

**NORTON SOUND DISTRICT
SHELLFISH REPORT
2001**

to the
Alaska Board of Fisheries

By

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ABSTRACT

The legal male abundance of red king crab for the 2001 Norton Sound summer commercial crab fishery was estimated at 3.8 million pounds. A guideline harvest level (GHL) of 303,000 pounds of crab was set for the 2001 summer season. The Norton Sound CDQ crab allocation is 7.5% of the GHL. Therefore, 22,725 pounds of crab were reserved for the CDQ fishery and 280,000 pounds was the target goal for the open access fishery. The 2001 summer open access, king crab fishery opened by regulation 12 noon, July 1 and closed by Emergency Order 12 noon, September 1, 2001. The total commercial catch was 11,928 crab or 288,199 pounds. Thirty vessels and 37 permit holders took part in the 2001 fishery. Two buyers operated in Norton Sound during the season. Local boats accounted for 66 percent of the total crab harvest. Overall CPUE was 7.6 crab per pot. The average price for crab was \$2.34 per pound and the fishery value was estimated at \$674,385. Recruit crab made up 33 percent of the legal crab sampled, an almost 10 percent decrease in recruitment since 1999. The CDQ portion of the fishery was open September 2 and closed September 9, 2001, but there was no crab harvest. The 2001 Norton Sound crab fishery had the highest number of participating vessels and permit holders since 1996. A shift in the fishery effort and harvest eastward and closer to shore since 1993 is caused in part by the change in character of the fishery to that of a small vessel fishery.

INTRODUCTION

Norton Sound

The Norton Sound Section (Q3) consists of all waters in Statistical Area Q north of the latitude of Cape Romanzof, east of 168° west longitude, and south of the latitude of Cape Prince of Wales (Figures 1 and 2). A large vessel summer commercial crab fishery existed in the Norton Sound Section from 1977 through 1992. No summer commercial fishery occurred in 1991 due to a cut in staff the previous winter needed to manage the fishery. In 1992 the summer commercial fishery resumed. Figure 6 shows the historic summer commercial harvest by year for the Norton Sound crab fishery. Regulation changes adopted during the March 1993 Board of Fisheries meeting changed participation in the fishery to that of small boats. A superexclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated that a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later a vessel moratorium put into place before the 1996 season had the intention of creating a license limitation program. The Community Development Quota (CDQ) groups were allocation a portion of the summer harvest beginning in 1998. Although the CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states that a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under the LLP by the National Marine Fisheries Service.

During the March 1999 meeting of the Board of Fisheries, a new management strategy was enacted for the Norton Sound summer red king crab fishery (5AAC 34.915). A threshold level of abundance of legal male red king crab biomass was set at 1.5 million pounds. The summer commercial season may only open if the population of legal crab exceeds 1.5 million pounds. If the legal biomass falls to a range of 1.5 to 2.5 million pounds the harvest rate will not exceed five percent, so that the stock may rebuild. If the legal biomass is 2.5 million pounds or more, the harvest rate will be no more than ten percent. Improved abundance estimates and the current management strategy will greatly reduce the risks of over fishing the stock.

Estimates of the legal red king crab biomass in Norton Sound, based on eight trawl surveys conducted between 1976 and 1999, have been standardized; accounting for design and coverage (Table 1). The Norton Sound legal red king crab biomass in 1976 was estimated to be roughly 1.7 million crab. By 1982, the legal biomass had fallen to 0.8 million crab because of a lack of recruitment and high harvest rates in the summer commercial fishery. The population then gradually recovered to an estimated 1.2 million legal crab in 1991. The trawl survey conducted during August of 1996 indicated a reduced stock size and estimated the legal biomass at 0.5 million crab. The surveys taken as a whole indicate there have been periods of weak and strong recruitment.

In 1999, the legal red king crab population of 1.5 million crab was estimated by a trawl survey to be near the historical high biomass (Table 1). The population level had nearly

tripled since 1996. An all-time high prerecruit-1 male abundance (sublegal male crab with carapace length 90-104 mm) was also detected. This estimate indicated that the legal component would continue to expand at least for the 2000 fishery. Conversely, the exceptionally weak 1999 prerecruit-2 (sublegal male crab with carapace length 76-89 mm) abundance estimate suggested at least one year of weaker recruitment beginning during the 2001 summer fishery. The combination of the trawl survey conducted during the summer of 1999 and the winter king crab study of 2000 resulted in an estimate of 4.2 million pounds of legal crab for the 2000 summer fishery. These high numbers were the result of strong recruitment over the previous three years. The estimated legal male crab abundance for the 2001 summer commercial crab fishery was estimated at 3.8 million pounds. An eight percent exploitation rate equated to a guideline harvest level (GHL) of 303,000 pounds of crab. This satisfied the harvest strategy set by the Board of Fisheries and also took into consideration the lower recruitment rate anticipated for the 2001 season. The Norton Sound CDQ crab allocation is 7.5% of the GHL. Therefore, 22,725 pounds of crab would be reserved for the CDQ fishery and 280,000 pounds would be the target goal for the open access fishery. The legal male biomass is now within the range staff believes will produce the highest sustainable yields. Current size composition data indicates, that the portion of crab population classified as large old shell males is somewhat depressed, but is expected to increase in number somewhat in the next few years. Large old-shell males are responsible for most reproduction within the male population. It will be important to maintain this segment of the population to provide for continued recruitment.

St. Lawrence Island

The St. Lawrence Island Section (Q4) lies immediately west and north of the Norton Sound Section (Figure 1). Commercial catches in the St. Lawrence Island Section have only been reported for four years. In 1983, 52,557 pounds of blue king crab delivered from 13 landings. The commercial crab fleet concentrated their efforts near the southeast shore of St. Lawrence Island. In 1984 a regulation was adopted to close the waters within ten miles of all inhabited islands within the St. Lawrence Island Section (St. Lawrence Island, Little Diomedes and King Island). This regulation was put into place in an attempt to protect stocks targeted by local fishers and reduce impacts on marine mammal subsistence harvests. In 1989, 3,603 pounds of red king crab and 984 pounds of blue king crab were delivered from 8 landings. In 1992, 53 pounds of blue king crab were landed. In 1995 7,913 pounds of blue king crab were delivered from three landings.

The villagers of Little Diomedes and St. Lawrence Island have also traded with and sold winter caught blue king crab to residents of Nome and other villages for years. The Department does not have an accurate estimate of the magnitude of this trade. The remoteness of the villages contributes to the lack of catch records. Current regulations allow a commercial harvest and sale of king crab near shore during the winter. However, local residents have decided not to export any of their winter catch for commercial sale.

HARVEST SUMMARY

Summer Open Access Fishery

In the summer of 2001 the open access commercial crab fishery began by regulation on 12 noon, July 1 in the Norton Sound Section. Two companies registered to buy crab. One of these buyers operated a floating processor and purchased crab from local Norton Sound fishers. An independent observer was placed onboard this floating processor. Nonlocal fishers delivered to the second buyer located in Nome who flew live crab to markets in Dutch Harbor and Anchorage. Fishers also sold their catch dockside as catcher/sellers. The open access portion of the fishery was closed by emergency order 12 noon, September 1, 2001 when the inseason estimate approached 280,000 pounds. The closure was done to enable the Norton Sound CDQ allocation to be harvested.

