

**Arctic Area (Bering Sea Registration Area Q)
Shellfish, 2024: A Report to the Alaska Board of
Fisheries**

by

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February 2025

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics		
centimeter	cm	Alaska Administrative Code	AAC	all standard mathematical signs, symbols and abbreviations		
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H _A	
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e	
hectare	ha			catch per unit effort	CPUE	
kilogram	kg			coefficient of variation	CV	
kilometer	km	at compass directions:	@	common test statistics	(F, t, χ^2 , etc.)	
liter	L			confidence interval	CI	
meter	m			correlation coefficient (multiple)	R	
milliliter	mL	east	E	correlation coefficient (simple)	r	
millimeter	mm	north	N	covariance	cov	
Weights and measures (English)		south	S	degree (angular)	°	
	cubic feet per second	ft³/s	west	degrees of freedom	df	
	foot	ft	copyright	expected value	E	
	gallon	gal	corporate suffixes:	greater than	>	
	inch	in	Company	greater than or equal to	≥	
	mile	mi	Corporation	harvest per unit effort	HPUE	
	nautical mile	nmi	Incorporated	less than	<	
	ounce	oz	Limited	less than or equal to	≤	
	pound	lb	District of Columbia	logarithm (natural)	ln	
	quart	qt	et alii (and others)	et al.	logarithm (base 10)	log
yard	yd	et cetera (and so forth)	etc.	logarithm (specify base)	log ₂ , etc.	
Time and temperature		exempli gratia		minute (angular)	'	
	day	d	(for example)	e.g.	not significant	NS
	degrees Celsius	°C	Federal Information Code	FIC	null hypothesis	H ₀
	degrees Fahrenheit	°F	id est (that is)	i.e.	percent	%
	degrees kelvin	K	latitude or longitude	lat or long	probability	P
	hour	h	monetary symbols		probability of a type I error	
	minute	min	(U.S.)	\$, ¢	(rejection of the null hypothesis when true)	α
	second	s	months (tables and figures): first three letters	Jan,...,Dec	probability of a type II error	
	Physics and chemistry		registered trademark	®	(acceptance of the null hypothesis when false)	β
		all atomic symbols		trademark	™	second (angular)
alternating current		AC	United States		standard deviation	SD
ampere		A	(adjective)	U.S.	standard error	SE
calorie		cal	United States of America (noun)	USA	variance	
direct current		DC	U.S.C.	United States Code	population sample	Var var
hertz		Hz	U.S. state	use two-letter abbreviations		
horsepower		hp		(e.g., AK, WA)		
hydrogen ion activity (negative log of)		pH				
parts per million		ppm				
parts per thousand	ppt, ‰					
volts	V					
watts	W					

FISHERY MANAGEMENT REPORT NO. 25-10

**ARCTIC AREA (BERING SEA REGISTRATION AREA Q) SHELLFISH,
2024: A REPORT TO THE ALASKA BOARD OF FISHERIES**

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ABSTRACT

The Norton Sound Section of Registration Area Q in the northern Bering Sea supports a variety of fisheries targeting red king crab *Paralithodes camtschaticus*. This report summarizes the dynamics of these fisheries, including commercial, subsistence, and sport harvests, from 1976 to 2024. Changes in stock abundance, harvest strategies, and regulatory frameworks for red king crab have shaped its socio-economic contributions to the region and overall sustainability. Abundance estimates, derived from triennial and annual trawl surveys and length-based population models, reveal periods of weak and strong recruitment that inform management strategies. Commercial fisheries, including summer, winter, and Community Development Quota (CDQ), have adapted to evolving regulations and market demands, as well as recent shifts due to ice conditions and economic factors. Subsistence and sport fisheries remain integral to the cultural and recreational fabric of Norton Sound communities. This report provides an overview of the scientific and management framework governing red king crab fisheries, emphasizing sustainable practices and the integration of new data into policy decisions.

Keywords: Red king crab *Paralithodes camtschaticus*, subsistence, open access, Community Development Quota (CDQ), management, Norton Sound, abundance, biomass estimate, population estimate, Bering Sea registration Area Q, Alaska Board of Fisheries

INTRODUCTION

The Norton Sound Section of Registration Area Q, encompassing waters north of Cape Romanzof (61°49'N latitude), east of the International Dateline, and south of 66°N latitude, is a critical management area for red king crab *Paralithodes camtschaticus* fisheries. These fisheries include subsistence, summer and winter commercial operations, personal use, and sport fisheries. Each sector plays a unique role in the economic, cultural, and ecological landscape of the region.

Since the initiation of management efforts in the mid-1970s, significant advancements have been made in understanding the population dynamics of red king crab in Norton Sound. Abundance estimates, initially based on periodic trawl surveys, have evolved with the adoption of length-based population models and annual survey data. These advancements have informed harvest strategies aimed at maintaining sustainable exploitation rates while supporting the livelihoods of local communities.

The Norton Sound red king crab fishery has undergone substantial regulatory changes, including the establishment of superexclusive registration requirements, Community Development Quota (CDQ) allocations, and gear modifications to reduce bycatch and protect sublegal and female crab. Harvest trends across the fisheries have fluctuated, influenced by stock abundance, market demands, and environmental factors such as ice conditions.

This report provides a comprehensive analysis of the Norton Sound red king crab stock from 1976 to 2024. By examining population trends, harvest data, and regulatory frameworks, it aims to support management practices that balance ecological sustainability with the socio-economic importance of this Bering Sea resource.

NORTON SOUND KING CRAB OVERVIEW

ABUNDANCE

From 1976 to the late 1990s, the abundance of legal (over 4.75-inch carapace width [CW]) red king crab biomass in Norton Sound was estimated based on standardized results from triennial trawl surveys and sporadic summer pot surveys, which indicated periods of weak and strong recruitment (Menard et al. 2013; Appendix A7).

Since 1998, a length-based population model has been used to predict biomass for the red king crab population in Norton Sound (Zheng et al. 1998). This population model incorporates data from trawl surveys, harvests, and pot studies, to project biomass estimates of legal male crab even in years when no trawl survey occurs, thus allowing biomass-based management of the summer and winter commercial crab fisheries. Winter pot surveys were discontinued after the 2011–2012 season because the Alaska Department of Fish and Game (the department) operated an expanded spring and summer tagging study from 2012 to 2015. Every time new data is incorporated into the model, it estimates current abundance and revises the abundance estimates of prior years. Trawl survey estimates prior to 1996 were revised and standardized in 2013 (NPFMC 2013). Starting in 2018, triennial trawl surveys were replaced with annual surveys.

COMMERCIAL FISHERY OVERVIEW: SUMMER

Commercial exploitation of red king crab began in 1977 after initial trawl surveys indicated that there were harvestable red king crab stocks in Norton Sound and large vessels from outside the area came north. 1990 was the last year that a large-vessel summer commercial crab fishery was prosecuted in the Norton Sound Section. Since 1981, to protect crab utilized by the inshore subsistence fishery from commercial harvest, an area delineated by a line approximately 10 to 15 miles offshore of southern Seward Peninsula from Port Clarence to St. Michael has been closed to the summer commercial fishery. This closure line has been adjusted over the years to its current position adopted by the Board of Fisheries (BOF) in 2002 (Figure 2). No summer commercial fishery occurred in 1991 because of staff constraints within the department and in 1992 the commercial fishery resumed. Regulations adopted during the March 1993 BOF meeting resulted in the fishery being utilized predominantly by small boats operated by residents of the region. The Norton Sound commercial crab fishery was designated as superexclusive effective June 27, 1994. This designation restricts a vessel that is registered for the Norton Sound king crab fishery to only prosecuting that fishery; the vessel cannot be used to take king crab in any other registration area during that registration year. Additionally, a vessel moratorium program was put into place through federal regulations before the 1996 season and was intended to precede a license limitation program. CDQ groups were allocated a portion of the summer harvest beginning in 1998, but CDQ harvest did not occur until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound king crab fishery on January 1, 2000. The program states that a vessel exceeding 32 feet in length overall must hold a valid crab license issued under LLP by the National Marine Fisheries Service. Changes in the fishery and market conditions resulted in harvest distribution moving eastward in Norton Sound in the mid-1990s (Appendix A9).

Harvest strategies have evolved over time as more has been learned about the Norton Sound red king crab stock, along with improved data and modeling techniques. In 1983, the BOF adopted a management plan for the department to manage the Norton Sound Section summer king crab fishery with exploitation rates for harvest at one-half of the exploitation rate common in other

commercial Bering Sea king crab fisheries. This management plan remained in place until the March 1999 BOF meeting when a new management plan was enacted. The new management plan was developed with historical performance data and a new length-based model that allowed yearly biomass estimate projections to be made versus the triennial biomass estimates that were previously used. A threshold biomass level was set, determining that 1.5 million lb of legal male red king crab would allow for a commercial fishery. If the legal biomass ranges from 1.5 to 2.5 million lb, the harvest rate would be no more than 5.0% so that the stock may rebuild. If legal biomass were 2.5 million lb or more, the harvest rate would be no more than 10.0%. In March 2012, this management plan was modified by the BOF with a new threshold level of legal male red king crab biomass set at 1.25 million lb. Exploitation rates were updated to reflect these criteria: when the estimated legal crab biomass ranges from 1.25 to 2.0 million lb, the exploitation rate can be no more than 7.0% of legal male biomass; for ranges of 2.0 to 3.0 million lb, the harvest rate can be no more than 13.0% of the legal estimated biomass; and for estimated legal biomass more than 3.0 million lb, the exploitation rate can be no more than 15.0% of the estimated legal biomass. During the March 2015 BOF meeting, the winter and summer commercial fisheries under the red king crab management plan were revised and an allocation scheme was enacted where the guideline harvest level (GHL) was separated with 8.0% allotted to the winter king crab fishery, 7.5% allotted to the CDQ fishery, and the remaining 84.5% allotted to the summer king crab fishery. Additionally, any commercial allocation not harvested during the winter commercial fishery is rolled over into the summer commercial king crab fishery allocation.

