

1988 Fishery Management Plan for
Norton Sound Section
Red King Crab Fishery
(Summer Fishery Only)

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Alaska Department of Fish and Game
Division of Commercial Fisheries
Arctic - Yukon - Kuskokwim Region

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1988 FISHERIES MANAGEMENT PLAN FOR NORTON SOUND SECTION
RED KING CRAB FISHERY

INTRODUCTION

The Norton Sound Section consists of all waters in statistical area Q that are 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 fishery has existed in this section since 1977. Limited local sales of king crab taken during the winter by Nome fishermen have also occurred for a number of years. Subsistence fishing for king crab occurs throughout the section during the winter.

STATUS OF STOCKS/RESEARCH

The Norton Sound king crab population in 1976 was largely composed of recruit and prerecruit crab. Crab abundance reached its peak in 1978 when 11 million pounds of legal male crab were estimated to be the biomass. Norton Sound king crab stock monitoring has included 4 trawl surveys, 4 pot assessment surveys, and 5 winter studies since 1976. The results of the National Marine Fisheries Survey trawl and Alaska Department of Fish and Game pot assessment surveys are presented in Table 1. The most recent population assessment work occurred during the summer of 1985 when a pot survey and a trawl survey were conducted.

From 1979 to 1982, the population experienced very low recruitment and the fishery was almost entirely supported by older postrecruit crab. This is apparent from the average weight of individual crab captured in the commercial catch, which increased from 2.7 to 3.7 pounds/crab (Table 2). As a result of fishing and natural mortality, the abundance of legal crab dropped to an estimated 1.3 million pounds in 1982.

Increased abundance of sublegal crab in both the NMFS and ADF&G 1985 research surveys indicated that improved recruitment has resulted in a moderate increase in the abundance of legal crab. A pre-season population estimate of 3 million pounds was made for the 1985 season based on catch per unit effort during the ADF&G pot survey. Further analysis of the survey data placed the legal male population at 2.4 million pounds. Based on the information collected in 1985 and the recent stable level of recruitment, the 1987 pre-season harvest was set at 400,000 pounds.

Unfortunately midway through the season it became apparent that recruitment levels had declined from the recent 5 year average of

47% to 23%. The season was closed when 327,000 pounds had been caught. The average weight had increased to 3.2 pounds each from an average of 2.9.

The Nome area staff has conducted a winter sampling program since 1982. Comparisons of size composition between the winter catches and the summer commercial samples show the same recruitment trends. The department staff plans to continue this research as an index of recruitment as funding and ice conditions allow. In addition, during late August of 1988, NMFS plans to conduct a trawl survey of Norton Sound. This upcoming survey should help to address the concern of declining recruitment and its effect on the population size.

STATUS OF FISHERY

Commercial catches made during the summer fishery have ranged from 2.9 million pounds in 1979 to 0.2 million pounds in 1982. Annual commercial catch data for this fishery are presented in Table 2. Deadloss was a major problem during 1977-79 but was largely eliminated after 1980 because crab were processed one or two days after being captured. Another factor reducing deadloss was that fishing and processing vessels have avoided inshore waters, which have a low surface salinity that crab cannot tolerate.

A winter commercial fishery also occurs from November 15 through May 15 when crab are taken through the ice. A total of 25,000 pounds was sold during the winter of 1978. During the past eight winters, less than 4,000 pounds has been sold due to poor weather, unstable ice conditions, a reported absence of crab from the nearshore area, and poor marketing conditions. During 1986, 1040 crab were sold by 7 local fishermen. Again, unstable ice conditions hindered fishing effort during the first half of the winter fishery.

Red king crab are utilized by Norton Sound residents for both recreational and subsistence purposes with fishing occurring in the winter through holes or cracks in the ice. The average catch per family in 1978 was about 70 crab with the average dropping to about 15 crab per family during the next four winters. Catches averaged 123 crab per family during the winter of 1983, 78 in 1984, 63 in 1985, 66 in 1986, and 59 in 1987, a large increase over the previous five winters. In 1987 winter subsistence harvest from the Nome area was 5,772 king crab. One hundred thirty-eight families received fishing permits with 134 being returned.

