

1996 FISHERY MANAGEMENT PLAN FOR NORTON SOUND SECTION

RED KING CRAB

(Summer Fishery Only)

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## 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 through the ice 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. Norton Sound king crab stock monitoring has included 6 trawl surveys and 4 pot assessment surveys from 1976-1991, and 9 winter studies from 1982-1991. The results of the National Marine Fisheries Survey trawl and Alaska Department of Fish and Game pot assessment surveys are presented in Table 3. The most recent population assessment work occurred during the late summer of 1991, when a trawl survey was conducted by NMFS.

From 1979 to 1982, the population experienced very low recruitment and the fishery was almost entirely supported by older postrecruit crab. This was apparent from the average weight of individual crab captured in the commercial catch, which increased from 2.7 (1979) to 3.7 (1982) pounds/crab. 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 had resulted in a moderate increase in the abundance of legal crab. A preseason population estimate of 3 million pounds was made for the 1985 season based on 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 apparent stable level of recruitment, the 1987 preseason harvest was set at 400,000 pounds, an exploitation rate of 20%. Unfortunately, it became apparent that recruitment levels had declined from the previous 5 year average (1982-1986) of 47% to 23%. The season was closed when 327,000 pounds had been caught. The average weight had increased to 3.2 pounds per individual crab from an average of 2.9. In subsequent seasons, the fishery was managed at an exploitation rate of 10%. Because the recruitment levels had decreased, the exploitation rate was reduced proportionately.

During the 1990 season four vessels participated in the fishery. The season lasted four days as a result of the high rate of harvest. A total of 192,800 pounds of crab were taken.

The 1991 summer season was not conducted because the budget for managing the fishery had been eliminated significantly reducing the ability of the staff to manage the fishery. The last population study had not indicated increased recruitment and recent catch rates seemed to be tapering off. Furthermore, there was no operating budget with which to monitor the fishery or monitor the population

During late August of 1991, NMFS conducted their triennial trawl survey to assess the abundance of Norton Sound red king crab. The results of that survey became available that spring. There appears to be a gradual trend of increasing abundance since the low of 1982. The survey found 3.4 million pounds of legal king crab in the open commercial fishing district.

The 1992 season was greatly affected by the late sea ice break-up and the placement of a 100 pot limit per vessel. The crab's normal offshore migration was delayed so that fewer than normal crab were available for harvest. The pot limit encouraged a greater than normal level of participation in the fishery. The combined effect from these factors caused the fishery to be closed after only two days with less than a quarter of the harvest goal being taken.

The Nome area staff had conducted a winter sampling program most years since 1982. Comparisons of the size composition between the winter catches and the summer commercial samples show similar recruitment trends. This information can be used to project the next two summer's age composition and the general health of the population. This project was not conducted due to budget cuts or poor conditions during 1988, 1992, and 1994. The loss of recruitment data and the ability to track the crab stock is particularly distressing since sublegal crab can no longer be sampled in the summer commercial fishery and no longer plans to conduct population surveys of the Northern Bering Sea.

In 1989, five vessels decided to prospect for crab in the St. Lawrence Island Section. Those vessels spent up to 10 days each exploring the section but reported only small catches. The best catch rates were roughly one legal crab per pot lift in the northern portion of the section. The catch reports from this fishery represent the best available information on crab from north of the Bering Strait.

## STATUS OF FISHERY

Commercial catches made during the summer fishery have ranged from 2.9 million pounds in 1979 to 0.07 million pounds in 1992. Annual commercial catch data for this fishery are presented in Table 1. 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. From 1979 to 1984,

the winter commercial fishery virtually ceased to exist due to low catch rates. Since 1984 the winter harvest recovered to some extent. During the winter 1991-92, the commercial harvest increased to 7,463 crab or roughly 21,000 pounds. This winter harvest was possible because of the stable and extensive shorefast ice conditions. During 1992, 11 local fishermen participated in the winter commercial fishery. The first commercial sales of king crab from eastern Norton Sound also occurred during 1992.