Regulations were also adopted at the 2008 March BOF meeting to reduce the handling of sublegal and female crab: a minimum of 4 escapement rings are required per pot, and each ring's minimum inside diameter of 4.5 inches located within 1 mesh size from the bottom of the pot, or at least one-half of the vertical surface of a square pot or sloping side-wall surface of a conical or pyramid pot, must be composed of no less than 6.5-inch stretched mesh. Additionally, beginning in 2008, it became standard practice for Norton Sound Seafood Products (NSSP) to purchase market-preferred sized red king crab (>5-inch CW) while other buyers and catcher-sellers continued to sell legal size and larger red king crab.

Due to concerns voiced by the Northern Norton Sound Fish and Game Advisory committee over recent declines in harvest rates, the BOF amended proposal 273 at its March 2020 meeting. This amendment changed the start of the winter commercial crab season from on or after January 15 to starting on February 1, and included closing commercial king crab fishing east of 167° west longitude (5 AAC 34.910(d)(3)). This closure took effect during the summer commercial crab season and expired in 2020.

COMMERCIAL FISHERY OVERVIEW: WINTER

A commercial winter through-the-ice king crab fishery has existed in Norton Sound since 1978. Until 2010, harvest occurred within 15 miles of Nome. To allow opportunity for subsistence and personal use king crab fishing an area roughly 2 miles west to 3 miles east of town and extending approximately 4 miles offshore (Figure 3) was closed to commercial harvest. Starting with the 2009–2010 winter season, crabbers in other Norton Sound villages started participating in the winter commercial crab fishery. In 2012, Shaktoolik and Unalakleet crabbers sold roughly a third of the total harvest, whereas Nome crabbers accounted for a quarter of the harvest sold. Since that time, ice conditions in eastern and southern Norton Sound have not been conducive to winter crab fishing. Consequently, Nome crabbers have harvested 90% or more of the total commercial winter

harvest since 2012. Crab harvested commercially outside of Nome are either shipped live to Nome or sold locally. In 2014 and 2015, a Nome crabber shipped some live crab to Aquatech in Anchorage. Harvest sales are thus generally divided in 3 main sectors: the seafood plant (NSSP) in Nome; the residents who purchase crab directly from fishery participants; and any other nonlocal markets such as Anchorage and South Korea.

Initially, the winter king crab season ran from January 1 to April 30. At its March 1985 meeting, the BOF set new season dates from November 15 to May 15 (Appendix A3). In March 2015, a proposal adopted by the BOF set new season dates with the start date to be established by emergency order on or after January 15 and regulatory closure on April 30 unless extended by emergency order. This action was intended to reduce potential pot loss and ghost fishing because shorefast ice is generally believed to be more stable from mid-January to April. In 2020, a proposal amended by the BOF set the season opening date on February 1 each year.

The winter commercial harvest peaked in 2015 (Appendix A3), which prompted several regulatory changes by the BOF at its March 2015 meeting. First, the board adopted regulations to include winter commercial harvest in the GHL and allocated 8.0% of the total open-access GHL to the winter commercial fishery. Additionally, regulations that went into effect in 2017 limited commercial permit holders to 20 pots and required each pot to have a current-year pot tag attached. In March 2020, the BOF prohibited the department from issuing replacement pot tags for the winter fishery. Not allowing pot tags to be reissued reduces the potential of lost pots because permit holders will be more cautious about where and when pots are set.

Dramatic increases in winter fishing efforts started in 2012 due to higher exvessel prices. From 1978 through 2011, an average of 9 permit holders fished commercially in winter and harvested an average of 7,000 lb. From 2012 to 2015, winter fishery participation more than tripled, with an average of 32 permit holders harvesting almost 55,000 lb. The average exvessel price for winter red king crab from 2012 to 2015 was \$6.68 per lb, more than twice the average price of \$3.25 per lb during the previous 5-year period (Appendix A3). Part of the reason for the increase in prices was due to the expansion of live king crab markets overseas, particularly in South Korea, where from 2013 to 2016, crab were sold live to Korea by 1 or 2 catcher-processors based in Nome.

Since 2017, the total commercial harvest (including CDQ) during the winter fishery has not exceeded 30,000 lb. Fishing efforts were hampered by poor ice and weather conditions in 2018, 2019, and 2024. Since 2020, NSSP, the region's major buyer, has not purchased winter caught commercial king crab. In 2024, the average price per lb set a new high at \$8.86, with king crab being sold locally by catcher-sellers. In 2024, there were 9 catcher-sellers that participated in the fishery harvesting a total of 13,675 lb, 37% greater than in 2023 (Appendix A3).

COMMERCIAL CATCH SAMPLING

From 1977 to 1999, commercial catch sampling was minimal and dependent upon the availability of department staff. The Norton Sound red king crab summer commercial fishery had an onboard observer conducting commercial catch sampling during the 2000 and 2001 seasons because there was a floating processor on the fishing grounds. The onboard observer sampled a larger percentage of the commercial harvest than shoreside sampling program. NSSP began operating in Nome in the summer of 2002, greatly improving access to sample crab. Crab were either sampled at NSSP or at the small boat harbor where those not selling to NSSP offloaded their catch. Excluding years 2020 and 2021, an average of 3,222 crab were sampled per year from 2013 to 2024. The summer red king crab commercial fishery onboard observer program started in 2012 and was discontinued

in 2019. This program was unsuccessful in providing data that were useful for management of the fishery. The data obtained were potentially biased because only a select few larger vessels operating in Norton Sound were willing or able to take onboard observers.

From 2016 to 2018, up to 500 crab were sampled during the winter commercial fishery; no sampling occurred from 2019–2024. No effort is currently made to sample catcher–seller harvests due to the small harvest and complex logistics involved. A winter observer program was started during the 2016 winter fishery, where observers collected information about handling nontarget (e.g., sublegal and female) red king crab. There were no observers from 2020 to 2024 due to similar reasons outlined in the summer fishery.

CDQ FISHERY OVERVIEW

Norton Sound Economic Development Corporation (NSEDC) and Yukon Delta Fisheries Development Association (YDFDA) divide the CDQ allocation of Norton Sound red king crab. Only those designated by these 2 CDQ groups may participate in this portion of the fishery. Fishery participants are required to have a CDQ fishing permit from CFEC and register their vessel with the department before they make their first delivery. Fishery participants operate under the authority of the CDQ group, and each CDQ group decides how their crab quota will be harvested. As in the previous 17 years, YDFDA has transferred its portion of the king crab CDQ quota to NSEDC to harvest.

During the March 2002 BOF meeting, regulations were adopted that affected the CDQ crab fishery. The Norton Sound CDQ crab fishery would begin at 12:00 PM, June 15, or no less than 72 hours after commercial gillnet or beach seine herring fishing was closed, whichever is later. The fishery would close at 12:00 p.m., June 28. After July 1, the commissioner could, by emergency order, open a CDQ fishery for any remaining allocation after the closure of the open-access fishery. At the March 2008 BOF meeting, the regulation requiring the herring fishery to be closed was repealed. The CDQ fishery can occur by emergency order before, during, or after the open-access fishery. Previously, the open-access fishery started on July 1, but the BOF passed a regulation in 2008 allowing the department to open the fishery by emergency order anytime beginning on or after June 15.

From 2016 to 2018, NSEDC chose to harvest its CDQ allocation during the winter king crab fishing season. Since 2019, except for a 2-year period when no CDQ harvest occurred (2020–2021), NSEDC has purchased all its CDQ allocation during the summer season.

SUBSISTENCE FISHERY OVERVIEW

Norton Sound residents utilize red king crab for subsistence, mainly during winter. Fishing occurs using handlines and pots through cracks or holes cut in the ice. To document trends in subsistence harvest, the BOF enacted a regulation in 1977 requiring subsistence fishery participants to obtain a permit before fishing. Participants record daily effort and catch using their permit. Since 1990, the winter subsistence crab fishery harvest has ranged from a low of 256 crab during the 2000–2001 season to a high of 12,152 crab during the 1989–1990 season (Appendix A5). Lack of success in the winter crab fishery during some years has been attributed to low recruitment, low effort, poor ice conditions, and changes in nearshore winter distribution of crab. All these factors, in addition to the use of more efficient gear (pots instead of hand lines), may affect the success of the winter fishery. Unstable ice conditions and record snowfalls adversely affected 1992–1993, 1996–1997, 2000–2001, 2003–2004, 2005–2006, 2018–2019, and 2023–2024 catches. For the last 10

years (2014–2023), winter subsistence harvest averaged 4,483 crab annually. Annual harvest had been on a yearly decline since the 2014–2015 season but returned to comparable historic levels during the 2021–2022 season due to more stable sea ice conditions, more participation in the fishery, and a higher estimated biomass.