The total harvest from fish ticket reports was 98,321 red king crab or 288,199 pounds (Table 2). Of this total, 6,384 pounds were reported as deadloss and 3,645 pounds were reported as personal use. A total of 30 vessels made deliveries and 37 permit holders fished. Twenty of the vessels were considered local, ten were non-local. A total of 320 landings were made. Local boats accounted for 66 percent of the total crab harvest. The average weight for commercially caught crab was 2.9 pounds. A total of 1,200 pots were registered and there were 11,928 pot pulls throughout the fishery. The average price paid was \$2.34 per pound. The exvessel value of the fishery is estimated at \$674,385.

Fish ticket reports document that nine statistical areas were fished (Table 2). Statistical areas 636401 and 626401 had the highest catch with 91,343 and 61,620 pounds of crab respectively. The other large catches came from statistical areas 656401 (55,158 pounds), 666401 (43,771 pounds) and 656330 (20,869 pounds). The catch from statistical areas south of Golovin Bay (626401, 636330, and 636401) made up 54 percent of the harvest. All other statistical areas comprised 46 percent of the harvest. Overall, catch per unit effort (CPUE) was 7.6 crab per pot.

The first delivery was made on July 3. The final delivery was made September 13, 2001. Although the open access fishery ended 12 noon, September 1, some fishers had been holding storage pots off shore and had to wait for weather and available airplanes to make deliveries. The commercial crab fleet concentrated in two areas of operations throughout most of the open access fishery. Part of the fleet delivered to the floating processor anchored in Golovin Bay. The other portion of the fleet based their operations out of the Port of Nome and fishers sold crab locally or to the processor operating there. The floating processor ceased operations in Norton Sound on August 17. When it left the grounds, local fishers had to find their own markets and coordinate transportation of live crab to Nome. Many fishers relocated their efforts toward Nome, or pulled their gear and stopped commercial fishing. This slow down was seen in the lower harvest numbers after August 17. Fishers reported double shell and molting crab in the harvest beginning the third week of August.

CDQ Fishery

By regulation, the CDQ fishery is allocated 7.5% of the combined summer season harvest, which translated to 23,260 pounds for 2001. The Norton Sound and Lower Yukon CDQ groups divided this allocation. The CDQ fishery was opened by emergency order at 12 noon, September 2, 2001 and closed 12 noon, September 9, 2001. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission (CFEC) and register their vessel with ADF&G before they make their first delivery. Fishers operate under the authority of the CDQ group. The individual CDQ groups decide how the CDQ crab quota will be harvested.

Because this fishery occurred in September, the department had concerns that molting would make the crab unmarketable and increase mortality rates of crab returned to the water. The crab molt had begun during the last 2 weeks of August. The incidence of molting crab would only continue to increase during the month of September. The timing of the CDQ fishery optimized the harvest of quality crab while they still had good shell condition. Fishers that participated in the open access fishery and who intended to take part in the CDQ fishery were allowed to leave their pots in the water with doors open and bait containers removed until the CDQ fishery began.

No harvest was reported from the CDQ fishery. Fishers had deployed pots, or had left gear in the water from the open access fishery. Most fishers had not received their CDQ permits by the opening of the CDQ fishery. This delayed fishers from making deliveries when weather was good. A request to extend the fishery was made by one of the CDQ groups on September 4. The department decided not to extend the fishery because of the biological concern of molting crab. Weather was good to fair until September 7, but no deliveries were made. Requests were made to extend the fishery because of poor weather and ocean conditions on September 8. The department chose to remain with the closing date of September 9 because of the continuing biological concern for molting crab.

Harvest Sampling

Carapace length measurements and shell age were collected from 20,030 crab during the open access portion of the fishery. Carapace age was classified as new (2-12 months old) or old (over 13 months old) (Figure 2). Recruit crab are new shell legal crab with carapace length < 116 mm. Postrecruit crab are legal new shell male crab with carapace length \geq 116 mm and all legal old shell males. Recruit crab made up 33 percent of the legal crab sampled and postrecruit crab made up 67 percent (Figure 3). Male crab with new shell carapaces made up 90 percent of the total legal crab sampled, and old shell crab made up 11 percent. Overall mean carapace length of legal male crab was 119.3 mm (Table 3).

Winter Commercial Fishery

A winter commercial fishery in the Norton Sound Section occurs from November 15 through May 15 and typically takes place near Nome. Vessels are prohibited and the winter commercial fishery takes place from the ice. Stability of the sea ice greatly affects the success of the winter fishery. Figure 7 and Table 4 illustrates the winter commercial and subsistence harvest of crab from 1978 to 2001. During the winter of 2000-2001, three commercial fishers reported selling a total of 1,098 red king crab (Table 4). Sea ice conditions were poor for the majority of the season. The first delivery was made January 20, 2001 and the last delivery was made May 12, 2001.

The harvest is divided between local residents who buy crab directly from the fishers and other non-local markets such as Anchorage. Crab are sold in Nome for an average of ten dollars per crab, roughly \$3.69 per pound. The 2001 winter catch of 1,098 pounds was estimated to be worth about \$10,581. Most fishers consider commercial crabbing a sideline and hold other jobs. Usually, two or three of the winter crab fishers sell the majority of the crab. Because the volume of crab involved is low, no processor has found it profitable to operate locally.

Winter Subsistence Fishery

Norton Sound residents utilize red king crab mainly during the winter. Fishing occurs through cracks or holes cut in the ice with the use of handlines and pots. In order to document trends in the subsistence harvest, the Board of Fisheries enacted a regulation in 1977 requiring subsistence fishers in Norton Sound to obtain a permit prior to fishing. Fishers record their daily effort and catch on these permits. During the 2001 season, fifty permits were issued in the Nome area, but only 12 permit holders fished (Table 4). A total of 250 crab were recorded kept for subsistence use in the Nome area. Unstable sea ice in the Nome area was the reason for poor harvests and why so few subsistence fishers took part in the fishery.

The first year subsistence permits were required had the highest number of permits issued and a relatively high harvest rate. The fishery declined sharply the following year and remained at very low levels throughout the 1981-82 season. The lack of success in the winter crab fishery during some past years has been attributed to a declining crab population caused by the removal of crab in the summer commercial fishery together with low recruitment, low effort due to poor ice conditions, and changes in the nearshore winter distribution of crab. All these factors probably had some effect on the success of the winter fishery in varying degrees. During the 1978-79 winter fishery, the king crab population was still relatively high. Despite this relatively large population, winter catches were the poorest on record indicating that the major factors limiting winter catches were probably poor ice conditions and the distribution of crab. During the winter of 1981-82, poor winter catches could more reasonably be attributed to a declining crab population since the crab population was at a much lower level. Subsistence fishing success during the winters of 1982-83 through 1986-87 had improved due to a rebuilding of the population and increased use of

more efficient gear (pots instead of handlines). Unstable ice conditions and record snowfalls adversely affected the 1987-88, 1988-89, 1992-93 and 2000-2001 catches. During years of stable ice conditions, approximately 100 fishers have averaged 100 crab each.

DISCUSSION

The 2001 Norton Sound summer crab fishery had the highest number of participating vessels and permit holders since 1996 (Table 5). The GHL set above 300,000 pounds of crab, also caused an increase in participation in the 2000 fishery. From 1997 through 1999, the GHL for the summer commercial crab fisheries was set at 80,000 pounds (Table 5, Figure 6). This level was set after the 1996 trawl survey showed a reduced stock size. Participation dropped significantly during these three years because fishing became economically impracticable for fishers and buyers.

