

Fishery Management Report No. 17-57

**Annual Management Report for the 2016/2017
Southeast Alaska/Yakutat Golden King Crab
Fisheries**

by

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December 2017

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	<i>all standard mathematical signs, symbols and abbreviations</i>	
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	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat or long	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT REPORT NO. 17-57

**ANNUAL MANAGEMENT REPORT FOR THE 2016/2017 SOUTHEAST
ALASKA/YAKUTAT GOLDEN KING CRAB FISHERIES**

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ABSTRACT

This report reviews the commercial, personal use, and subsistence fisheries for golden king crab in Region I which includes Registration Area A—Southeast Alaska and Registration Area D—Yakutat.

Golden king crab harvest in Region I totaled 61,586 lb valued at \$.67 million during the last completed season. The average dock price per pound for golden king crab during the 2016/17 season was \$12.25.

Currently a stock assessment survey for the golden king crab stocks in Southeast Alaska does not exist. Managers of the fishery in Southeast Alaska rely on fishery observer, logbook/harvest ticket, and port sampling data to adjust guideline harvest levels. Dockside sampling and skipper interviews also are routinely conducted in Southeast Alaska golden king crab fisheries.

Key words: golden king crab, *Lithodes aequispinus*, Southeast Alaska, Yakutat, fisheries management, invertebrate fisheries, crab, harvest statistics

INTRODUCTION

The golden king crab fishery in Registration Area A (Southeast Alaska) is prosecuted under limited entry and is less developed than the red king crab fishery in Southeast Alaska. For the golden king crab fishery in Southeast Alaska, managers rely on fishery observer, harvest ticket, and port sampling data to adjust guideline harvest levels (GHLs).

No stock assessment work has been conducted on golden king crab stocks in Southeast Alaska. The life history of golden king crab in Southeast Alaska is poorly understood. They are thought to have an asynchronous molt. The fishery is governed by a management plan in regulation.

This report presents an overview of the commercial golden king crab fishery in Southeast Alaska with emphasis on the 3 most recent seasons, 2014/15, 2015/16, and 2016/17, with an outlook for the 2017/18 season. Information is presented on historical harvest and effort, regulation development, and available dockside sampling data. Stock assessment surveys are not conducted for this fishery; however, stock status is assessed using fish ticket, logbook, dockside sampling, and onboard observer data. This report also describes regulations that govern the commercial golden king crab fishery in Registration Area D (Yakutat), and personal use and subsistence fisheries in Southeast Alaska and Yakutat.

LIFE HISTORY

Golden king crab, *Lithodes aequispinus*, are distributed in deeper waters, between 100 and 350 fathoms, of Southeast Alaska. Few golden king crab are harvested from the southern portion of Southeast Alaska although their range extends to British Columbia (Butler and Hart 1962). Important golden king crab fishing grounds are located at the confluence of Icy Strait, Lynn Canal, and Chatham Strait; where Chatham Strait and the western portion of Frederick Sound meet; and where Stephens Passage and Frederick Sound meet (Figures 1 and 2).

The biology of golden king crab is poorly understood, but they are thought to have a 20-month reproductive cycle (Paul and Paul 2001a), asynchronous timing of mating and molting (McBride et al. 1982; Otto 1984; Sloan 1985) and large yolk-rich eggs with low fecundity—about 30,000 (Jewett et al. 1985). Relatively long-lived, golden king crab males in Southeast Alaska become sexually mature at a size of approximately 118 mm carapace length (CL) (Jewett et al. 1985; Koeneman and Buchanan 1985; Otto 1984). Extrapolating the juvenile growth data of Paul and Paul (2001a) forward, this size is approximately eight years of age. Golden king crab in Southeast Alaska enter the fishery at 178 mm carapace width (CW), which corresponds to 150.6

mm CL (using the length-width relationship of $CL = 44.336 + .8875 * CW$ from Koeneman and Buchanan (1985)). Adult male molt increment is probably the only parameter that has been well-described for this species in Southeast Alaska, where it is estimated as 16.4 mm CL (Koeneman and Buchanan 1985). Using this molt increment, the legal size is between 2 and 3 molts from the mature size; because molt frequency is only slightly more than 12 months at this size, this means that male golden king crab in Southeast Alaska have in excess of two years to contribute to the reproductive potential of the population before they begin to be exploited at about 10.5 years of age. From the legal size of 156.6 mm CL to the maximum observed size in the fishery of 215 mm CL is 4 molts post-maturity. Since the molt frequency begins to decline at sexual maturity, it is likely to take well in excess of four years to reach this maximum size. Using a molt frequency of 48 months, the maximum age would be approximately 18.5 years of age.

COMMERCIAL FISHERY

Commercial vessels participating in the golden king crab fishery are primarily salmon tenders, salmon purse seine vessels, and a few large drift gillnet boats. Fishing gear has gradually evolved to include side-loading king crab pots (7 ft x 7 ft x 30 in) and top-loading conical or pyramid-style pots. Because of challenging fishing conditions, fishermen prefer heavier gear, and use different line and buoy train set-ups. Soak times are generally longer compared to red king or Tanner crab fishing.

Management of the commercial golden king crab fishery in Southeast Alaska is based on a management plan and policies that have been reviewed and approved by the Alaska Board of Fisheries (board). Primary elements of the management plan are as follows:

- Seasons that open concurrently with the Tanner crab fishery,
- Harvest of only male crab with a minimum legal CW,
- Gear limits of 100 pots per vessel,
- Seven separate management areas, and
- Guideline Harvest Ranges (GHRs) by management area based on historic harvest levels.

Before 1986, commercial fishing for golden king crab in Yakutat was allowed under an exploratory fishery opened by emergency order with other exploratory areas in Southeast Alaska. The Yakutat registration area, Registration Area D, was split into its own registration area separate from the rest of Southeast Alaska in 1986, but the emergency order opening requirement for the golden king crab fishery remained. In 2015, the golden king crab fishery opening requirement was changed from an emergency order to a commissioner's permit.

PERSONAL USE AND SUBSISTENCE FISHERIES

The personal use golden king crab fishery occurs in both Southeast and in Yakutat, while the subsistence golden king crab fishery occurs only in Yakutat. The Southeast personal use golden king crab fishery is a male only fishery occurring from July 1–June 15 with a legal size of seven inches or greater carapace width. The bag and possession limit is six male king crab per person; however, in Sections 12-B, 15-B, and 15-C the bag and possession limit is three male king crab per person. These bag and possession limits are for all species of king crab (red, blue, and golden) in combination, so bag and possession limits of golden king crab are somewhat

dependent on current red and blue king crab bag and possession limits which, unlike golden king crab, can be adjusted based on stock health.

The Yakutat personal use and subsistence golden king crab fisheries are male only fisheries with a legal size of seven inches or greater carapace width. There is no closed season and the bag and possession limit for all species of king crab combined is two crab per person. Operators of a commercially licensed and registered king crab fishing vessel are required to obtain a permit from the Alaska Department of Fish and Game (department) before harvesting golden king crab for personal use and/or subsistence purposes in the waters of Yakutat Bay.

Harvest and effort in Southeast and Yakutat in the personal use and subsistence fisheries is very limited due to the depths golden king crab inhabit and heavy pot gear required making it difficult for residents to target this species. Most often golden king crab are caught as bycatch when personal use fishermen are targeting red and/or blue king crab.

FISHERY DEVELOPMENT AND HISTORY

COMMERCIAL FISHERY HISTORY

The department began collecting species composition information from the commercial king crab harvest in Southeast Alaska in 1970. Reliable golden king crab harvest data have been available since the 1972/73 fishing season. From the 1972/73 through the 1979/80 seasons, harvest ranged from about 32,000 to almost 178,000 lb by 20 or fewer permit holders (Table 1). Effort and harvest increased significantly after the 1979/80 fishing season.

During the 1980/81 through 1989/90 seasons, the average number of permits fished was 65 with a high of 124 (Table 1). This effort level resulted in an average harvest of 824,383 lb. At current prices, this would be worth about \$10.1 million. These relatively high harvests coincided with four years of good recruitment starting in 1983. Fishing effort peaked during the 1984/85 season when 124 permits fished for a harvest of 848,818 lb. The harvest peaked two seasons later during the 1986/87 season when only 51 permits fished for a harvest of 1,016,011 lb. Although effort and harvest declined through the 1995/96 season when only 16,000 lb was harvested, they have increased since then in response to increasing recruitment.

The development of the golden king crab fishery in Southeast Alaska occurred in five phases. Initial development (first phase) occurred from in 1960 through the 1971/72 fishing season. This development phase was characterized by fishermen determining which fishing methods, gear types, depth ranges, geographic areas, and other factors yielded adequate harvests of golden king crab. Also during this phase, processing facilities developed product forms and studied marketing potential. Prices and effort were generally low and harvest fluctuated, probably because red king crab was the primary target species during this phase. The entire fishery was managed as a single stock. Basic regulations included establishing a quota, gear limits, size limits, and other regulatory needs. These initial regulations were based on a short history of commercial exploitation, little scientific information, and experiences in other Alaska king crab fisheries. Many of these initial regulations changed dramatically as better information became available.