SPORT FISHERY OVERVIEW

The department has conducted a mail survey to estimate sport fishing total harvest since 1977 and total catch since 1990. In addition, sport fishery participants are required to obtain a harvest log (like a subsistence permit) issued at the Nome office to fish for crab in the Norton Sound Section of Registration Area Q. Sport fishery participants have a daily limit of 6 male crab of legal commercial size (4.75-inch or greater CW). Harvest by the sport fishery has been sporadic in the last 10 years (2012–2023), with only 3 of the last 10 years reporting any effort or harvest. In the most recent of those years, 2021, sport fishery participants harvested 43 crab, and from 2022–2024, there was no reported catch (data on file with Arctic Management Group, ADF&G, Division of Commercial Fisheries, Nome).

2024 NORTON SOUND CRAB FISHERY

ABUNDANCE

The department’s length-based population model estimated harvestable legal (≥ 4.75 -inch carapace width) male crab biomass for the 2024 commercial crab fishery was 4.9 million lb. The North Pacific Fishery Management Council set an acceptable biological catch (ABC) of 513,000 lb for 2024, which includes the winter, summer, and CDQ commercial harvests; winter and summer estimated subsistence harvests; and estimated incidental mortality of nontarget crab discards. The department applied a harvest rate of 9.86% to the legal male biomass (LMB), yielding a GHL of 483,000 lb for the commercial red king crab fisheries (5 AAC 34.915). By regulation, 8.0% of the GHL is allocated to the winter commercial fishery, resulting in a 38,640-lb allocation (5 AAC 34.915(a)(1)(A)). The combined CDQ fishery is allocated 7.5% of the GHL, resulting in a 36,225 lb allocation.

WINTER OPEN ACCESS COMMERCIAL FISHERY

The 2024 winter open access fishery was opened on February 1. One buyer registered to buy crab: Arctic Circle Wild Seafoods based out of Kotzebue. However, this buyer made no purchases during the winter season. Eleven participants applied for catcher–seller permits to sell king crab dockside, with 9 making deliveries for a total of 142 landings (Table 1). The season’s catch per unit effort (CPUE) was lower (3 crab per pot) than either the 5- or 10-year average of 4 and 5, respectively (Appendix A3). The winter commercial fishery closed by regulation on April 30 with 13,675 lb sold, or 35% of the GHL.

SUMMER OPEN ACCESS COMMERCIAL FISHERY

The 2024 summer open access commercial king crab fishery was opened by emergency order at 12:00pm, June 15, with a GHL of 433,100 lb (24,965 lb of which was rolled over from the winter king crab season). Thirty vessels participated in the fishery, with NSSP and Pacific Seafoods Kodiak as the only 2 buyers. Additionally, 3 permit holders registered as catcher–sellers. A total of 95 landings were made and 421,301 lb (136,889 crab) were harvested, 97% of the GHL (Tables 2 and 3). CPUE was the highest on record with an average of 40 crab per pot, eclipsing last year’s

record 29 crab per pot average. The average weight was 3.1 lb. The season closed by emergency order at midnight July 13, with a season length of 29 days (Appendix A1).

COMMERCIAL HARVEST SUMMARY

Sales from the 9 catcher–sellers making deliveries achieved a record high average price of \$8.86 per lb, valuing the winter fishery for 2024 at \$110,885 (Appendix A3). During the summer open access and CDQ season, the average price paid per lb was \$7.42 resulting in a total exvessel value of 3.23 million dollars (Appendix A1).

CDQ FISHERY

In 2024, the CDQ fishery was opened June 15, but the first landing was not made until June 25. From then until the last landing on July 8, 4 CDQ-registered crabbers harvested 36,224 lb—1 lb less than their CDQ allocation of 36,225 lb (11,222 crab). NSEDC harvested the combined CDQ allocation for NSEDC and YDFDA. CPUE was 38 crab per pot and average weight was 3.2lb.

HARVEST AREAS AND COMMERCIAL CATCH SAMPLING

All reported harvest in the winter fishery was offshore of Nome east or west of the subsistence-only boundary (Figure 2). No commercial catch sampling occurred in the winter commercial fishery in 2024. During the summer commercial season department personnel sampled a total of 2,686 crab from the NSEDC and the Pacific Seafoods Kodiak plants for carapace length and shell age. The average carapace length was 122 mm (Appendix A2). No fisheries observers were deployed to sample the commercial harvest in 2024.

ENFORCEMENT

No Alaska Wildlife Troopers (AWT) made dockside checks during the 2024 summer or winter commercial crab fisheries. Fishers newly registered to fish area Q had their gear inspected by department staff for regulation compliance. Winter subsistence crabbers attempting to sell crab were contacted by department peace officers to correct their actions. Notices were also given from the department via radio, reminding subsistence fishers that selling subsistence crab is an unlawful activity and advising the public to verify that a seller of crab possesses the appropriate commercial permits to engage in this activity.

SUBSISTENCE FISHERY

For the 2023–2024 winter crab season, 107 of the 109 permits issued were returned. The 74 permit holders that fished reported catching 5,879 crab (including discards). This harvest was near the previous 10-year average harvest of nearly 6,000 crab (Appendix A5). The catch was above the 5-year average of approximately 5,000 crab. A total of 5,407 crab were retained, and the average number of crab retained per permit fished was 82. A total of 2 crab pots were reported lost during the winter crab season (Appendix A8). During the 2024 Norton Sound summer subsistence crab season, 35 of 39 permits issued were returned. The 20 permit holders that fished reported catching a total of 1,865 crab, averaging 75 crab per permit holder, which is comparable to the 5-year average (1,636 crab) and below the 10-year average (2,212 crab; Appendix A4). Four crab pots were reported lost during the summer crab season. A summary of summer and winter commercial and subsistence harvest can be found in Appendix A6.

SPORT FISHERY

In 2024, no harvest logs were issued.

ANNUAL TRAWL SURVEY

Red king crab abundance estimates from Norton Sound trawl surveys are an integral part of the length-based population model used to project the red king crab legal biomass and determine GHL for the commercial red king crab fishery. Starting in 2018, trawl surveys have taken place annually. Before 2018, they occurred every 3 years.

Results from the 2023 trawl survey were a legal male red king crab abundance of 2,887,533 crab and a prerecruit-1 abundance of 621,420 crab. Legal male red king crab abundance was the highest since the annual trawl survey began in 2017, whereas prerecruit-1 crab abundance was the second highest since 2017 (Menard et al. 2013; Appendix A7). Estimated prerecruit-2 abundance (27,619 crab) was the lowest in the history of the trawl survey. The 2024 trawl survey data will be used to project the 2025 legal male biomass and GHL.

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- NPFMC (North Pacific Fisheries Management Council). 2013. Stock assessment and fishery evaluation report for the king and Tanner crab fisheries of the Bering Sea and Aleutian Islands Regions. Stock Assessment and Fishery Evaluation Reports. North Pacific Fishery Management Council, Anchorage.
- Zheng, J., G. H. Kruse, and L. Fair. 1998. Using multiple data sets to assess red king crab *Paralithodes camtschaticus* in Norton Sound, Alaska: a length-based stock synthesis approach. Fishery Stock Assessment Models. Alaska Sea Grant College Program Report No. AK-SG-98-01, University of Alaska Fairbanks.

TABLES AND FIGURES

Table 1.—Daily catch for the winter open access commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, February 01–April 30, 2024.

Date ^a	Landings	Number of crab	Crab harvested (lb)	Cumulative total (lb)	Number of pots pulled	Average weight (lb)	CPUE
02/03	1	6	16.8	16.8	13	2.8	0.5
02/04	1	7	19.6	36	10	2.8	0.7
02/08	1	7	19.6	56	16	2.8	0.4
02/09	2	17	47.6	104	18	2.8	0.9
02/10	1	6	16.8	120	12	2.8	0.5
02/11	2	15	42.0	162	22	2.8	0.7
02/12	1	20	56.0	218	20	2.8	1.0
02/13	2	23	64.4	283	32	2.8	0.7
02/14	1	7	19.6	302	20	2.8	0.4
02/16	1	17	47.6	350	20	2.8	0.9
02/17	1	30	84.0	434	20	2.8	1.5
02/18	1	8	22.4	456	12	2.8	0.7
02/19	1	9	25.2	482	20	2.8	0.5
02/20	2	60	168.0	650	26	2.8	2.3
02/22	1	3	8.4	658	20	2.8	0.2
02/23	1	7	19.6	678	20	2.8	0.4
02/24	4	116	324.8	1,002	42	2.8	2.8
02/25	1	5	14.0	1,016	2	2.8	2.5
02/26	1	45	126.0	1,142	13	2.8	3.5
02/28	1	20	56.0	1,198	13	2.8	1.5
02/29	2	62	173.6	1,372	41	2.8	1.5
03/01	2	26	72.8	1,445	19	2.8	1.4
03/02	2	28	78.4	1,523	20	2.8	1.4
03/03	3	175	490.0	2,013	24	2.8	7.3
03/04	1	60	168.0	2,181	24	2.8	2.5
03/05	1	10	28.0	2,209	17	2.8	0.6
03/06	4	135	378.0	2,587	48	2.8	2.8
03/07	2	61	170.8	2,758	39	2.8	1.6
03/09	3	81	226.8	2,985	45	2.8	1.8
03/10	1	50	140.0	3,125	19	2.8	2.6
03/11	3	67	187.6	3,312	29	2.8	2.3
03/12	1	19	53.2	3,366	18	2.8	1.1
03/13	2	42	117.6	3,483	16	2.8	2.6
03/14	2	38	106.4	3,590	38	2.8	1.0
03/15	2	110	308.0	3,898	30	2.8	3.7
03/16	2	60	168.0	4,066	12	2.8	5.0
03/17	4	288	806.4	4,872	52	2.8	5.5
03/18	2	83	232.4	5,104	24	2.8	3.5
03/20	2	49	137.2	5,242	14	2.8	3.5
03/21	3	132	369.6	5,611	40	2.8	3.3
03/22	1	70	196.0	5,807	6	2.8	11.7
03/23	1	47	131.6	5,939	18	2.8	2.6
03/24	3	35	98.0	6,037	24	2.8	1.5
03/25	1	41	114.8	6,152	18	2.8	2.3
03/26	6	120	336.0	6,488	44	2.8	2.7

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Table 1.–Page 2 of 2.