There has been a shift in the fishery effort and harvest eastward and closer to shore since 1993 (Figure 5, Table 6). This is caused in part by the change in participation to that of small vessels. Before 1993, most vessels participating in the Norton Sound summer king crab fishery were 100 foot or greater in length and had circulating holding tanks. These vessels could deploy hundreds of pots and the fishery usually lasted a few days. These larger vessels with tanks also had to stay away from fresh water influences that would kill crab in holding tanks. Since 1993, most of the vessels participating in the summer crab season are 32-foot modified herring and salmon skiffs without circulating tanks. These boats are ill equipped to handle heavy seas, and fish closer to shore in case of bad weather. Near shore fishing has focused the commercial crab fleet toward statistical areas offshore of Golovin Bay. Crab are abundant at the beginning of the season, the closed water boundary line is close to land and boats have a short distance to run if weather deteriorates.

Average CPUE was down from 17.7 crab per pot in 2000 to 7.6 crab per pot in 2001. More vessels took part in the fishery during the 2001 season, and there were several fishers with little or no commercial crab fishing experience. Fishers in the Golovin area were also setting gear in close proximity to each other. At one point in the fishery, 18 vessels were fishing in the same area offshore of Golovin. Fishers stated throughout the season that they were not able to locate large quantities of crab as easily as they had during the 2000 season. The floating processor remained anchored in Golovin Bay for most of the fishery, requiring some vessels to run longer distances to check pots and deliver. Therefore, fishers were reluctant to move gear and locate the movements of the crab migration.

The Norton Sound summer commercial crab harvest has shown an almost 10 percent decrease in recruitment since 1999 (Table 3). This decrease was expected, as the 1999 trawl survey pointed to an all-time high prerecruit-1 male crab population, and indicated an exceptionally weak prerecruit-2 abundance (Table 1). The decrease would also suggest another year of lower recruitment for the 2002 summer fishery.

The average legal mean length of male crab during the 2001 fishery showed a 3 mm increase since the 2000 fishery. An increasing trend in average legal mean length is likely for the 2002 season. The larger populations of recruit crab observed in 1999 and 2000 will molt and become the larger postrecruit crab portion of the population.

The Norton Sound red king crab fishery has had the benefit of an observer onboard the floating processor present in 2000 and 2001 seasons. Previously, the last season Norton Sound had a floating processor on the fishing grounds was 1993. In years when there is no floating processor with observer, a smaller percentage of crab from the commercial harvest is sampled because fishers deliver at all times of the day and night. Norton Sound Economic Development Corporation is building a seafood processing plant in Nome to begin operations in the summer of 2002. Processing crab will be one of the main functions for this plant. It is unclear if a floating processor will be in operation for the 2002 season. The department will have to make a concerted effort to coordinate catch sampling with fishers and buyers to ensure optimal harvest data collection.

The Norton Sound CDQ Fishery has occurred directly after the open access fishery that generally ends in late August or early September. By late August, male red king crab in Norton Sound begin to molt. This has caused a problem with handling mortality and has produced a marketing problem. In 2000, the CDQ fishery harvested 14,870 pounds of crab, only half of the allocation. In 2001 there was no harvest during the one week CDQ fishery. The department did not extend the fishery because of the high probability of mortality associated with handling molting crab. There were also marketing concerns with double shell crab. If the CDQ fishery continues to occur after the open access fishery, these problems will adversely affect the CDQ harvest. One solution would be to open the CDQ fishery in late June, prior to the July 1 open access fishery. CDQ fishers could harvest their allocation without the risk of fishing on molting crab. If the allocation were not filled by July 1, CDQ fishers would be allowed to harvest the remainder after the open access fishery closed.

2002 BOARD OF FISHERIES PROPOSALS

There are two proposals the Board of Fisheries will consider in March 2002 effecting Norton Sound crab. Proposal 409 would allow commercial fishing at an earlier date and allow commercial fishing closer to the eastern shore of Norton Sound. It would also allocate different percentages of the GHL to different statistical areas open to commercial fishing. Proposal 410 would increase the waters closed to the summer king crab commercial fishery in the Golovin Bay area for the expressed desire to protect winter subsistence harvests.

FUTURE INVESTIGATIONS

A winter pot survey is planned during February, March and April of 2002. The results of the winter project will be used in a model to project the summer 2002 legal biomass and appropriate GHL. The triennial Norton Sound Trawl Survey will take place in August of 2002. Results from the trawl survey will not be available until January 2003 and will be used to set the GHL in 2003.

Table 1. The results of the population assessment surveys conducted for red king crab in Norton Sound since 1976.

Year	Date	Research Agency	Gear	Population Abundance Estimates			Legal Male Biomass (millions of pounds)
				Pre-2 males ^b	Pre-1 Males ^b	Legal Males ^a	
1976	9/2-9/5, 9/16-10/7	NMFS	Trawl	331,555	808,091	1,742,755	5,228,265
1979 ^e	7/26-8/5	NMFS	Trawl			809,799	2,429,397
1980 ^d	7/4-7/14	ADF&G	Pots			1,900,000	5,700,000
1981	6/28 - 7/14	ADF&G	Pots			1,285,195	3,855,585
1982	7/6 - 7/20	ADF&G	Pots			353,273	1,059,819
1982	9/5 - 9/11	NMFS	Trawl	356,724	832,581	877,722	2,633,166
1985	7/1 - 7/14	ADF&G	Pots			907,579	2,722,737
1985	9/16 - 10/1	NMFS	Trawl	466,858	707,140	1,051,857	3,155,571
1988	8/16 - 8/30	NMFS	Trawl	565,255	493,030	978,748	2,936,244
1991	8/22 - 8/30	NMFS	Trawl	294,801	303,682	1,287,486	3,862,458
1996	9/7 - 9/18	ADF&G	Trawl	452,580	325,699	536,235	1,608,705
1999	7/28 - 8/7	ADF&G	Trawl	103,832	940,198	1,594,341	4,783,023

^a Legal male red king crab were defined as at least 105 mm in carapace length for the 1996 ADF&G trawl survey and all NMFS trawl surveys except the 1979 survey which defined legal males as at least 100 mm in carapace length. ADF&G pot surveys defined legal males as at least 121 mm in carapace width.

^b Pre-2 males were defined as 76-89 mm in carapace length and pre-1 males were defined as 90-104 mm in carapace length.

^c Population estimates are valid for the date of the survey (i.e., either before or after the summer commercial fishery).

^d The 1980 pot survey estimate has been revised from the original estimate of 13.4 million pounds which was thought inaccurate due to an under-reporting of recovered tagged crab.

^e Pre-2 male and pre-1 male data is unavailable for the 1979 NMFS trawl survey.

Table 2. Red king crab summer commercial harvest (from fish ticket reports) by statistical area for Norton Sound Section, Eastern Bering Sea, July 1 - September 1, 2001.

Statistical Area	Number	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)	Percent of Pots Pulled in Stat. Area (%)	Percent Harvest in Stat. Area (%)
626401	21,554	61,620	2,767	7.8	2.86	23.2	21.4
636330	804	2,253	113	7.1	2.80	0.9	0.8
636401	31,590	91,343	3,698	8.5	2.89	31.0	31.7
646330	623	1,868	80	7.8	3.00	0.7	0.6
646401	1,485	4,287	244	6.1	2.89	2.0	1.5
656330	7,297	20,869	731	10.0	2.86	6.1	7.2
656401	17,870	55,158	2,100	8.5	3.09	17.6	19.1
666330	2,443	7,030	312	7.8	2.88	2.6	2.4
666401	14,655	43,771	1,883	7.8	2.99	15.8	15.2
Total	98,321	288,199 ^a	11,928	8.2	2.9		

^a Includes 6,384 pounds of deadloss and 3,645 pounds for personal use.

Table 3. A comparison of the proportion of recruit and postrecruit king crab sampled from summer commercial harvest, Norton Sound Section, Eastern Bering Sea, 1983 - 2001.