Red king crab are utilized by Norton Sound residents for subsistence as well as commercial purposes. Both fisheries occur in the winter through holes or cracks in the ice. The average catch per family in 1995 was about 70 crab. Permittees during winters with unstable ice conditions commonly report harvests of less than 60 crab and during years of stable ice conditions the average climbs to over 100 crab. The 1994-1995 winter subsistence harvest totalled 4,059 crab. Of the 167 families receiving permits 57 returned their permits, and of those all permittees reported having fished. Table 2 summarizes winter commercial and subsistence red king crab fishery data.

### OUTLOOK FOR 1996

A conservative quota of 340,000 pounds has been set for the Norton Sound Section during the 1996 season. The red king crab population is estimated to be less than 1/3 of the historic population. The population level has increased only slightly since 1985 even without a summer commercial fishery during 1991. A 340,000 pound harvest equates to roughly a 10% exploitation level. It is hoped that this rate of exploitation will allow the crab population to recover and stabilize at a higher level.

With the new regulations that have recently gone into effect, the character of the summer crab fishery will change. The pot limits will tend to slow the rate of harvest. Markets and delivery points are now subject to change throughout the season. A new system of catch reporting and catch sampling will be implemented. Port samplers will be stationed at Nome. The Nome office will continue to be the center of management for the fishery but the catch reporting schedule may change to accommodate the slower pace of the fishery.

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

The earlier opening date of the fishery since 1993, the nearshore closure boundary had been relaxed both northward and eastward. This season we anticipate no relaxation of the closure line. The nearshore abundance of legal size crab has fallen significantly. The winter study indicates that recruitment is minimal for the 1996 season, however the prerecruit one and two age classes are quite significant. More sublegal crab have been observed in both the recent summer and winter fisheries. The higher incidence of sublegal crab results in higher mortality due to handling and an impact on the winter fisheries that was to be avoided by the nearshore closure regulation. In 1981, the Alaska Board

of Fisheries set the closed waters regulation in place to provide opportunity to the winter fisheries because of the historic harvests and subsistence priority. One half of the harvestable surplus was to be set aside for these fisheries. There has been a decline in nearshore crab abundance as documented by recent harvest rates and department studies. The summer commercial fishery seems to have been part of the cause of that decline. If a high proportion of the harvest is found to be sublegals, further restrictions might be implemented. If catch rates remain poor throughout July the summer fishery may be closed in early August. If catch reporting becomes a problem the Department will close the fishery if it becomes unmanageable.

## 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 July 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 July 1 and the vessel has received a tank inspection.

A commercial fisherman may not operate subsistence gear less than 14 days before or after their participating in a commercial king crab fishery.

### 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 either the Nome or Unalakleet ADF&G office. Inspections will begin at 12:00 noon June 29. Inspections will continue on a daily basis as needed and will be conducted during office hours. Appointments should be made at least 24 hours prior to desired time of inspection. 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 Norton Sound Section of the Bering Sea (K--Z) is required for fishing in Norton Sound. The fishing vessel must also be licensed. All crewmembers must be licensed.

Pot Limit (5 AAC 34.925. (i) and (j) and 5 AAC 34.050. (e)):

No more than 40 king crab pots may operate from a vessel of 125 feet or less in length or 50 pots if the vessel is larger in the Norton Sound Section or Area Q3. Each pot must have its own identification tag issued by the Department. To replace lost tags a sworn statement signed by the vessel operator and three crew members describing how they were lost must be submitted to the Dutch Harbor office.

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 can 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 fisherman is required to set up a reporting time with a Department representative from the Nome office prior to leaving the section. All deadloss and crab kept for home use out of the commercial harvest must also be reported.

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 carapace width size limit will be in effect for red king crab, and only males can be harvested. Male blue king crab with a carapace width of 5-1/2" or greater may also be harvested.

Gear Requirements 5AAC 34.050.

Each pot will have its own buoy.

Each pot must have a pot tag which can be purchased at ADF&G.

Each buoy must have the vessel license number plainly marked with letters at least 4 inches in height.