Date ^a	Landings	Number of crab	Crab harvested (lb)	Cumulative total (lb)	Number of pots pulled	Average weight (lb)	CPUE
03/27	2	64	179.2	6,667	30	2.8	2.1
03/28	1	22	61.6	6,728	5	2.8	4.4
03/29	1	46	128.8	6,857	18	2.8	2.6
03/30	1	10	28.0	6,885	6	2.8	1.7
03/31	1	27	75.6	6,961	12	2.8	2.3
04/01	1	42	117.6	7,078	18	2.8	2.3
04/02	1	35	98.0	7,176	6	2.8	5.8
04/03	1	47	131.6	7,308	5	2.8	9.4
04/04	2	124	347.2	7,655	32	2.8	3.9
04/05	2	91	254.8	7,910	24	2.8	3.8
04/07	4	201	562.8	8,473	21	2.8	9.6
04/08	1	48	134.4	8,607	8	2.8	6.0
04/09	4	274	767.2	9,374	37	2.8	7.4
04/11	2	22	61.6	9,436	12	2.8	1.8
04/12	1	44	123.2	9,559	6	2.8	7.3
04/13	4	124	347.2	9,906	36	2.8	3.4
04/14	2	54	151.2	10,058	14	2.8	3.9
04/16	1	16	44.8	10,102	6	2.8	2.7
04/17	4	197	551.6	10,654	26	2.8	7.6
04/18	1	20	56.0	10,710	1	2.8	20.0
04/20	4	65	322.0	11,032	25	2.8	2.6
04/21	1	41	114.8	11,147	12	2.8	3.4
04/23	2	92	257.6	11,404	21	2.8	4.4
04/24	1	34	95.2	11,500	9	2.8	3.8
04/25	1	15	42.0	11,542	10	2.8	1.5
04/26	3	82	229.6	11,771	30	2.8	2.7
04/27	1	40	112.0	11,883	18	2.8	2.2
04/28	4	318	890.4	12,774	48	2.8	6.6
04/30	5	322	901.6	13,675	47	2.8	6.9
Total	142	4,834	13,675	13,675	1,593	2.8	3.0

Source: Fish ticket data.

^a Information includes CDQ data.

Table 2.—Daily catch for the summer commercial open-access and CDQ king crab harvest, Norton Sound Section, Eastern Bering Sea, June 15–July 13, 2024.

Date ^a	Landings	Number of crab	Lb of crab	Cumulative total (lb)	Number of pots pulled	Average weight (lb)	CPUE
06/19	1	303	939.3	939	9	3.1	34
06/24	3	2,744	8,926.0	9,865	116	3.3	24
06/25	12	19,340	59,303.0	69,168	388	3.1	50
06/26	7	15,232	48,729.1	117,897	426	3.2	36
06/27	5	4,265	13,220.1	131,118	155	3.1	28
06/28	16	15,261	45,784.0	176,902	556	3.0	27
06/29	3	2,594	8,008.0	184,910	82	3.1	32
06/30	11	11,324	34,795.0	219,705	258	3.1	44
07/01	12	10,183	31,214.0	250,919	404	3.1	25
07/02	2	1,384	4,416.0	255,335	47	3.2	29
07/03	1	1,101	3,520.0	258,855	18	3.2	61
07/07	5	7,627	23,667.0	282,522	155	3.1	49
07/08	6	7,586	23,013.0	305,535	190	3.0	40
07/09	7	15,317	47,582.0	353,117	267	3.1	57
07/10	3	9,717	30,560.0	383,677	113	3.1	86
07/11	3	5,852	18,282.0	401,959	102	3.1	57
07/12	5	10,549	30,677.0	432,636	132	2.9	80
07/19	3	7,732	24,889.0	457,525	273	3.2	28
Total	105	148,111	457,525.0	457,525	3,691	3.1	40

Note: Both fisheries closed on July 13th, but the last open access delivery was made on July 19th, and the last CDQ delivery was made on July 8th.

^a Information includes CDQ data.

Table 3.–Summer commercial open-access and CDQ harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2024.

Statistical area	Number of crab	Lb of crab	Number of pots pulled	CPUE	Average weight (lb)
616331	145	394	36	4	2.7
616401	204	566	40	5	2.8
626331	221	618	24	9	2.8
626401	11,847	34,025	424	28	2.9
636330	1,914	5,665	80	24	3.0
636401	38,283	114,067	965	40	3.0
646301	1,982	6,144	38	52	3.1
646401	6,144	20,150	180	34	3.3
656330	9,861	31,660	363	27	3.2
656401	57,748	183,193	1,178	49	3.2
666330	1,606	5,065	50	32	3.2
666401	14,551	45,715	226	64	3.1
666402	3,605	10,263	87	41	2.8
Total	148,111	457,525	3,691	40	3.1

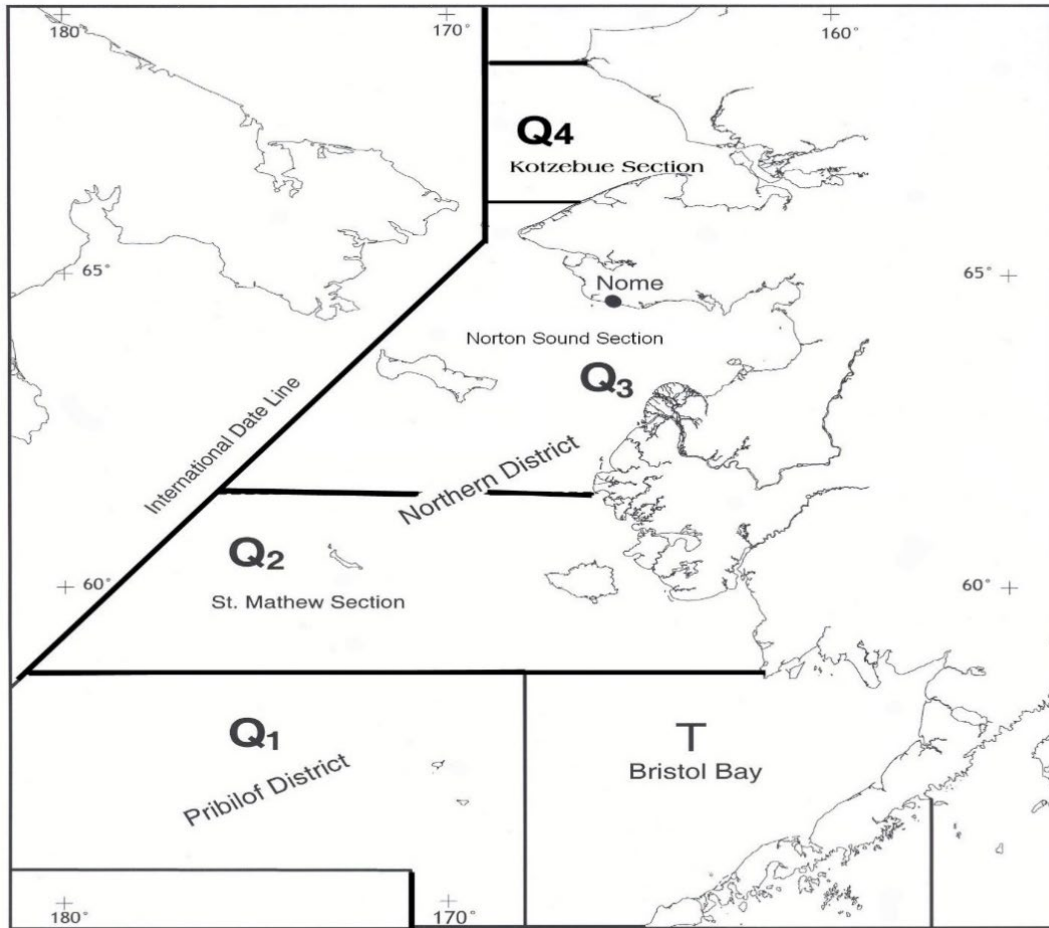


Figure 1.—King crab fishing districts and sections of Statistical Area Q.