The second phase occurred during the 1972/73 through 1979/80 seasons and was characterized by relatively low effort levels but generally increasing harvest. Additional knowledge on gear requirements, fishing techniques, and geographic distribution of the species became available.

Exvessel prices continued to be low. Due to concentrated effort and resulting harvest, it was necessary to reduce fishing time in District 10, and eventually to eliminate the year-round season.

The third phase began with the 1980/81 fishing season and ended with the 1984/85 fishing season. Effort gradually increased from 30 to 124 permits fished. A significant portion of the increase in effort can be attributed to the evolving limited entry program for king and Tanner crab in Southeast Alaska. Knowledge on gear design and fishing techniques developed to a point where the available stock could be harvested throughout the range in Southeast Alaska. Fishing occurred throughout the year in some areas. This phase is important because it showed consistent increases in harvest that led to a liberalization of some regulations. Specifically, quotas used to manage the fishery were increased due to industry interactions with the board and the gear limit was increased to 100 pots per vessel. Although fishing effort and resulting harvest were increasing, scientific information sufficient to properly manage stocks was not available.

The fourth phase began with the 1985/86 fishing season and extended through the 1995/96 fishing season. The peak harvest of slightly more than one million pounds occurred during the 1986/87 season and declined through the 1995/96 season due to lack of recruitment and overexploitation. The fishery was separated into five management areas with GHRs established in each area in an attempt to prevent further overexploitation in any single area or serial depletion of a number of fishing areas. The department has used emergency order authority to close the fishery early each season, when data indicated that substantial recruitment had not entered the fishery and stocks were not strong enough to support significant harvest. The effort and harvest declined for seven seasons, to a low of 15,845 lb in 1995/96.

The fifth and current phase began with the 1996/97 fishing season. Effort increased in response to improved prices with the development of a live market and harvest increased as a result of increases in the availability of recruit size crab. Anecdotal information from pot shrimp fishermen in Frederick Sound and Clarence Strait during previous years indicated a very significant increase in the number of juvenile golden king crab. By the 1996/97 season these juvenile crab had recruited to legal size, surviving at relatively high levels. Recruitment had remained fairly high since 1996/97 leading a slow, but consistent increase in GHs and seasonal harvest. Between the 2000/01 and 2009/10 seasons, annual harvests improved again averaging 603,171 lb. Harvests in the most recent decade showed a precipitous decline, similar to that seen in the early to mid-1990s, averaging 328,798 lb since the 2010/11 season. Substantial reductions to GHs began prior to the 2012/13 season and continued through the 2016/17 season in the majority of areas based on harvest ticket/logbook, port sampling, and onboard observer data. Inseason closures short of fishery area GHs have also been prevalent in the fishery in the last five seasons based on poor fishery performance, in order to avoid damage to the long-term reproductive potential of the stock.

REGULATION DEVELOPMENT

FISHING SEASONS

Regulation development in the golden king crab fishery has generally paralleled that of the red king and Tanner crab fisheries. The limited biological information on golden king crab life history timing in Southeast Alaska suggests that molting and mating may occur throughout the year, with a slight peak in molt timing in late spring and early summer. Soft-shelled crabs,

however, are frequently caught during the fishery starting in February. The presence of eggs in all stages of development throughout the year lends additional support to the conclusion of no distinct molting or mating period. As a result, fishing seasons have been liberal. From 1961 through 1968 there was no closed season. Closures have been primarily established to provide fair start opportunities during red king crab and Tanner crab fisheries. Fishing has started on dates ranging from August 1 through mid-February. The fishery currently starts on the day with the smallest Juneau tidal range between February 10 and 17, concurrently with the start of the commercial Tanner crab fishery, and continues until the season is closed by emergency order due to resource conservation concerns or the attainment of established GHs. In recent seasons, the fishery areas have closed between March and November, depending upon effort, harvest rates, and recruitment levels, and in some instances have been closed by emergency order due to conservation concerns. Also, in 2012 weather delay criteria were added to regulation to delay the fishery start date due to adverse weather conditions.

SEX AND SIZE LIMITS

From its inception, the golden king crab fishery has been restricted to harvesting only male crab in order to protect the reproductively important females. From 1961 through 1968, a minimum legal size of 6½ inches in CW was in place. The minimum legal size was established to protect sexually mature male king crab from harvest during the early years of sexual maturity. The minimum legal size was increased to 7 in or 178 mm CW in 1969. This corresponds to a carapace length of 151 mm (Koeneman and Buchanan 1985). This size limit was based on growth and size at maturity information collected from Gulf of Alaska red king crab stocks. The larger minimum size limit was implemented to increase reproductive potential by providing additional protection to mature male crab. In 1993, the board developed a regulation allowing the department to open a fishery on male golden king crab 6½ inches or greater in CW by emergency order in the Lower Chatham and Southern management areas. At the 2005 board meeting, the board carried a proposal allowing a fishery start date for both fisheries between February 10 and February 17 set by emergency order. In 2012 the board clarified that male golden king crab 6½ inches CW may only be retained in the Lower Chatham Area and Southern Areas during specified periods opened by emergency order, not simply by any emergency order announcing a golden king crab opening.

A general standard of size at maturity plus two molts of growth has been used to establish size limits for king crab in Alaska (Otto 1984). This provides for several years of reproductive participation prior to commercial harvest. Although size at maturity has not been directly determined for Southeast Alaska, it has been estimated that golden king crab males mature at a minimum size of 114 mm carapace length (CL) in British Columbia (Jewett et al. 1985), 110 mm CL in Prince William Sound (Paul and Paul 2001b), and 130 mm CL in the Southern Bering Sea (Somerton and Otto 1986). Size at maturity decreases with latitude in the Bering Sea; this is thought to be a function of slower growth with colder water temperature. After two molts a 110 mm CL crab in Southeast Alaska would achieve a size of 151 mm CL or 178 mm CW and a 130 mm CL crab would achieve a size of 165 mm CL or 186 mm CW (Koeneman and Buchanan 1985). However, some crab of this size range will skip a molt. So if male golden king crab in Southeast Alaska mature at 110 mm CL then the legal size complies well with the standard of size at maturity plus two molts of growth but if the size at maturity is 130 mm CL as in the Southern Bering Sea then the current 7-inch (178 mm CW) size limit is slightly under the standard.

In 1990, a regulation was adopted allowing the harvest of any king crab infected with the parasitic barnacle, *Briarosaccus callosus*, regardless of the sex or size of the crab. Crab infected with this parasite are incapable of reproduction and may experience reduced growth (Hawkes et al. 1986, 1987). Removal of infected crab may improve stock reproduction and growth.

QUOTAS AND GUIDELINE HARVEST RANGES

In 1970, a quota of 1.5 million lb was provided for king crab (all species combined). In 1971, separate red and golden king crab fisheries were recognized with the adoption of distinct seasons, and a quota of 600,000 lb was established for the golden king crab fishery. This quota remained in regulation through 1977. After 1977, GHRs replaced quotas. The first GHR of 50,000 to 200,000 lb was established in 1978. The GHR was increased to 200,000 to 500,000 lb in 1981 based on industry recommendations. This GHR remained in regulation through the 1986/87 fishing season. When stocks were strong and prices good, the GHRs were often exceeded from 1979/80 through 1997/98 seasons because the department monitored the fishery primarily by fish tickets. Seasons were closed when the fish ticket data neared the GHR set pre-season. Relying solely on fish ticket data, however, may not include crab caught and delivered in the prior week or crab caught and still held on the vessels. Also, any crab caught in pots but not yet harvested are excluded. This combination of factors diminished the department's ability to manage for a GHR in-season.

Due to the propensity of the fleet to concentrate fishing effort only in the most productive fishing grounds, and in order to prevent overexploitation on any single fishing ground, separate GHRs were established in 1986/87 season. Initially only 3 areas (Frederick Sound, Icy Strait, and Lower Chatham Strait) were assigned GHRs. The following five defined fishing areas and GHRs existed in regulation until 2005:

- Frederick Sound Area: 0 to 250,000 lb
- Icy Strait Area: 0 to 200,000 lb
- Chatham Strait Area: 0 to 150,000 lb
- Cape Ommaney Area: 0 to 50,000 lb
- Clarence Strait Area: 0 to 25,000 lb

From the 2001/02 through the 2004/05 seasons the original five management areas were managed as seven; Frederick Sound and Icy Strait areas were split and managed as two subareas each with their own GHRs as follows:

- Frederick Sound Area (all waters of Section 11-D (Seymour Canal), all waters of District 10, all waters of District 9 east of a line from Kingsmill Point to Point Gardner, all waters of District 8 north of the latitude of Blaquiere Point, all waters of Section 6-A, and all waters of District 5 north of the latitude of Point Baker). GHR is 0 to 225,000 lb.
- North Frederick Sound Subarea (all waters of Sections 11-B and 11-C). GHR is 0 to 25,000 lb.
- Icy Strait Area (all waters of Sections 11-A, 13-C and 13-A in Peril Strait east of Point Kakul, and Districts 12 and 15). GHR is 0 to 110,000 lb.
- West Icy Strait Subarea (all waters of District 14). GHR is 0 to 90,000 lb.