Each pot must have an escape mechanism that will allow crab to escape after a period of time if the pot should get lost. By regulation a slash must be made 18 inches in length and within 6 inches of the bottom. The slash is sewn shut with 30 strand untreated cotton thread and is tied at both ends only. 30-day alvanic Time Release Devices (GTR) may be substituted for the cotton string.

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 be removed from the water 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 2.)

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.

Bait harvest by crab permit holders (5AAC27.971. and 5ACC 28.670.):

These regulations allow a permit holder to harvest up to a ton of herring or groundfish for use as commercial bait for their own use. These fish may not be sold and must be reported on a fish ticket. Herring may not be harvested under these regulations within 72 hours of a commercial opening.

Table 1. Historic summer commercial red king economic performance, Norton Sound Section, Bering Sea, 1977 - 1995.

Year	Guideline Harvest Level (lbs) <sup>b</sup>	Legal Male Pop. Est. (lbs) <sup>b</sup>	Commercial Harvest (lbs) <sup>a,b</sup>	Number of			Number of Pots		Exvessel Price/lb	Fishery Value (millions \$)	Season Length	
				Vessels	Permits	Landings	Registered	Pulls			Days	Dates
1977	<sup>d</sup>	10.0	0.52	7	7	13	<sup>d</sup>	5,457	0.75	0.229	60	<sup>d</sup>
1978	3.00	11.0	2.09	8	8	54	<sup>d</sup>	10,817	0.95	1.897	60	6/7-8/15
1979	3.00	5.4	2.93	34	34	76	<sup>d</sup>	34,773	0.75	1.878	16	7/15-7/31
1980	1.00	6.6	1.19	9	9	50	<sup>d</sup>	11,199	0.75	0.890	16	7/15-7/31
1981	2.50	4.7	1.38	36	36	108	<sup>d</sup>	33,745	0.85	1.172	38	7/15-8/22
1982	0.50	1.3	0.23	11	11	33	<sup>d</sup>	11,230	2.00	0.405	23	8/9-9/1
1983	0.30	2.1	0.37	23	23	26	3,583	11,195	1.50	0.537	3.8	8/1-8/5
1984	0.40	2.7	0.39	8	8	21	1,245	9,706	1.02	0.395	13.6	8/1-8/15
1985	0.45	2.4	0.43	6	6	72	1,116	13,209	1.00	0.427	21.7	8/1-8/23
1986	0.42	2.8	0.48	3	3	<sup>d</sup>	578	4,284	1.25	0.600	13	8/1-8/25 <sup>e</sup>
1987	0.40	2.2	0.33	9	9	<sup>d</sup>	1,430	10,258	1.50	0.491	11	8/1-8/12
1988	0.20	3.2	0.24	2	2	<sup>d</sup>	360	2,350	<sup>d</sup>	<sup>d</sup>	9.9	8/1-8/11
1989	0.20	3.2	0.25	10	10	<sup>d</sup>	2,555	5,149	3.00	0.739	3	8/1-8/4
1990	0.20	3.2	0.19	4	4	<sup>d</sup>	1,388	3,172	<sup>d</sup>	<sup>d</sup>	4	8/1-8/5
1991	<sup>c</sup> 0.34	3.4										
1992	0.34	3.4	0.07	27	27	<sup>d</sup>	2,635	5,746	1.75	0.130	2	8/1-8/3
1993	0.34	3.4	0.33	14	20	208	560	7,063	1.28	0.430	52	7/1-8/28 <sup>f</sup>
1994	0.34	3.4	0.32	34	52	407	1,360	11,729	2.02	0.646	31	7/1-7/31
1995	0.34	3.4	0.32	48	81	665	1,900	18,782	2.87	0.926	67	7/1-9/5

<sup>a</sup> Deadloss included in total.

<sup>b</sup> Millions of pounds.

<sup>c</sup> No summer commercial fishery.

<sup>d</sup> Information not available.

<sup>e</sup> Fishing actually began 8/12.

