Regional Information Report No. 1J21-10

2020 Golden King Crab Stock Status and Management Plan for the 2020/21 Season

by

Joseph Stratman

Andrew Olson

and

Katie Palof

June 2021

Alaska Department of Fish and Game **Division of Commercial Fisheries**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
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

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	′
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	″
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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By
Joseph Stratman
Alaska Department of Fish and Game, Division of Commercial Fisheries, Petersburg

Andrew Olson
Alaska Department of Fish and Game, Division of Commercial Fisheries, Douglas

and

Katie Palof
Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau

Alaska Department of Fish and Game
Division of Commercial Fisheries, Publications Section
802 3rd, Douglas, Alaska, 99824-0020

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Joseph Stratman
Alaska Department of Fish and Game, Division of Commercial Fisheries,
16 Sing Lee Alley, Petersburg, AK 99833 USA

Andrew Olson
Alaska Department of Fish and Game, Division of Commercial Fisheries,
802 3rd St Douglas, AK 99824, USA

and

Katie Palof
Alaska Department of Fish and Game, Division of Commercial Fisheries,
1255 W. 8th Street, Juneau, AK 99801, USA

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TABLE OF CONTENTS

Page

LIST OF TABLES ii

LIST OF FIGURES ii

ABSTRACT 1

INTRODUCTION 1

Area Description 1

Overview 1

RECOMMENDED HARVEST STRATEGY 2

Purpose 2

MANAGEMENT GOALS AND OBJECTIVES 2

Proposed Plan 2

- Performance Indicators 2
- Reference Points 4

Monitoring Strategy 4

- Decision Rules 4
  - Inseason 4
  - Postseason 5
- Review of GHLs or Decision Rules 5
- Other Considerations for Management and Future Recommendations 5

2020/2021 GOLDEN KING CRAB SEASON 6

Management Action Summary 6

Data Sources and Limitations 6

MANAGEMENT AREA UPDATES AND RECOMMENDATIONS 7

North Stephens Passage 7

Icy Strait 7

Southern 8

Lower Chatham Strait 9

Mid-Chatham Strait 9

Northern 9

East Central 9

REGULATIONS 10

Legal Gear 10

Registration 10

- Simultaneous Registration Regulations 10

Logbook and Reporting Requirements 10

Retention of Parasitized Golden King Crab 11

Golden King Crab Fishing in the Exclusive Economic Zone (EEZ) 11

Lost Pots 11

TABLE OF CONTENTS (Continued)

Page

Other Requirements and Information 11

REFERENCES CITED 13

TABLES AND FIGURES 15

LIST OF TABLES

Table **Page**

1. Summary of the golden king crab fishery guideline harvest levels (GHL), in pounds, by management area for 1999/00 through 2020/21 commercial seasons. 16
2. Summary of the golden king crab fishery harvest data, in pounds, by management area for 1999/00 through 2019/20 commercial seasons. 17
3. Summary of the golden king crab fishery season length, in days, for each management area for 1999/00 through 2019/20 commercial seasons. 18
4. Summary of golden king crab fishery effort (permits fished and number of pot lifts) by management area for 1999/00 through 2019/20 commercial seasons. 19
5. Summary of golden king crab fishery average logbook catch per unit effort (CPUE; crab per pot lift) by management area for 1999/00 through 2019/20 commercial seasons. 19
6. Summary of the golden king crab commercial fishery harvest by pounds (lb) per boat per day (total number of days the area was open) for each management area for 1999/00 through 2019/20 seasons. 21
7. Summary of size frequency data, in millimeters, from dockside sampling collected during the golden king crab fishery by management area from the 1999/00 through 2019/20 seasons. 22
8. Golden king crab guideline harvest ranges for Registration Area A [5 AAC 34.115]. 24
9. Northern management area logbook catch per unit of effort (CPUE) reference points. 24
10. Icy Strait management area logbook catch per unit of effort (CPUE) reference points. 24
11. North Stephens Passage management area logbook catch per unit of effort (CPUE) reference points. 24
12. East Central management area logbook catch per unit of effort (CPUE) reference points. 24
13. Mid-Chatham Strait management area logbook catch per unit of effort (CPUE) reference points. 24
14. Lower Chatham Strait management area logbook catch per unit of effort (CPUE) reference points. 25
15. Southern management area logbook catch per unit of effort (CPUE) reference points. 25

LIST OF FIGURES

Figure **Page**

1. Southeast Alaska golden king crab commercial harvest, 1970/71–2019/20 seasons. 26
2. Golden king crab management areas for Southeast Alaska. 27
3. Map of Exclusive Economic Zone (EEZ) where fishing for GKC is allowed under the conditions of a permit issued by the commissioner [5 AAC 34.116]. 28
4. North Stephens Passage golden king crab length frequencies of sampled commercial catch from 2000–2020. 29
5. Icy Strait golden king crab length frequencies of sampled commercial catch from 2000–2020. 30
6. Southern golden king crab length frequencies of sampled commercial catch 2003–2020. 31
7. East Central golden king crab length frequencies of sampled commercial catch from 2000–2019. 32
8. Commercial GKC fishery harvest from the Northern management area. Dots represent the GHL in a given year (2001–present). 33
9. Northern management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 33
10. Northern management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 34

LIST OF FIGURES (Continued)

Figure **Page**

11. Commercial GKC fishery harvest from the Icy Strait management area. Dots represent the GHL in a given year (2001–Present). 34
12. Icy Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 35
13. Icy Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 35
14. Icy Strait golden king crab logbook CPUE and pot lift proportions based on reduction of Tanner crab harvest influence. 36
15. Commercial GKC fishery harvest from the North Stephens Passage management area. Dots represent the GHL in a given year (2001–Present). 37
16. North Stephens Passage management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 37
17. North Stephens management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 38
18. North Stephens Passage golden king crab logbook CPUE and pot lift proportions based on reduction of Tanner crab harvest influence. 39
19. Number of golden king crab caught during the annual Tanner crab stock assessment survey in Holkham Bay (2014–2020). 40
20. Number of golden king crab caught during the annual Tanner crab stock assessment survey in Holkham Bay by sex and recruit status (1999–2020). 41
21. Commercial GKC fishery harvest from the East Central management area. Dots represent the GHL in a given year (2001–Present). 41
22. East Central management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE 42
23. East Central management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 42
24. Commercial GKC fishery harvest from the Mid-Chatham Strait management area. Dots represent the GHL in a given year (2001–Present). 43
25. Mid-Chatham Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 43
26. Mid-Chatham Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE 44
27. Commercial GKC fishery harvest from the Lower Chatham Strait management area. Dots represent the GHL in a given year (2001–Present). 44
28. Lower Chatham Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 45
29. Lower Chatham Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 45
30. Commercial GKC fishery harvest from the Southern management area. Dots represent the GHL in a given year (2001–Present). 46
31. Southern management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 46
32. Southern management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE. 47

ABSTRACT

This report provides a summation of the history of the golden king crab, *Lithodes aequispinus,* commercial fishery, an overview of available data sources and recent management actions, and a review of recent season's fishery dependent data including commercial and personal use fishery recommendations by management area for the 2020/2021 season. The golden king crab fishery in Registration Area A (Southeast Alaska) is managed in seven distinct management areas including Mid-Chatham Strait, East Central, North Stephens Passage, Northern, Icy Strait, Lower Chatham Strait, and Southern.

Key words: golden king crab, GKC, *Lithodes aequispinus*, guideline harvest range, GHR, guideline harvest level, GHL, catch per unit effort, harvest strategy, CPUE, 2020/21 season, Registration Area A, Southeast Alaska.

INTRODUCTION

AREA DESCRIPTION

The Golden king crab (*Lithodes aequispinus,* GKC) commercial fishery is managed within all waters of Registration Area A defined in 5 AAC 34.100 and described in 5 AAC 34.107 and 5 AAC 34.116.

OVERVIEW

The Alaska Department of Fish and Game (department) evaluates stock status and establishes guideline harvest levels (GHLs) for each management area using fishery dependent data including: catch per unit of effort (CPUE), harvest and biological information (carapace length, weight, and maturity) from dockside sampling landings. No population abundance estimates are obtained for GKC stocks.

Harvests of GKC in Southeast (SE) Alaska have fluctuated widely since the development of the fishery in the early 1970s (Figure 1). Harvests reached peak levels in the 1980s, followed by a collapse in the early 1990s. The fishery performance substantially improved with strong increases in recruitment beginning around 1999 and harvests were at relatively high levels from the 1999/00 to 2010/11 seasons. Harvests of GKC have steadily declined since the 2010/11 season. The fishery is currently managed in seven separate management areas, each with a specific guideline harvest range (GHR) and GHL. These areas include: Northern, Icy Strait, North Stephens Passage, East Central, Mid-Chatham Strait, Lower Chatham Strait, and Southern (Figure 2).

Golden king crab are relatively long-lived slow growing species that have an asynchronous 20-month reproductive cycle (Somerton and Otto 1986; Long and Van Sant 2016), morphometric maturity at approximately 8 years of age (Koeneman and Buchanan 1985; Paul and Paul 2001; Hebert et al. 2008), lecithotrophic larvae that remain at depth (Sloan 1985; Shirley and Shijie 1997; Long and Van Sant 2016). Golden king crab exhibit spatial variability in size at maturity across the North Pacific and among the seven management areas within Southeast Alaska where size at maturity increases with increases in latitude (Jewett et al. 1985; Somerton and Otto 1986; Nizyaev 2005; Olson et al. 2018). Certain aspects of this species' life history are well documented whereas other critical components such as, growth rates, age at maturity, longevity, etc. are unknown.

RECOMMENDED HARVEST STRATEGY

PURPOSE

The purpose of a harvest strategy is to lay the framework for a consistent and transparent inseason and postseason approach to determine GHLs and close fisheries when warranted. The harvest strategy described herein remains consistent with the Board of Fisheries' Policy on King and Tanner Crab Resource Management (90-04-FB, March, 1990) [5 AAC 34.080], the Southeast Alaska Golden King Crab Management Plan [5 AAC 34.114], and will be treated as a guideline for managing GKC and not a prescriptive step by step approach. Many factors and sources of information can affect determining GHLs or closing of fisheries that cannot be captured in a prescriptive framework.

MANAGEMENT GOALS AND OBJECTIVES

The primary goal and objective is to recommend a harvest strategy for Southeast Alaska GKC to improve and stabilize fishery performance using transparent and repeatable metrics (and their rationale) to evaluate stock health and measure performance for more consistent inseason and postseason management. Additional goals and objectives include minimizing and mitigating ecological risks from fishing related activities, maintaining various size and age compositions of stocks in order to maintain long-term reproductive viability; minimizing handling and unnecessary mortality of non-legal GKC and non-target species; and reducing dependency on annual recruitment.

Harvest strategies have been implemented for the GKC fisheries in the Aleutian Islands and Pribilof Islands to improve fisheries management and sustainability. These harvest strategies are comprised of biological, fishery dependent and independent reference points (i.e. mature male biomass, CPUE, annual recruitment, etc.) that are used in recommending the total allowable catch (TAC) or GHL for a given management area and season (Daly et al. 2019; Daly and Jackson 2020; Siddeek et al. 2020).

PROPOSED PLAN

Here we propose a harvest strategy plan that informs inseason and postseason management using fishery dependent performance indicators and management decision rules.

Performance Indicators

The primary performance indicator used in this harvest strategy is commercial catch rate defined as logbook catch of GKC per unit of effort (CPUE):

$$CPUE_{le} = \frac{catch}{effort} \tag{1}$$

where *CPUE* is the catch of legal size male GKC per unit of *effort (pot lifts)* for each logbook entry (*le*). Equation (1) is then applied to all logbook entries and averaged for a given management area and season where:

$$\overline{CPUE_{a,s}} = \frac{\sum CPUE_{le}}{n} \quad (2)$$

where *a* is a given management area, *s* is a given season, and *n* is the total number of logbook entries. Future iterations will incorporate soak time in order to standardize CPUE.

Due to the GKC and Tanner crab fishery occurring concurrently, it is difficult to differentiate between GKC that are harvested as bycatch or directly targeted. GKC that are harvested as bycatch can bias logbook CPUE and consequently trigger management actions during and after the season. To evaluate this concern a proportion of ≥ 60% will be applied to GKC catch from commercial logbooks:

$$catch_{le}^{\geq 0.6} = \frac{crab_{gkc}}{\left(total\ crab_{gkc+tc}\right)} \quad (3)$$

where *catch* is for a given logbook entry (*le*), *gkc* is golden king crab and *tc* is Tanner crab. Then subsequently Equations (1) and (2) will be applied to calculate CPUE.

A secondary performance indicator that will be used in this harvest strategy is commercial catch rate obtained from fish ticket data. With fish ticket data, CPUE is calculated using each harvest landing for the entire season divided by the difference between the first and last catch date (which is defined as active fishing season). This secondary CPUE indicator is defined as "pounds per pot day" and will aid in understanding catch rates over time:

$$active\ fishing\ season(days) = \left(date_{first\ catch} - date_{last\ catch}\right) \quad (4)$$

$$CPUE_f = \frac{harvest(lbs)}{active\ fishing\ season(days)} \quad (5)$$

where *CPUE* is the harvest (lbs) per day for each fish ticket landing (*f*). Equation (5) is then applied to all fish ticket landings and averaged for a given area and season where:

$$\overline{CPUE_{a,s}} = \frac{\sum CPUE_f}{n} \quad (6)$$

where *a* is a given management area, *s* is a given season, and *n* is the total number of fish ticket landings.

Supplementary information that may be evaluated in this harvest strategy includes biological, local ecological knowledge (LEK), and other anecdotal information that may not be captured quantitatively in this harvest strategy framework.

- Biological information will be evaluated by analyzing carapace length (CL) mm frequencies by area and season for recruit classes of GKC sampled during commercial landings. Size of GKC is defined as the CL measurement. Recruit class is used as an indicator of shell age and is defined as recruit (new shell and a CL of 151–166mm) and postrecruit (new or old shell and a CL $\geq$ 167 mm).
- LEK is experiential information from fishermen and the fishing industry about the natural environment as it pertains to GKC. LEK will be evaluated and reviewed through permit holder comments in logbooks, communication with permit holders and industry representatives, and discussion at annual industry meetings (Ainsworth 2011; Beaudreau and Levin 2014). Examples of LEK include lots of crab (recruits, females, and undersized), females with full clutches, softshell, sand fleas, bad weather, large tides, and parasitized crab.