OUTLOOK FOR 1988

A conservative quota of 200,000 pounds has been set for the Norton Sound Section during the 1988 season. Using data from the 1985 pot survey conducted in Norton Sound and applying recruitment, harvest and natural mortality factors observed in subsequent years, the legal male biomass is estimated to be 2 million pounds. Given low levels of recruitment observed in the 1987 summer fishery recruitment is thought to be low. The Board of Fisheries has set in regulation a management strategy that allows one-half normal exploitation rate for the summer fishery in order to protect the winter fisheries. Low recruitment and a declining population will require a reduction of the exploitation rate during the summer fishery from 15 to 20%, the rate used from 1982 - 1987, to 10% during the 1988 season.

The Board of Fisheries has also established a nearshore closed waters area to further protect the winter fisheries. In the past, this line has been relaxed to accommodate fishermen when catch rates were slow and it appeared that the crab population had not migrated far offshore. Because of the apparent low population levels and lack of recent assessment work, this line will not be relaxed in the 1988 season.

With the small quota in effect fishermen should expect the season closure to be announced with as little as 24 hours notice. The Department will place observers onboard vessels to verify catch per pot figures and to record the size distribution of the catch. A projection of when the allowed harvest can be expected to be taken will be made and a closure date will be announced giving as much notice as possible. Fishermen are required to have all pots unbaited with doors secured fully open at the time of the closure, regardless of how many pots they are fishing.

Fishermen are advised that each vessel is required to report (deliver a fish ticket) their catch within 24 hours of the final delivery of their catch within Norton Sound. If the vessel travels outside the Section to deliver their catch then they must advise the Nome Fish and Game office and agree to a reporting time and method prior to departure from the Section.

IMPORTANT REGULATIONS

Harvest Strategy 5AAC 34.915 states "the department shall manage the Norton Sound Section summer season king crab fishery for a harvest of one-half of the exploitation rate common in other Bering Sea commercial king crab fisheries."

Fishing Season (5AAC 34.910 (d) (1)):

The commercial king crab season in the Norton Sound Section of the Northern District occurs from 12:00 noon August 1 through 12:00 noon September 3 or until the optimum yield (OY) is taken. King crab pots may not be set until 12:00 noon August 1 and the vessel has received a tank inspection.

Tank Inspections (5AAC 34.940), (5AAC 34.950 (a) (b) (c) (d)), (5AAC 34.070) :

Vessels planning to fish in the Northern District must have their holds inspected before fishing. Vessels that plan to begin fishing in the Norton Sound Section must receive a tank inspection from the Nome ADF&G office. Inspections will begin at 12:00 noon July 31. If poor weather prevents department personnel from boarding vessels, tank inspection requirements will not be waived. Tank inspections will be given when weather subsides.

Permits (16.05.480 (a)):

A king crab fishing permit for the Bering Sea (K--Q) is also valid for fishing in Norton Sound.

Fishing Vessel Registration/Catch Reporting (5AAC 34.950 (a))., (5AAC 39.130):

Vessels planning to fish in the Northern District must register for the district. District registration can be completed during the tank inspection.

During registration catch reporting schedules will be established and fishermen will be required to report daily the number of crab taken, number of pots pulled, area fished, and information on tagged crab recoveries. Codes will be provided so that reports will be kept confidential.

Reporting Requirements: 5AAC 34.035 (h)

If delivery of the catch is to be made in the registration area where the crab are taken then the catch report is due within 24 hours of delivery. If the catch is to be delivered outside the registration area then the fishermen is required to set up a reporting time with a department representative from the Nome office when he leaves the Section.

Tender/Processors (5AAC 34.940), (5AAC 34.950), (5AAC 34.070):

Prior to operating, Norton Sound processors must report to the Nome ADF&G office. When an operator intends to leave the management section, he must check out by making personal or radio contact with the Nome office, stating the number of king crab on

board at the time of departure. He shall also indicate his unloading destination. Fish tickets will be turned into the Nome office no later than one week after the fishery closes.

Sex and Size Restrictions (5AAC 34.920 (d)), (5AAC 34.065):

A 4-3/4" minimum size limit will be in effect and only males can be harvested.

Gear Storage (5AAC 34.925 (g)):

Prior to and after the fishing season, gear must be stored in the specified gear storage area and may not be stored in waters less than 25 fathoms.

At the time of the season closure, pots must have all doors secured and fully open with all bait and bait containers removed. Within 72 hours following the closure, pots must either be removed from the water, stored in the storage area, or be moved to open waters (St. Lawrence Section, August 1-Sept. 3).

Closed Waters (5AAC 34.935 (a) (b)):

All waters of the Norton Sound Section enclosed by a line from 65° 23' N. latitude, 167° W. longitude to 64° 15' N. latitude, 167° W. longitude to 64° 15' N. latitude, 162° W. longitude to 63° 27' N. latitude, 162° W. longitude are closed to the taking of king crab from August 1 through September 3. (See Figure 3.)