<sup>f</sup> Fishing actually began 7/8.

Table 2. Winter commercial and subsistence red king crab harvests, Norton Sound, Bering Sea, 1978-1995.

COMMERCIAL			SUBSISTENCE						
Year <sup>a</sup>	Number of Fishermen	# Crab Harvested	Winter <sup>b</sup>	Permits Issued	Permits Returned	Permits Fished	Total Crab Captured <sup>c</sup>	Total Crab Harvested <sup>d</sup>	Average Harvest/fm
1978	37	9,625	1977 -78	290	206	149	<sup>e</sup>	12,506	84
1979	1	221	1978 -79	48	43	38	<sup>e</sup>	224	6
1980	1	22	1979 -80	22	14	9	<sup>e</sup>	213	24
1981	0	0	1980 -81	51	39	23	<sup>e</sup>	360	16
1982	1	17	1981 -82	101	76	54	<sup>e</sup>	1,288	24
1983	5	549	1982 -83	172	106	85	<sup>e</sup>	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	149	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	166	131	97	7,777	5,426	56

<sup>a</sup> Prior to 1985 the winter commercial fishery occurred from January 1 thru April 30; as of March 1985, the winter commercial season was open by regulation from November 15 thru May 15.

<sup>b</sup> The winter subsistence fishery occurs during months of two calendar years (as early as December, thru May).

<sup>c</sup> The number of crab actually caught; some crab may have been released.

<sup>d</sup> The number of crab "Harvested" is the number of crab caught and kept.

<sup>e</sup> Data unavailable.

Table 3. Results of the population assessment surveys conducted for red king crab in Norton Sound since 1976.

Year	Date	Research Agency	Vessel	Gear Effort	Number of Red King Crab Captured <sup>1</sup>			Population Estimates of Legal Male Crab <sup>3</sup>	
					Sublegal Males	Legal <sup>2</sup> Males	Females	Numbers	Pounds
1976	9/02 - 9/05 9/16 - 10/07	NMFS	Miller-Freeman	Trawl 158 tows	768	555	180	3,119,800	8,111,480
1979	7/26 - 8/05	NMFS	Miller-Freeman	Trawl 71 tows	46	194	40	837,241	2,511,723
1980	7/04 - 7/14	ADF&G	Altair	Pots 397 lifts	443	3,290	158	1,900,000	6,600,000 <sup>4</sup>
1981	6/28 - 7/14	ADF&G	Altair	Pots 718 lifts	4,097	3,415	1,933	1,285,195	4,755,221
1982	7/06 - 7/20	ADF&G	Aleutian #1	Pots 689 lifts	5,019	2,001	424	353,273	1,271,783
1982	9/05 - 9/11	NMFS	Miller-Freeman	Trawl 50 tows	322	107	265	970,646	2,620,744
1985	7/01 - 7/14	ADF&G	Arctic Sea	Pots 642 lifts	6,086	4,645	181	907,579	2,414,644
1985	9/16 - 10/01	NMFS	Argosy	Trawl 78 tows	266	163	151	1,203,000	3,369,000
1988	8/16 - 8/30	NMFS	Miller-Freeman	Trawl 82 tows	258	141	218	1,037,000	3,038,000
1991	8/22 - 8/30	NMFS	Ocean Hope	Trawl 53 tows				1,384,000	4,009,000

<sup>1</sup> Number of crab captured on ADF&G surveys represent data standardized for a 24 hour soak.

<sup>2</sup> Legal male red king crab were defined as at least 106mm in carapace length for the 1976 NMFS survey; 105mm for the 1979, 1985, 1988 and 1991 NMFS survey; and at least 121mm in carapace width for all ADF&G surveys.

<sup>3</sup> Population est. are valid for the date of the survey, ie either before or after the summer commercial fishery.

<sup>4</sup> The 1980 estimate has been revised from the original estimate of 13.4 million pounds. The original estimate was thought inaccurate due to under-reporting of recovered tagged crab.