Reference Points

The primary indicator Target Reference Point (RP_{targ}) for each management area and is set at the average logbook CPUE for the years 2000-2017 because these years capture logbook requirements for the fishery in 2000 and represents contrasting data (highs and lows) in fishery performance. The exception to this includes North Stephens Passage (excludes 2000) and Lower Chatham (excludes 2013) due to having substantial outliers in those given years that influenced the Target Reference Point. The Trigger Reference Point (RP_{trig}) is set between the Target and Limit Reference Point that prompts management actions and is set at 75% of the RP_{targ}. The Limit Reference Point (RP_{lim}) is set at the level at which stocks are considered in a danger zone and are no longer resilient to fishing pressure and is set at 50% of the RP_{targ}.

MONITORING STRATEGY

Herein lies a monitoring strategy with associated decision rules for inseason and post season management of GKC.

Decision Rules

As the primary performance indicator is the most readily available estimate of fishery performance the following decision rules will guide inseason and postseason management decisions.

Inseason

- Fishery performance will be assessed biweekly and/or with a minimum requirement of 500 pot lifts before taking management action whichever is the least restrictive under the following guidelines:
    - If logbook CPUE is $\geq RP_{targ}$ manage to GHL.
    - If logbook CPUE is $\geq RP_{trig}$ but $< RP_{targ}$ manage to GHL and monitor closely.
    - If logbook CPUE is $\geq RP_{lim}$ and $< RP_{trig}$ fishery close early.
    - If logbook CPUE is $< RP_{lim}$ close fishery early **and** subsequent closure of management area for a minimum of 1 year for commercial and personal use fisheries the following season, depending upon a postseason review.
- GHLs will not be changed inseason and are only subject to change per postseason decision rules.

Postseason

Increase in a GHL

- If the most recent logbook CPUE is > than the most recent previous season and is > RP_{targ} the GHL may increase up to a maximum of 20% the following season.
- If the most recent logbook CPUE is > than the most recent previous season and ≤ RP_{targ} and > RP_{trig} the GHL may increase up to a maximum of 10% the following season.
- If the most recent logbook CPUE is > than the most recent previous season and is ≤ RP_{trig} and > RP_{limit} the GHL may increase up to a maximum of 5% the following season.
    - New GHLs may not exceed respective management area GHRs.

Decrease in a GHL

- **If the fishery closed short of a GHL inseason due to poor fishery performance and/or the most recent CPUE is < than the previous season the GHL will be decreased based on the following conditions:**
    - If CPUE is < than the most recent previous season and is > RP_{trig} and ≤ RP_{targ} the GHL may be reduced up to a maximum of 40% the following season.
    - If the fishery closed short in-season due to poor fishery performance and CPUE is < than the most recent season and > RP_{lim} then the GHL decrease the following season may be within 20% of the total harvest at the time of closure during the most recent previous season, but not less than 7,500 lbs.

Closure and Re-opening

- If logbook CPUE is < the RP_{lim} further management action may be required by implementing an area closure of a minimum of 1 year to reduce the risk of localized depletion.
- Upon re-opening an area after a closure, the GHL will be equal to the harvest at the time of closure rounded to the nearest 1,000 lbs and must not be less than 7,500 lbs whichever is greatest.

Review of GHLs or Decision Rules

If and when new information becomes available indicating that the harvest strategy framework and GHL setting decision rules are not consistent with the Board's policy of managing a sustainable GKC resource, the decision rules must be reviewed and the reference points must be adjusted accordingly.

Other Considerations for Management and Future Recommendations

Logbook CPUE currently lacks a soak time data field and cannot be standardized for comparison across years. Soak time was introduced as a reporting field in logbooks for the 2020 fishing season and will be used to inform this harvest strategy in future iterations.

This harvest strategy may be amended in future iterations as more information and tools become available. This harvest strategy is a first step to increase transparency regarding management metrics utilized for inseason and postseason decisions. We recommend that this harvest strategy is further developed using a management strategy evaluation (MSE). A MSE is a tool that uses simulation to test how well a harvest strategy performs and if the objectives of the harvest strategy are being achieved (Punt et al. 2016; Goethel et al. 2019).

2020/2021 GOLDEN KING CRAB SEASON

MANAGEMENT ACTION SUMMARY

The department reviewed available data from fish tickets, logbooks, and dockside sampling for each of the seven GKC management areas in advance of the 2020/21 season. For areas that were open in the 2019/20 season (North Stephens Passage, Icy Strait, and Southern), the department used postseason decision rules from a recommended harvest strategy which includes comparing harvest (lbs) to corresponding GHLs, logbook CPUE compared to reference points (i.e. target, trigger, and limit), reviewing Tanner crab harvest influence, and spatial distribution of incidental catch during the annual Tanner crab stock assessment survey in Holkham Bay for each respective management area. Biologists compared CPUE values to two sets of reference points – the first set (target (avg CPUE), trigger (75% of target), and limit (50% of target)) developed by the department and a second set (target (75% of avg CPUE), trigger (60% of target), and limit (40% of target)) recommended by industry. For areas that were closed in the 2019/20 season (Lower Chatham Strait, Mid-Chatham Strait, Northern, and East Central), biologists considered re-opening these areas at the minimum of 7,500 lb, re-opening at the last GHL fished, or using a percentage of the top end of the GHR to set the GHL. Based on that review, GHLs were increased for North Stephens Passage, decreased for Southern, and unchanged for the Icy Strait management areas from the 2019/20 season (Table 1). The Lower Chatham Strait, Mid-Chatham Strait, Northern, and East Central management areas were reopened for minimal GHLs ranging from 5–15% of the top end of their respective GHRs. The department intends to refine the harvest strategy, with input from stakeholders, and use it for future inseason and postseason management decisions.

DATA SOURCES AND LIMITATIONS

There is no fishery independent stock assessment for GKC in SE Alaska although some limited size and sex data of GKC bycatch in the annual Tanner crab survey in the North Stephens Passage management area has been collected (Rebert et al. 2019). All data currently available to assess GKC stocks is fishery dependent. Each data type (logbook CPUE and dockside sampling) has specific limitations. Logbook CPUE provides a broad view of fishery performance but has the additional limitations of potential reporting errors (e.g., numbers of crab, pots lifted, etc.). Soak time began being collected during the 2019/20 season to allow for standardization of CPUE, however, to date all logbook CPUE data remains unstandardized. Dockside sampling is used to collect biological information on commercial harvested crab that includes carapace length (CL), sex, weight, and shell condition, a proxy for age, which is used to track changes in recruitment (e.g. recruit and postrecruit) over time. The validity of dockside sampling data depends on the number of trips sampled each season and can be variable. Dockside information on changes in the size of crabs harvested and corresponding proportion of recruit to postrecruit crabs is difficult to interpret, especially at low harvest levels. For these reasons, data are highly variable, and there is less predictive power and a potential for failing to detect signs of recruitment failure. For each of the seven management areas, fishery data are summarized in Tables 1–7, Figures 1; 4–7, and Figures A1–A32. Averages referenced in relation to CPUE data are calculated using all seasons (except the most recent) since the inception of logbook requirements (1999/00 through 2018/19 seasons).

MANAGEMENT AREA UPDATES AND RECOMMENDATIONS

NORTH STEPHENS PASSAGE

The 2019/2020 GKC harvest for this area was 19,769 lb (Table 2) with a season length of 2 days (Table 3), the shortest fishery on record. Eight permit holders participated in the fishery and there were 791 pot lifts (Table 4). The 2019/20 logbook CPUE was 3.6 crabs per pot, which is above the average of 1.6 crabs per pot and the highest CPUE since the 1999/00 season (Table 5). The GKC catch per boat per day (total number of days the area was open) of 1,236 lb was well above the average of 64 lb and the highest on record (Table 6). Dockside sampling data show a length frequency range of 141–206 mm CL with an average crab size of 174 mm and is the same as the previous 20-year average (Table 7).

The North Stephens Passage GHL increased 15% to **15,000** lb for the 2020/2021 fishing season.

Current management considerations for the North Stephens Passage management area include:

- Comparing the previous season CPUE to department decision rules (target (avg CPUE), trigger (75% of target), and limit (50% of target)) and industry decision rules (target (75% of avg CPUE), trigger (60% of target), and limit (40% of target)) in the harvest strategy both point to a GHL increase up to 20% since in both cases the previous season's CPUE of 3.6 crabs per pot is above the target reference point (Tables 5 and 11, Figures 17 and 18).
- Dockside sampling data show increasing average size over the past five seasons (Table 7, Figure 4).
- GKC bycatch in the annual Tanner crab survey data from Holkham Bay suggests a large recruitment event occurred at a similar time as fishery data indicate, around 2015, and also that recruit class crabs have declined from the previous year but historically high amounts of legal (recruit and postrecruit class crabs) remain (Figures 19 and 20).

In 2019/20, the GKC fishery occurred exclusively inside of Holkham Bay (statistical area 111-21) and was the shortest season on record. Increases in logbook CPUE and recruitment, evident beginning in 2015/16 with a drop to an historical low mean CL (Table 7, Figure 4), combined with indications of a similarly timed recruitment event, with increases in pre-recruit CPUE in 2014 and 2015, and an increase in recruit CPUE in 2016 in GKC catch in the annual Tanner crab stock assessment survey (Figure 18), suggests potential recruitment in the area and possible early stages of a stock recovery. Increases in fishery performance in the past 4 seasons (2016/17–2019/20) and supporting bycatch trends in the Tanner crab stock assessment survey indicated continued improvement in stock dynamics in Tracy and Endicott Arm of Holkham Bay. However, whether these trends have also been seen in a larger spatial scale within the North Stephens Passage management area has not been determined. These considerations lead to a 15% increase in the GHL for the 2020/2021 season instead of the maximum 20% allowed by the decision rules in the harvest strategy.

ICY STRAIT

The 2019/20 GKC harvest for this area was 6,833 lb (Table 2). The season opened for 34 days (Table 3). Six permit holders participated in the fishery and there were 820 pot lifts (Table 4). The

2019/20 logbook CPUE was 1.2 crabs per pot, which is below the average of 2.1 crabs per pot (Table 5). The GKC catch per boat per day of 33 lb was well below the average of 125 lb (Table 6). Dockside sampling data show a length frequency range of 155–192 mm CL with an average crab size of 172 mm which is lower than the previous 20-year average of 177 mm (Table 7).

The GHL for the Icy Strait management area remained at **7,500** lb for the 2020/21 fishing season.

Current management considerations for the Icy Strait management area include:

- Comparing the previous season CPUE to department decision rules (target (avg CPUE), trigger (75% of target), and limit (50% of target)) in the harvest strategy is unclear when the CPUE decreases from the previous season and is below the trigger but above the limit. There was some discussion about the third bulleted point in the draft harvest strategy under "Decrease in a GHL" and whether that applied here but there was no consensus (Figure 12).
- Comparing the previous season CPUE to industry decision rules (target (75% of avg CPUE), trigger (60% of target), and limit (40% of target)) was clearer. Since the CPUE falls between the target and the trigger, the decision rules in the harvest strategy prescribe the GHL may be reduced up to a maximum of 40% (Figure 13).
- Dockside sampling data show a relatively small average size, suggesting some recent recruitment in the area (Table 7, Figure 5).

Observed trends in available data suggest a relatively stable fishery in this area, and thus the department did not change the GHL for the 2020/2021 season.

SOUTHERN

The 2019/20 GKC harvest for the Southern management area was 20,557 lb (Table 2). The season opened for 38 days (Table 3), the second shortest fishery on record. Five permit holders participated in the fishery with a total of 1,580 pot lifts (Table 4). The 2019/20 logbook CPUE was 2.3 crabs per pot, below the average of 3.7 (Table 5). The GKC catch per boat per day of 108 lb was double the average of 54 lb (Table 6). Dockside sampling data show a length frequency range of 153-191 mm with an average crab size of 168 mm CL which is lower than the previous 20-year average of 169 mm (Table 7).

The Southern GHL decreased to **20,000** lb for the 2020/2021 fishing season.

Current management considerations for the Southern management area include:

- Comparing the previous season CPUE to department decision rules (target (avg CPUE), trigger (75% of target), and limit (50% of target)) in the harvest strategy is unclear when the CPUE decreases from the previous season and is below the trigger but above the limit. There was some discussion about the third bulleted point in the draft harvest strategy under "Decrease in a GHL" and whether that applied here but there was no consensus (Figure 31).
- Comparing the previous season CPUE to industry decision rules (target (75% of avg CPUE), trigger (60% of target), and limit (40% of target)) was clearer. Since the CPUE falls between the target and the trigger, the decision rules in the harvest strategy prescribe the GHL may be reduced up to a maximum of 40% (Figure 32).

- Dockside sampling data show below average size crab for the past three seasons (Table 7, Figure 6).

Strong fishery performance in 2018/19 was followed by below average fishery performance in 2019/20. However, the stable average crab size for a number of seasons suggests steady annual recruitment in the area. Therefore, there was only a modest 1,000 lb decrease in the GHL for the 2020/21 season.

LOWER CHATHAM STRAIT

This area was closed in the 2019/20 season due to continued poor fishery performance (Stratman 2020). The Lower Chatham Strait GHL was set at **7,500** lb for the 2020/21 fishing season. Biologists were directed to consider a 7,500 lb GHL for re-opening as provided for in the draft harvest strategy, but also asked to consider other options such as opening at the last GHL fished or using a percentage of the top end of the GHR to set the GHL. For Lower Chatham Strait, though unreportable due to fewer than three permits fished (Table 2 and Figure 27), the poor fishery performance evident in the 2018/19 season led biologists to recommend a 7,500 lb GHL as outlined in the draft harvest strategy (Figures 28 amd 29).

MID-CHATHAM STRAIT

This area was closed in the 2019/20 season due to continued poor fishery performance (Stratman 2020). The Mid-Chatham Strait GHL was set at **7,500** lb for the 2020/2021 fishing season. Biologists were directed to consider a 7,500 lb GHL for re-opening as provided for in the draft harvest strategy, but also asked to consider other options such as opening at the last GHL fished or using a percentage of the top end of the GHR to set the GHL. For Mid-Chatham Strait the poor fishery performance evident in the 2018/19 season with just 4,481 lb landed (Table 2 and Figure 24) led biologists to recommend a 7,500 lb GHL as outlined in the draft harvest strategy (Figures 25 and 26).