- Chatham Strait Area: GHR is 0 to 150,000 lb.
- Cape Ommaney Area: GHR is 0 to 50,000 lb.
- Clarence Strait Area: GHR is 0 to 25,000 lb.

At the 2005 board meeting, the two subareas that had been unofficially managed separately were officially added as distinct management areas. Secondly, the areas formerly managed as the Icy Strait Area and West Icy Strait Subarea had their GHRs altered to more accurately represent historical harvests. Lastly, all seven areas were renamed. Since the 2005/06 season the area names (Figures 1 and 2) and associated GHRs are as follows:

- East Central Area: 0 to 225,000 lb
- North Stephens Passage Area: 0 to 25,000 lb
- Northern Area: 0 to 145,000 lb
- Icy Strait Area: 0 to 55,000 lb
- Mid Chatham Strait Area: 0 to 150,000 lb
- Lower Chatham Strait Area: 0 to 50,000 lb
- Southern Area: 0 to 25,000 lb

At the 2009 board meeting, GHRs for 3 fishery areas were changed. Since the 2009/10 season the GHRs are as follows:

- East Central Area: 0 to 300,000 lb
- North Stephens Passage Area: 0 to 25,000 lb
- Northern Area: 0 to 175,000 lb
- Icy Strait Area: 0 to 75,000 lb
- Mid Chatham Strait Area: 0 to 150,000 lb
- Lower Chatham Strait Area: 0 to 50,000 lb
- Southern Area: 0 to 25,000 lb

FISHING GEAR

From 1961 through 1967 there were no restrictions on the amount or type of gear that could be fished by a vessel participating in the king crab fishery. In 1968, a limit of 40 pots per vessel was established for Southeast Alaska waters. The maximum number of pots per vessel was increased to 60 pots in 1974 and to the current 100 pots in 1978.

There is no minimum mesh size requirement for king crab pots although four 6¼-in escape rings or a panel of 9-in stretch mesh must be installed on every king crab pot. Regulations also require biodegradable twine or a timed galvanic release device in case the pot is lost. The rigid tunnel eye openings for standard side loading pots must be no less than five inches in any one dimension with tunnel eye opening perimeters that individually are more than 36 inches. There are restrictions on pot storage before and after fishing seasons and each pot must be independently buoyed and marked. Ring nets were eliminated as legal gear for king crab in 1990.

Over the past 10 years, as the fishery has intensified and season length has decreased, the popularity of cone pots in the fishery has increased. They are more easily moved between areas and for the now frequent shorter soak times are said to be fairly competitive with the more traditional square pots. A recent estimate of pot type fished in the 2016/17 fishery noted that 92% of the pots fished were cone-type pots.

In 2005, escape ring placement was amended to clarify how escape rings were to be optimally located to escape non-legal size and female crab. Also in 2005, the gear storage regulations were changed from a limit of 3 days to a limit of 5 days after closure of a portion of Southeast Alaska. In 2009, the board allowed king crab to be taken in a Tanner crab pot if both seasons are open and both permits are held. In 2015, the board allowed the use of square pots for king crab in Yakutat, with a sunset clause making squares legal for king crab in Yakutat only until January 1, 2018.

LIMITED ENTRY

In January 1984 the Commercial Fisheries Entry Commission (CFEC) established a limited entry program for the king and Tanner crab pot fisheries in Southeast Alaska. The CFEC adopted a maximum effort level of 52 permits for the golden king crab fishery. Currently, there are 51 active permanent and interim permits in the golden king crab fishery in Southeast.

MANAGEMENT CONCERNS

Fish tickets, logbooks, dockside sampling data, and observer data provide inseason and postseason analysis of stock condition, and a limited estimate of future stock condition. To date these four data sources have been used to adjust GHLs. Catch rates in the fishery have declined the past three seasons, resulting in low catch per landing (Table 1).

Currently the fishery is managed through call-ins of logbook data. Compliance with the call-in requirement is fair. Most vessels still rely on undependable cellular communications to relay logbook data. The department has increased the frequency of these call-ins in recent seasons to more accurately stay apprised of progress towards GHLs, catch rates, and the movement of the fleet. Secondly, with the 100 pots currently allowed in the fishery it is difficult to allow enough lead time for fishery area closures in consideration of tides and weather. This has often led to exceeding fishery area GHLs. Management of the fishery would improve if the pot limits were reduced.

Lastly, improvements in fishery performance in the early to mid-2000s brought pressure from industry to increase GHRs so GHLs could be set higher. The GHRs for three fishery areas were increased in 2009, with the upper end of the GHRs approaching the average harvest in the 1980s. With increased GHRs there has and will be pressure to increase GHLs to what are perhaps unsustainable levels. This fishery has already gone through a decade of high harvests in the 1980s, with harvests from the 1980/81 through 1989/90 seasons averaging 825,000 lb (Table 1). This was followed by a fishery collapse in the early to mid-1990s. Harvests from the 1990/91 through 1999/00 seasons averaged 209,000 lb (Table 1). Harvests improved in the 2000s, though managers did make efforts to keep GHLs from reaching the levels of average harvest in the 1980s. Harvests from the 2000/01 through 2009/10 seasons averaged 603,000 lb (Table 1). Although this level of harvest did not reach that seen in the 1980s, a precipitous decline in fishery performance and harvests reminiscent of the early to mid-1990s has occurred recently, with harvests from the 2010/11 through 2016/17 seasons averaging 329,000 lb, with just 62,000

lb harvested in the most recent season (Table 1). No fishery independent stock status data exists with which to adjust GHRs or GHGs. The only source of available data, harvest data, show that average harvests that did not reach the top end of the regionwide GHR in the 2000s are likely unsustainable, suggesting fishery area GHRs should be lowered to provide better guidance for department staff to set GHGs that are sustainable.

STOCK ASSESSMENT

Golden king crab stock status is determined and GHGs are set using fish ticket, logbook, dockside sampling, and onboard observer information. GHGs are adjusted based on trends in these data. In the mid-2000s, the department began setting GHGs triennially. Poor fishery performance in the 2012/13 season led to an interim review prior to the 2013/14 season in which GHGs were reduced in two fishery areas. Poor fishery performance was again documented during the 2013/14 season, eventually resulting in the closure of three major fishery areas short of their respective GHGs. The rapidly declining trends in fishery performance and other metrics available led the department to inform the King and Tanner Task Force (KTTF) during the meeting on March 19, 2014, that the department would evaluate GKC GHGs annually. Conducting a full assessment of GHGs annually is a new approach in managing this fishery. With GHGs now beginning to be fully assessed and adjusted each season instead of every three years, the department will be more nimble in reacting to trends in stock health, though there remains a lack of guidance for managers on the appropriate magnitude of annual adjustments.

LOGBOOK

Since the 1999/00 season, the department has required vessels participating in the golden king crab fishery to maintain a daily logbook of their catch throughout the season. Information in the logbooks includes; date, area description, statistical area, number of pot lifts, number of legal golden and blue king crab, and type of gear used. Logbook information is used for monitoring harvest inseason to estimate CPUE to assist with targeting GHGs, and in some years for Leslie depletion estimations (Leslie and Davis 1939) of harvest rate.

DOCKSIDE SAMPLING

Department personnel have sampled dockside deliveries of golden king crab, for carapace length, and shell condition at various ports throughout the region since 1970 (Table 10). Length frequency data are used to monitor recruitment trends and the relative contribution of various recruit-classes of crab. Department personnel began collecting average weight data dockside in 1974 (Table 11); this data provides additional insight into stock dynamics. In 1985, skipper interviews were initiated to provide an estimate of catch per unit of effort.

OBSERVER PROGRAM

The department reinstated a program of deploying observer's onboard volunteer vessels to sample the catch of golden king crab when funding became available beginning in the 2006/07 season. Vessels with observers were asked to close the escape rings, or 9-inch stretch mesh panel, on up to 20 of their pots. This program provides data on the commercial catch rate of sublegal and female golden king crab in the fishery and may provide a useful index of prerecruit abundance. During the 2014/15 season, observer trips were conducted in five management areas: Mid Chatham Strait, East Central, Northern, Icy Strait, and Southern. During the 2015/16 season, observer trips were conducted in three management areas: Northern, Icy Strait, and Southern.

The observer program was defunded in the 2017 fiscal year, and the biologist position responsible for coordinating the observer program was eliminated.

RECENT COMMERCIAL SEASONS

2014/2015 SEASON SUMMARY

The 2014/15 season opened concurrent with the commercial Tanner crab fishery on February 13, 2015. The department announced new GHGs by fishing area for the 2014/15 season through a news release. Fishing seasons were closed by area using emergency orders. The earliest closure was for the East Central and Northern areas on March 17, 2015, short of the GHG due to low catch rates and concern over stock health. The Icy Strait and North Stephens Passage areas closed next on April 3, 2015 short of the GHG for stock health concerns and fishery performance to similar to that seen earlier in the East Central and Northern areas. The GHG was reached in the Southern area and it was closed on June 5, 2015. The Mid-Chatham Strait area closed on June 29, 2015, short of the GHG for poor fishery performance and stock health concerns. The last management area to close, due to the GHG being reached, was the Lower Chatham Strait area on November 24, 2015. During the season, 33 permit holders fished and a total of 129,822 lb of golden king crab were caught from all fishing areas (Table 1). The Mid-Chatham Strait, Lower Chatham Strait, East Central, and Southern areas produced the majority of the harvest (Tables 3–9).

