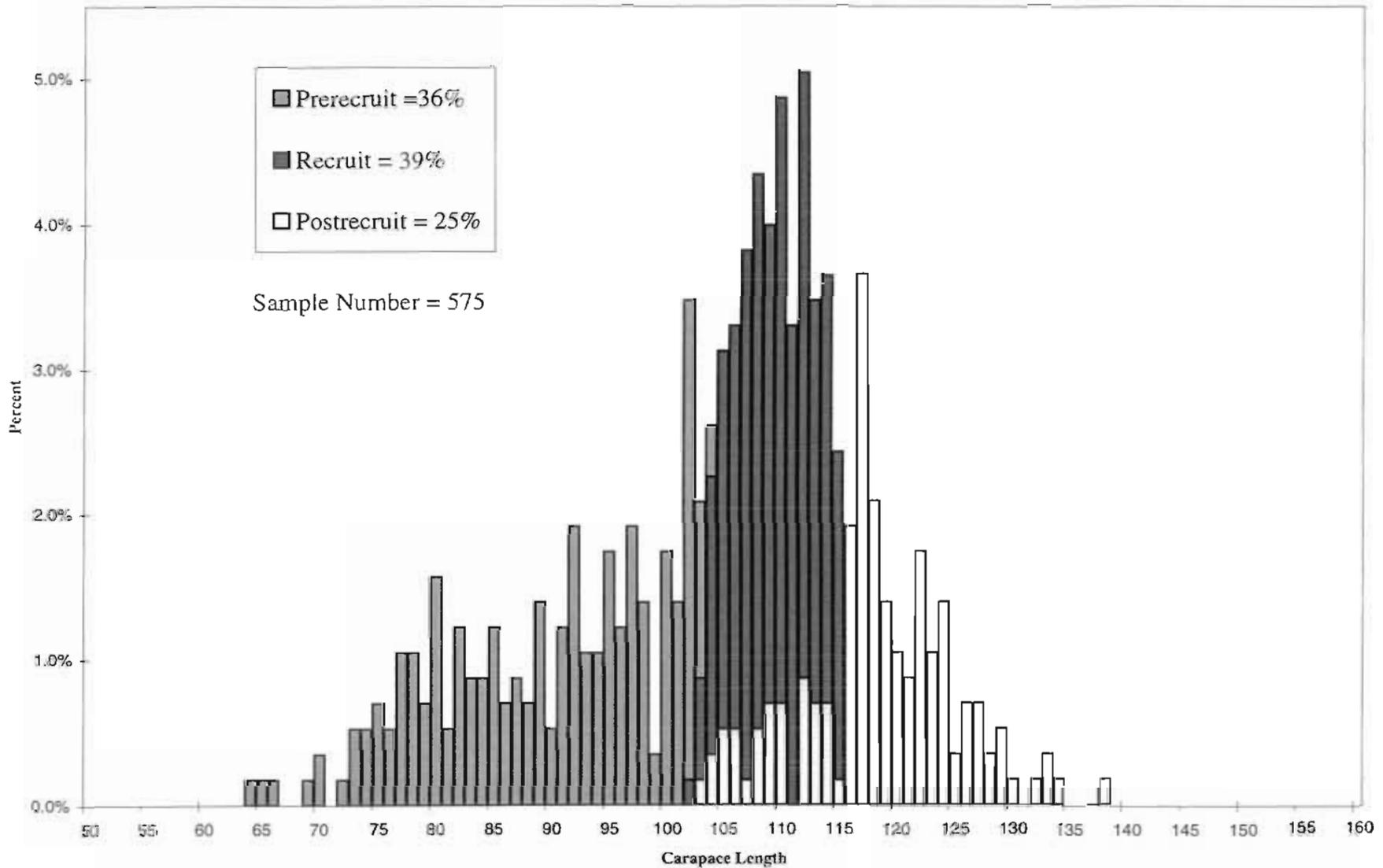


Figure 2. Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 2000.