NORTHERN

This area was closed in the last two seasons (2018/19 and 2019/20) due to continued poor fishery performance (Stratman 2020). The Northern GHL was set at **7,500** lb for the 2020/21 fishing season. Biologists were directed to consider a 7,500 lb GHL for re-opening as provided for in the draft harvest strategy, but also asked to consider other options such as opening at the last GHL fished or using a percentage of the top end of the GHR to set the GHL. For Northern, the poor fishery performance evident in the last open season (Table 2 and Figure 8), and lack of any recent information by which to judge stock status, led biologists to recommend a 7,500 lb GHL as outlined in the draft harvest strategy (Figures 9 and 10).

EAST CENTRAL

The East Central GKC fishery has historically been the most important area in terms of total harvest for SE Alaska. From the 1999/00 to 2018/19 seasons, approximately 42% of the total regional GKC harvest has come from this management area.

This area was closed in the 2019/20 season due to continued poor fishery performance (Stratman 2020). The East Central GHL was set at **11,500** lb for the 2020/21 fishing season. Biologists were directed to consider a 7,500 lb GHL for re-opening as provided for in the draft harvest strategy, but also asked to consider other options such as opening at the last GHL fished or using a

percentage of the top end of the GHR to set the GHL. For East Central, the large size of the area combined with smaller sized legal crab harvested in the area in the 2018/19 season (Table 7, Figure 7) which suggested some recruitment, led biologists to recommend an 11,500 lb GHL (Figures 22 and 23).

REGULATIONS

LEGAL GEAR

GKC taken in Tanner crab pots as described in 5 AAC 35.125(f) may be retained if the CFEC permit holder fishing for Tanner crab is also registered to fish for GKC and both crab fisheries are open at the same time [5 AAC 34.125(a)]. Permit holders with simultaneous registration in GKC and Tanner fisheries are required to comply with inseason reporting requirements in place for the GKC fishery, even if the permit holder begins by targeting Tanner crab.

REGISTRATION

The registration deadline for the 2020/21 commercial GKC fishery was Tuesday, January 19, 2021. All commercial fishermen registering for the 2020/2021 commercial GKC fishery after January 19, 2021, are required to pay a $45.00 late fee [A.S. 16.05.065]. Simultaneous, though separate, registrations are allowed for golden king and Tanner crab. Processors are reminded that registration for tenders is required.

Commercial fishermen may register and obtain logbook packets, buoy tags, and other fishery information in the Juneau, Sitka, Ketchikan, Petersburg, and Haines area offices. The king crab vessel registration year [5 AAC 34.020(b)] is June 28–June 27. Permit holders wishing to fish in open GKC management areas after June 27, 2021 need to re-register with the department.

Buoy tags are mandatory for all commercial GKC gear and are available in most SE area offices for $1.25 each. Buoy tag placement requirements are in regulation [5 AAC 34.051(b)]. Replacement tags are available at area offices upon receipt of a completed tag replacement affidavit. All missing tag numbers must be provided on the affidavit form before replacements can be issued [5 AAC 34.126]. The completed affidavit form must be signed by the permit holder and a crewmember. All purchased buoy tags are nonrefundable.

Simultaneous Registration Regulations

While the Tanner crab fishery is open, a GKC fisherman who is also registered for the Tanner crab fishery may use a maximum of 80 pots [5 AAC 34.125(b)(3)]. Twenty-four hours after the Tanner crab season closes regionwide in Registration Area A [5 AAC 35.020(k)], or after a fisherman, or his agent, has unregistered from the Tanner crab fishery, fishermen already registered for the GKC fishery may purchase an additional 20 tags in order to fish the maximum of 100 pots for GKC.

LOGBOOK AND REPORTING REQUIREMENTS

Logbooks and inseason reporting are mandatory in the GKC fishery [5 AAC 34.130 & 5 AAC 34.143]. Logbook packets include instructions for filling out the logbooks, logbook sheets, envelopes for their delivery, maps showing ADF&G statistical areas, and all pertinent advisory announcements available at the time the packet is obtained. Logbooks should be sealed in one of the envelopes provided in the registration packets and attached to the fish ticket submitted to the processor upon delivery. The number of crabs, pounds, number of pot lifts, and average soak time (hrs) by statistical area must be recorded on logbooks and fish tickets with the exception that

average soak time (hrs) is not required for fish tickets. Each king crab fisherman shall indicate on the fish ticket at the time of landing any king crab harvested which are not purchased by the processor, or which have been discarded at sea [5 AAC 34.075(a)]. Each buyer of king crab shall indicate on the fish ticket any king crab which was not purchased from a load [5 AAC 34.075(b)]. If golden king and Tanner crab are landed on the same trip, separate logbooks must be completed for each species.

For all GKC management areas, inseason reporting will be required daily. The first mandatory call-in for the 2020/21 season was Wednesday, February 17, 2021. If there was no harvest to report on February 17, 2021, fishermen were instructed to report the statistical area in which gear had been set or would be set. This reporting requirement applied to all GKC registrants, even if the permit holder began by targeting Tanner crab. Reporting requirements may be relaxed, by emergency order, inseason. A dedicated phone line, (907) 465-2000, has been established for the reporting of crab logbook data. Fishermen are also requested to call when they change management areas or when discontinuing fishing for the season.

RETENTION OF PARASITIZED GOLDEN KING CRAB

GKCs that are infected with the barnacle parasite, *Briarosaccus callosus*, may be retained regardless of size or sex [5 AAC 34.112]. Either a scar or the externa of the parasite located under the abdominal flap indicates the presence of this parasite. The scar is a dark brown or black spot about ¼ inch in diameter on the soft tissue of the abdominal flap. The externa varies in size, is shaped like a hot dog, and is usually attached to the soft tissue of the abdominal flap. It is possible to have more than one scar or externa on the same crab. The parasite's externa must be removed before the crab is placed into the vessel holding tank.

GOLDEN KING CRAB FISHING IN THE EXCLUSIVE ECONOMIC ZONE (EEZ)

A commissioner's permit is required to fish GKC in the EEZ (Figure 3). The required commissioner's permit may specify season dates, pot limits, and areas of fishing operations. The commissioner's permit will require a detailed logbook for fishing operations and may require observer coverage and other conditions deemed necessary for conservation and management purposes [5 AAC 34.116]. For more information on fishing in the EEZ contact shellfish regional staff in the Douglas or Petersburg area offices.

LOST POTS

Reporting of lost pots or pots left in a closed area in fishing condition should be directed to the Alaska Wildlife Troopers (AWT) offices in Juneau (465-4000) or Ketchikan (225-5118).

OTHER REQUIREMENTS AND INFORMATION

Fishermen with gear in more than one fishery area are asked to make every effort to separate crab in their hold so crab can be sampled by department dockside sampling staff. Zip ties to mark crab are available to permit holders to assist with dockside sampling efforts. For more information on obtaining zip ties and separating crab by fishery area please contact shellfish regional staff in the Douglas or Petersburg area offices.

Fishermen are also reminded that weather delay criteria for Tanner and king crab fisheries have been adopted in regulation. Any delay to the start of the 2020/2021 Tanner and GKC fisheries due to weather will be announced 24 hours before the start of the fisheries [5 AAC 35.110(b) and 34.110(f)].

A person or vessel that operates pots or ring nets for commercial, subsistence, personal use, or sport purposes during the 30 days immediately before the scheduled opening date of the commercial fishery may not participate in that king crab fishery [5 AAC 34.128(a)]. This prohibition does not apply to the operation of commercial shrimp or Dungeness crab pots [5 AAC 34.128 (b)]. Fishermen are reminded to review gear storage requirements and other pertinent regulations in the 2020–2021 King and Tanner Crab Commercial Fishing Regulations booklet.

Fishermen are reminded to account for any groundfish taken for bait prior to or during the GKC fishery. Groundfish harvested for bait should be marked as disposition code 92, landed catch, on the crab fish ticket for the trip on which the bait was taken. Sablefish, halibut, lingcod, thornyhead, shortraker, rougheye, and yelloweye rockfish may not be taken or used for bait, except that the head, tail, fins, closely trimmed skeleton and visera of delivered or processed commercial sablefish, lingcod, thornyhead, shortraker, rougheye, and yelloweye rockfish may be used for bait [5 AAC 28.190].

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TABLES AND FIGURES

Table 1.–Summary of the golden king crab fishery guideline harvest levels (GHL), in pounds, by management area for 1999/00 through 2020/21 commercial seasons.

	Season	Mid-Chatham Strait	East Central	North Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
GHL (lb)	1999/00*	75,000	175,000		100,000		25,000	25,000
	2000/01	125,000	225,000	25,000	110,000	90,000	40,000	15,000
	2001/02	110,000	225,000	10,000	100,000	40,000	40,000	15,000
	2002/03	100,000	200,000	20,000	100,000	40,000	15,000	10,000
	2003/04	100,000	200,000	20,000	100,000	40,000	15,000	10,000
	2004/05	100,000	200,000	20,000	100,000	40,000	15,000	10,000
	2005/06	80,000	225,000	20,000	120,000	55,000	15,000	10,000
	2006/07	80,000	225,000	20,000	120,000	55,000	15,000	10,000
	2007/08	80,000	225,000	20,000	120,000	55,000	15,000	10,000
	2008/09	100,000	225,000	20,000	145,000	55,000	25,000	20,000
	2009/10	110,000	260,000	20,000	145,000	45,000	25,000	20,000
	2010/11	110,000	260,000	20,000	145,000	45,000	25,000	20,000
	2011/12	110,000	260,000	20,000	145,000	45,000	25,000	20,000
	2012/13	110,000	285,000	10,000	105,000	30,000	28,000	22,000
	2013/14	110,000	200,000	10,000	105,000	20,000	28,000	22,000
	2014/15	80,000	115,000	8,000	65,000	18,000	28,000	22,000
	2015/16	40,000	30,000	8,000	15,000	12,000	28,000	22,000
	2016/17	20,000	15,000	8,000	10,000	10,000	23,000	19,000
	2017/18	10,000	CLOSED	10,000	7,500	7,500	16,000	19,000
	2018/19	7,500	15,000	11,000	CLOSED	7,500	14,000	20,500
	2019/20	CLOSED	CLOSED	13,000	CLOSED	7,500	CLOSED	21,000
	2020/21	7,500	11,500	15,000	7,500	7,500	7,500	20,000

*During the 1999/2000 season and prior GHLs were combined for the East Central and North Stephens management area and for the Northern and Icy Strait management areas.

Table 2.–Summary of the golden king crab fishery harvest data, in pounds, by management area for 1999/00 through 2019/20 commercial seasons.

	Season	Mid-Chatham Strait	East Central	North Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
Harvest (lb)	1999/00	79,208	299,585	11,678	34,706	101,111	25,709	**
	2000/01	126,579	196,810	11,563	108,058	41,221	37,560	**
	2001/02	113,426	267,637	23,335	131,277	50,080	11,848	**
	2002/03	78,284	226,905	26,085	178,938	45,106	5,630	1,436
	2003/04	55,107	233,655	19,608	181,154	53,034	**	**
	2004/05	61,841	261,035	18,580	142,449	62,843	**	**
	2005/06	81,463	249,330	16,366	142,455	61,290	**	**
	2006/07	78,416	243,675	19,450	152,145	71,058	7,736	**
	2007/08	89,873	251,004	27,441	184,227	58,453	**	**
	2008/09	123,626	303,811	22,770	156,261	51,026	20,004	**
	2009/10	141,558	308,013	20,568	176,782	42,136	22,328	20,742
	2010/11	114,966	305,659	20,714	161,522	44,882	17,786	21,976
	2011/12	106,620	223,616	15,657	150,453	45,244	**	**
	2012/13	99,101	265,049	5,323	102,351	8,185	**	**
	2013/14	43,475	81,375	7,644	39,802	19,583	23,376	19,636
	2014/15	30,910	25,259	6,280	7,226	12,359	26,424	21,364
	2015/16	9,228	9,052	5,321	6,939	10,255	**	19,167
	2016/17	**	972	16,558	5,610	7,007	**	16,722
	2017/18	**	CLOSED	10,345	1,852	6,458	**	19,908
	2018/19	4,481	6,749	17,581	CLOSED	**	**	20,105
	2019/20	CLOSED	CLOSED	19,769	CLOSED	6,833	CLOSED	20,557
Avg. (1999/00–2018/19)		**72,419**	**197,852**	**16,143**	**108,642**	**39,841**	**14,845**	**15,570**

** Confidential data—fewer than three permits fished.

Table 3.–Summary of the golden king crab fishery season length, in days, for each management area for 1999/00 through 2019/20 commercial seasons.

	Season	Mid-Chatham Strait	East Central	North Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
Season length (days)	1999/00	59	26	26	30	30	104	133
	2000/01	76	18	162	76	162	153	162
	2001/02	82	39	39	54	54	132	132
	2002/03	146	37	29	37	37	228	228
	2003/04	178	26	75	21	17	178	228
	2004/05	177	31	111	19	15	177	211
	2005/06	243	52	253	52	54	319	319
	2006/07	228	57	98	33	20	298	298
	2007/08	78	21	36	18	17	209	227
	2008/09	61	11	89	17	25	176	263
	2009/10	56	9	78	26	28	127	299
	2010/11	54	19	114	42	26	217	112
	2011/12	59	6	255	101	255	95	85
	2012/13	282	78	282	118	65	282	75
	2013/14	149	73	148	73	90	148	102
	2014/15	136	32	49	32	49	284	112
	2015/16	133	33	64	33	64	268	133
	2016/17	139	36	19	49	49	139	109
	2017/18	183	CLOSED	9	45	45	278	102
	2018/19	111	64	6	CLOSED	34	111	35
	2019/20	CLOSED	CLOSED	2	CLOSED	34	CLOSED	38
Avg. (1999/00–2018/19)		**132**	**35**	**97**	**46**	**57**	**196**	**168**

Table 4.–Summary of golden king crab fishery effort (permits fished and number of pot lifts) by management area for 1999/00 through 2019/20 commercial seasons.