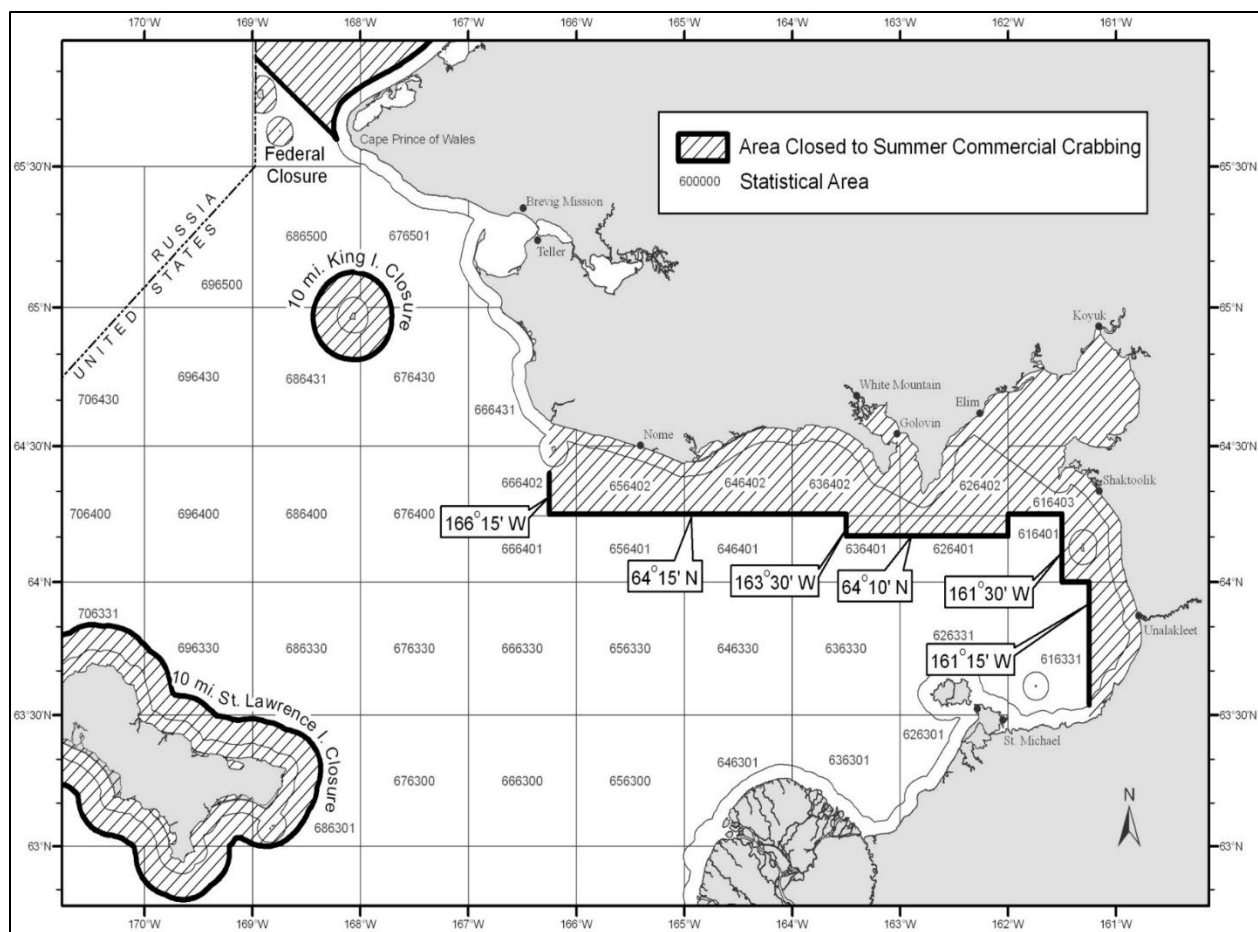


Figure 2.—Closed waters area in effect for the Norton Sound summer commercial crab fishery.

Note: Line drawn around the coastline delineates the 3-mile state waters zone.

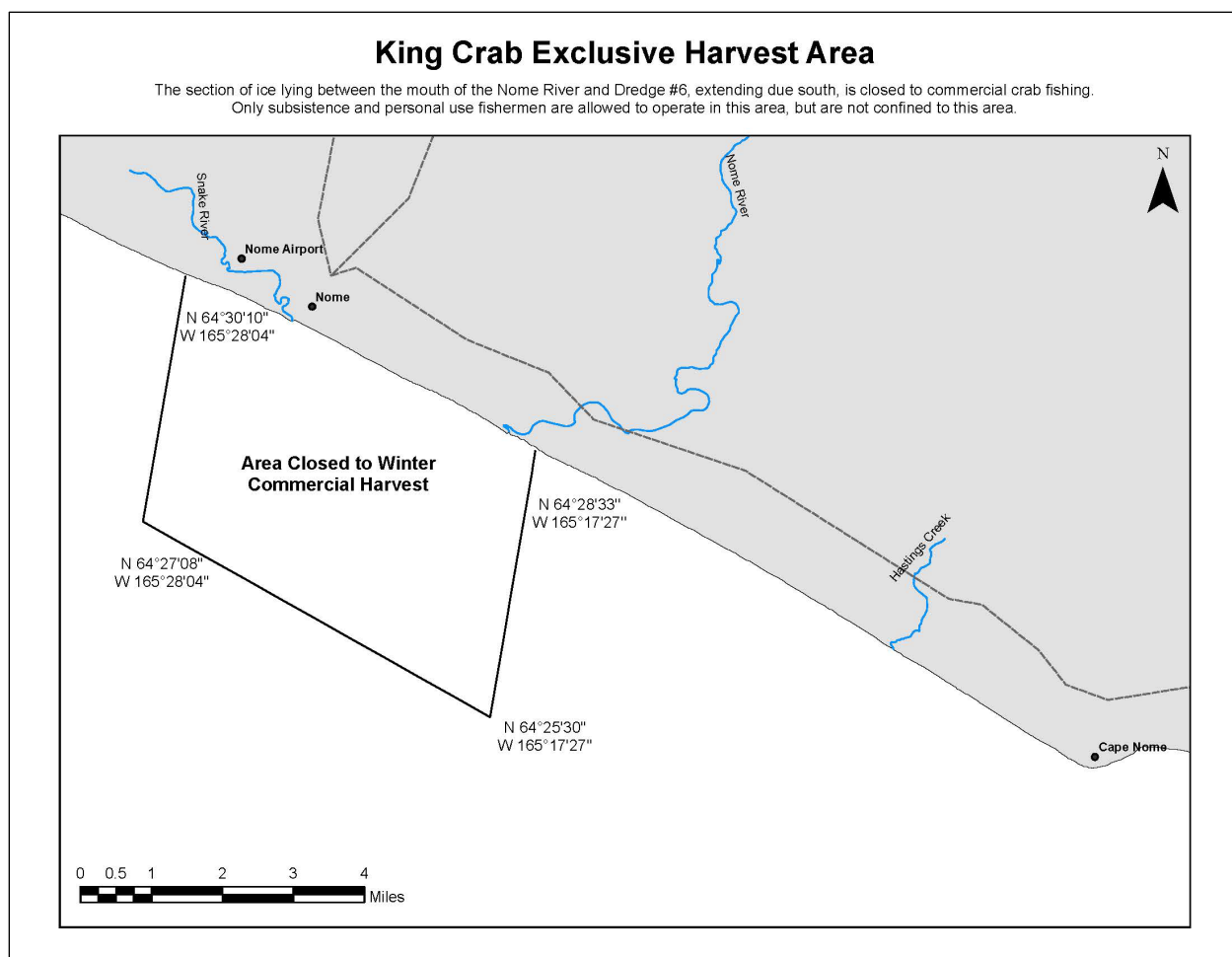


Figure 3.—Closed waters area in effect for the Norton Sound winter commercial crab fishery.

APPENDIX A

Appendix A1.—Historical summer commercial red king crab fishery catch statistics and economic performance, Norton Sound Section, Eastern Bering Sea, 1990–2024.

Year	GHL (lb) ^b	Commercial harvest (lb) ^{a,b}		Number of			Number of pots		CPUE	Avg weight (lb)	Exvessel price/lb	Fishery value (millions \$)	Days	Season length dates	
		Open access	CDQ	Vessels	Permits	Landings	Registered	Pulls						Open access	CDQ
1990	0.20	0.19	^d	4	4	^c	1,388	3,172	19	3.1	^c	^c	4	8/01–8/05	^d
1991	0.34						No summer fishery								
1992	0.34	0.07	^d	27	27	^c	2,635	5,746	4	3.0	1.75	0.130	2	8/01–8/03	^d
1993	0.34	0.33	^d	14	20	208	560	7,063	16	2.9	1.28	0.430	52	7/01–8/28	^d
1994	0.34	0.32	^d	34	52	407	1,360	11,729	9	3.0	2.02	0.646	31	7/01–7/31	^d
1995	0.34	0.32	^d	48	81	665	1,900	18,782	6	3.0	2.87	0.926	67	7/01–9/05	^d
1996	0.34	0.22	^d	41	50	264	1,640	10,453	7	3.0	2.29	0.519	57	7/01–9/03	^d
1997	0.08	0.09	^d	13	15	100	520	2,982	11	2.8	1.98	0.184	44	7/01–8/13	^d
1998	0.08	0.03	0.00	8	11	50	360	1,639	7	2.8	1.47	0.041	65	7/01–9/03	^d
1999	0.08	0.02	0.00	10	9	53	360	1,630	5	2.7	3.08	0.073	66	7/01–9/04	^d
2000	0.33	0.29	0.01	15	22	201	560	6,345	18	2.7	2.32	0.715	91	7/01–8/29	9/01–9/29
2001	0.30	0.28	0.00	30	37	319	1,200	11,918	8	2.9	2.34	0.674	97	7/01–9/01	9/01–9/09
2002	0.24	0.24	0.01	32	49	201	1,120	6,491	14	3.0	2.81	0.729	77	7/01–8/06	8/9–9/3
2003	0.25	0.25	0.01	25	43	236	960	8,494	11	2.8	3.09	0.823	68	7/01–8/13	6/15–6/28; 8/15–8/24
2004	0.35	0.31	0.03	26	39	227	1,120	8,066	15	2.8	3.12	1.063	51	7/01–8/08	6/15–6/28 6/15–6/28;
2005	0.37	0.37	0.03	31	42	255	1,320	8,867	16	2.9	3.14	1.264	73	7/01–8/15	8/17–8/27
2006	0.45	0.42	0.03	28	40	249	1,120	8,867	17	3.0	2.26	1.021	68	7/01–8/22	6/15–6/28
2007	0.32	0.29	0.02	38	30	251	1,200	9,118	12	2.8	2.49	0.750	52	7/01–8/17	6/15–6/28
2008	0.41	0.36	0.03	23	30	248	920	8,721	16	2.8	3.20	1.231	73	6/23–8/18	8/17–9/03