Year	Recruits (%)	Postrecruits (%)	Oldshell (%)	Average Weight	Legal mean Length (mm)
1977	53	47	b	2.7	113.4
1978	29	71	b	3.0	118.9
1979	33	67	b	3.0	119.8
1980	15	85	b	3.6	125.8
1981	10	90	b	3.7	128.5
1982	27	73	b	3.6	125.4
1983	55	45	b	2.8	115.2
1984	59	41	b	2.8	112.5
1985	45	55	b	2.9	115.8
1986	48	52	b	2.9	115.9
1987	22	78	13	3.2	121.7
1988	25	75	26	3.1	119.0
1989	23	77	29	3.1	119.8
1990	21	79	17	3.1	121.1
1991 ^a					
1992	28	72	29	3.0	119.7
1993	31	69	10	2.9	119.1
1994	14	86	71	3.0	118.8
1995	36	64	21	3.0	118.2
1996	30	70	36	3.0	117.1
1997	49	51	14	2.8	115.7
1998	32	68	39	2.8	116.9
1999	42	58	12	2.7	118.1
2000	41	60	16	2.7	116.0
2001	33	67	11	2.9	119.3

^a Fishery closed in 1991.

^b No information.

Table 4. Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1978 - 2001.

Commercial			Subsistence						
Year ^a	Fishers	# Crab Harvested	Winter ^b	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught ^c	Total Crab Harvested ^d	Average/ permit fished
1978	37	9,625	1977-78	290	206	149	^e	12,506	84
1979	1	221	1978-79	48	43	38	^e	224	6
1980	1	22	1979-80	22	14	9	^e	213	24
1981	0	0	1980-81	51	39	23	^e	360	16
1982	1	17	1981-82	101	76	54	^e	1,288	24
1983	5	549	1982-83	172	106	85	^e	10,432	123
1984	8	856	1983-84	222	183	143	15,923	11,220	78
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59
1988	10	425	1987-88	71	58	40	3,573	2,724	68
1989	5	403	1988-89	139	115	94	7,945	6,126	65
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58
1995	42	7,538	1994-95	167	71	57	5,918	4,059	71
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48
1997	2	83	1996-97	38	22	13	1,617	745	57
1998	5	984	1997-98	94	73	64	20,327	8,622	135
1999	5	2,714	1998-99	95	80	71	10,651	7,533	106
2000	10	3,045	1999-2000	98	64	52	9,816	5,723	107
2001	3	1,098	2000-2001	50	26	12	366	256	21
Avg 1978-2000	10	2,395	Avg 1984-2000	121	93	72		5,701	70

^a Prior to 1985 the winter commercial fishery occurred from January 1 - April 30; As of March 1985, fishing may occur from November 15 - May 15.

^b The winter subsistence fishery occurs during months of two calendar years (as early as December, through May).

^c The Number of crab actually caught; some may have been returned.

^d The number of crab harvested is the number of crab caught and kept.

Table 5. Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977 - 2001.

Year	Guideline	Legal Male		Commercial		Number of			Number of Pots		Exvessel Price/lb	Fishery Value (millions \$)	Season Length	
	Harvest	Pop. Est.		Harvest (lbs) ^{a,b}		Vessels	Permits	Landings	Registered	Pulls			Days	Dates
	Level (lbs) ^b	No. crab (millions)	lbs ^b	Open Access	CDQ									
1977	^d	1.7	5.1	0.52		7	7	13	^d	5,457	0.75	0.229	60	^d
1978	3.00			2.09		8	8	54	^d	10,817	0.95	1.897	60	6/7-8/15
1979	3.00	0.8	2.4	2.93		34	34	76	^d	34,773	0.75	1.878	16	7/15-7/31
1980	1.00	1.9	5.7	1.19		9	9	50	^d	11,199	0.75	0.890	16	7/15-7/31
1981	2.50	1.2	3.6	1.38		36	36	108	^d	33,745	0.85	1.172	38	7/15-8/22
1982	0.50	0.9	2.7	0.23		11	11	33	^d	11,230	2.00	0.405	23	8/9-9/1
1983	0.30			0.37		23	23	26	3,583	11,195	1.50	0.537	3.8	8/1-8/5
1984	0.40			0.39		8	8	21	1,245	9,706	1.02	0.395	13.6	8/1-8/15
1985	0.45	1.1	3.3	0.43		6	6	72	1,116	13,209	1.00	0.427	21.7	8/1-8/23
1986	0.42			0.48		3	3	^d	578	4,284	1.25	0.600	13	8/1-8/25 ^e
1987	0.40			0.33		9	9	^d	1,430	10,258	1.50	0.491	11	8/1-8/12
1988	0.20	1.0	3.0	0.24		2	2	^d	360	2,350	^d	^d	9.9	8/1-8/11
1989	0.20			0.25		10	10	^d	2,555	5,149	3.00	0.739	3	8/1-8/4
1990	0.20			0.19		4	4	^d	1,388	3,172	^d	^d	4	8/1-8/5
1991 ^c	0.34	1.3	3.9											
1992	0.34			0.07		27	27	^d	2,635	5,746	1.75	0.130	2	8/1-8/3
1993	0.34			0.33		14	20	208	560	7,063	1.28	0.430	52	7/1-8/28 ^f
1994	0.34			0.32		34	52	407	1,360	11,729	2.02	0.646	31	7/1-7/31
1995	0.34			0.32		48	81	665	1,900	18,782	2.87	0.926	67	7/1-9/5
1996	0.34	0.5	1.5	0.22		41	50	264	1,640	10,453	2.29	0.519	57	7/1-9/3 ^g
1997	0.08			0.09		13	15	100	520	2,982	1.98	0.184	44	7/1-8/13 ^h
1998	0.08			0.03	0.00	8	11	50	360	1,639	1.47	0.041	65	7/1-9/3 ⁱ
1999	0.08	1.6	4.8	0.02	0.00	10	9	53	360	1,630	3.08	0.073	66	7/1-9/4 ^j
2000	0.33	1.4	4.2	0.29	0.01	14	17	202	560	6,345	2.29	0.715	91	7/1- 9/29 ^k
2001	0.30	1.3	3.8	0.28	0.00	30	37	320	1,200	11,928	2.31	0.674	97	7/1 - 9/9 ^l

^a Deadloss included in total.

^b Millions of pounds.

^c No summer commercial fishery.

^d Information not available.

^e Fishing actually began 8/12.

^f Fishing actually began 7/8.

^g Fishing began 7/9 due to fishermen's strike.

^h First delivery was made 7/10.

ⁱ First delivery was made 7/16.

^j The season was extended 24 hours due to bad weather.

^k Open access fishery closed 8/29/00. CDQ fishery ran from 9/1/00 - 9/29/01

^l Open access fishery closed 9/1/01. CDQ fishery ran from 9/1/01 - 9/9/01

Table 6. Historical commercial harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2001 (catch in pounds).