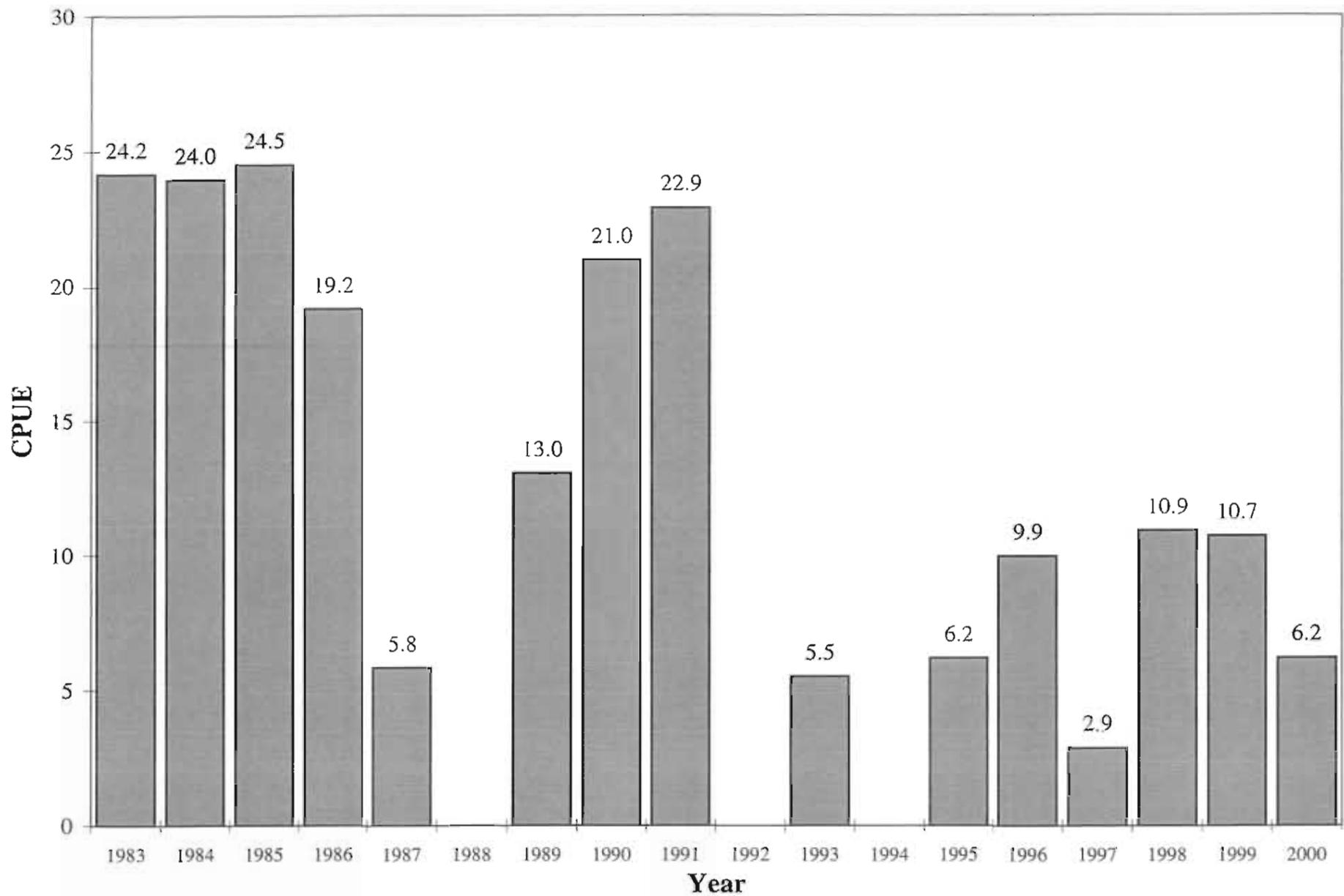
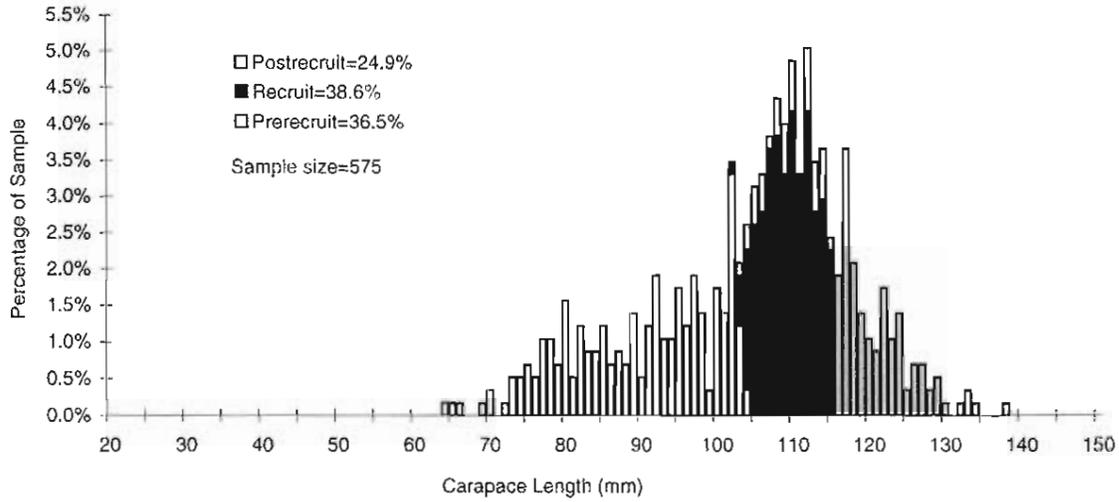