	Season	Mid-Chatham	East Central	N. Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
Effort (# permits)	1999/00	6	21	11	6	14	5	**
	2000/01	10	25	11	18	10	4	**
	2001/02	10	29	10	19	8	4	**
	2002/03	15	23	7	22	16	6	3
	2003/04	7	24	10	23	12	**	**
	2004/05	4	25	8	20	13	**	**
	2005/06	5	16	3	19	13	**	**
	2006/07	5	18	5	15	13	3	**
	2007/08	6	14	7	17	14	**	**
	2008/09	8	19	10	17	10	3	**
	2009/10	10	24	7	22	9	5	3
	2010/11	10	20	8	21	10	5	4
	2011/12	9	19	6	19	11	**	**
	2012/13	9	23	3	12	6	**	**
	2013/14	4	17	4	9	6	3	3
	2014/15	7	17	11	11	8	4	5
	2015/16	5	13	9	7	3	**	5
	2016/17	**	4	8	8	6	**	4
	2017/18	**	CLOSE	6	4	3	**	3
	2018/19	3	6	8	CLOSED	**	**	4
	2019/20	CLOSED	CLOSE	8	CLOSED	6	CLOSED	5
Avg. (1999/00–2018/19)		**7**	**19**	**8**	**15**	**9**	**3**	**3**
Effort (# pot lifts)	1999/00	2,627	9,276	652	2,545	6,568	934	**
	2000/01	3,585	8,976	2,610	6,190	3,150	1,481	**
	2001/02	4,899	14,901	2,634	5,695	3,419	958	**
	2002/03	4,633	13,057	2,131	6,832	3,392	492	280
	2003/04	3,487	10,237	2,173	8,016	2,280	**	**
	2004/05	3,090	11,010	1,499	6,276	2,859	**	**
	2005/06	4,200	11,657	1,030	6,986	3,466	**	**
	2006/07	3,326	9,173	1,037	4,406	3,179	379	**
	2007/08	3,050	6,725	1,351	4,877	2,515	**	**
	2008/09	3,339	7,241	1,812	5,231	2,595	794	**
	2009/10	4,119	9,646	1,871	7,335	1,704	1,210	768
	2010/11	3,745	8,906	2,071	6,473	2,778	1,093	1,110
	2011/12	4,117	5,249	2,646	8,242	2,626	**	**
	2012/13	4,469	18,713	665	6,163	740	**	**
	2013/14	2,555	6,824	1,588	3,188	1,440	1,046	913
	2014/15	2,461	3,943	2,103	1,378	1,576	1,081	1,290
	2015/16	763	1,719	1,676	855	819	**	1,306
	2016/17	**	281	2,728	766	833	**	1,109
	2017/18	**	CLOSE	2,124	441	855	**	1,017
	2018/19	525	1,124	2,174	CLOSED	**	**	865
	2019/20	CLOSED	CLOSE	791	CLOSED	820	CLOSED	1,580
Avg. (1999/00-2018/19)		**2,998**	**8,347**	**1,829**	**4,837**	**2,358**	**755**	**704**

** Confidential data—fewer than three permits fished.

Table 5.–Summary of golden king crab fishery average logbook catch per unit effort (CPUE; crab per pot lift) by management area for 1999/00 through 2019/20 commercial seasons.

	Season	Mid-Chatham Strait	East Central	North Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
Average Logbook CPUE (crab/pot)	1999/00	4.3	4.8	6.1	2.3	2.2	2.7	**
	2000/01	3.8	3.0	0.9	2.3	1.6	3.9	**
	2001/02	3.2	2.6	1.3	3.5	2.1	2.2	**
	2002/03	2.3	2.6	1.4	3.0	1.7	2.0	0.9
	2003/04	2.4	3.4	1.3	3.1	3.2	**	**
	2004/05	3.2	3.6	2.0	3.2	3.3	**	**
	2005/06	3.4	3.4	2.3	2.8	2.5	**	**
	2006/07	3.7	4.2	2.7	4.9	3.6	3.8	**
	2007/08	4.5	5.5	2.6	4.7	3.0	**	**
	2008/09	6.3	6.5	1.8	4.0	2.5	4.5	**
	2009/10	5.0	4.9	1.1	2.9	2.5	3.6	3.7
	2010/11	4.5	5.0	1.0	3.1	2.0	2.6	3.0
	2011/12	3.9	5.8	0.8	2.0	1.7	**	**
	2012/13	3.0	1.8	0.7	1.9	1.4	**	**
	2013/14	2.3	1.7	0.6	1.3	1.5	3.5	3.1
	2014/15	1.9	0.9	0.6	0.7	1.1	3.3	2.7
	2015/16	2.0	0.7	0.7	1.1	1.7	**	2.3
	2016/17	**	0.4	1.1	0.9	1.0	**	2.5
	2017/18	**	CLOSED	1.2	0.6	1.3	**	3.7
	2018/19	1.3	0.9	1.0	CLOSED	**	**	3.8
	2019/20	CLOSED	CLOSED	3.6	CLOSED	1.2	CLOSED	2.3
Avg. (1999/00–2018/19)		**3.2**	**3.3**	**1.6**	**2.6**	**2.1**	**3.5**	**3.7**

** Confidential data—fewer than three permits fished.

Table 6.–Summary of the golden king crab commercial fishery harvest by pounds (lb) per boat per day (total number of days the area was open) for each management area for 1999/00 through 2019/20 seasons.

	Season	Mid-Chatham Strait	East Central	North Stephens Passage	Northern	Icy Strait	Lower Chatham	Southern
	1999/00	224	549	41	193	241	49	**
	2000/01	167	437	6	79	25	61	**
	2001/02	138	237	60	128	116	22	**
	2002/03	36	267	128	220	76	4*	2*
	2003/04	44	374	26	375	260	**	**
	2004/05	87	337	21	375	322	**	**
	2005/06	67	300	22*	144	87	**	**
	2006/07	69	238	40	307	273	9*	**
	2007/08	192	854	109	602	246	**	**
lbs/boat/day	2008/09	253	1454	26	541	204	38	**
	2009/10	253	1426	38	309	167	35	23*
	2010/11	213	804	23	183	173	16*	49
	2011/12	201	1962	10*	78	16*	**	**
	2012/13	39	148	6*	72	21	**	**
	2013/14	73	66	13	61	36	53	64
	2014/15	32	46	12	21	32	23*	38
	2015/16	14	23	10	30	53	**	29
	2016/17	**	7	124	14	24	**	38
	2017/18	**	CLOSED	192	10	48	**	65
	2018/19	13	18	366	CLOSED	**	**	144
	2019/20	CLOSED	CLOSED	1,236	CLOSED	33	CLOSED	108
Avg. (1999/00-2018/19)		**107**	**502**	**64**	**197**	**125**	**37**	**54**

*Values may be underestimated due to the fact that the season continued into the fall with no fishing effort in the summer months.

** Confidential data—fewer than three permits fished.

Table 7.–Summary of size frequency data, in millimeters, from dockside sampling collected during the golden king crab fishery by management area from the 1999/00 through 2019/20 seasons.

	Mid-Chatham Strait			East Central			N. Stephens Passage			Northern		
Season	**Range**	**Mean**	**N**	**Range**	**Mean**	**N**	**Range**	**Mean**	**N**	**Range**	**Mean**	**N**
1999/00	146–191	168	478	138–194	166	2,245	150–192	168	197	152–197	169	150
2000/01	152–200	172	667	145–196	167	2,656	145–206	170	308	143–197	171	412
2001/02	143–200	171	300	137–200	168	2,935	148–204	170	430	152–204	176	580
2002/03	145–204	174	785	149–196	168	2,574	151–198	171	344	149–206	179	537
2003/04	145–202	167	156	149–201	169	1,500	154–205	171	180	151–206	174	354
2004/05	147–194	163	247	149–202	168	1,511	151–192	169	49	148–195	170	218
2005/06	148–188	167	200	138–194	166	1,694	151–203	171	145	154–205	175	265
2006/07	150–190	166	250	148–205	166	1,575	155–201	177	100	150–204	176	275
2007/08	149–198	166	450	148–195	166	948	152–201	175	150	152–210	178	225
2008/09	151–195	166	150	148–185	166	525	152–203	176	100	153–204	180	195
2009/10	151–197	168	523	142–196	168	927	151–207	185	263	152–215	180	365
2010/11	152–194	169	300	151–205	170	819	154–212	185	359	151–221	182	661
2011/12	151–193	170	304	152–193	170	754	150–216	185	358	147–217	183	851
2012/13	150–200	173	486	148–203	172	1,515	152–215	186	266	155–220	185	712
2013/14	150–203	172	250	146–215	172	1,054	154–212	184	338	157–210	185	495
2014/15	148–201	170	399	152–207	172	777	140–209	169	328	154–214	180	177
2015/16	150–198	170	142	155–207	172	310	143–178	160	144	153–205	178	115
2016/17	**	**	**	153–203	176	61	149–186	163	164	152–199	174	218
2017/18	**	**	**	CLOSED			147–198	166	190	152–190	172	57
2018/19	155–188	167	28	105–179	161	187	150–197	170	187	CLOSED		
2019/20	CLOSED			CLOSED			141–206	174	320	CLOSED		
Avg (1999/00–2018/19)		**169**	**313**		**169**	**1293**		**174**	**234**		**177**	**361**

** Confidential data—fewer than three permits fished.

Table 7.–continued (page 2 of 2)

	Icy Strait			Lower Chatham			Southern		
Season	**Range**	**Mean**	**N**	**Range**	**Mean**	**N**	**Range**	**Mean**	**N**
1999/00	140–203	169	635	152–186	166	75	-	-	-
2000/01	153–198	173	434	153–191	168	198	-	-	-
2001/02	155–197	177	200	144–193	165	190	**	**	**
2002/03	151–202	182	75	-	-	-	157–182	171	12
2003/04	154–205	179	100	-	-	-	-	-	-
2004/05	158–194	177	50	-	-	-	-	-	-
2005/06	150–199	177	197	-	-	-	-	-	-
2006/07	155–205	179	155	-	-	-	-	-	-
2007/08	-	-	-	-	-	-	-	-	-
2008/09	158–202	179	69	-	-	-	**	**	**
2009/10	-	-	-	152–172	161	50	-	-	-
2010/11	153–208	183	119	152–184	163	100	149–199	169	400
2011/12	150–211	181	649	**	**	**	**	**	**
2012/13	-	-	-	**	**	**	**	**	**
2013/14	155–203	184	50	149–200	163	250	152–198	172	200
2014/15	151–208	178	298	142–200	163	200	150–202	171	478
2015/16	146–201	176	312	**	**	**	148–199	170	578
2016/17	153–202	173	117	**	**	**	150–198	170	250
2017/18	151–203	169	160	-	-	-	149–197	167	439
2018/19	**	**	**	**	**	**	152–191	166	150
2019/20	155–192	172	196	CLOSED			153–191	168	152
Avg (1999/00–2018/19)		**177**	**219**		**164**	**144**		**169**	**237**

** Confidential data—fewer than three permits fished.

Table 8.–Golden king crab guideline harvest ranges for Registration Area A [5 AAC 34.115].

Management Area	Guideline Harvest Range (lbs)
Northern	0–145,000
Icy Strait	0–55,000
North Stephens Passage	0–25,000
East Central	0–225,000
Mid-Chatham Strait	0–150,000
Lower Chatham Strait	0–50,000
Southern	0–25,000

Table 9.–Northern management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	2.7 crab/pot	Average Commercial Logbook CPUE from 2000–2017
Trigger Reference Point	2.0 crab/pot	75% of the Target Reference Point
Limit Reference Point	1.3 crab/pot	50% of the Target Reference Point

Table 10.–Icy Strait management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	2.2 crab/pot	Average Commercial Logbook CPUE from 2000–2017
Trigger Reference Point	1.6 crab/pot	75% of the Target Reference Point
Limit Reference Point	1.1 crab/pot	50% of the Target Reference Point

Table 11.–North Stephens Passage management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	1.6 crab/pot	Average Commercial Logbook CPUE from 2001–2017 (excluding 2000)
Trigger Reference Point	1.2 crab/pot	75% of the Target Reference Point
Limit Reference Point	0.8 crab/pot	50% of the Target Reference Point

Table 12.–East Central management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	3.4 crab/pot	Average Commercial Logbook CPUE from 2000–2017
Trigger Reference Point	2.5 crab/pot	75% of the Target Reference Point
Limit Reference Point	1.7 crab/pot	50% of the Target Reference Point

Table 13.–Mid-Chatham Strait management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	3.4 crab/pot	Average Commercial Logbook CPUE from 2000–2017
Trigger Reference Point	2.5 crab/pot	75% of the Target Reference Point
Limit Reference Point	1.7 crab/pot	50% of the Target Reference Point

Table 14.–Lower Chatham Strait management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	3.1 crab/pot	Average Commercial Logbook CPUE from 2000-2017 (excluding 2013)
Trigger Reference Point	2.3 crab/pot	75% of the Target Reference Point
Limit Reference Point	1.6 crab/pot	50% of the Target Reference Point

Table 15.–Southern management area logbook catch per unit of effort (CPUE) reference points.

Indicators	Reference Point	Description
Target Reference Point	4.1 crab/pot	Average Commercial Logbook CPUE from 2000-2017
Trigger Reference Point	3.1 crab/pot	75% of the Target Reference Point
Limit Reference Point	2.0 crab/pot	50% of the Target Reference Point

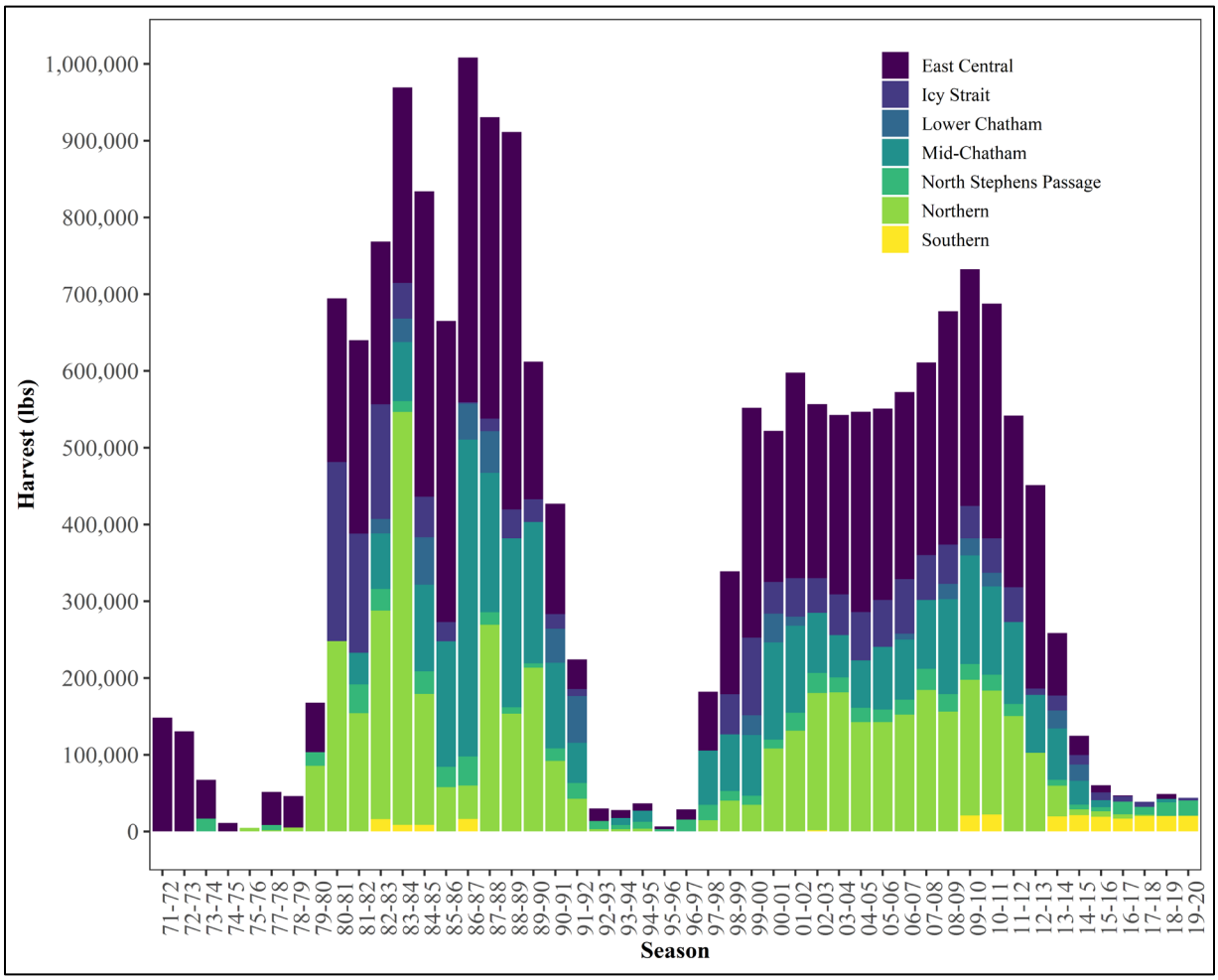

Figure 1.–Southeast Alaska golden king crab commercial harvest, 1970/71–2019/20 seasons.