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Year	Commercial harvest (lb) ^{a,b}								Avg		Fishery		Season length dates		
	GHL (lb) ^b	Open access	CDQ	Number			Number of pots		CPUE	weight (lb)	Exvessel price/lb	value (millions \$)	Days	Open	
				Vessels	Permits	Landings	Registered	Pulls						access	CDQ
2009	0.38	0.37	0.03	22	27	359	920	11,934	12	2.8	3.17	1.225	98	6/15–9/20	6/15–7/28
2010	0.40	0.39	0.03	23	32	286	1,040	9,698	15	2.8	3.73	1.528	58	7/01–8/24	6/28–7/16
2011	0.36	0.37	0.03	24	25	173	1,040	6,808	21	2.8	5.23	2.016	33	6/28–7/30	6/28–7/08
2012	0.47	0.44	0.03	40	29	312	1,200	10,041	16	2.9	5.41	2.556	72	6/29–8/11	6/29–9/08
2013	0.50	0.37	0.02	37	33	460	1,420	15,058	9	3.0	5.63	2.165	74	7/03–9/14	7/03–9/14
2014	0.38	0.36	0.03	52	33	309	1,560	10,127	13	3.0	5.12	1.960	52	6/25–8/02	6/25–8/15
2015	0.39	0.37	0.03	42	36	251	1,480	8,356	17	2.8	5.40	2.130	26	6/29–7/24	6/29–7/24
2016	0.52	0.46	0.04	36	38	229	1,520	8,009	17	3.0	6.50	2.710	25	6/27–7/21	6/27–7/08
2017	0.50	0.45	0.04	36	36	270	1,640	9,440	14	3.0	6.25	2.560	30	6/26–7/25	winter only
2018	0.32	0.30	0.02	33	33	256	1,400	8,797	10	3.3	6.25	1.846	35	6/24–7/28	winter only
2019	0.15	0.08	0.00	24	28	153	1,096	5,436	5	3.0	6.98	0.514	71	6/25–9/03	6/25–9/03
2020 ^c	0.17	0.00	0.00	0	0	0	0	0	0	0.0	0.00	0.000	0	6/15–9/03	none
2021 ^c	0.29	0.00	0.00	0	0	0	0	0	0	0.0	0.00	0.000	0	6/15–9/03	none
2022	0.34	0.30	0.03	27	31	153	1,240	5,154	24	2.5	12.00	3.708	40	6/15–7/24	7/08–7/20
2023	0.35	0.39	0.03	25	31	150	1,240	5,085	29	2.8	6.49	2.688	29	6/21–7/19	7/08–7/17
2024	0.47	0.42	0.04	30	32	105	1,280	3,691	40	3.1	7.42	3.230	29	6/15–7/13	7/08–7/15

Note: Starting in 2016, the guideline harvest level (GHL) and the harvests include the winter commercial fishery, but all other information is for the summer only

^a Deadloss included in total.

^b Millions of lb.

^c Information not available.

^d No CDQ harvest was allocated until 1998, and no harvest occurred until 2000.

^e Season was open by regulation, but NSEDC did not purchase any crab, and no catcher-seller registered to sell crab.

Appendix A2.—Average length and percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples in Norton Sound Section, Bering Sea, 1990–2024.

Year	Average length (mm)	Recruits ^a	Postrecruits ^b	Total percentage
1990	121	21	79	100
1991 ^c	—	—	—	—
1992	120	28	72	100
1993	119	31	69	100
1994	119	20	80	100
1995	118	36	64	100
1996	117	30	70	100
1997	116	49	51	100
1998	117	32	68	100
1999	118	42	58	100
2000	116	41	60	101
2001	119	33	67	100
2002	120	33	67	100
2003	117	48	52	100
2004	117	49	51	100
2005	118	36	64	100
2006	119	25	75	100
2007	117	45	55	100
2008	115	45	55	100
2009	116	43	57	100
2010	115	49	51	100
2011	116	43	57	100
2012	118	33	67	100
2013	120	32	68	100
2014	120	35	65	100
2015	115	58	42	100
2016	118	36	64	100
2017	120	25	75	100
2018	123	16	84	100
2019	119	38	62	100
2020 ^c	—	—	—	—
2021 ^c	—	—	—	—
2022	113	58	42	100
2023	117	36	64	100
2024	122	17	83	100

^a Recruits are all new-shell, legal size, male king crab of carapace length <116 mm.

^b Postrecruits are all other male king crab of legal size.

^c No summer commercial fishery.

Appendix A3.—Historical winter commercial red king crab fishery catch statistics and economic performance, Norton Sound Section, Eastern Bering Sea, 1990–2024.

Year	Commercial harvest (lb) ^a	Permits fished	Landings	Pot pulls	CPUE	Average weight (lb)	Exvessel price/lb	Fishery value (\$)	Season dates ^b
1990	9,792	12	199	257	14	2.8	5.33 ^c	19,327 ^c	11/15–5/15
1991	10,064	11	187	609	6	2.7	5.00 ^c	19,000 ^c	11/15–5/15
1992	21,177	13	287	1,823	4	2.8	3.60	76,283	11/15–5/15
1993	4,926	8	66	^d	^d	2.8	2.84 ^c	14,000 ^c	11/15–5/15
1994	17,214	25	183	1,018	6	3.0	3.01	51,709	11/15–5/15
1995	21,813	42	345	3,302	2	2.9	3.09	66,190	11/15–5/15
1996	5,064	9	68	292	7	2.5	3.16	14,838	11/15–5/15
1997	^e	2	^e	^e	^e	^e	^e	^e	11/15–5/15
1998	2,349	5	31	749	1	2.4	3.57	8,168	11/15–5/15
1999	7,041	5	61	425	6	2.6	3.69	24,777	11/15–5/15
2000	7,894	10	90	1,230	2	2.6	3.72	29,300	11/15–5/15
2001	2,943	3	21	534	2	2.7	3.60	10,582	11/15–5/15
2002	6,860	11	68	1,247	2	2.7	3.53	22,682	11/15–5/15
2003	16,827	13	128	1,960	3	2.5	3.52	57,577	11/15–5/15
2004 ^f	1,293	2	16	397	1	2.5	3.95	5,110	11/15–5/15
2005	5,619	4	51	1,076	2	2.7	4.52	25,054	11/15–5/15
2006	^e	1	^e	^e	^e	^e	^e	^e	11/15–5/15
2007	8,023	8	106	926	4	2.4	3.06	24,464	11/15–5/15
2008	14,676	9	129	1,008	6	2.5	3.03	43,664	11/15–5/15
2009	12,348	7	130	1,282	4	2.5	3.01	32,649	11/15–5/15
2010	12,028	10	184	1,848	3	2.5	3.54	41,265	11/15–5/15
2011	8,669	5	129	1,747	2	2.6	3.59	30,776	11/15–5/15
2012	24,142	35	319	1,668	5	2.6	6.47	150,569	11/15–5/15
2013	62,179	26	495	6,093	4	2.8	6.73	402,256	11/15–5/15
2014	34,587	21	323	4,037	4	2.3	6.94	234,291	11/15–5/15
2015	98,750	44	664	7,314	6	2.4	6.57	617,434	11/15–4/30
2016 ^g	79,986	48	471	5,459	5	2.7	7.22	559,803	2/15–4/21
2017 ^g	77,843	88	435	3,225	8	3.0	6.73	483,797	2/07–3/22
2018 ^g	29,118	43	322	2,566	4	3.2	6.95	186,044	3/03–4/30
2019	3,295	6	21	195	5	3.1	6.97	20,699	2/25–4/30
2020 ^c	^e	1	^e	^e	^e	^e	^e	^e	2/29–4/30

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Year	Commercial harvest (lb) ^a	Permits fished	Landings	Pot pulls	CPUE	Average weight (lb)	Exvessel price/lb	Fishery value(\$)	Season dates ^b
2021	922	3	18	89	3	2.9	6.77	4,471	2/01–4/30
2022	7,683	8	86	765	3	2.8	8.25	55,614	2/01–4/30
2023	10,013	7	90	659	5	2.8	8.84	84,815	2/01–4/30
2024	13,675	9	142	1,593	3	2.8	8.86	110,855	2/01–4/30
Average									
2019–23	5,478	5	54	427	4	3.0	8	41,400	
Average									
2014–23	38,022	27	270	2,701	5	3.0	7	249,663	

^a Deadloss included in total.