Dockside sampling data from commercial landings indicated that an overall 27.3% of the crab were recruit crab and the average size was 172.9 mm in CL (Table 10). About 40.3% of the crab landed were one-molt postrecruit (Table 10). Port sampling coverage was good, with an estimated 19.8% of the harvest sampled (Table 11).

2015/2016 SEASON SUMMARY

The start date for the 2015/16 season was February 17, 2016, again opening concurrently with the Tanner crab fishery. The department announced new GHGs by fishing area for the 2015/16 season through a news release. Fishing seasons were closed by area using emergency orders. The earliest closure was for the East Central and Northern areas on March 21, 2016, short of the GHG due to low catch rates and concern over stock health. The Icy Strait and North Stephens Passage areas closed next on April 21, 2016 short of the GHG for stock health concerns and fishery performance to similar to that seen earlier in the East Central and Northern areas. The Mid-Chatham Strait and Southern areas closed on Wednesday, June 29, 2016, in response to continued poor fishery performance. The Lower Chatham Strait area closed later that year on November 11, 2016. During the season, 21 permit holders fished and a total of 76,829 lb of golden king crab were caught from all fishing areas (Table 1). The Southern, Lower Chatham, and Icy Strait areas produced the majority of the harvest (Tables 3–9).

Dockside sampling data from commercial landings indicated that percent recruit had increased from the previous season to 33.0%. The average size was 171.1 mm in CL (Table 10). About 37.6% of the crab landed were one-molt postrecruit (Table 10). Port sampling coverage was good, with an estimated 20.5% of the harvest sampled (Table 11).

2016/2017 SEASON SUMMARY

The 2016/17 golden king crab fishery opened concurrent with the commercial Tanner crab fishery on February 17, 2017. The department announced new GHGs by fishing area for the 2016/17 season through a news release. Fishing seasons were closed by area using emergency orders. The GHG for the North Stephens Passage area was reached and it closed first on March 8, 2017. Next the East Central area closed on March 25, 2017, followed closely by closures of the Northern and Icy Strait areas on April 7, 2017. All three areas were closed short of reaching their GHGs due to continued declines in catch rates and concern over stock health. The GHG for the Southern area was reached and it was closed on June 6, 2017. The Mid-Chatham Strait and Lower Chatham Strait areas closed short of their GHGs on July 6, 2017, due to continued declines in catch rates and concern over stock health. During the season, 18 permit holders, the lowest amount of effort in the fishery since the 1997/1998 season, fished and a total of just 61,586 lb of golden king crab were caught from all fishing areas (Table 1), the lowest harvest since the 1995/96 season. The North Stephens Passage, Southern, and Lower Chatham areas produced the majority of the harvest (Tables 3–9).

Dockside sampling data from commercial landings indicated that 34.3% of the crab were recruit crab, the highest percentage of recruits since the 2008/09 season (Table 10), and correspondingly the trend towards smaller average size was also evident, with average size at 170.1 mm in CL, the smallest crab seen since the 2007/08 season (Table 10). About 41.0% of the crab landed were one-molt postrecruit (Table 10), and just 17.8% were two-molts postrecruit, similar to the late 2000s (Table 10). Port sampling coverage dropped off some but was still good with an estimated 12.3% of the harvest sampled (Table 11).

2017/2018 OUTLOOK

The golden king crab fishery lacks independent survey information making trends in stock abundance difficult to detect. Recent declines in relative abundance indices indicate the golden king crab stock is at historic low levels of abundance for most management areas reminiscent of the fishery collapse in the 1990s. Average prices of golden king crab per pound have increased substantially making the fishery economically feasible even at abundance levels and catch rates much lower than in other king crab fisheries in Alaska. There is little evidence of new recruitment in areas any area except the North Stephens Passage area; postrecruit crab are the main reproductive contributors to future populations in most management areas. Current management strategies consist of reducing GHGs and closing inseason short of an area's GHG if catch rates and recruit percentages continue to decline in order to promote recovery and sustainability of the fishery, and to avoid damage to the long term reproductive potential of the stock. The fishery will be re-evaluated prior to the start of the 2017/18 season. The department will assess whether each of the fishery areas will open, and will determine an appropriate GHG for each area based on fish ticket/logbook and port sampling data. Management concerns and strategies will be discussed with stakeholders.

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TABLES AND FIGURES

Table 1.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in Registration Area A by season (October through September), 1972/1973 to present.

Season	Total harvest (lb)	Number of landings	Number of permits	Lb per landing
1972/1973	177,544	85	12	2,089
1973/1974	71,783	38	11	1,889
1974/1975	32,332	28	9	1,155
1975/1976	68,842	33	7	2,086
1976/1977	75,046	30	6	2,502
1977/1978	83,407	54	14	1,545
1978/1979	52,476	66	10	795
1979/1980	167,823	82	20	2,047
1980/1981	704,622	158	30	4,460
1981/1982	655,562	255	54	2,571
1982/1983	801,917	283	70	2,833
1983/1984	973,100	307	89	3,170
1984/1985	848,818	277	124	3,064
1985/1986	698,249	211	61	3,309
1986/1987	1,016,011	222	51	4,577
1987/1988	949,205	235	56	4,039
1988/1989	968,296	228	59	4,247
1989/1990	632,872	260	63	2,434
1990/1991	426,882	221	40	1,932
1991/1992	229,242	154	33	1,489
1992/1993	103,781	80	18	1,297
1993/1994	30,318	51	13	594
1994/1995	39,344	65	19	605
1995/1996	15,845	40	11	396
1996/1997	67,164	62	16	1,083
1997/1998	244,484	87	18	2,810
1998/1999	367,782	105	30	3,503
1999/2000	560,427	143	46	3,919
2000/2001	530,765	189	45	2,808
2001/2002	609,510	211	45	2,889
2002/2003	562,395	190	48	2,960
2003/2004	557,251	144	45	3,843
2004/2005	557,725	130	42	4,290
2005/2006	563,615	165	37	3,416
2006/2007	581,101	131	34	4,436
2007/2008	638,582	104	33	6,140
2008/2009	698,637	134	36	5,214
2009/2010	732,127	147	38	4,980
2010/2011	687,505	172	40	3,997
2011/2012	599,723	205	36	2,925
2012/2013	511,229	219	33	2,334
2013/2014	234,891	175	30	1,342
2014/2015	129,822	141	33	921
2015/2016	76,829	94	21	817
2016/2017	61,586	78	18	790

Table 2.—Commercial golden king crab harvest (in thousands of pounds) in Registration Area A by district and season (October through September), 1972/1973 to present.

Season	District															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1972/1973	0	0	0	0	0	0	0	*	1.5	128.6	19.0	*	0	*	*	177.5
1973/1974	0	0	0	0	0	0	0	0	0	50.4	17.1	0	0	*	*	71.8
1974/1975	0	0	0	0	0	0	0	*	17.2	14.4	*	0	0	0	*	32.3
1975/1976	0	0	0	0	0	0	0	*	0	*	0	*	*	*	*	68.8
1976/1977	0	0	0	0	0	0	0	0	*	*	*	*	0	0	*	75.0
1977/1978	0	0	0	0	0	0	0	*	*	74.4	7.3	*	*	0	*	83.4
1978/1979	0	0	0	0	0	0	0	0	0	39.5	6.7	1.3	0	*	*	52.5
1979/1980	0	0	0	0	0	0	0	*	0	61.3	21.8	61.8	0	*	21.5	167.8
1980/1981	0	0	0	0	0	0	0	1.2	*	204.6	29.8	169.7	*	236.9	55.9	704.6
1981/1982	0	0	0	0	0	0	0	6.1	48.8	248.2	48.8	92.9	6.2	152.6	49.4	655.6
1982/1983	0	0	0	0	0	13.9	*	*	109.3	186.5	44.6	228.7	12.9	151.7	39.3	801.9
1983/1984	0	0	0	0	0	3.2	*	5.4	135.4	222.7	24.6	438.2	*	46.5	91.7	973.1
1984/1985	0	*	0	0	0	*	14.1	*	192.3	375.9	34.5	153.3	2.5	52.8	13.7	848.8
1985/1986	*	*	0	0	0	18.2	*	4.6	234.0	324.4	35.6	23.3	*	24.8	25.5	698.2
1986/1987	*	0	0	0	0	10.1	*	*	609.3	298.8	43.8	*	0	1.5	16.2	1,016.
1987/1988	0	0	0	0	0	*	*	*	298.0	318.6	36.9	195.7	0	16.4	67.0	949.2
1988/1989	0	0	0	0	0	*	*	10.3	413.6	338.8	9.1	140.5	0	37.5	12.0	968.3
1989/1990	*	0	0	0	0	*	0	*	231.3	146.1	6.9	206.0	0	30.2	9.2	632.9
1990/1991	0	0	0	0	0	*	0	*	213.3	83.2	18.5	82.9	0	19.4	8.7	426.9
1991/1992	0	0	0	0	0	*	*	*	137.8	13.1	21.0	38.1	0	9.2	4.0	229.2
1992/1993	0	0	0	0	0	*	0	*	74.7	6.7	11.2	*	0	*	0	103.8
1993/1994	0	0	0	0	0	0	0	0	15.9	3.8	5.6	*	0	*	0	30.3
1994/1995	0	0	0	0	0	*	0	0	22.3	*	9.0	2.8	0	*	*	39.3
1995/1996	0	0	0	0	0	0	0	0	10.3	0	3.1	*	0	*	0	15.8
1996/1997	0	0	0	0	0	*	0	*	*	3.9	15.7	0	0	0	0	67.2
1997/1998	0	0	0	0	0	*	*	*	150.9	18.6	21.0	13.0	0	*	*	244.5
1998/1999	0	*	0	0	0	*	*	*	190.8	57.8	13.1	37.4	0	52.1	*	367.8
1999/2000	0	0	0	0	0	*	*	*	236.0	168.1	11.8	34.6	0	101.1	0	560.4
2000/2001	0	0	0	0	0	*	*	0	246.4	114.6	11.6	104.5	*	41.2	2.9	530.8
2001/2002	0	0	0	0	0	*	*	0	174.4	218.5	23.4	121.0	*	50.1	9.9	609.5
2002/2003	0	*	0	0	0	*	*	0	156.8	153.5	35.6	165.8	*	45.1	*	562.4
2003/2004	*	*	0	0	0	*	*	0	184.0	104.9	38.6	144.4	*	53.0	17.0	557.3