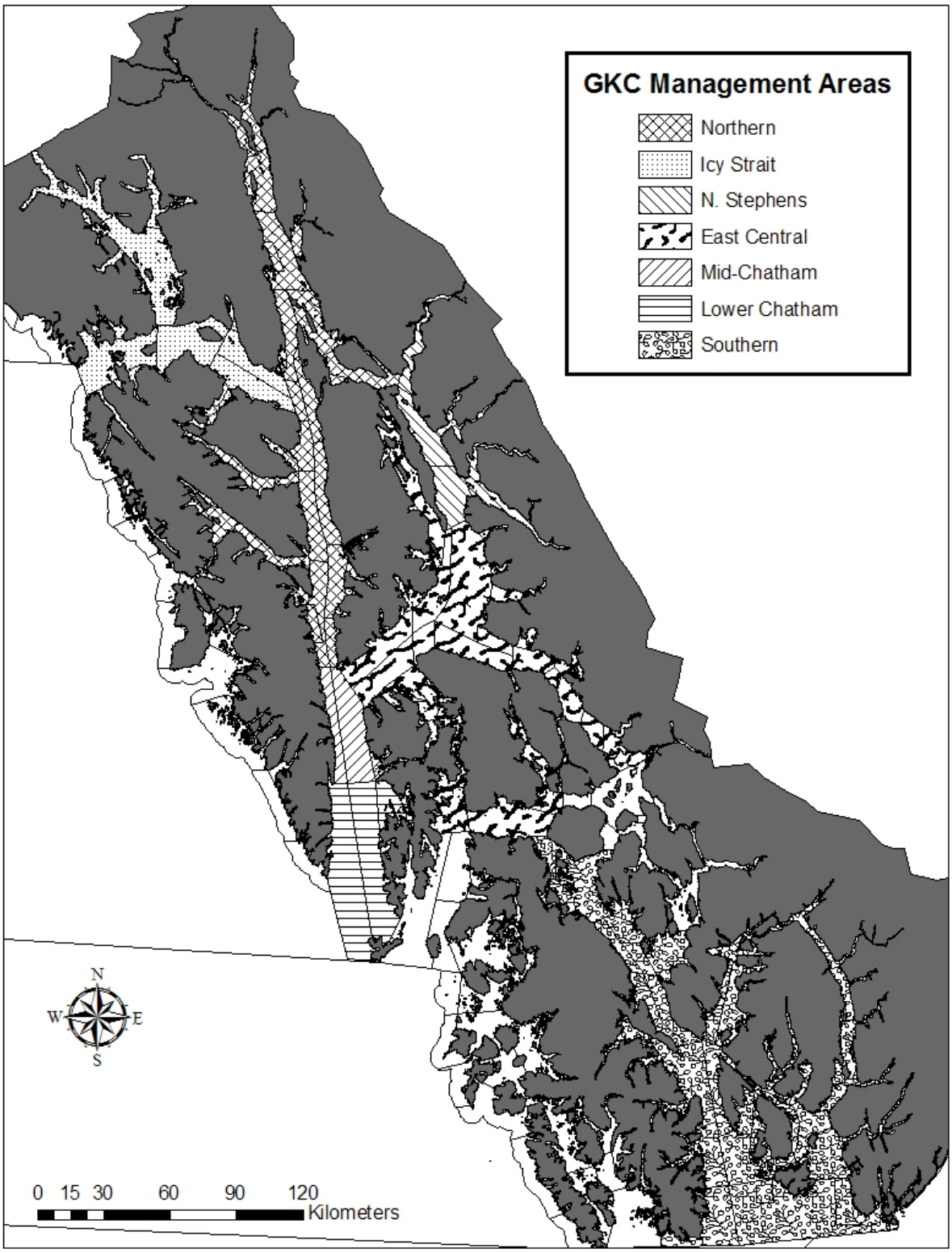

Figure 2.–Golden king crab management areas for Southeast Alaska.

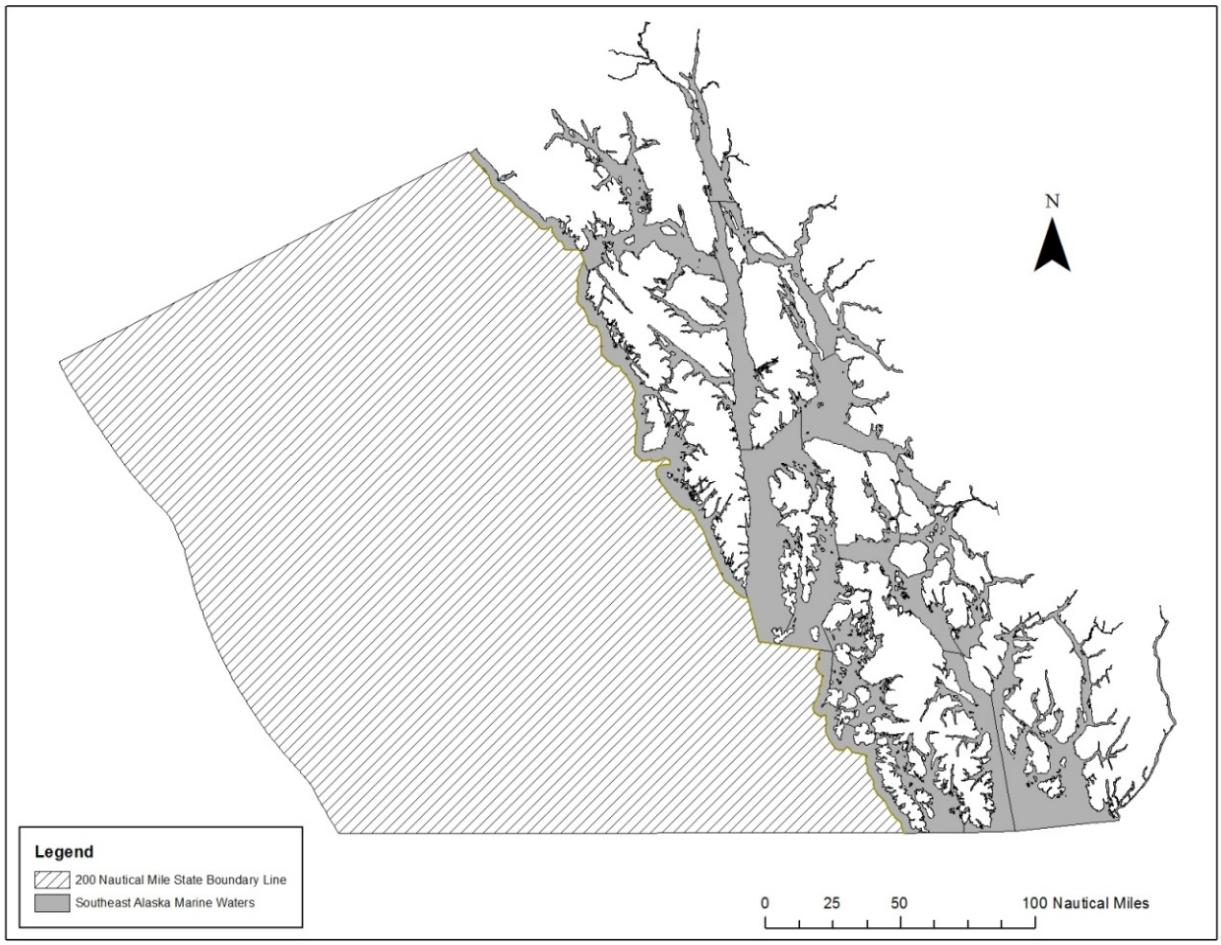

Figure 3.–Map of Exclusive Economic Zone (EEZ) where fishing for GKC is allowed under the conditions of a permit issued by the commissioner [5 AAC 34.116].

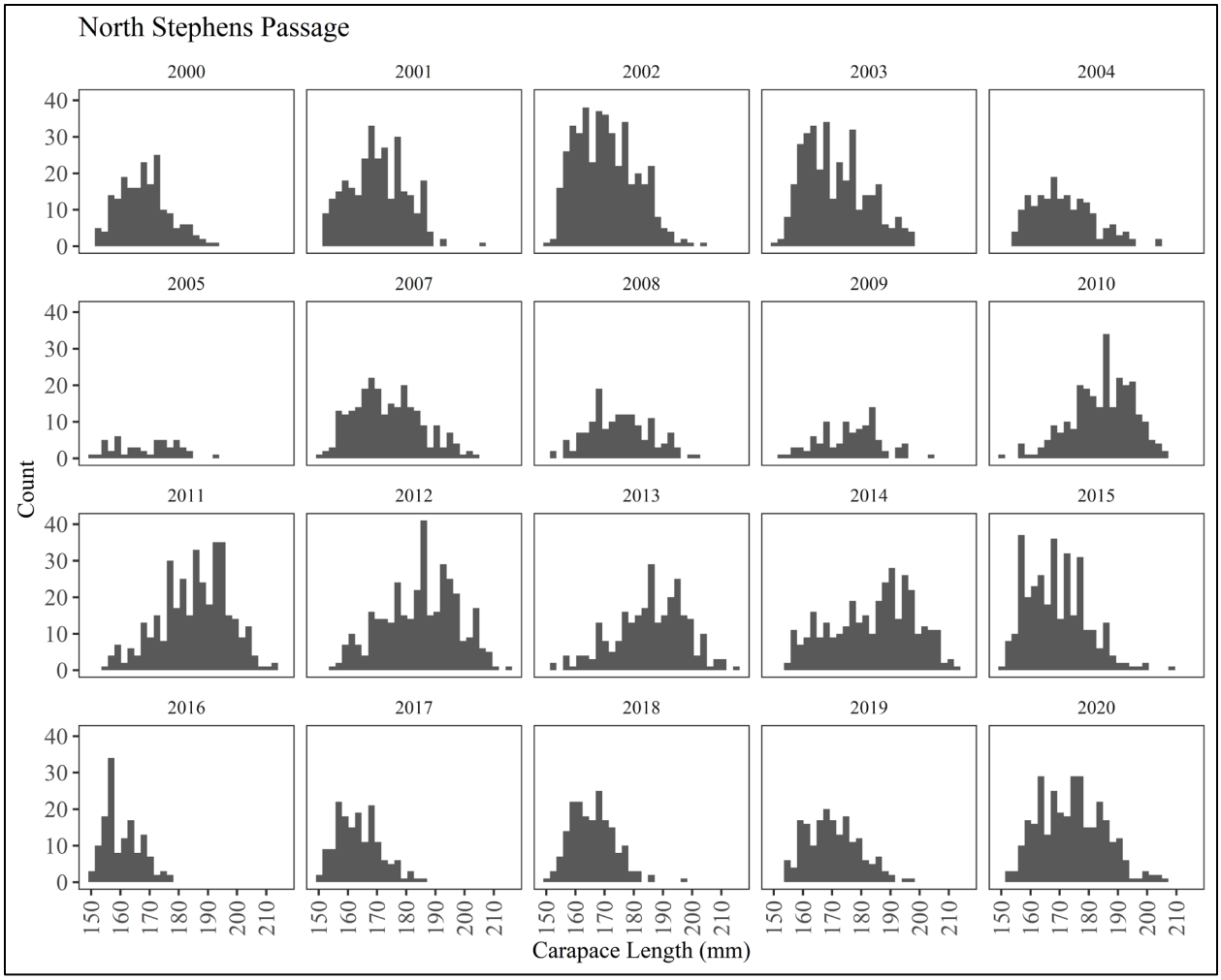

Figure 4.–North Stephens Passage golden king crab length frequencies of sampled commercial catch from 2000–2020.