^b Prior to 2015, season dates were from November 15 of the previous year to May 15 of the current year. In 2015, season dates were from November 15, 2014, to April 30, 2015.

^c Exvessel value is price per crab. Fishery value was derived by multiplying price per crab by number of crab harvested.

^d Information is not available.

^e Information is confidential because less than 3 permit holders fished.

^f Confidentiality was waived by the fishers.

^g Information includes catch statistics and fishery values from the winter CDQ fishery.

Appendix A4.– Summer subsistence red king crab harvest statistics, Norton Sound, Eastern Bering Sea, 2004–2024.

Year ^a	Permits issued	Permits returned	Permits fished	Crab caught ^b	Crab harvested ^c	Multiplier ^d	Lb harvested ^d	Average number kept/ permits fished
2004	38	18	5	996	350	2.3	805	70
2005	14	12	4	753	304	2.4	727	76
2006	6	4	3	67	62	2.5	155	21
2007	19	19	5	1,425	1,008	2.3	2,318	202
2008	30	30	14	1,816	1,176	2.3	2,705	84
2009	20	20	13	1,874	653	2.3	1,502	50
2010	27	27	15	1,086	660	2.3	1,518	44
2011	43	42	27	4,026	2,658	2.3	6,193	98
2012	45	44	13	1,346	912	2.4	2,189	70
2013	47	46	26	3,102	1,865	2.5	4,663	72
2014	40	40	25	2,185	1,210	2.5	3,025	48
2015	31	30	14	5,812	2,862	2.3	6,525	204
2016	29	29	16	2,952	1,930	2.5	4,825	121
2017	39	39	17	2,164	1,777	2.5	4,443	105
2018	32	32	14	828	673	2.8	1,884	48
2019	38	38	15	461	315	2.5	788	21
2020	64	64	17	1,752	1,054	2.3	2,424	62
2021	42	42	13	823	718	2.4	1,723	55
2022	38	37	8	3,133	1,385	2.0	2,770	173
2023	47	47	20	2,011	1,499	2.3	3,448	75
2024	39	35	20	1,865	1,504	2.6	3,910	75
Average								
2019–23	46	46	15	1,636	994	2.3	2,231	77
Average								
2014–23	40	40	16	2,212	1,342	2.4	3,185	91

Note: There were no recorded summer subsistence harvests prior to 2004.

^a The summer subsistence fishery is open June through November.

^b The number of crab actually caught; some may have been released.

^c The number of crab harvested is the number of crab retained.

^d Multiplier is the average weight of crab from the summer commercial fishery of the same year minus 0.5 pound, except in 2020 and 2021 where the average weight of crab from the winter commercial fishery of the same year minus 0.5 pound was used because summer commercial harvest did not occur. Pounds harvested are derived by multiplying the total number of harvested crab by the multiplier.

Appendix A5.—Winter subsistence red king crab harvest statistics, Norton Sound, Eastern Bering Sea, 1990–2024.

Winter ^a	Permits issued	Permits returned	Permits fished	Crab caught ^b	Crab harvested ^c	Multiplier ^d	Lb harvested ^d	Average number kept/ permits fished
1989–90	136	118	107	16,635	12,152	2.3	27,464	114
1990–91	119	104	79	9,295	7,366	2.2	15,911	93
1991–92	158	105	105	15,051	11,736	2.3	27,345	112
1992–93	88	79	37	1,193	1,097	2.3	2,479	30
1993–94	118	95	71	4,894	4,113	2.5	10,241	58
1994–95	166	131	97	7,777	5,426	2.4	12,968	56
1995–96	84	44	35	2,936	1,679	2.0	3,408	48
1996–97	38	22	13	1,617	745	2.0	1,512	57
1997–98	94	73	64	20,327	8,622	1.9	16,296	135
1998–99	95	80	71	10,651	7,533	2.1	15,744	106
1999–00	98	64	52	9,816	5,723	2.1	11,961	110
2000–01	50	27	12	366	256	2.2	558	21
2001–02	114	101	67	8,805	3,669	2.2	7,888	55
2002–03	107	73	64	9,052	4,140	2.0	8,114	65
2003–04	96	77	41	1,775	1,181	2.0	2,338	29
2004–05	170	102	60	6,496	3,973	2.2	8,542	66
2005–06	98	97	67	2,083	1,239	2.4	2,974	18
2006–07	129	127	116	21,444	10,690	1.9	20,525	92
2007–08	139	137	108	18,621	9,485	2.0	19,255	88
2008–09	105	105	70	6,971	4,752	2.0	9,456	68
2009–10	125	123	85	9,004	7,044	2.0	14,018	83
2010–11	148	148	95	9,183	6,640	2.1	13,811	70
2011–12	204	204	138	11,341	7,371	2.1	15,774	53
2012–13	149	148	104	21,752	7,662	2.3	17,240	74
2013–14	103	103	75	5,421	3,252	1.8	5,886	43
2014–15	155	154	108	9,849	7,660	1.9	14,631	72
2015–16	139	139	92	6,584	5,408	2.2	11,898	59
2016–17	163	163	109	7,185	6,039	2.5	15,098	55
2017–18	123	121	82	5,767	4,424	2.7	11,945	54
2018–19	101	101	60	2,080	1,545	2.6	4,017	26
2019–20	80	79	50	814	548	2.3	1,260	11
2020–21	103	103	76	4,655	2,892	2.4	6,941	38
2021–22	125	125	80	10,752	7,656	2.3	17,609	96
2022–23	113	110	66	6,611	5,407	2.3	12,436	82
2023–24	109	107	74	5,879	4,751	2.3	10,927	64
Average								
2019–23	104	104	66	4,982	3,610	2.0	8,453	51
Average								
2014–23	121	120	80	5,972	4,483	2.0	10,172	54

^a The winter subsistence fishery is open December through May.

^b The number of crab actually caught: some may have been released.

^c The number of crab harvested is the number of crab retained.

^d Multiplier is the average weight of crab from the winter commercial fishery of the same year minus 0.5 lb.

Appendix A6.—Summer and winter, commercial and subsistence red king crab harvests in lb, Norton Sound, Eastern Bering Sea, 1990–2024.

Year	Commercial					Subsistence				Combined total harvest ^b
	Summer harvest	Winter harvest	Winter/ total harvest (%)	Total harvest	Guideline harvest level	Summer harvest ^a	Winter harvest ^a	Winter/ total harvest (%)	Total harvest	
1990	192,831	9,792	5	202,623	200,000	c	27,464	100	27,464	230,087
1991	^d	10,064	100	10,064	^d	c	15,911	100	15,911	25,975
1992	74,029	21,177	22	95,206	340,000	c	27,345	100	27,345	122,551
1993	335,790	4,926	1	340,716	340,000	c	2,479	100	2,479	343,195
1994	327,858	17,214	5	345,072	340,000	c	10,241	100	10,241	355,313
1995	322,676	21,813	6	344,489	340,000	c	12,968	100	12,968	357,457
1996	224,231	5,064	2	229,295	340,000	c	3,408	100	3,408	232,703
1997	92,988	^c	c	92,988	80,000	c	1,512	100	1,512	94,500
1998	29,684	2,349	7	32,033	80,000	c	16,296	100	16,296	48,329
1999	23,553	7,041	23	30,594	80,000	c	15,744	100	15,744	46,338
2000	312,524	7,894	2	320,418	336,000	c	11,961	100	11,961	332,379
2001	288,199	2,943	1	291,142	303,000	c	558	100	558	291,700
2002	259,601	6,860	3	266,461	248,000	c	7,888	100	7,888	274,349
2003	267,207	16,827	6	284,034	253,000	c	8,114	100	8,114	292,148
2004	340,746	1,293	0	342,039	326,500	805	2,338	74	3,143	345,182
2005	400,804	5,619	1	406,423	370,000	727	8,542	92	9,269	415,692
2006	451,748	^c	c	451,748	454,000	155	2,974	95	3,129	454,877
2007	312,875	8,023	3	320,898	315,000	2,318	20,525	90	22,843	343,741
2008	395,135	14,676	4	409,811	412,000	2,705	19,255	88	21,959	431,770
2009	397,587	12,348	3	409,935	375,000	1,502	9,456	86	10,958	420,893
2010	417,304	12,028	3	429,332	400,000	1,518	14,018	90	15,536	444,868
2011	400,840	8,669	2	409,509	358,000	6,193	13,811	69	20,004	429,513
2012	475,990	24,142	5	500,132	465,450	2,189	15,774	88	17,963	518,095
2013	391,863	62,179	14	454,042	495,600	4,663	17,240	79	21,902	475,944
2014	389,008	34,587	8	423,595	382,800	3,025	5,886	66	8,911	432,506
2015	401,115	98,750	20	499,865	394,600	6,583	14,613	69	21,196	514,478

-continued-

Year	Commercial					Subsistence				Combined total harvest ^b
	Summer harvest	Winter harvest	Winter/total harvest (%)	Total harvest	Guideline harvest level	Summer harvest ^a	Winter harvest ^a	Winter/total harvest (%)	Total harvest	
2016	420,159	79,986	16	500,145	517,200	4,825	11,898	71	16,723	516,868
2017	411,739	77,843	16	489,582	496,800	4,443	15,098	77	19,541	509,123
2018	298,396	29,118	9	327,514	319,410	1,884	11,945	86	13,829	341,343
2019	75,023	3,295	4	78,318	150,600	788	4,017	84	4,805	83,123
2020	0	^c	100	^c	170,100	2,424	1,260	34	3,684	3,684
2021	0	922	100	922	314,400	1,723	6,941	80	8,664	9,586
2022	317,173	7,683	2	324,856	341,600	2,770	17,609	86	20,379	345,235
2023	416,469	10,013	2	426,482	392,500	3,448	12,436	78	15,884	442,366
2024	457,525	13,675	3	471,200	483,000	3,910	10,927	74	14,837	486,037
Average 2019–23	161,733	5,478	42	207,645	273,840	2,231	8,453	73	10,683	176,799
Average 2014–23	272,908	38,022	28	341,253	348,001	3,191	10,170	73	13,362	319,831

^a Harvest in lb is derived by multiplying number of crab by 0.5 lb less than the average weight from the respective commercial fishery.