Tanner Crab Closure (5AAC 35.510 (b)):

Tanner crab may not be taken or possessed in the Norton Sound section. This regulation was enacted in March 1982 to prevent circumvention of the king crab regulations and because there are no commercially sized tanner crab in Norton Sound.

Tagged Crab: Department personnel will be on board processing vessels to sample commercial catches for biological information and to collect tagged crab. All tagged crab, whether legal or sublegal should be kept and returned to department personnel. Receiving the exact recapture locations (loran reading or latitude/longitude) from commercial fishermen will greatly assist the department in developing a data base for Norton Sound crab. A three dollar reward will be paid for each tagged crab turned in with information on recapture area. Also there will be three tag numbers drawn from all reported tag recoveries, with the first tag drawn worth \$100 and the second and third worth \$75 and \$50 respectively. This drawing will take place 3 days after the fishery is closed.

Departure for St. Matthew (5AAC 34.070), (5AAC 34.940):

An additional tank inspection will be required prior to fishing in the St. Matthew Section. Inspection times and locations will be announced by news release prior to the opening date of September 1. Vessels may not have crab on board at the time of inspection. Vessels departing Norton Sound with crab on board must notify department personnel in Norton Sound of the number of crab on board at the time of departure. These crab must be off loaded prior to receiving an inspection for the General Section.