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
616331	7,893											
616401												
626331	40,020					22						
626401	31,572			4,830	399							
626402	38,995											
636330												
636401				12,398	61,823	32,246	5,880	41	891			
636402												
646301												
646330					4,716							
646401			155,972		1,319	17,532						
646402	80,969					748						
656300			161,699		15,174							
656330			323,518	72,735	395,662	3,983	24,246	83,479	7,632		79,006	36,129
656401			138,011	121,147	253,387	60,480	11,422	183,119	246,200		194,408	165,644
656402	306,302	90,187	288,869	918	3,098	2,832			132,363			
666230		55,490			77							
666300		162,795	60,816	84,874	9,167	95		4,534				
666330		353,016	505,050	367,446	141,513	8,990	1,192		389	70,615	2,963	13,020
666401		179,212	486,947	205,400	381,510	79,580	325,045	116,254	5,341	408,848	50,744	21,895
666402	12,036	515,778	534,938	183,581		17,585			32,992			
666431			146,029									
676300		13,238		126,231								
676330		51,304	81,798	6,762	18,734							
676400		667,130	33,856	274	92,026	1,315	247		32			
676430		3,811	12,309		373	3,513			1,171			
676501					36							
686330			1,860									
Totals	517,787	2,091,961	2,931,672	1,186,596	1,379,014	228,921	368,032	387,427	427,011	479,463	327,121	236,688

Table 6. (continued) ^a

Statistical Area	1989	1990	1992	1993	1994	1995	1996 ^b	1997	1998	1999	2000	2001	Totals
616331					48					633	4,557		13,131
616401						35							35
626331							61						40,103
626401						18,971	45,045	18,066	8,065	508	4,689	61,620	193,765
626402													38,995
636330							4,560	3,838	2,449			2,253	13,100
636401	22,030		1,159	1,373	8,087	24,329	70,677	59,206	10,771	14,201	126,994	91,343	543,449
636402					1,754	3,466							5,220
646301						4,628	13,888						18,516
646330	5,212					1,493	2,894	314		3,021		1,868	19,518
646401				1,963	37,222	105,045	22,834	1,052	3,194	221		4,287	350,641
646402				730	143,511	66,821							292,779
656300													176,873
656330	1,757		4,814	265		19,745	15,446	4,661	4,078	1,300		20,869	1,099,325
656401	100,956	171	53,119	105,341	29,566	32,289	9,985	4,035	1,127	2,739	94,813	55,158	1,863,117
656402				193,079	106,053	44,000							1,167,701
666230													55,567
666300							25,519						347,800
666330	1,275	27,185	4,305	31,758		730					5,839	7,030	1,542,316
666401	115,257	162,263	10,632	746	396		3,001	1,816		930	60,762	43,771	2,660,350
666402				535	1,221								1,298,666
666431							1,124						147,153
676300							546						140,015
676330													158,598
676400		3,212					9,775						807,867
676430													21,177
676501													36
686330													1,860
Totals	246,487	192,831	74,029	335,790	327,858	322,676	224,231	92,988	29,684	23,553	297,654	288,199	13,017,673

^a No commercial fishery occurred in 1991.^b Does not include approximately 2,490 lbs not reported on fish tickets.

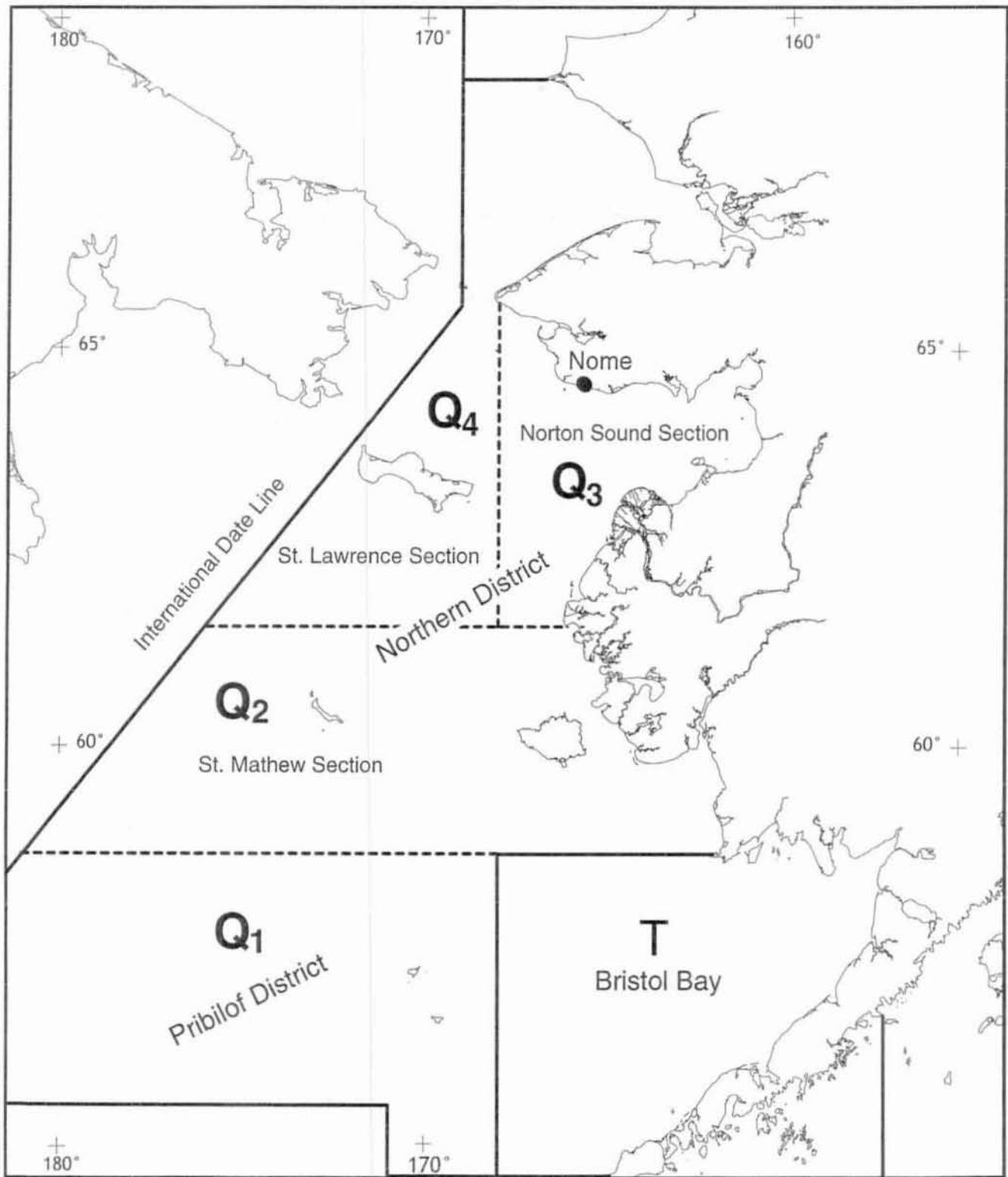


Figure 1. King crab fishing districts and sections of Statistical Areas Q.