^b Combined total harvest is from summer and winter, commercial and subsistence red king crab harvests.

^c There were no recorded summer subsistence harvests prior to 2004.

^d There was no summer commercial fishery, and therefore no GHL was set.

^e Information is confidential.

Appendix A7.—The results of the population assessment trawl surveys conducted for red king crab in Norton Sound since 1990.

Year	Date	Research agency	Population abundance estimates ^a (number of crab)			Legal male biomass (lb) ^d	Standard error (number of crab)		
			Pre-2 males ^b	Pre-1 males ^b	Legal males ^c		Pre-2 males ^b	Pre-1 males ^b	Legal males ^c
1991	8/22–08/30	NMFS	386,338	408,241	1,545,558	4,636,674	297,059	157,018	450,814
1996	9/07–09/18	ADF&G	395,888	277,595	528,431	1,585,293	243,594	78,712	157,909
1999	7/28–08/07	ADF&G	96,295	582,799	1,542,589	4,627,767	56,017	165,689	318,731
2002	7/27–08/06	ADF&G	393,689	482,815	740,450	2,221,350	85,797	81,271	81,271
2006	7/25–08/08	ADF&G	937,083	571,890	718,379	2,155,137	551,144	153,272	105,487
2008	7/24–08/11	ADF&G	795,777	689,843	811,727	2,435,181	187,516	120,153	152,145
2011	7/18–08/15	ADF&G	431,153	311,550	1,310,634	3,931,902	151,713	87,866	123,310
2014	7/18–07/30	ADF&G	1,547,538	2,110,274	1,747,720	5,243,160	643,563	1,474,574	912,399
2017	7/28–08/08	ADF&G	258,235	288,615	941,797	2,825,391	78,381	100,434	270,551
2018	7/22–08/09	ADF&G	212,664	151,903	303,806	911,418	58,798	61,909	93,597
2019	7/17–07/27	ADF&G	1,215,222	106,332	407,525	1,222,575	764,608	53,261	132,697
2020	7/30–08/14	ADF&G	850,655	349,376	227,854	683,562	262,534	54,844	103,037
2021	7/19–8/03	ADF&G	683,562	789,894	729,133	2,187,399	441,496	391,333	531,956
2023	7/21–7/30	ADF&G	27,619	621,420	2,887,533	8,662,599	27,619	222,844	891,092

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

^b Pre-2 male crab were defined as 76–89 mm in carapace length (CL) and pre-1 male crab were defined as sublegal crab greater than or equal to 90 mm in CL.

^c Legal male red king crab were defined as greater than or equal to 121 mm (4.75 inches) in carapace width (CW) for all ADF&G trawl surveys (except for 1996, when legal male crab were defined as at least 105 mm CL), and greater than or equal to 104 mm CL for the NMFS trawl survey.

^d Legal male biomass is estimated by multiplying the population abundance estimate of legal males by an average weight of 3.0 lb.

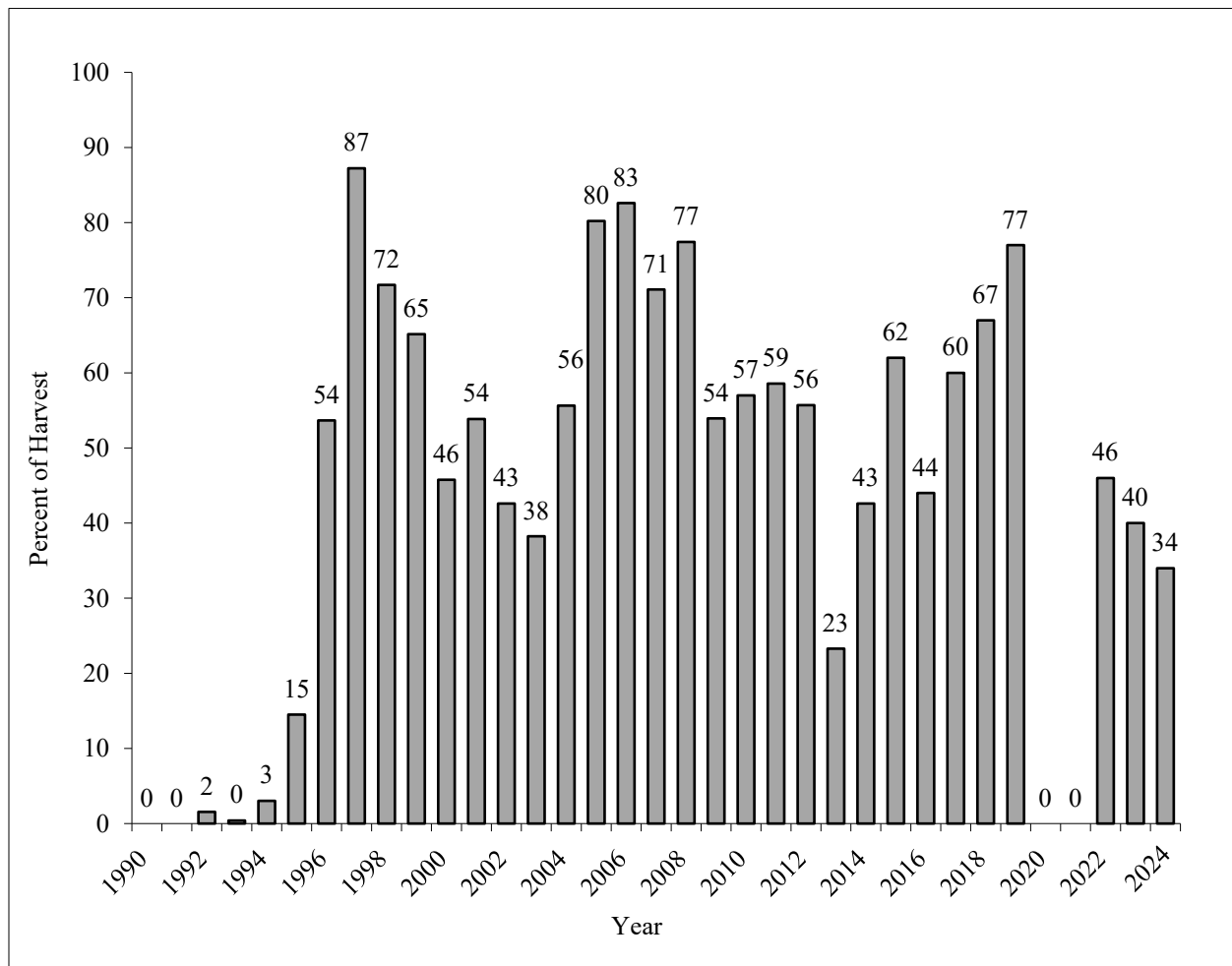
Appendix A8.—Reported number of crab pots lost during the commercial and subsistence winter crab fisheries, and ADF&G studies/surveys, 2005–2024.

Year	Commercial ^a	Subsistence	ADF&G winter study & spring/fall tagging studies ^b	Total
2005–06	^a	50	6	56
2006–07	^a	132	7	139
2007–08	^a	6	4	10
2008–09	^a	8	2	10
2009–10	30	23	2	55
2010–11	3	8	0	11
2011–12	64	19	4	87
2012–13	23	4	3	30
2013–14	105	16	1	122
2014–15	104	16	0	120
2015–16	38	20	No tagging studies done	58
2016–17	201	11	No tagging studies done	212
2017–18	179	33	No tagging studies done	212
2018–19	32	59	No tagging studies done	91
2019–20	3	33	No tagging studies done	36
2020–21	0	39	No tagging studies done	39
2021–22	0	3	No tagging studies done	3
2022–23	0	11	No tagging studies done	11
2023–24	1	2	No tagging studies done	3

^a Prior to the 2009–10 season, lost pots were not tracked for the winter commercial fishery.

^b The 2011–12 winter season was the last time the winter study took place. The spring/fall tagging studies took place 2012–2015.

Appendix A9.—The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of 164° west longitude, 1990–2024.



Note: No commercial fishery occurred in 1991, 2020, or 2021.