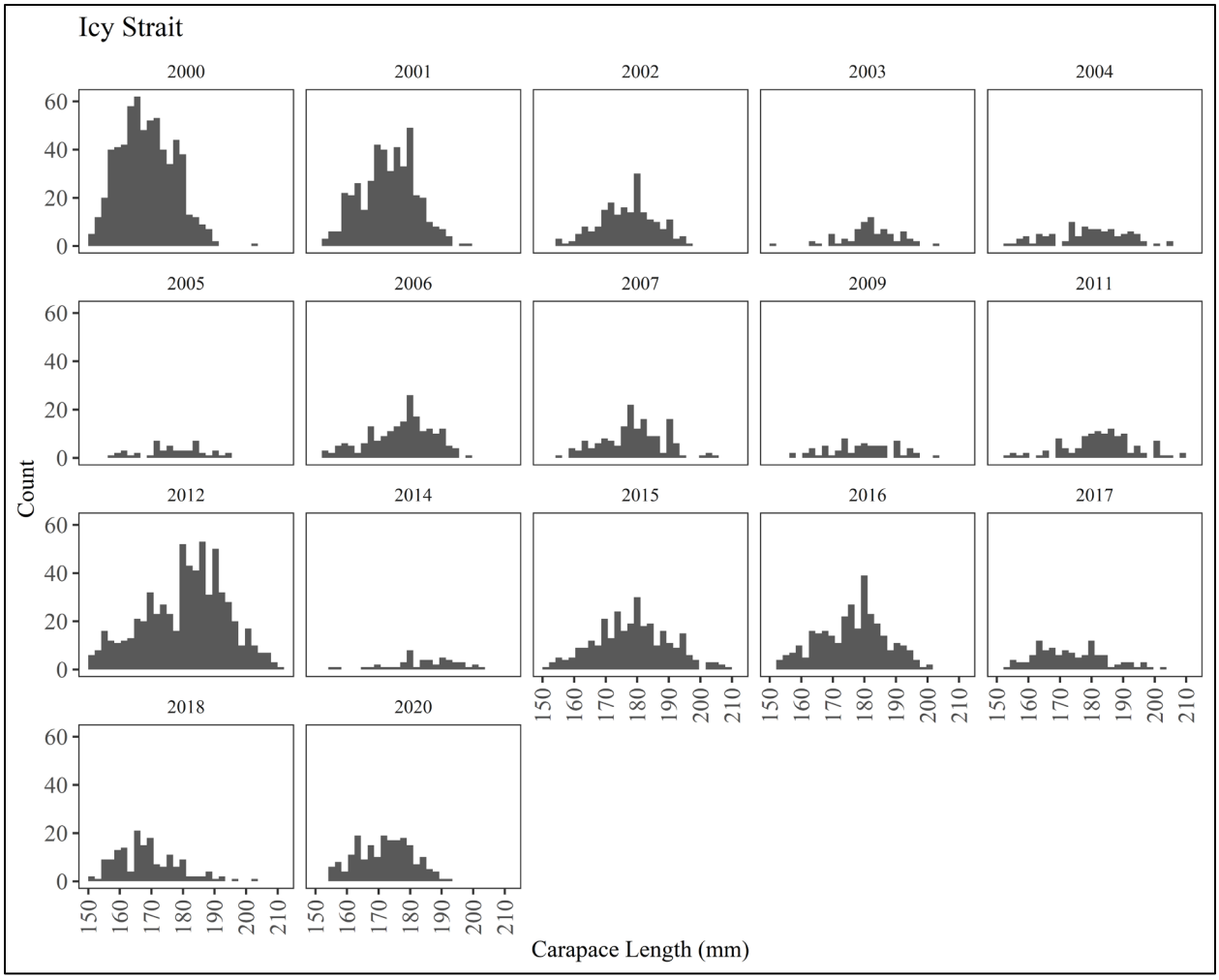

Figure 5.–Icy Strait golden king crab length frequencies of sampled commercial catch from 2000–2020.

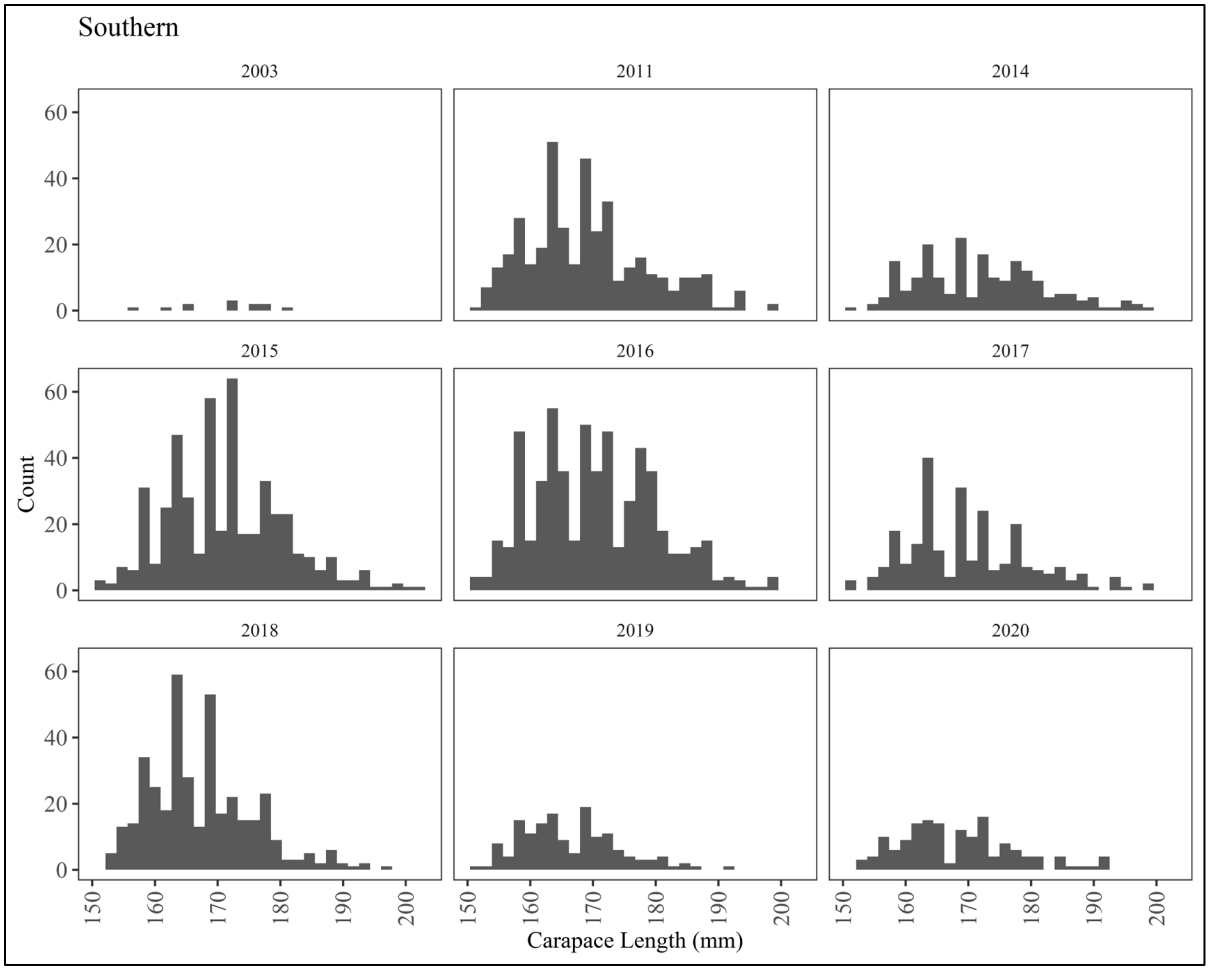

Figure 6.–Southern golden king crab length frequencies of sampled commercial catch 2003–2020.

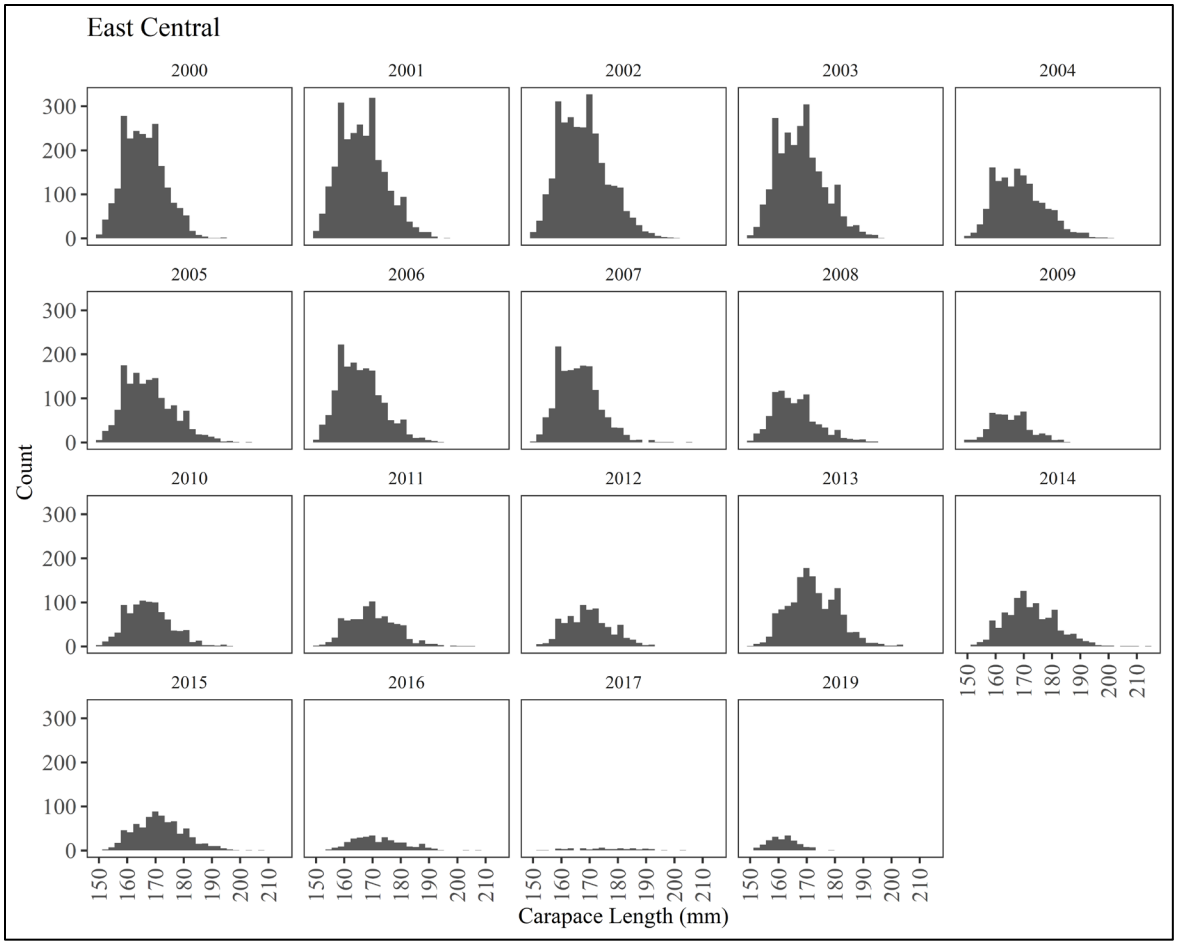

Figure 7.–East Central golden king crab length frequencies of sampled commercial catch from 2000–2019.

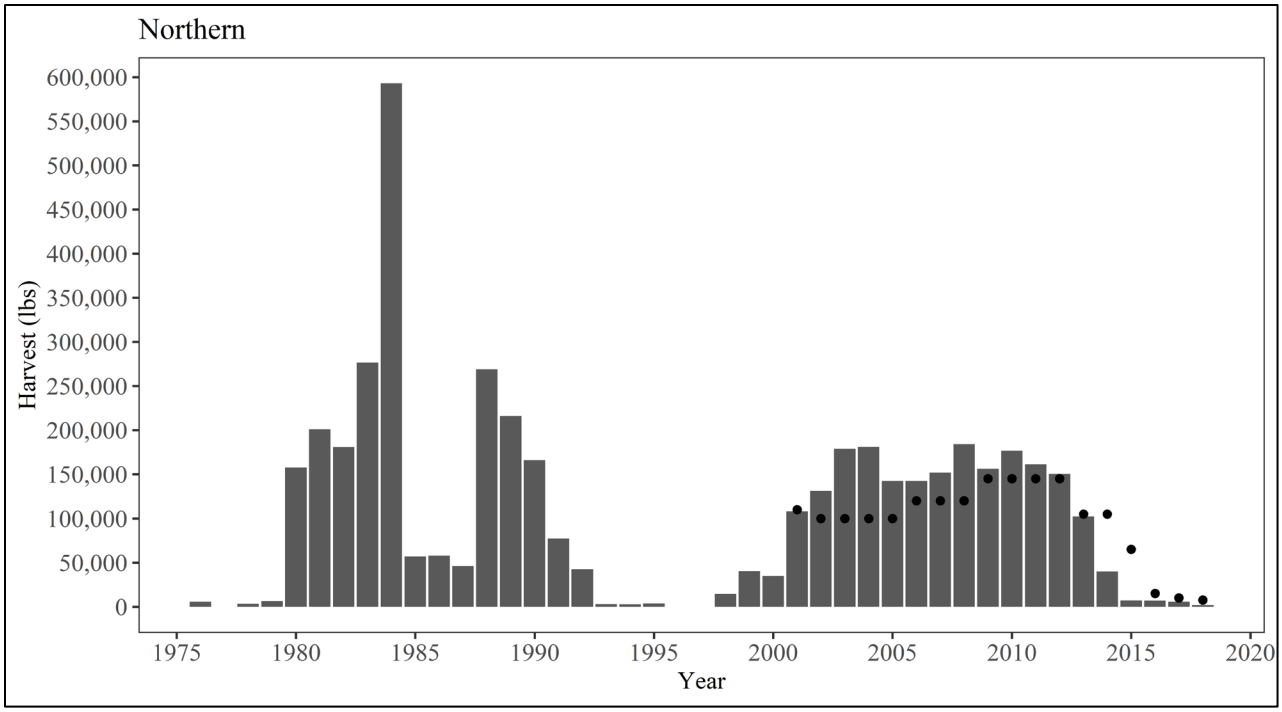

Figure 8.–Commercial GKC fishery harvest from the Northern management area. Dots represent the GHL in a given year (2001–present).