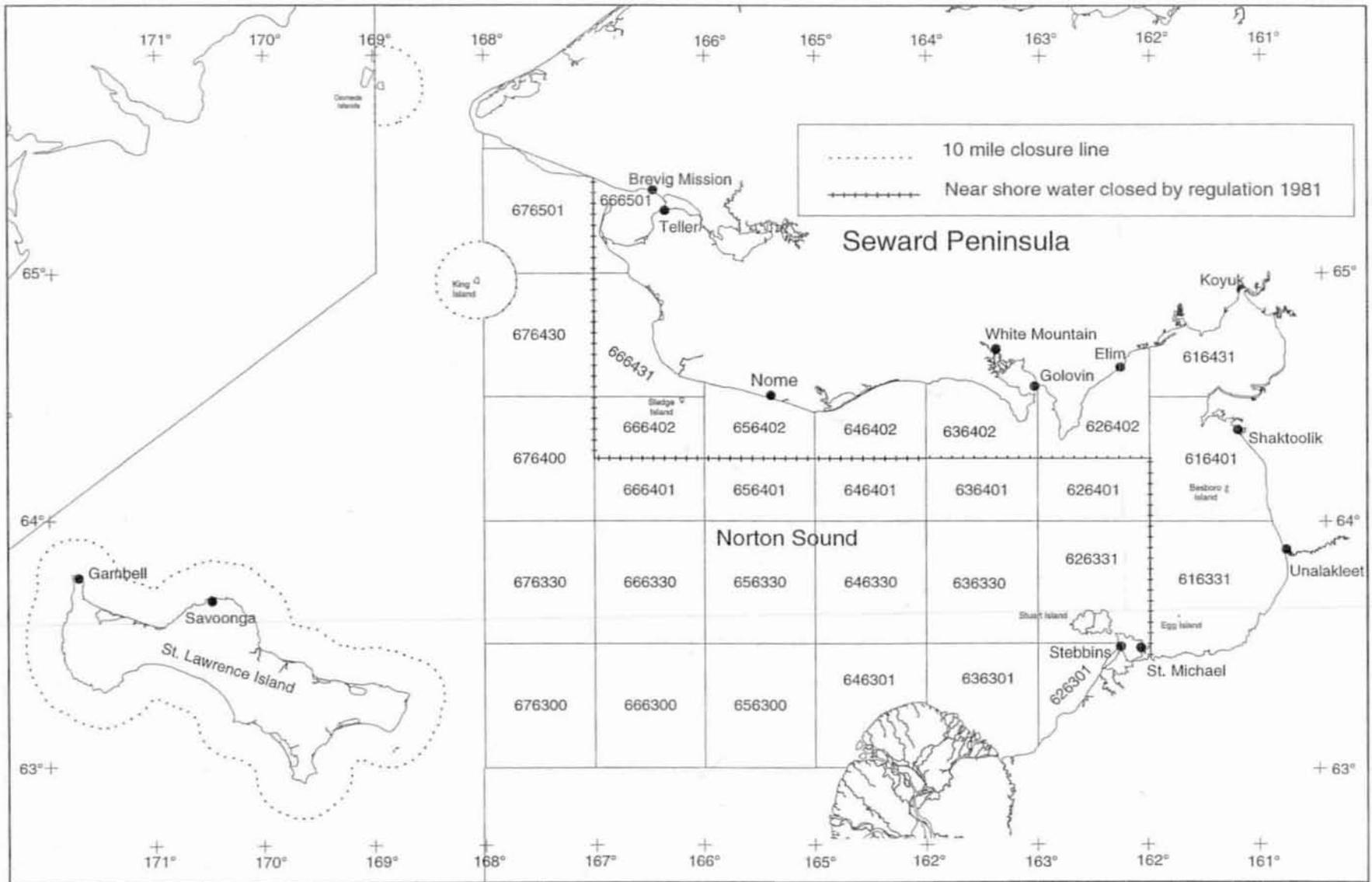


Figure 2. Norton Sound Section of Area Q and associated statistical Areas.

2001 Norton Sound SummerCrab Fishery
Legal Male Red King Crab

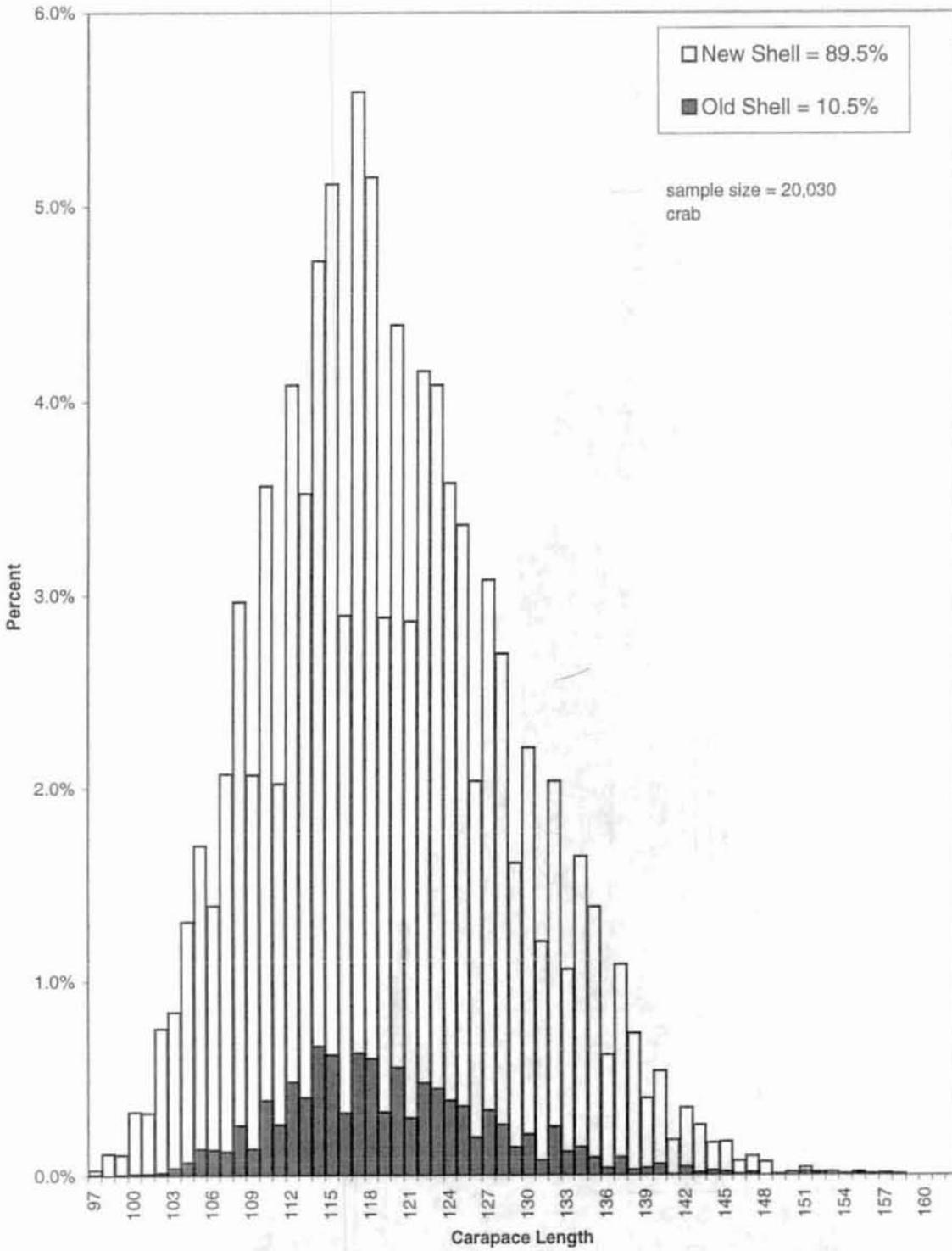


Figure 3. Length frequency distribution for new and old carapace age condition of legal male red king crab, sampled from the Norton Sound summer commercial fishery, July 1 - September 1, 2001.