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Table 2.–Page 2 of 2.

Season	District															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
2004/2005	*	*	0	0	0	*	*	0	214.9	108.4	48.5	102.7	*	62.8	9.3	557.7
2005/2006	0	*	0	0	0	*	*	0	208.9	126.5	23.6	116.7	*	61.3	18.1	563.6
2006/2007	*	*	0	0	0	0	*	*	146.4	183.4	24.3	138.1	*	71.1	8.0	581.1
2007/2008	*	*	0	0	0	0	*	0	177.5	178.3	54.9	145.0	*	58.5	*	638.6
2008/2009	*	*	0	0	0	*	*	0	184.6	262.9	57.3	92.5	0	51.0	29.2	698.6
2009/2010	*	*	0	0	0	*	13.3	0	270.1	201.8	45.7	112.0	*	42.1	39.3	732.1
2010/2011	*	4.1	0	0	0	1.5	*	0	291.3	147.1	27.1	118.9	0	44.9	36.3	687.5
2011/2012	*	*	0	0	0	*	*	0	232.8	130.3	16.9	123.5	0	45.2	29.2	599.7
2012/2013	*	*	0	0	0	*	*	0	202.2	169.5	13.6	72.7	0	8.2	21.4	511.2
2013/2014	4.5	5.9	0	0	0	5.7	3.6	0	82.9	65.4	11.8	24.5	0	19.6	11.2	234.9
2014/2015	*	4.8	0	0	0	8.2	3.8	0	61.8	20.8	6.6	4.3	0	12.4	2.6	129.8
2015/2016	*	*	0	0	0	8.4	2.6	0	26.9	8.2	5.3	5.7	0	10.3	1.3	76.8
2016/2017	*	*	0	0	0	6.9	3.3	0	15.0	0.7	16.6	5.1	0	7.0	0.5	61.6

* Fewer than 3 permits were fished; information is confidential.

Table 3.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the East Central management area by season (October–September), 1971/1972 to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1971/1972	148,391	49	5	3,028
1972/1973	130,544	61	7	2,140
1973/1974	50,393	21	6	2,400
1974/1975	28,296	22	8	1,286
1975/1976	*	*	*	*
1976/1977	*	*	*	*
1977/1978	74,465	40	6	1,862
1978/1979	41,042	39	6	1,052
1979/1980	64,257	32	7	2,008
1980/1981	213,212	48	10	4,442
1981/1982	251,930	85	10	2,964
1982/1983	211,995	61	21	3,475
1983/1984	254,407	78	23	3,262
1984/1985	397,881	92	42	4,325
1985/1986	392,323	71	23	5,526
1986/1987	449,202	61	22	7,364
1987/1988	393,464	48	25	8,197
1988/1989	491,786	83	35	5,925
1989/1990	184,111	90	37	2,046
1990/1991	143,597	97	19	1,480
1991/1992	38,487	35	12	1,100
1992/1993	16,248	19	7	855
1993/1994	10,277	13	4	791
1994/1995	9,656	12	4	805
1995/1996	*	*	*	*
1996/1997	12,994	23	9	565
1997/1998	76,803	27	11	2,845
1998/1999	160,072	29	17	5,520
1999/2000	299,585	47	21	6,374
2000/2001	196,810	61	25	3,226
2001/2002	267,637	99	29	2,703
2002/2003	226,905	72	23	3,151
2003/2004	233,655	53	24	4,409
2004/2005	261,035	52	25	5,020
2005/2006	249,330	65	16	3,835
2006/2007	243,675	57	18	4,275
2007/2008	251,004	29	14	8,655
2008/2009	303,811	43	19	7,065
2009/2010	308,013	51	24	6,039
2010/2011	305,659	54	20	5,660
2011/2012	223,616	28	19	7,986
2012/2013	265,049	100	23	2,650
2013/2014	81,375	72	17	1,130
2014/2015	25,259	40	17	631
2015/2016	9,052	25	12	362
2016/2017	972	6	4	162

* Fewer than 3 permits were fished; information is confidential.

Table 4.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the North Stephens Passage management area by season (October–September), 1971/1972 to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1971/1972	*	*	*	*
1972/1973	*	*	*	*
1973/1974	16,961	10	4	1,696
1974/1975	*	*	*	*
1975/1976	0	0	0	0
1976/1977	*	*	*	*
1977/1978	7,349	10	6	735
1978/1979	*	*	*	*
1979/1980	17,748	21	6	845
1980/1981	*	*	*	*
1981/1982	41,994	28	7	1,500
1982/1983	28,324	15	7	1,888
1983/1984	16,674	14	10	1,191
1984/1985	29,573	21	16	1,408
1985/1986	26,432	28	11	944
1986/1987	37,608	20	12	1,880
1987/1988	16,280	19	11	857
1988/1989	7,965	17	7	469
1989/1990	5,450	18	6	303
1990/1991	16,359	32	10	511
1991/1992	20,377	32	11	637
1992/1993	10,750	25	9	430
1993/1994	5,548	30	8	185
1994/1995	8,932	35	12	255
1995/1996	2,960	23	10	129
1996/1997	15,556	27	10	576
1997/1998	19,888	16	6	1,243
1998/1999	*	*	*	*
1999/2000	11,678	18	11	649
2000/2001	11,563	27	11	428
2001/2002	23,335	22	10	1,061
2002/2003	26,085	16	7	1,630
2003/2004	19,608	25	10	784
2004/2005	18,580	29	8	640
2005/2006	16,366	12	3	1,364
2006/2007	19,450	12	5	1,621
2007/2008	27,441	9	7	3,049
2008/2009	22,770	20	10	1,139
2009/2010	20,568	18	7	1,143
2010/2011	20,714	25	8	829
2011/2012	15,657	27	6	580
2012/2013	*	*	*	*
2013/2014	7,644	15	4	510
2014/2015	6,280	23	11	273
2015/2016	5,321	19	8	280
2016/2017	16,558	16	8	1035

* Fewer than 3 permits were fished; information is confidential.

Table 5.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the Mid-Chatham Strait management area by season (October–September), 1974/1975 to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1974/1975	*	*	*	*
1975/1976	0	0	0	0
1976/1977	0	0	0	0
1977/1978	0	0	0	0
1978/1979	0	0	0	0
1979/1980	0	0	0	0
1980/1981	0	0	0	0
1981/1982	*	*	*	*
1982/1983	89,870	22	9	4,085
1983/1984	78,271	12	4	6,523
1984/1985	112,704	24	11	4,696
1985/1986	163,694	37	13	4,424
1986/1987	412,789	86	16	4,800
1987/1988	181,679	39	8	4,658
1988/1989	224,211	42	7	5,338
1989/1990	184,327	44	6	4,189
1990/1991	111,348	42	5	2,651
1991/1992	52,419	29	5	1,808
1992/1993	*	*	*	*
1993/1994	*	*	*	*
1994/1995	*	*	*	*
1995/1996	*	*	*	*
1996/1997	*	*	*	*
1997/1998	70,709	19	4	3,722
1998/1999	73,934	17	5	4,349
1999/2000	79,208	28	6	2,829
2000/2001	126,579	34	10	3,723
2001/2002	113,426	43	10	2,638
2002/2003	78,284	47	15	1,666
2003/2004	55,107	33	7	1,670
2004/2005	61,841	20	4	3,092
2005/2006	81,463	31	5	2,628
2006/2007	78,416	26	5	3,016
2007/2008	89,873	26	6	3,388
2008/2009	123,626	27	8	4,579
2009/2010	141,558	26	10	5,445
2010/2011	114,966	32	10	3,593
2011/2012	106,620	31	9	3,439
2012/2013	99,101	51	9	1,943
2013/2014	43,475	22	4	1,976
2014/2015	30,910	32	7	966
2015/2016	9,228	15	5	615
2016/2017	*	*	*	*

* Fewer than 3 permits were fished; information is confidential.