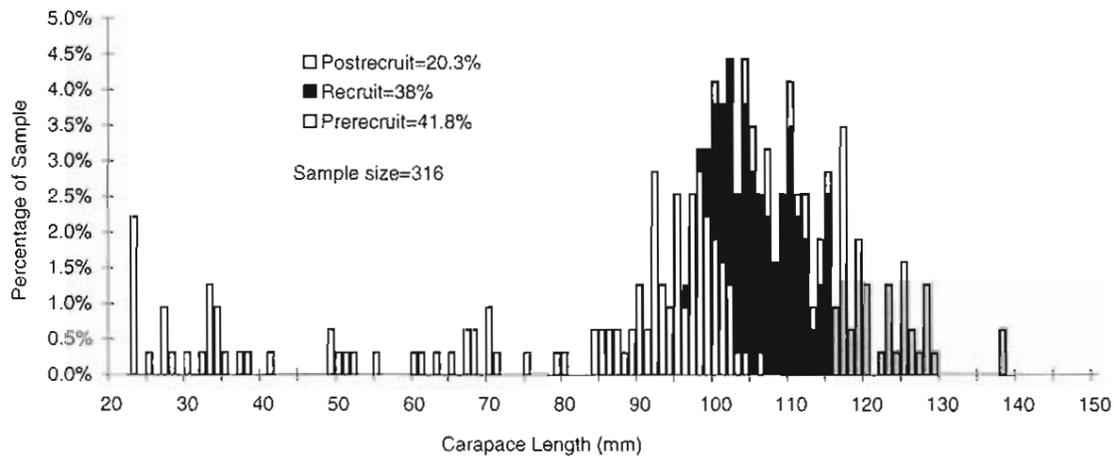
Figure 3. Annual catch per unit effort (CPUE) for male red king crab in the winter pot survey, Norton Sound, 1983 - 2000. There were no winter pot surveys in 1988, 1992 and 1994.

Figure 4. Comparison of the length frequency distribution of all male red king crab captured during the winter and summer pot and trawl surveys, Norton Sound, 1995 - 2000.

Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 2000.



Length frequency distribution of all male red king crab captured during the summer trawl survey, Norton Sound, 1999.



Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 1999.