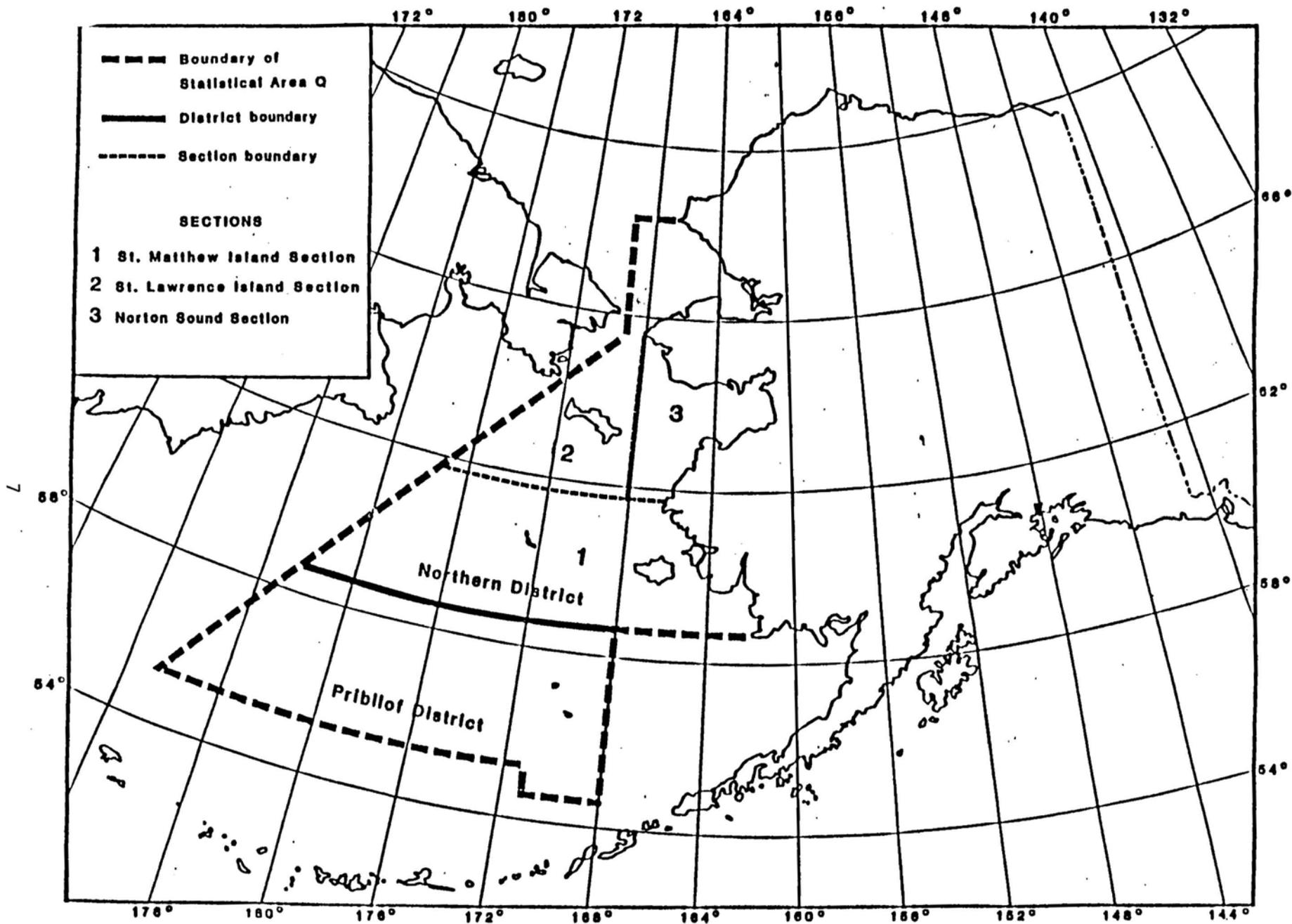


Figure 1. King crab fishing districts and sections of Statistical Area Q

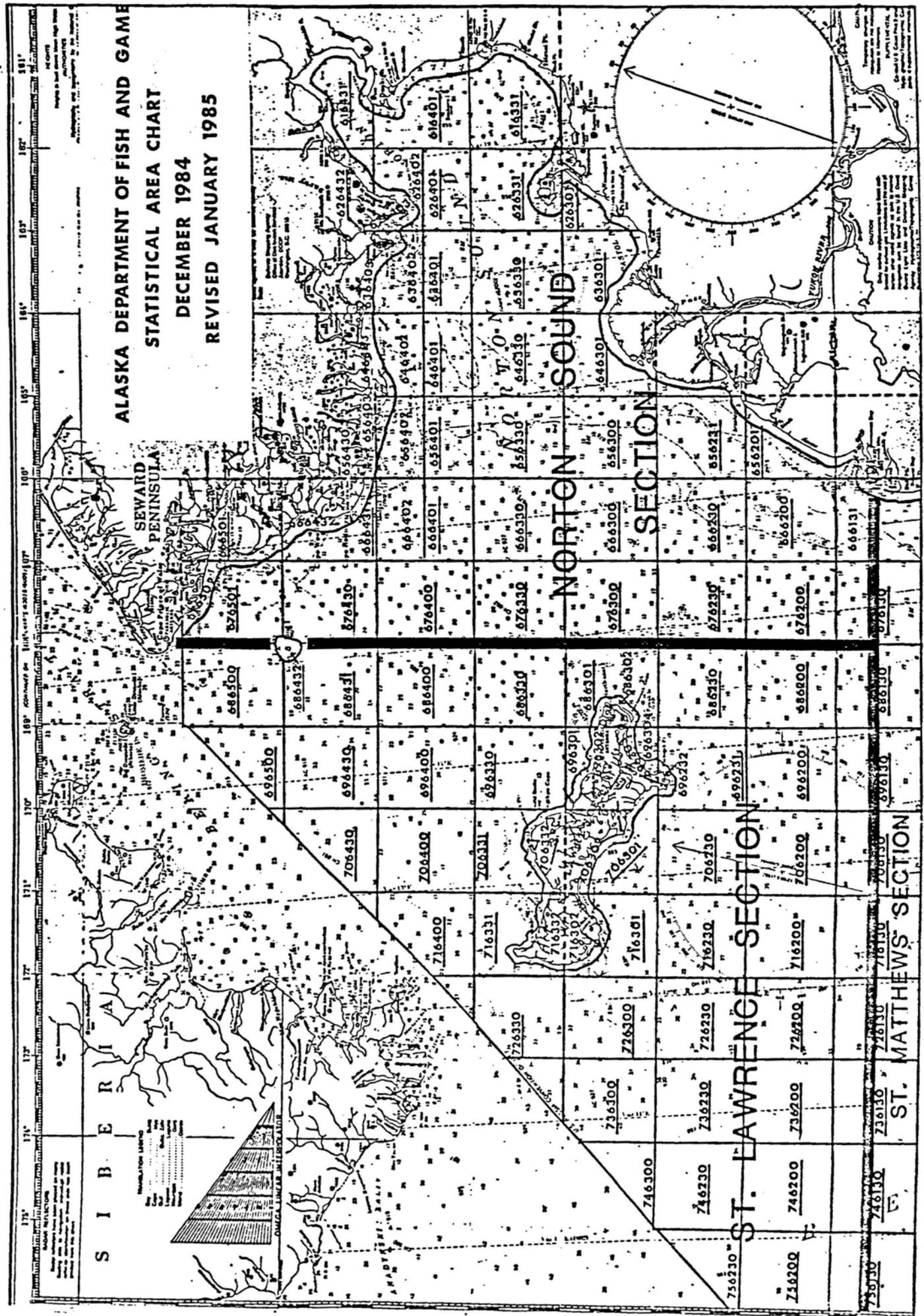


Figure 2. Statistical areas for the Northern District Red King Crab Fishery.