Table 6.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the Northern management area by season (October–September), 1971/1972 season to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1971/1972	*	*	*	*
1972/1973	*	*	*	*
1973/1974	*	*	*	*
1974/1975	*	*	*	*
1975/1976	*	*	*	*
1976/1977	*	*	*	*
1977/1978	*	*	*	*
1978/1979	6,835	17	5	402
1979/1980	85,568	28	11	3,056
1980/1981	247,940	73	18	3,396
1981/1982	154,018	78	27	1,975
1982/1983	271,729	92	33	2,954
1983/1984	537,907	139	43	3,870
1984/1985	170,458	70	49	2,435
1985/1986	57,730	30	16	1,924
1986/1987	43,773	27	12	1,621
1987/1988	271,422	101	30	2,687
1988/1989	153,588	65	21	2,363
1989/1990	213,443	88	21	2,425
1990/1991	91,963	52	18	1,769
1991/1992	42,542	33	10	1,289
1992/1993	2,960	9	4	329
1993/1994	*	*	*	*
1994/1995	3,669	10	6	367
1995/1996	*	*	*	*
1996/1997	0	0	0	0
1997/1998	14,619	10	5	1,462
1998/1999	40,208	18	6	2,234
1999/2000	34,706	10	6	3,471
2000/2001	108,058	53	18	2,039
2001/2002	131,277	56	19	2,344
2002/2003	178,938	60	22	2,982
2003/2004	181,154	47	23	3,854
2004/2005	142,449	36	20	3,957
2005/2006	142,455	58	19	2,456
2006/2007	152,145	38	15	4,004
2007/2008	184,227	36	17	5,117
2008/2009	156,261	44	17	3,551
2009/2010	176,782	48	22	3,683
2010/2011	161,522	52	21	3,106
2011/2012	150,453	92	19	1,635
2012/2013	102,351	85	12	1,204
2013/2014	39,802	52	9	765
2014/2015	7,226	27	11	268
2015/2016	6,939	16	7	434
2016/2017	5,610	25	8	224

* Fewer than 3 permits were fished; information is confidential.

Table 7.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the Icy Strait management area by season (October–September), 1971/1972 season to present.

Season	Total Harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1971/1972	*	*	*	*
1972/1973	*	*	*	*
1973/1974	*	*	*	*
1974/1975	0	0	0	0
1975/1976	*	*	*	*
1976/1977	0	0	0	0
1977/1978	0	0	0	0
1978/1979	*	*	*	*
1979/1980	*	*	*	*
1980/1981	236,890	26	10	9,111
1981/1982	152,441	50	23	3,049
1982/1983	151,715	72	32	2,107
1983/1984	46,514	48	28	969
1984/1985	52,811	34	24	1,553
1985/1986	24,827	19	9	1,307
1986/1987	1,455	10	7	146
1987/1988	16,356	16	12	1,022
1988/1989	37,496	21	7	1,786
1989/1990	30,168	21	11	1,437
1990/1991	19,350	18	9	1,075
1991/1992	*	*	*	*
1992/1993	*	*	*	*
1993/1994	*	*	*	*
1994/1995	*	*	*	*
1995/1996	*	*	*	*
1996/1997	0	0	0	0
1997/1998	*	*	*	*
1998/1999	52,127	22	4	2,369
1999/2000	101,111	21	14	4,815
2000/2001	41,221	25	10	1,649
2001/2002	50,080	25	8	2,003
2002/2003	45,106	39	16	1,157
2003/2004	53,034	22	12	2,411
2004/2005	62,843	24	13	2,619
2005/2006	61,290	35	13	1,751
2006/2007	71,058	26	13	2,733
2007/2008	58,453	26	14	2,243
2008/2009	51,026	19	10	2,686
2009/2010	42,136	21	9	2,006
2010/2011	44,882	22	10	2,040
2011/2012	45,244	51	11	887
2012/2013	8,185	20	6	409
2013/2014	19,583	30	6	653
2014/2015	12,359	28	8	441
2015/2016	10,255	17	3	603
2016/2017	7,007	21	6	334

* Fewer than 3 permits were fished; information is confidential.

Table 8.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the Lower Chatham management area by season (October–September), 1971/1972 season to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1974/1975	*	*	*	*
1975/1976	0	0	0	0
1976/1977	0	0	0	0
1977/1978	0	0	0	0
1978/1979	0	0	0	0
1979/1980	0	0	0	0
1980/1981	0	0	0	0
1981/1982	*	*	*	*
1982/1983	19,124	4	7	4,781
1983/1984	30,756	4	9	7,689
1984/1985	61,644	10	13	6,164
1985/1986	*	*	*	*
1986/1987	47,136	7	17	6,734
1987/1988	54,264	7	21	7,752
1988/1989	46,076	4	14	11,519
1989/1990	8,208	2	4	4,104
1990/1991	44,260	4	24	11,065
1991/1992	61,007	5	31	12,201
1992/1993	20,193	2	8	10,097
1993/1994	*	*	*	*
1994/1995	0	0	0	0
1995/1996	0	0	0	0
1996/1997	0	0	0	0
1997/1998	23,013	2	7	11,507
1998/1999	14,694	2	7	7,347
1999/2000	25,407	5	19	5,081
2000/2001	37,560	4	14	9,390
2001/2002	11,848	6	14	1,975
2002/2003	5,630	2	9	2,815
2003/2004	*	*	*	*
2004/2005	*	*	*	*
2005/2006	*	*	*	*
2006/2007	7,736	7	3	1,105
2007/2008	*	*	*	*
2008/2009	20,004	8	3	2,501
2009/2010	22,328	11	5	2,030
2010/2011	17,786	14	5	1,270
2011/2012	*	*	*	*
2012/2013	*	*	*	*
2013/2014	23,376	12	3	1,948
2014/2015	26,424	16	4	1,652
2015/2016	*	*	*	*
2016/2017	*	*	*	*

* Fewer than 3 permits were fished; information is confidential.

Table 9.—Golden king crab commercial harvest, number of landings, number of permits, and pounds per landing in the Southern management area by season (October–September), 1982/1983 season to present.

Season	Total harvest (lb)	Number of		Lb per landing
		Landings	Permits	
1982/1983	15,960	12	4	1,330
1983/1984	*	*	*	*
1984/1985	21,594	22	5	982
1985/1986	25,232	24	4	1,051
1986/1987	*	*	*	*
1987/1988	*	*	*	*
1988/1989	*	*	*	*
1989/1990	*	*	*	*
1990/1991	0	0	0	0
1991/1992	*	*	*	*
1992/1993	*	*	*	*
1993/1994	0	0	0	0
1994/1995	*	*	*	*
1995/1996	*	*	*	*
1996/1997	*	*	*	*
1997/1998	*	*	*	*
1998/1999	*	*	*	*
1999/2000	*	*	*	*
2000/2001	*	*	*	*
2001/2002	*	*	*	*
2002/2003	*	*	*	*
2003/2004	*	*	*	*
2004/2005	*	*	*	*
2005/2006	*	*	*	*
2006/2007	*	*	*	*
2007/2008	*	*	*	*
2008/2009	*	*	*	*
2009/2010	20,724	20	3	1,036
2010/2011	21,976	20	4	1,099
2011/2012	*	*	*	*
2012/2013	*	*	*	*
2013/2014	19,636	16	3	1,227
2014/2015	21,364	22	5	971
2015/2016	19,167	25	5	767
2016/2017	16,722	21	4	796

* Fewer than 3 permits were fished; information is confidential.

Table 10.—Commercial golden king crab size frequency and shell condition data collected during dockside sampling in Registration Area A (Southeast Alaska) by season, 1969/1970 to present.