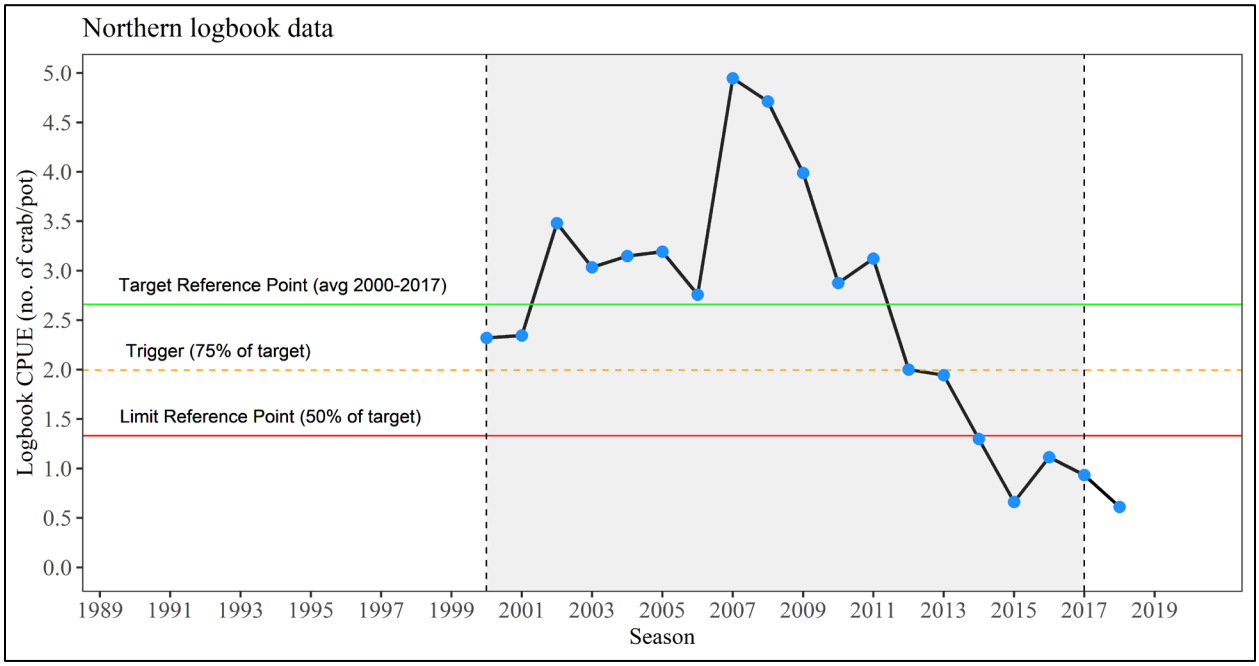

Figure 9.–Northern management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

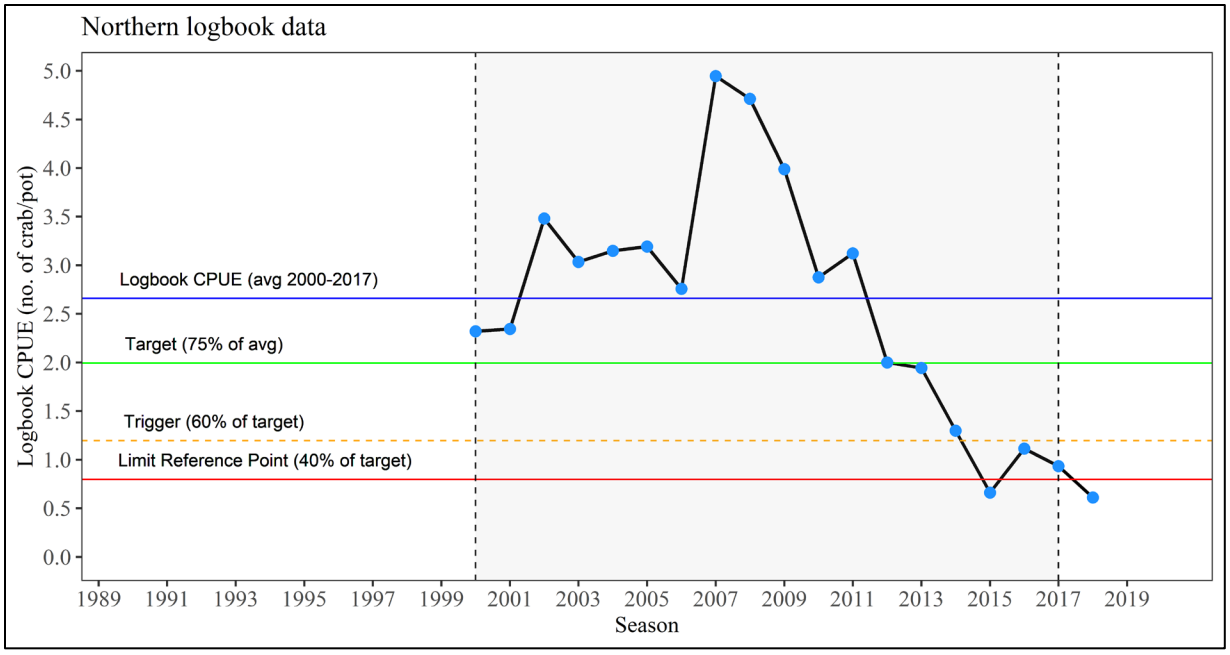

Figure 10.–Northern management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

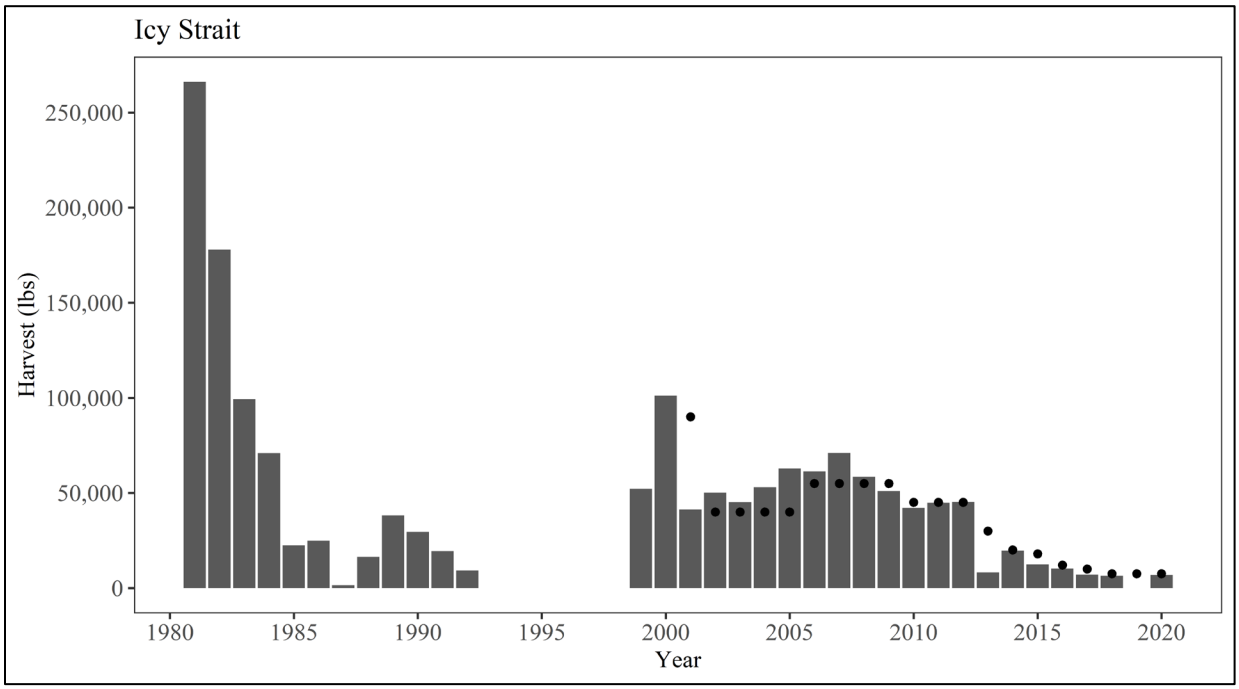

Figure 11.–Commercial GKC fishery harvest from the Icy Strait management area. Dots represent the GHL in a given year (2001–Present).