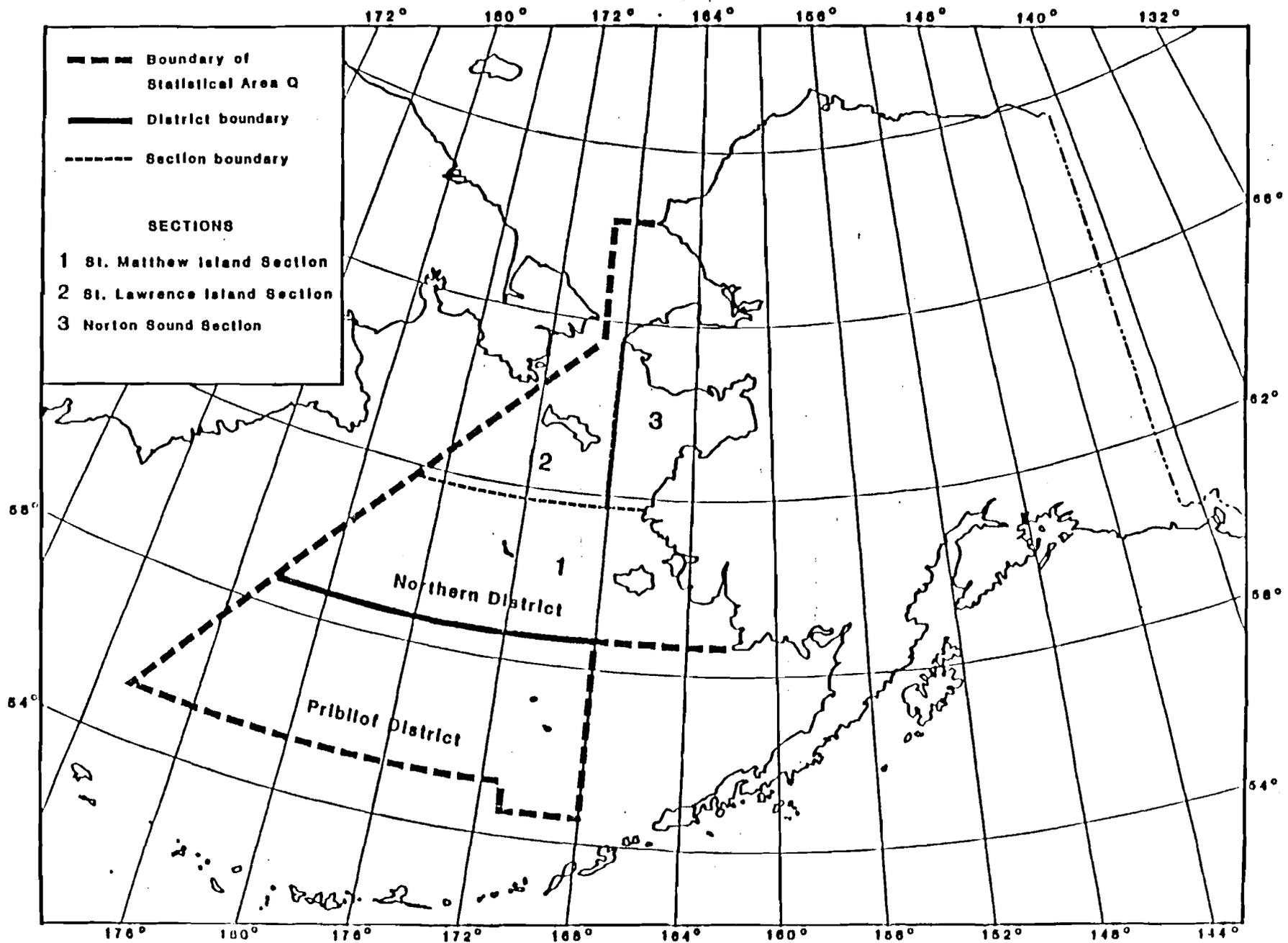


Figure 1. King crab fishing districts and sections of Statistical Area Q

Figure 2. Statistical areas for the Norton Sound Red King Crab Fishery.