2001 Norton Sound Summer Crab Fishery
 Recruit vs. Postrecruit

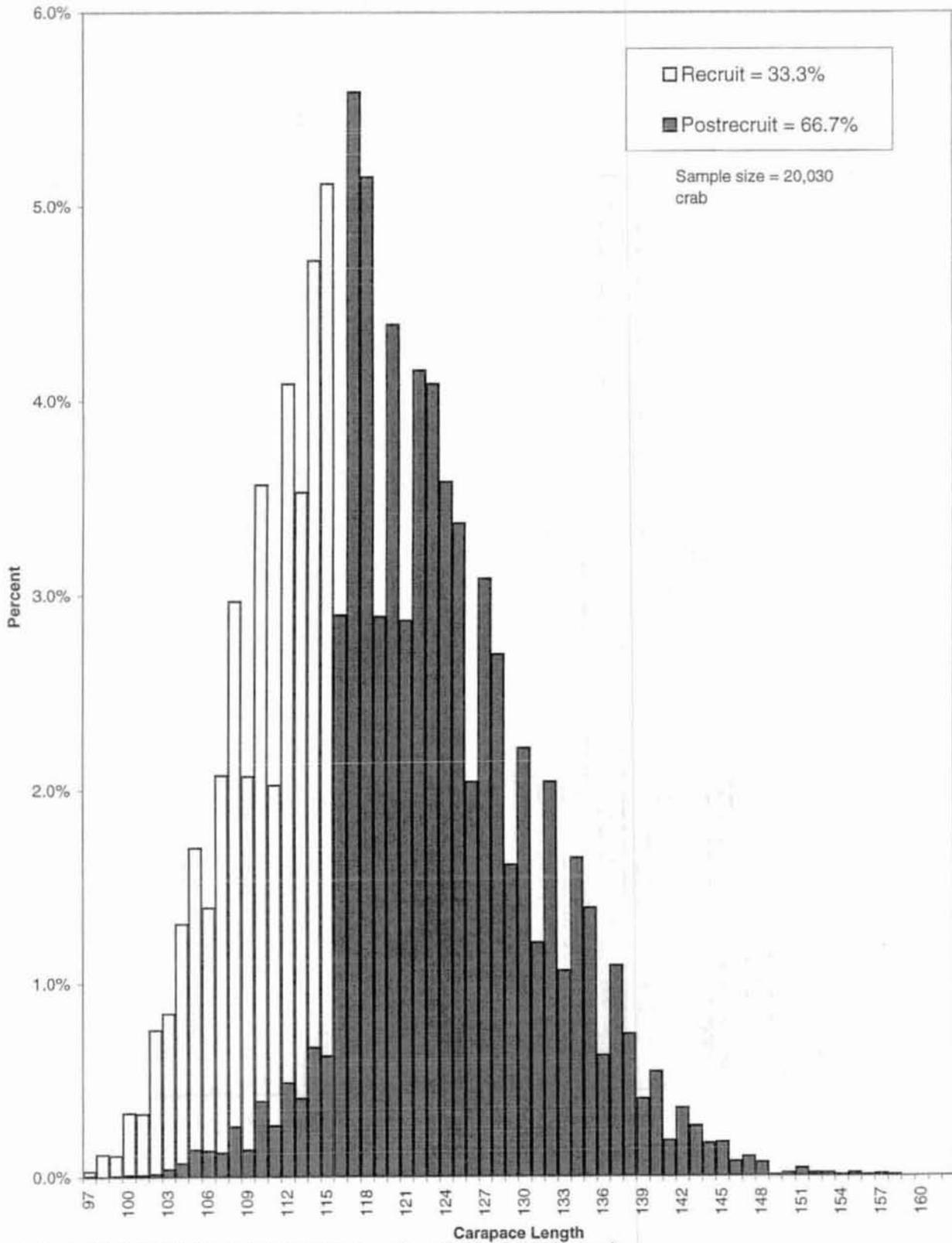


Figure 4. Carapace length measurement summary of sampled legal male king crab captured during the commercial king crab harvest, July 1 - September 1, 2001.

Percent of Crab Harvest East of 164 Degrees W

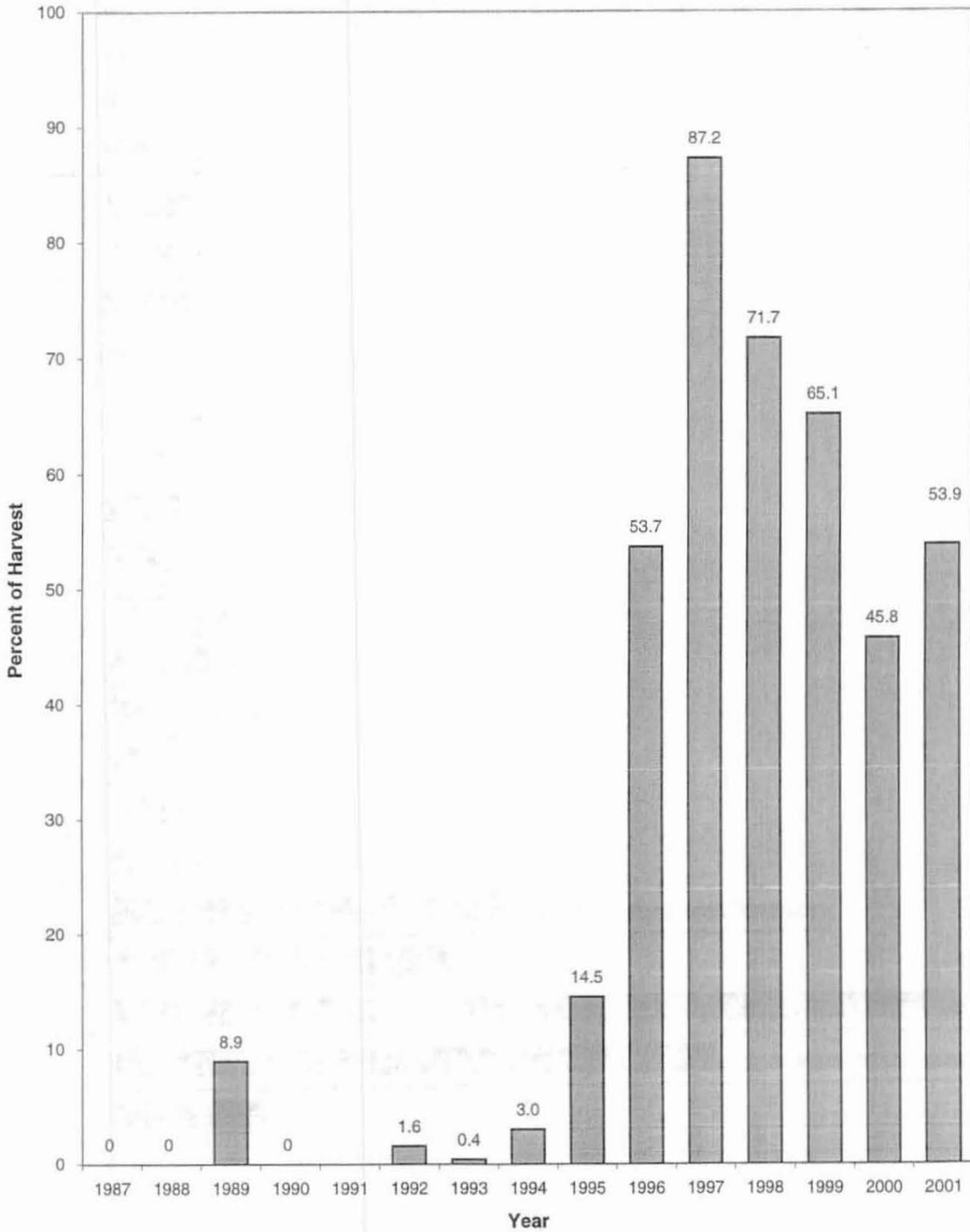


Figure 5. The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of 164 degrees west longitude, 1987 - 2001.