Season	Number of		Carapace length (mm)		Recruit composition					
	Boats sampled	Crab sampled	Mean	Range	%Recruits ^a	%PR+1 ^b	%PR+2 ^c	%PR+3 ^d	%PR+4 ^e	% Skip molts ^f
1969/1970	4	72	173.5	154–202	30.6	44.4	22.2	2.8	0.0	12.5
1970/1971	18	1,138	174.6	142–214	25.6	49.0	20.7	4.0	0.7	12.2
1971/1972	21	1,705	175.1	150–211	19.9	47.6	27.4	5.1	0.1	23.5
1972/1973	11	1,040	174.7	149–208	24.3	50.2	21.6	3.9	0.1	13.0
1973/1974	8	604	173.0	146–210	26.8	39.4	28.8	4.7	0.3	28.8
1974/1975	2	201	169.5	151–204	40.3	47.8	10.0	2.0	0.0	11.9
1975/1976	9	837	172.2	145–208	35.1	43.2	18.5	3.1	0.1	10.7
1976/1977	2	153	168.8	152–205	46.4	39.2	12.4	2.0	0.0	16.3
1977/1978	7	678	169.9	149–201	23.0	36.5	31.4	9.1	0.0	59.2
1978/1979	6	498	171.0	145–201	35.4	39.6	23.2	1.8	0.0	20.6
1979/1980	6	478	169.8	145–203	37.7	35.6	19.0	7.6	0.2	32.8
1980/1981	20	1,354	171.6	149–206	31.7	45.8	18.6	3.9	0.0	20.2
1981/1982	6	533	176.4	148–214	24.1	43.8	23.9	7.4	1.0	18.2
1982/1983	18	1,567	169.8	146–204	35.7	43.1	17.7	3.5	0.1	24.0
1983/1984	10	703	169.6	150–196	40.9	41.3	15.2	2.6	0.0	15.8
1984/1985	12	1,368	165.3	148–196	58.3	31.9	9.0	0.7	0.0	16.0
1985/1986	17	1,765	166.6	148–198	51.1	40.4	7.7	0.8	0.0	12.4
1986/1987	43	4,609	168.0	143–210	42.2	41.4	13.1	3.3	0.0	22.5
1987/1988	63	5,408	173.4	148–214	20.9	48.1	24.4	6.7	0.0	26.4
1988/1989	76	7,120	172.7	142–210	25.8	46.5	23.7	4.0	0.0	24.0
1989/1990	86	7,880	176.7	146–211	16.5	45.9	31.4	6.2	0.1	22.4
1990/1991	80	7,108	175.4	147–214	23.0	40.5	28.3	8.0	0.2	24.7
1991/1992	61	5,157	172.8	146–213	31.2	38.2	22.1	8.2	0.4	26.9
1992/1993	18	1,454	171.8	148–211	35.0	40.9	18.6	5.5	0.1	20.5
1993/1994	13	1,080	171.1	133–206	30.7	52.7	14.2	2.4	0.0	16.2
1994/1995	13	1,037	171.1	137–208	34.0	43.6	16.9	5.4	0.2	22.1
1995/1996	15	351	172.2	146–208	36.1	40.5	19.7	3.8	0.0	12.7
1996/1997	19	1,585	165.9	143–206	54.6	33.8	10.2	1.4	0.0	16.0
1997/1998	31	2,390	166.1	147–212	37.9	45.3	15.1	1.7	0.0	34.6

-continued-

Table 10.–Page 2 of 2.

Season	Number of		Carapace length (mm)		Recruit composition					
	Boats sampled	Crab sampled	Mean	Range	%Recruits	%PR+1	%PR+2	%PR+3	%PR+4	% Skip molts
1998/1999	35	2,401	166.7	145–210	46.3	44.0	8.8	1.0	0.0	20.4
1999/2000	59	4,154	166.9	138–203	45.5	45.0	9.2	0.3	0.0	18.4
2000/2001	85	5,717	168.9	143–206	34.9	45.9	18.1	1.2	0.0	25.8
2001/2002	71	4,858	171.2	148–210	35.7	42.1	19.1	3.0	0.0	17.7
2002/2003	76	5,494	169.7	137–204	39.5	43.2	15.9	1.5	0.0	14.3
2003/2004	60	2,854	170.5	145–206	39.2	41.1	16.7	3.0	0.1	16.7
2004/2005	63	3,097	168.9	147–210	39.2	38.7	18.1	3.1	0.3	18.0
2005/2006	65	3,211	169.6	138–214	40.2	40.9	16.3	2.2	0.1	8.6
2006/2007	66	3,358	170.0	148–205	36.4	40.1	19.3	3.7	0.2	16.9
2007/2008	40	2,022	169.1	148–210	40.5	38.6	17.1	3.2	0.4	15.5
2008/2009	33	1,692	170.2	147–205	39.9	39.2	15.9	4.3	0.4	9.2
2009/2010	57	2,917	171.6	142–215	32.8	40.7	19.8	5.8	0.7	16.5
2010/2011	74	3,850	175.0	143–221	23.2	41.2	25.6	8.3	1.5	14.7
2011/2012	71	3,517	176.4	147–217	20.7	36.8	25.4	13.7	3.0	22.5
2012/2013	65	3,310	176.1	148–220	18.0	36.8	29.8	12.4	2.8	29.3
2013/2014	58	2,937	175.8	146–215	22.0	36.9	24.4	12.9	3.4	25.4
2014/2015	71	3,294	172.9	140–214	27.3	40.3	21.9	7.8	2.3	21.8
2015/2016	48	2,129	171.1	143–207	33.0	37.6	20.5	7.0	0.9	21.6
2016/2017	26	1,021	170.1	149–203	34.3	41.0	17.8	6.0	0.5	21.4

^a Recruits = all new and soft shell crab ≥ 151 mm and ≤ 167 mm carapace length.

^b PR+1 = all new and soft shell crab ≥ 168 mm and ≤ 184 mm, and old shell crab ≥ 151 mm and ≤ 167 mm, carapace length.

^c PR+2 = all new and soft shell crab ≥ 185 mm and ≤ 201 mm, and old crab ≥ 168 mm and ≤ 184 mm, and very old ≥ 151 mm and ≤ 167 mm, carapace length.

^d PR+3 = all new and soft shell crab ≥ 202 mm and all old ≥ 185 mm and ≤ 201 mm, and very old ≥ 168 mm and ≤ 184 mm, carapace length.

^e PR+4 = all old and very old where carapace length ≥ 202 mm.

^f Skip molts = all old and very old crab.

Table 11.—Summary of traditional commercial golden king crab CPUE and average weight, 1973/1974 to present. Data were collected during dockside sampling and interviews.

Season	Number Sampled			Mean catch/pot	Range of catch/pot	Weight (lb)		Estimated no. crab harvested ^a	Percent of harvest sampled ^b
	Boats interviewed	Pots lifted	Crab captured			Mean	Range		
1973/1974	1	—	—	—	—	6.9	6.9–6.9	10,388	5.8
1975/1976	1	—	—	—	—	8.8	8.8–8.8	7,868	10.6
1977/1978	2	—	—	—	—	7.5	7.2–7.6	11,166	6.5
1979/1980	1	—	—	—	—	8.8	8.8–8.8	19,180	2.5
1980/1981	9	—	—	—	—	7.8	6.6–8.8	90,919	1.5
1981/1982	2	50	1,368	27.4	27.4–27.4	7.4	6.5–7.8	89,071	0.6
1982/1983	15	1,697	3,482	2.1	1.1–5.3	7.1	6.5–7.9	113,747	1.4
1983/1984	8	300	900	3.0	3.0–3.0	7.1	6.3–7.6	137,833	0.5
1984/1985	12	—	—	—	0.0–0.0	6.4	5.7–7.3	131,803	1.0
1985/1986	17	2,471	11,743	4.8	1.6–7.5	6.6	6.0–8.5	106,038	1.7
1986/1987	40	9,023	35,064	3.9	1.6–16.4	6.9	6.2–8.5	148,029	3.1
1987/1988	62	14,365	52,275	3.6	0.1–12.7	7.3	6.5–10.6	129,578	4.4
1988/1989	78	23,811	83,295	3.5	0.4–9.0	7.2	5.8–8.7	133,190	5.5
1989/1990	90	18,068	40,560	2.2	0.3–8.7	8.0	6.5–9.4	78,597	10.7
1990/1991	80	14,544	29,877	2.1	0.3–8.8	7.8	6.5–11.0	54,798	13.0
1991/1992	61	9,850	19,072	1.9	0.2–6.6	7.4	6.3–9.8	30,812	16.7
1992/1993	18	2,507	6,627	2.6	0.5–4.9	7.4	6.4–8.2	14,101	10.3
1993/1994	13	1,425	2,771	1.9	0.7–3.4	7.2	6.5–8.3	4,234	25.5
1994/1995	13	1,389	2,164	1.6	0.5–2.7	7.3	6.6–9.2	5,427	19.1
1995/1996	15	835	208	0.3	0.0–1.1	7.2	6.0–8.5	2,204	15.9
1996/1997	19	2,782	5,284	1.9	0.3–3.3	6.6	5.9–8.0	10,162	15.6
1997/1998	30	4,665	17,503	3.8	0.1–6.7	6.6	5.8–7.7	37,269	6.4
1998/1999	37	7,143	33,901	4.8	1.0–10.0	6.5	5.9–7.4	56,236	4.3
1999/2000	59	14,999	57,871	3.9	0.6–10.0	6.7	4.8–7.9	83,896	5.0
2000/2001	85	16,204	48,403	3.0	0.4–7.5	7.2	6.1–8.5	73,923	7.7
2001/2002	76	14,514	35,442	2.4	0.6–5.1	6.9	6.2–8.3	87,826	6.3
2002/2003	77	14,975	36,102	2.4	0.4–6.0	7.2	6.0–8.7	78,218	6.8
2003/2004	60	13,041	40,174	3.1	0.3–6.4	7.1	6.1–9.5	78,267	3.8
2004/2005	62	15,350	50,958	3.3	0.2–5.8	7.1	6.0–8.5	78,664	3.9
2005/2006	66	13,227	36,332	2.8	0.5–8.9	7.0	5.9–8.6	76,735	4.2
2006/2007	66	11,641	50,310	4.3	1.3–10.7	7.1	5.6–9.1	84,733	4.0
2007/2008	40	8,374	44,397	5.3	1.5–10.7	6.9	5.9–8.6	94,640	2.1
2008/2009	33	9,446	51,683	5.5	0.9–11.8	7.1	5.9–8.8	96,726	1.8
2009/2010	57	13,265	58,556	4.4	0.6–12.6	7.4	5.9–9.6	100,026	2.9
2010/2011	72	11,855	45,530	3.8	0.5–12.3	7.8	6.1–10.3	88,830	4.3
2011/2012	74	9,320	31,899	3.4	0.1–11.1	7.8	5.9–10.2	76,848	4.6
2012/2013	65	15,676	30,393	1.9	0.4–14.5	8.2	6.7–10.6	59,152	5.6
2013/2014	58	6,779	13,932	2.1	0.4–8.4	8.2	6.9–10.3	31,709	9.6
2014/2015	70	6,640	8,800	1.3	0.1–5.7	7.8	6.5–9.1	16,643	19.8
2015/2016	47	3,620	4,977	1.4	0.1–3.5	7.4	5.8–8.6	10,382	20.5
2016/2017	27	2,416	3,177	1.3	0.1–4.0	7.4	6.3–8.3	8,322	12.3

^a Calculated by dividing fish ticket weight data from Table 1, by dockside sampling average weight per crab data.