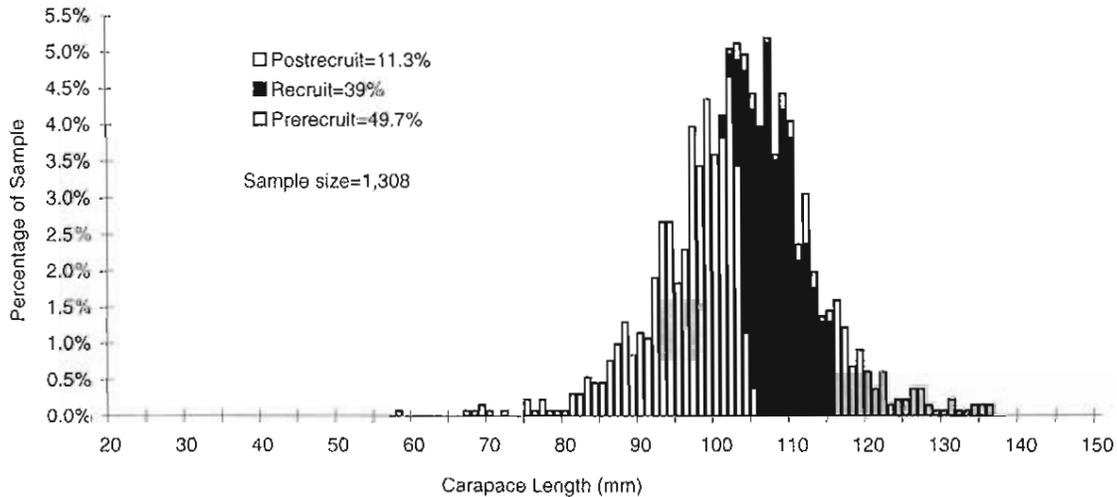
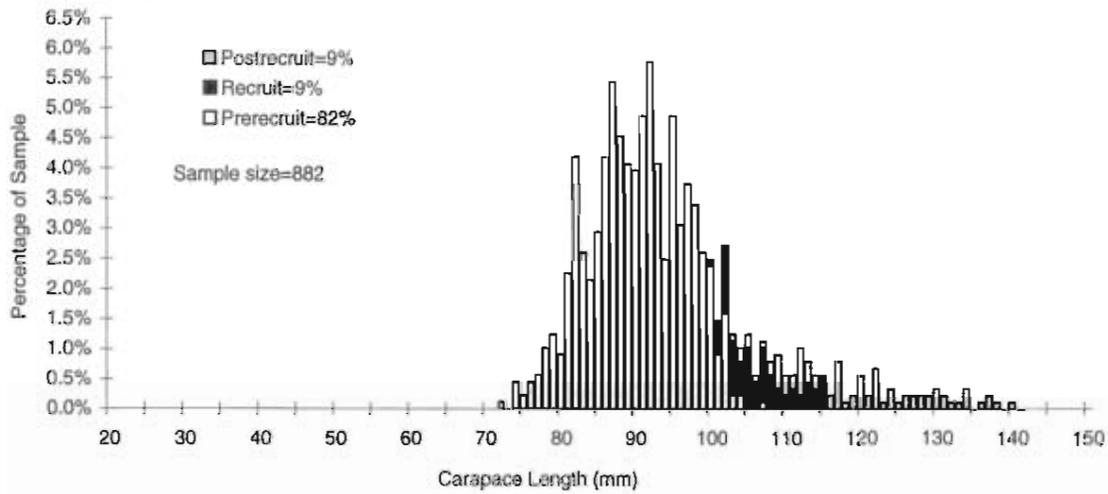
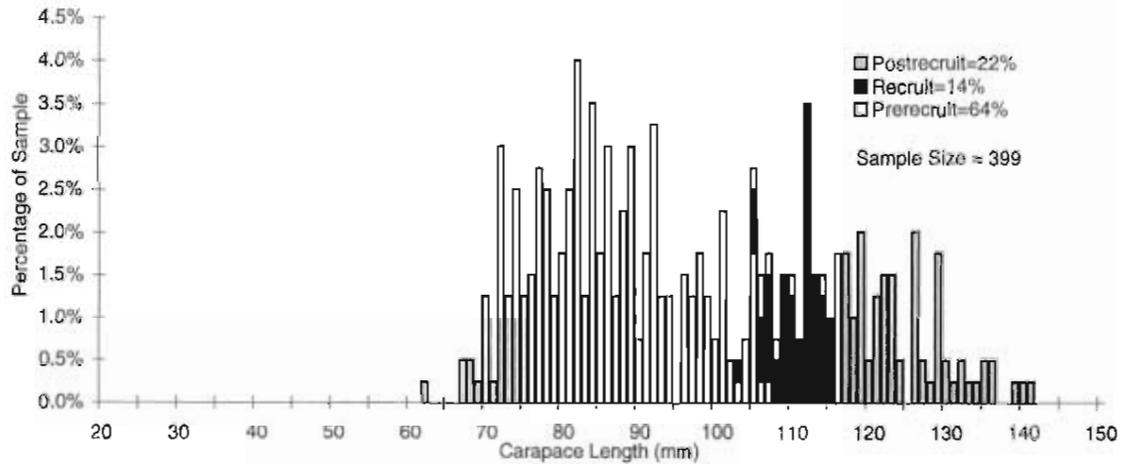


Figure 4. (Page 2 of 3)

Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 1998.



Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 1997.



Length frequency distribution of all male red king crab captured during the summer trawl survey, Norton Sound, 1996.

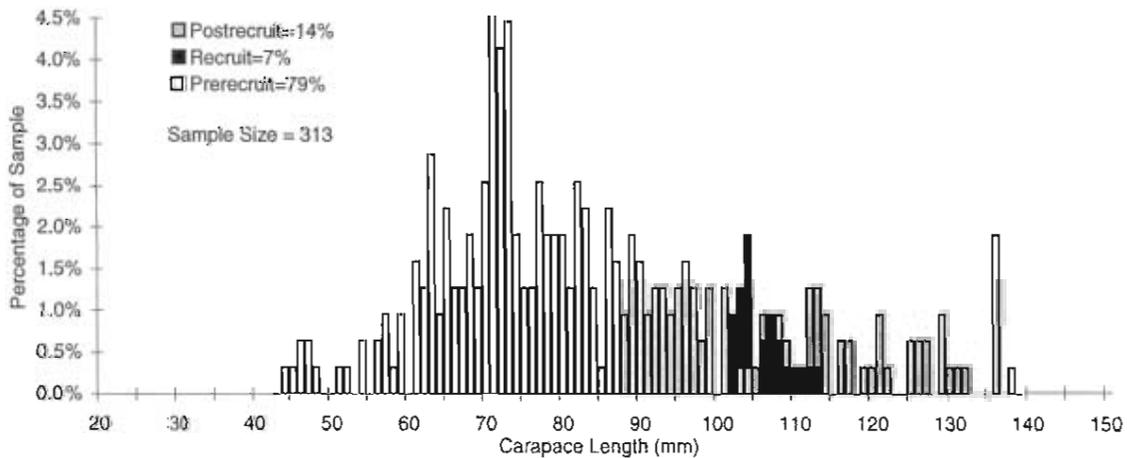
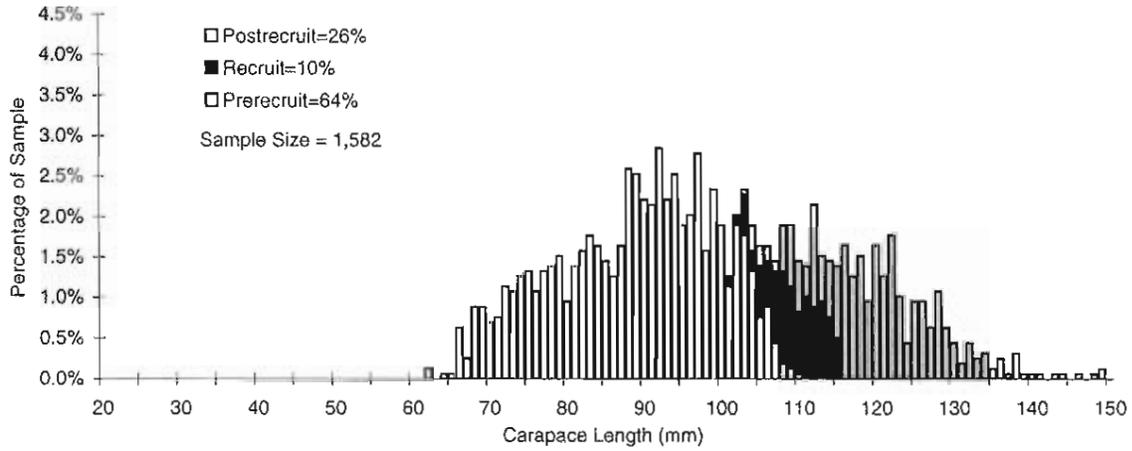
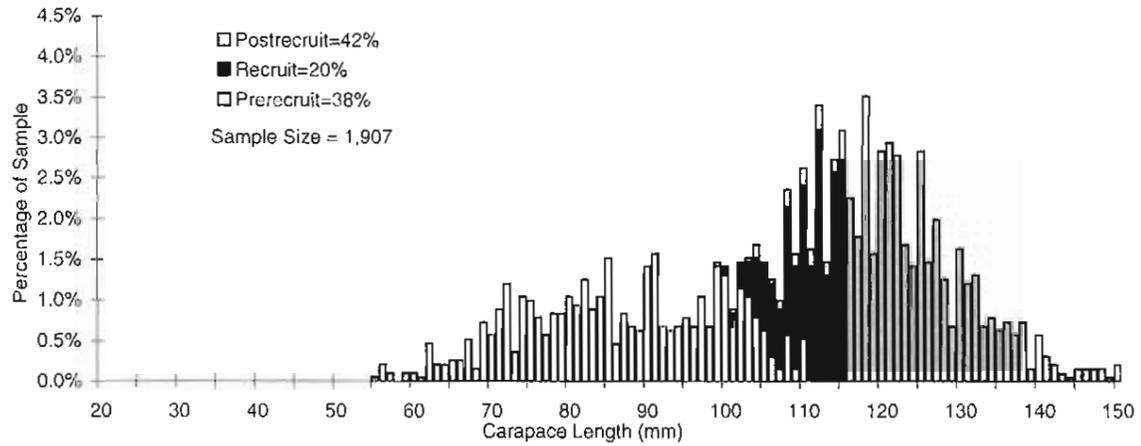