Figure 3. Statistical areas for the Norton Sound Red King Crab Fishery.

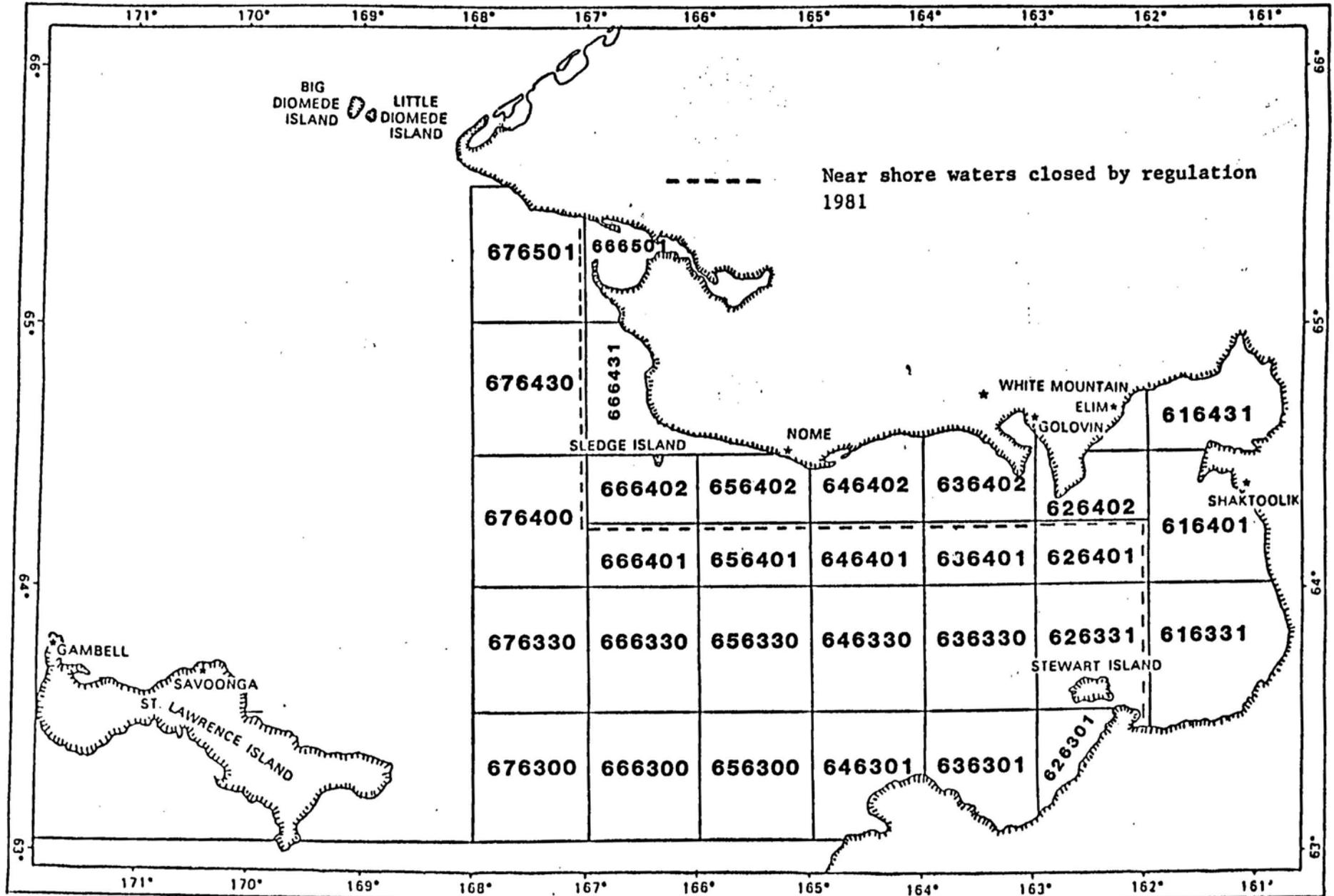


Table 1. Catch of red king crabs in Norton Sound during research surveys and resulting population estimates, 1976-1985.