^b Calculated by dividing number of crab sampled for size frequency by estimated number of crab caught.

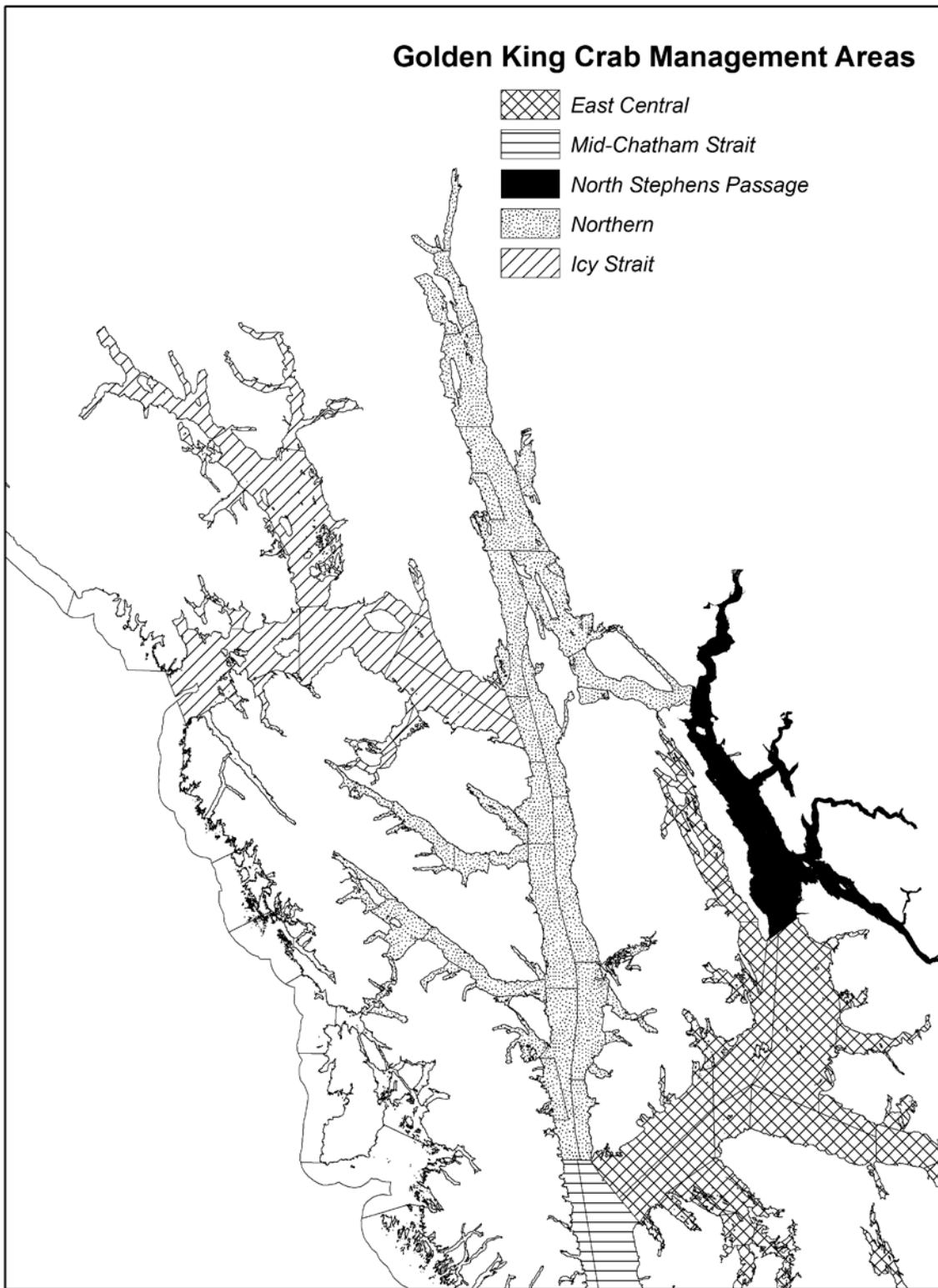


Figure 1.—Map showing northern golden king crab (GKC) management area boundaries in Southeast Alaska, Registration Area A.

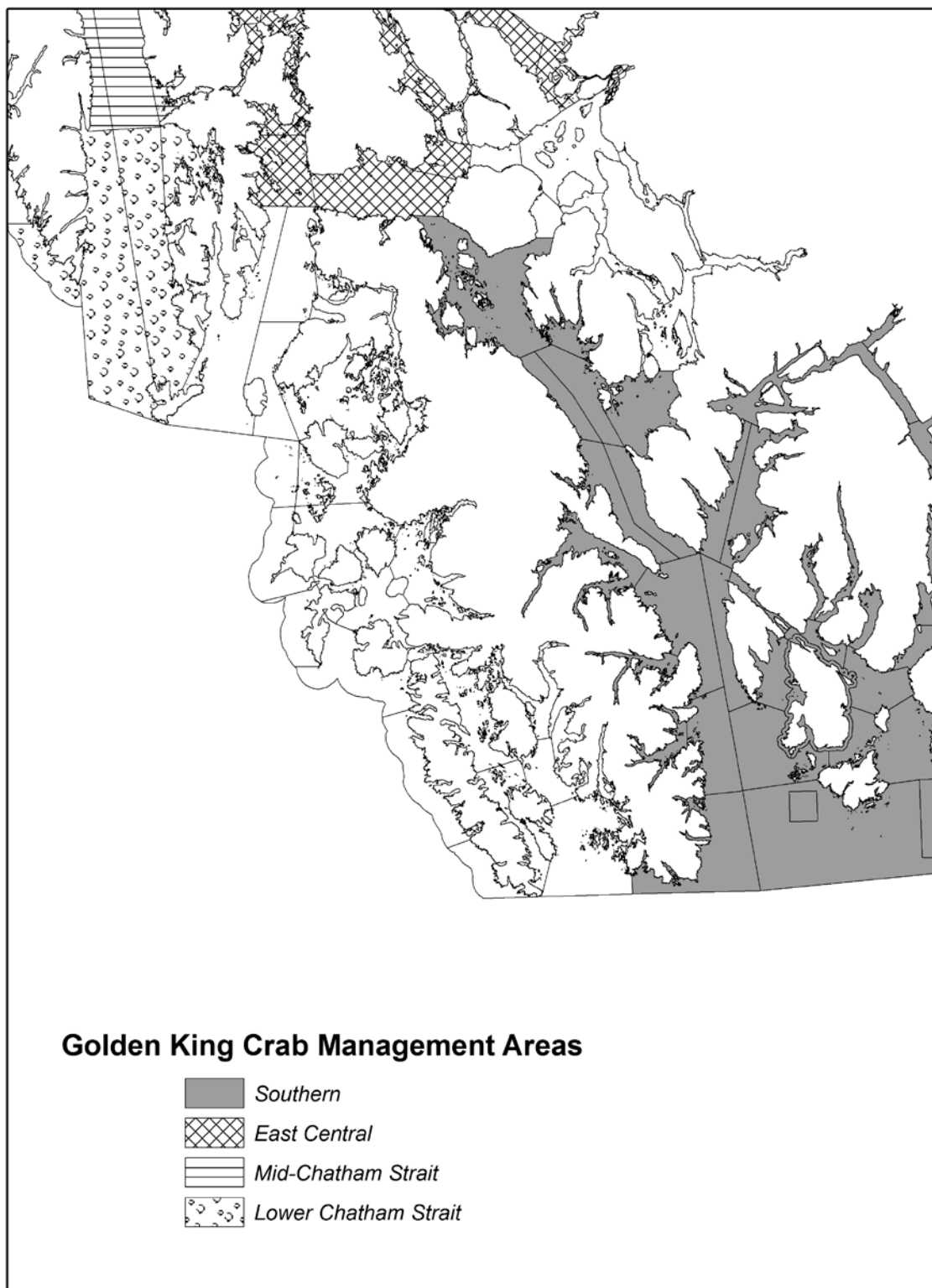


Figure 2.—Map showing southern golden king crab (GKC) management area boundaries in Southeast Alaska, Registration Area A.