Figure 4. (Page 3 of 3).

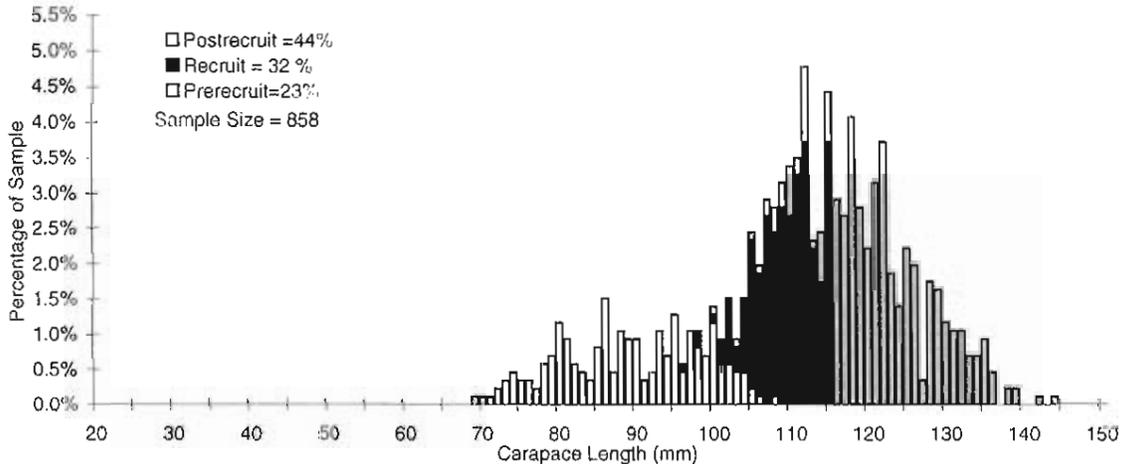
Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 1996.



Length frequency distribution of all male red king crab captured during the summer pot survey, Norton Sound, 1995.



Length frequency distribution of all male red king crab captured during the winter pot survey, Norton Sound, 1995.



Appendix Table A. Record of catches for fishing stations in the 2000 Norton Sound winter red king crab study.
(page 1 of 4)

Station E1

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
22-Feb	6	5	5	2	2
25-Feb	3	1	6	0	2
1-Mar	5	16	22	0	2
3-Mar	2	3	25	0	2
6-Mar	3	0	25	1	3
9-Mar	3	7	32	1	4
13-Mar	4	6	38	3	7
16-Mar	3	3	41	0	7
24-Mar	8	23	64	2	9
30-Mar	6	23	87	3	12
6-Apr	7	6	93	0	12
10-Apr	4	1	94	0	12
Avg. male catch per pot lift =		7.8			