King Crab Survey				# Crabs Captured 1/			Avg. Legal Crab per Pot	Population Estimates		Commercial Harvest		
Date	Days	Agency	Vessel	Method	Sub-legal Males	Legal Males		Fe-males	Legal Males Numbers	Legal Males Pounds	Pounds	Weight
1976 9/2-9/5 9/16-18/7	13	NMFS	Miller-Freeman	Trawling. 158 tows	768	555	188	--	3,119,800	8,111,480	None	--
1979 7/26-8/5	11	NMFS	Miller-Freeman	Trawling 71 tows	46	194	49	--	837,241	2,511,723	2,931,672	3.8
1982 9/5-9/11	7	NMFS	Miller-Freeman	Trawling 58 tows	322	187	265	--	970,646	2,620,744	228,921	3.6
1985 9/16-18/1	16	NMFS	Argosy	Trawling 78 tows	226	163	151	--	1,283,800	3,369,800	427,811	2.9
1980 7/4-7/14	11	ADF&G	Altair	Pots-397	443	3,298	158	8	1,900,000	6,600,000	1,186,596	3.4
1981 6/28-7/14	17	ADF&G	Altair	Pots-718	4,897	3,415	1,933	5	1,285,195	4,755,221	1,379,814	3.7
1982 7/6-7/20	16	ADF&G	Aleutian #1	Pots-689	5,819	2,881	424	3	353,273	1,271,783	228,921	3.6
1985 7/1-7/14	14	ADF&G	Arctic Sea	Pots-642	6,886	4,645	185	7	987,579	2,474,644	427,811	2.9

- 1/ Number of crab captured on ADF&G surveys represents data standardized for a 24-hour soak period. these data are edited and finalized.
- 2/ Legal males include crab of 106 mm and greater carapace length.
- 3/ Legal males include crab of 105 mm and greater carapace length.
- 4/ Legal males include crab of 103 mm and greater carapace length. ADF&G research has shown 103 mm is the point where over 50% of the crab that length are of legal width.
- 5/ Estimate of crab immediately after the 1979 summer commercial fishery.
- 6/ Estimate of crab immediately after the 1982 summer commercial fishery. The molt was in progress during the survey so this estimate also includes some recruitment as well as the remaining legal crab.
- 7/ The poundage for the 970,646 estimated legal crab was derived by comparing the 1982 research average legal crab length of 113 mm to the 1977 commercial fishery which had a similar average length of 115 mm and an average weight of 2.7 pounds.
- 8/ Legal male crab captured on ADF&G research surveys are crab with carapace width equal to or greater than 4 3/4 inches regardless of length.
- 9/ Estimate of crab immediately after 1985 summer commercial fishery. The molt was in progress during the fishery; this estimate also includes some recruitment as well as the remaining legal size crab.
- 10/ ADF&G estimates are calculated using the Peterson mark and recapture methods. Estimates are for legal male crab prior to the summer commercial fishery.
- 11/ The 1980 estimate has been revised from the original estimate of 13.4 million pounds. The original estimate was inaccurate due to inadequate recovery of tagged crab.
- 12/ Obtained from actual samples taken aboard the catcher/processor, BILLIKIN.
- 13/ Preliminary data standardized for a 24 hour soak period.

Table 2. Commercial harvest of red king crabs in Norton Sound, summer fishery, 1977-1986.

Year	Legal male pop. est. 1/	Commercial harvest 3/	Number of vessels	Crab/pot	Avg. wt.	Exvessel price	Fishery value millions \$
^{2/} 1976	8.1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1977	10.0	0.52	7	36	2.7	0.75	0.229
1978	11.0	2.1	8	64	3.0	0.95	1.897
1979	9.0	2.9	34	28	3.0	0.75	1.878
1980	6.6	1.2	9	29	3.6	0.75	0.890
1981	4.7	1.4	36	11	3.7	0.85	1.172
1982	1.3	0.23	11	6	3.6	2.00	0.405
1983	2.1	0.37	23	12	2.8	1.50	0.537
1984	2.7	0.39	8	14	2.8	1.02	0.395
1985	2.4	0.42	6	11	2.9	1.00	0.423
1986	2.8	0.48	3	38	2.9	1.25	0.600
1987	2.2	0.33	9	10	3.2	1.50	0.491

1/ Population estimate prior to fishery in given year in millions of pounds.

2/ No commercial fishery in 1976.

3/ Millions of pounds.