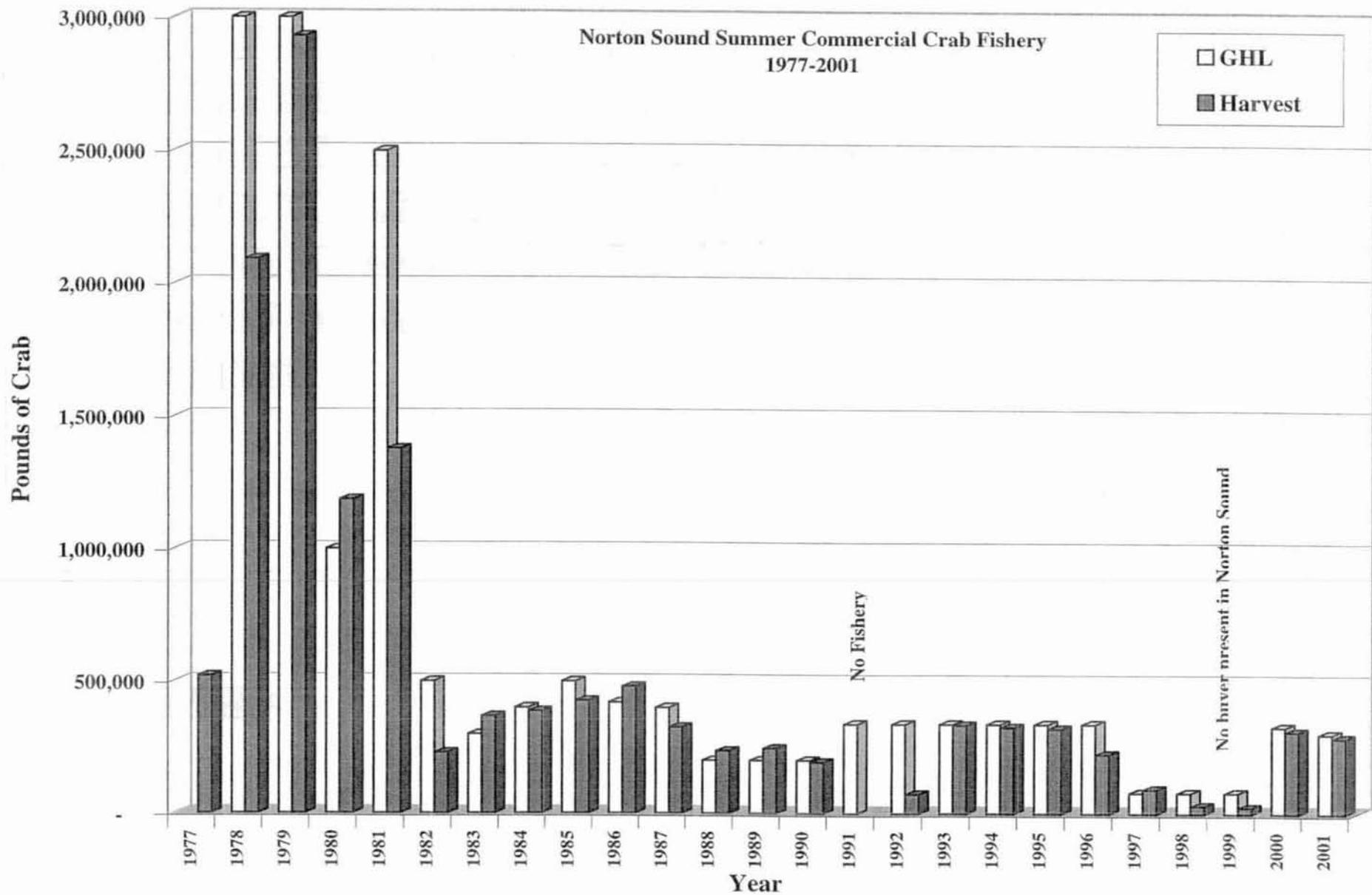


Figure 6. Historical Norton Sound summer commercial crab harvest, 1977-2001

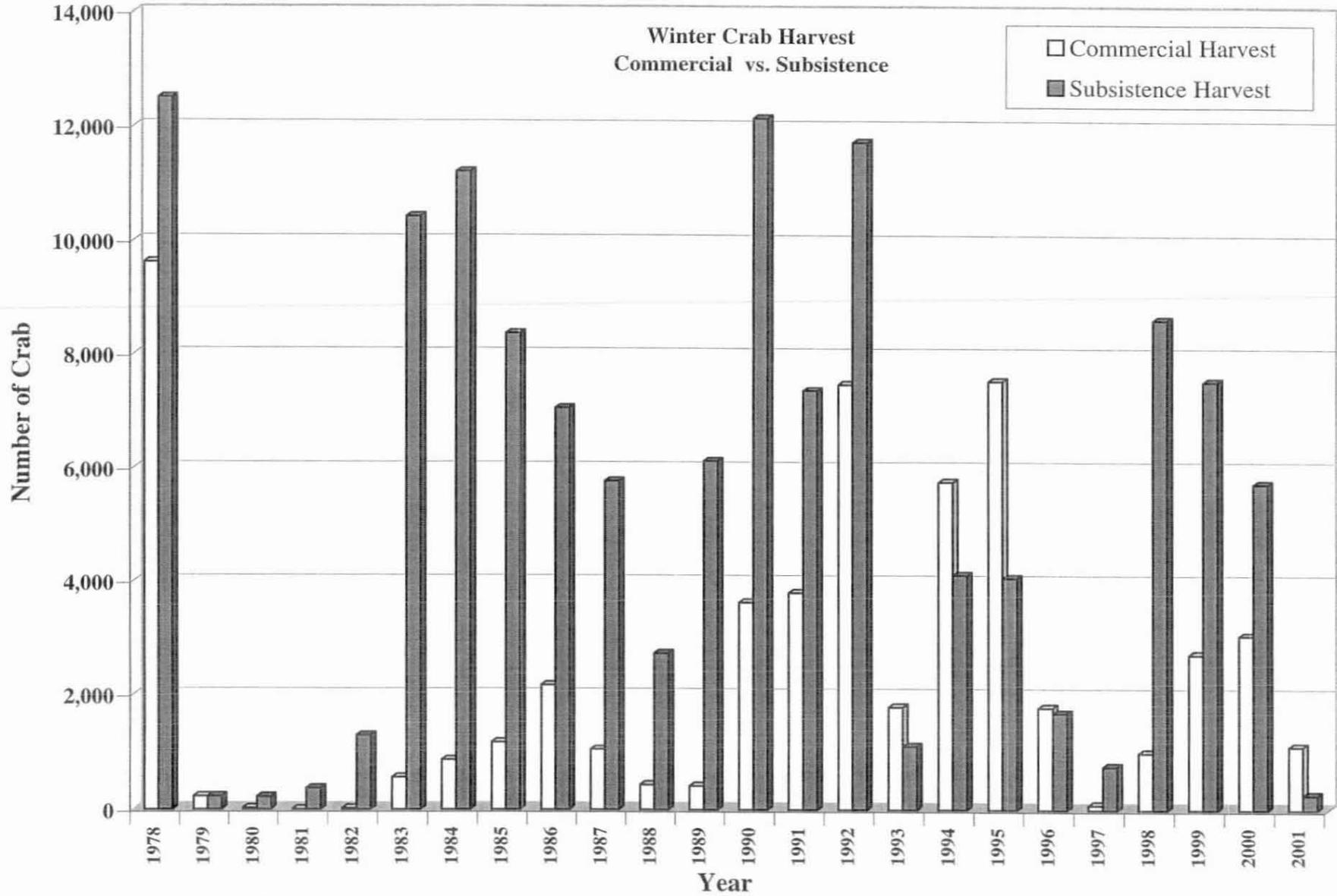


Figure 7. Historical Norton Sound winter subsistence and commercial crab harvest, 1978-2001