Station E2

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
22-Feb	6	0	0	0	0
25-Feb	3	0	0	0	0
1-Mar	5	0	0	0	0
3-Mar	2	0	0	0	0
6-Mar	3	0	0	0	0
9-Mar	3	0	0	0	0
13-Mar	4	0	0	0	0
16-Mar	3	0	0	0	0
24-Mar	8	0	0	0	0
30-Mar	6	0	0	0	0
6-Apr	7	0	0	0	0
Avg. male catch per pot lift =		0.0			

Appendix Table A. Record of catches for fishing stations in the 2000 Norton Sound winter red king crab study. (page 2 of 4)

Station N2

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
16-Feb	2	2	2	0	0
22-Feb	6	26	28	0	0
25-Feb	3	18	46	0	0
1-Mar	5	25	71	0	0
3-Mar	2	18	89	0	0
6-Mar	3	11	100	0	0
9-Mar	6	21	121	0	0
13-Mar	4	28	149	1	1
17-Mar	4	24	173	1	2
24-Mar	7	5	178	0	2
30-Mar	6	1	179	0	2
6-Apr	7	7	186	0	2
10-Apr	4	2	188	1	3
Avg. male catch per pot lift =		14.5			

Station N3

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
16-Feb	2	0	0	0	0
22-Feb	6	2	2	0	0
25-Feb	3	0	2	0	0
1-Mar	5	0	2	0	0
3-Mar	2	0	2	0	0
6-Mar	3	3	5	0	0
9-Mar	3	0	5	0	0
13-Mar	4	0	5	0	0
17-Mar	4	0	5	0	0
24-Mar	7	5	10	0	0
30-Mar	6	0	10	0	0
6-Apr	7	0	10	0	0
10-Apr	4	0	10	0	0
Avg. male catch per pot lift =		0.8			

Appendix Table A. Record of catches for fishing stations in the 2000 Norton Sound winter red king crab study.
(page 3 of 4)

Station W1

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
28-Feb	4	2	2	0	0
2-Mar	3	0	2	0	0
7-Mar	5	0	2	0	0
10-Mar	3	2	4	0	0
14-Mar	4	6	10	0	0
23-Mar	9	28	38	0	0
29-Mar	6	2	40	0	0
31-Mar	2	1	41	0	0
7-Apr	7	0	41	0	0
10-Apr	3	3	44	0	0
Avg. male catch per pot lift =		4.4			

Station W2

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
28-Feb	4	0	0	0	0
2-Mar	3	0	0	0	0
7-Mar	5	0	0	0	0
10-Mar	3	1	1	0	0
14-Mar	4	0	1	0	0
23-Mar	9	0	1	0	0
29-Mar	6	0	1	0	0
31-Mar	2	0	1	0	0
7-Apr	7	0	1	0	0
Avg. male catch per pot lift =		0.1			

Appendix Table A. Record of catches for fishing stations in the 2000 Norton Sound winter red king crab study.
(page 4 of 4)

Station W3

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
22-Feb	7	0	0	0	0
24-Feb	2	5	5	0	0
28-Feb	4	15	20	1	1
2-Mar	3	0	20	0	1
7-Mar	5	19	39	0	1
10-Mar	3	1	40	0	1
14-Mar	4	11	51	1	2
17-Mar	3	21	72	0	2
23-Mar	6	18	90	1	3
28-Mar	5	7	97	0	3
31-Mar	3	8	105	1	4
6-Apr	6	1	106	0	4
10-Apr	4	1	107	0	4
Avg. male catch per pot lift =		8.2			

Station W4

Date	Soak Time (days)	Daily No. of males captured	Cumulative No. of males captured	Daily No. of females captured	Cumulative No. of females captured
22-Feb	7	14	14	0	0
24-Feb	2	0	14	0	0
28-Feb	4	8	22	0	0
2-Mar	3	11	33	0	0
7-Mar	5	15	48	0	0
10-Mar	3	15	63	1	1
14-Mar	4	14	77	1	2
17-Mar	3	6	83	0	2
23-Mar	6	18	101	0	2
28-Mar	5	9	110	0	2
31-Mar	3	7	117	0	2
6-Apr	6	12	129	0	2
10-Apr	4	1	130	1	3
Avg. male catch per pot lift =		10.0			