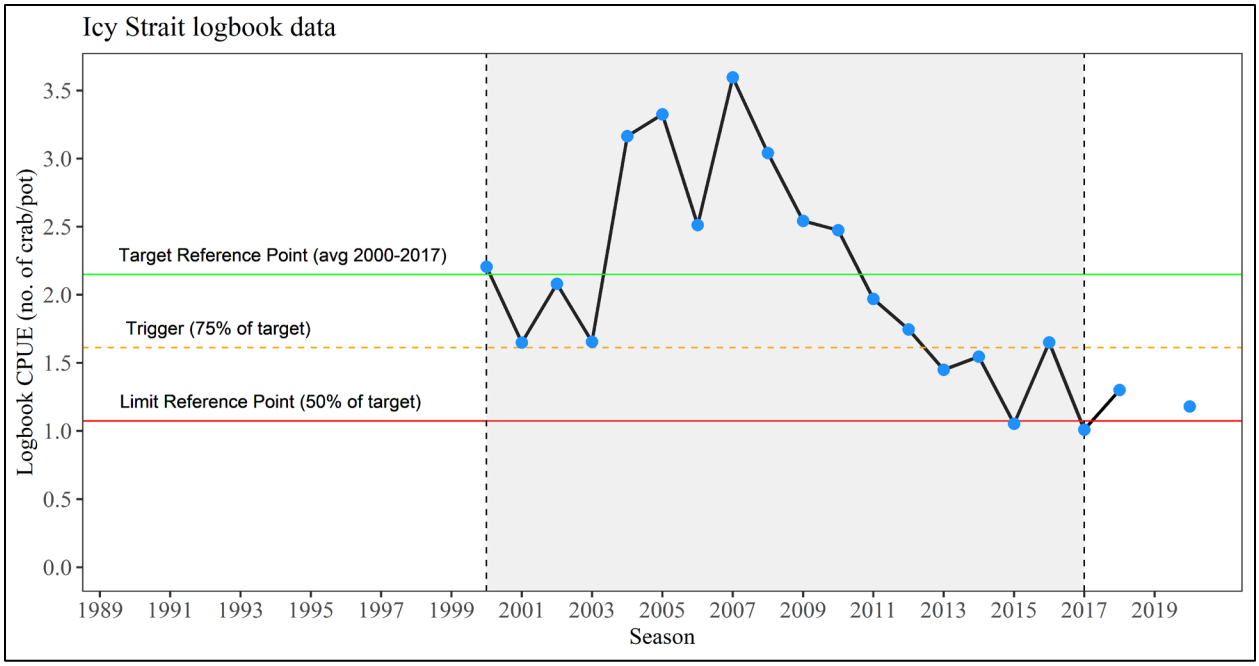

Figure 12.–Icy Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

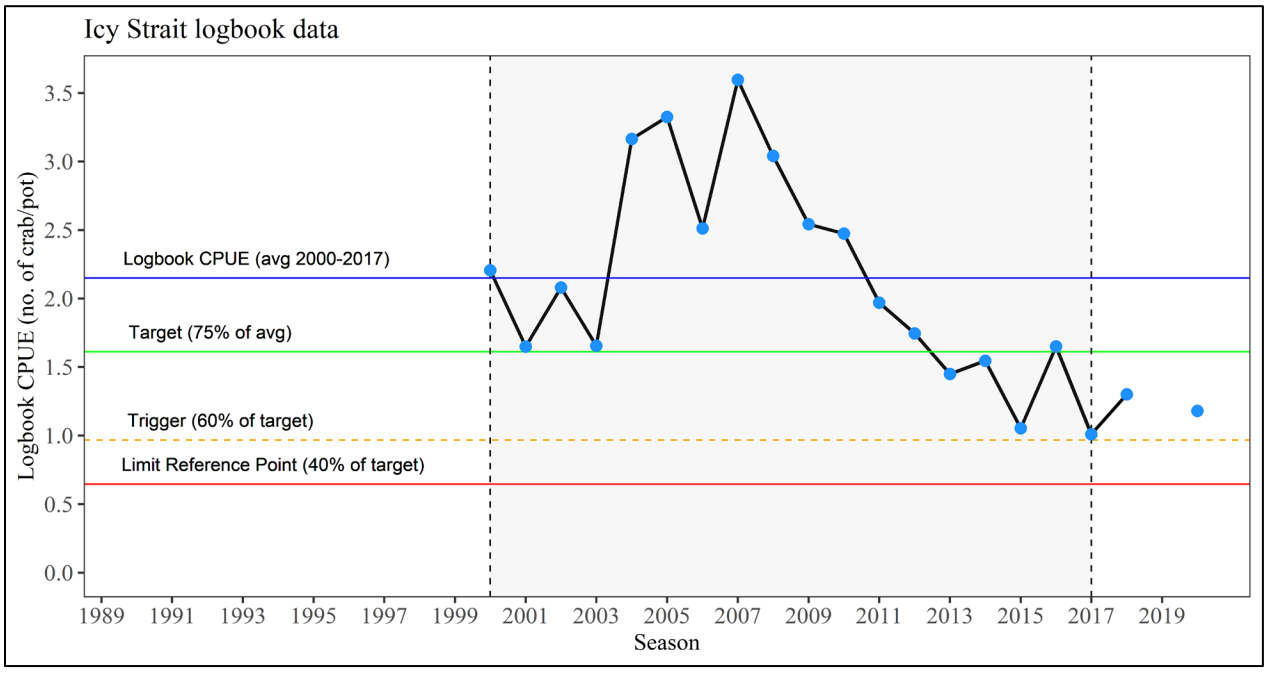

Figure 13.–Icy Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

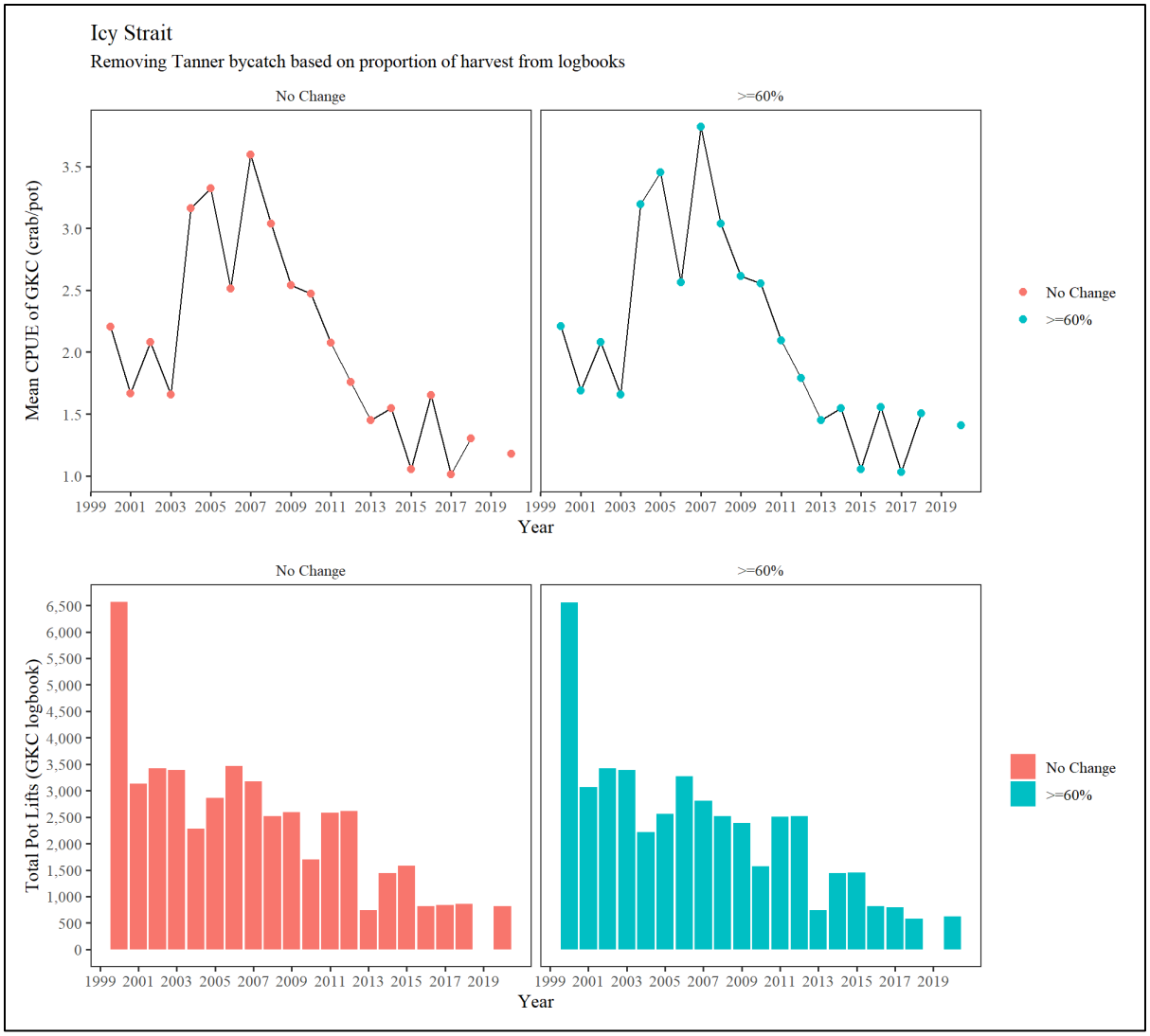

Figure 14.–Icy Strait golden king crab logbook CPUE and pot lift proportions based on reduction of Tanner crab harvest influence.

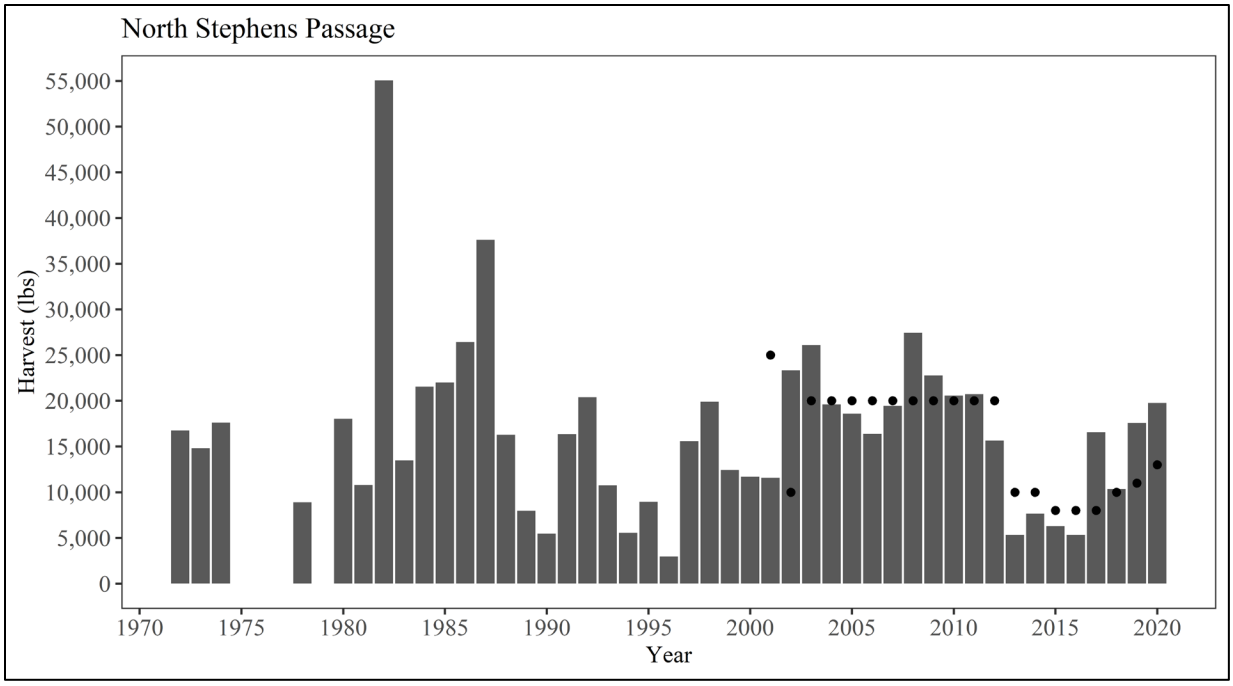

Figure 15.–Commercial GKC fishery harvest from the North Stephens Passage management area. Dots represent the GHL in a given year (2001–Present).

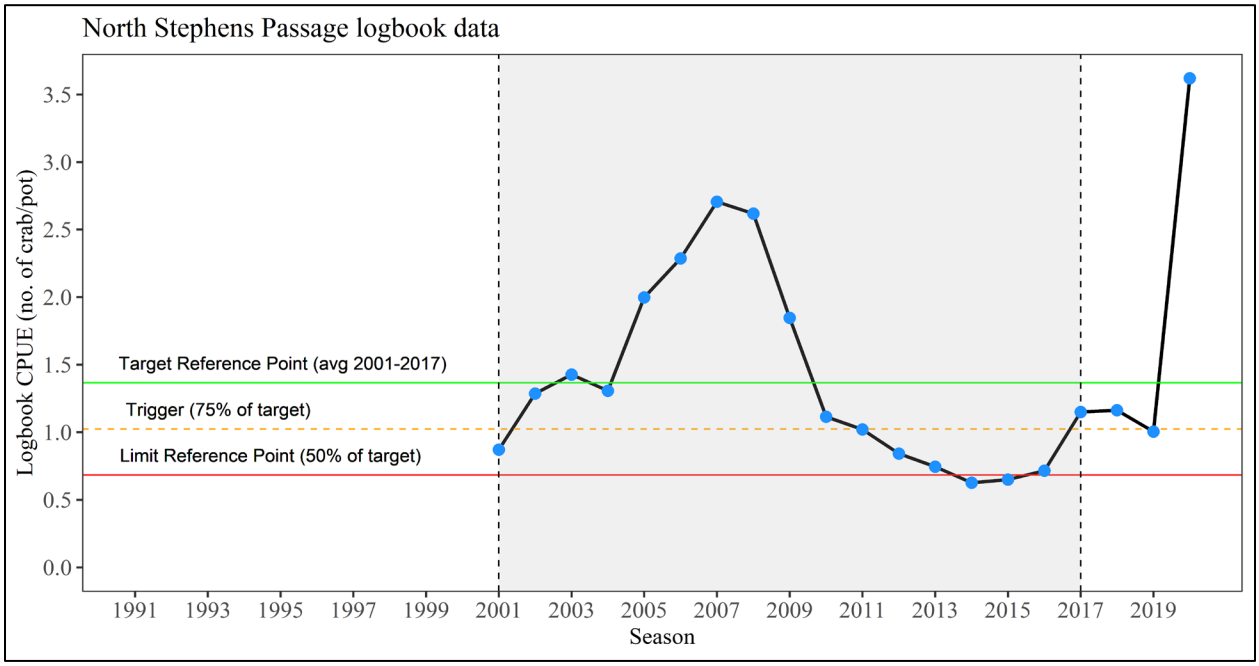

Figure 16.–North Stephens Passage management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

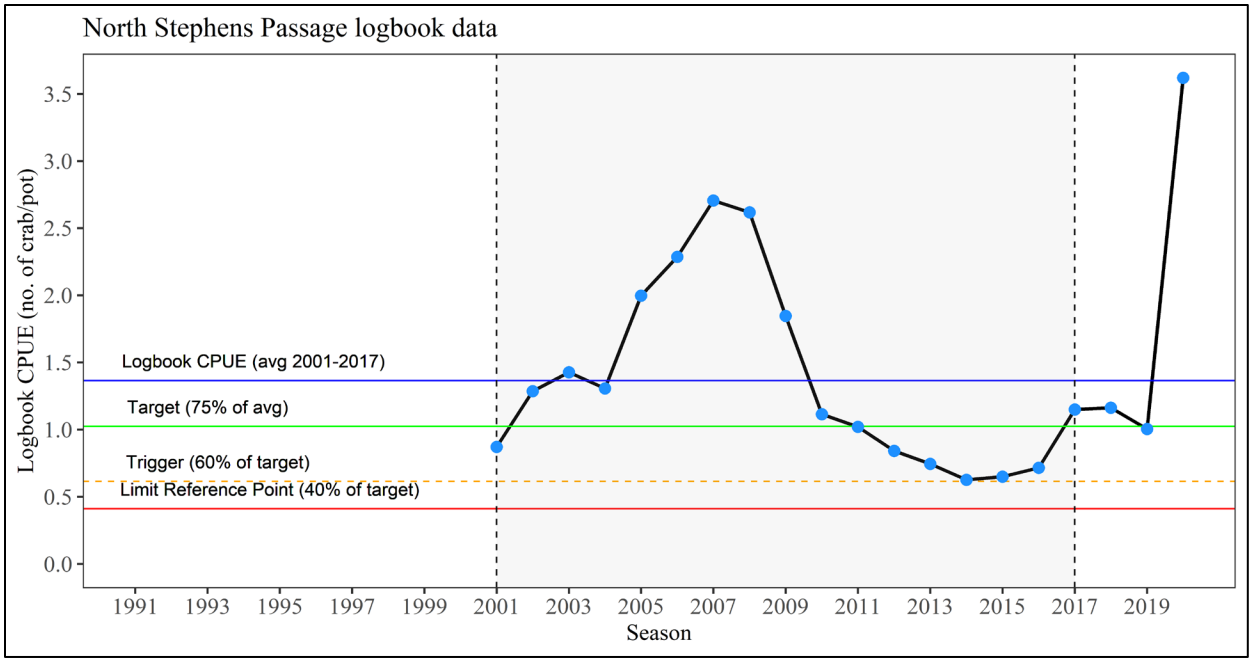

Figure 17.–North Stephens management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

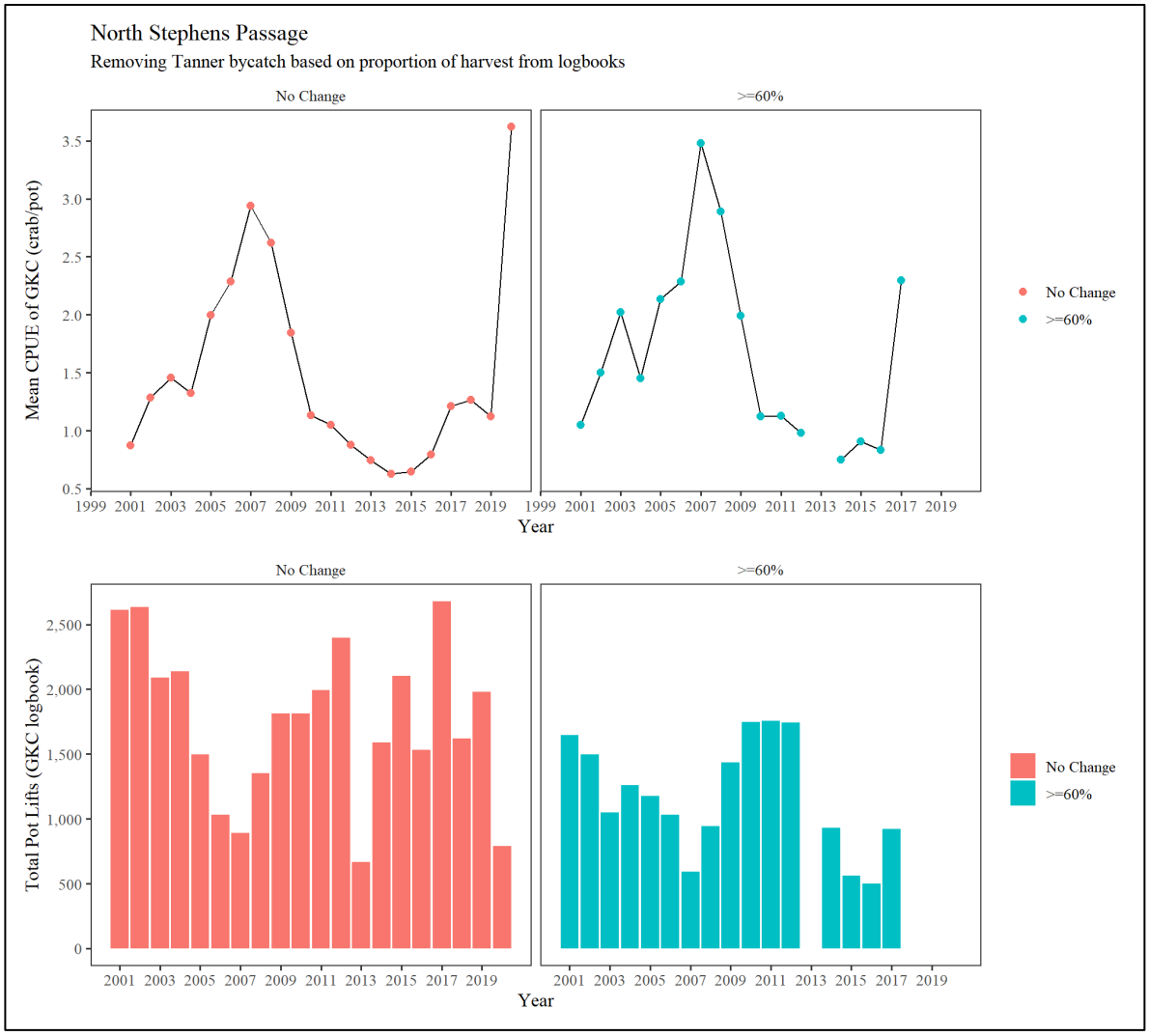

Figure 18.–North Stephens Passage golden king crab logbook CPUE and pot lift proportions based on reduction of Tanner crab harvest influence.

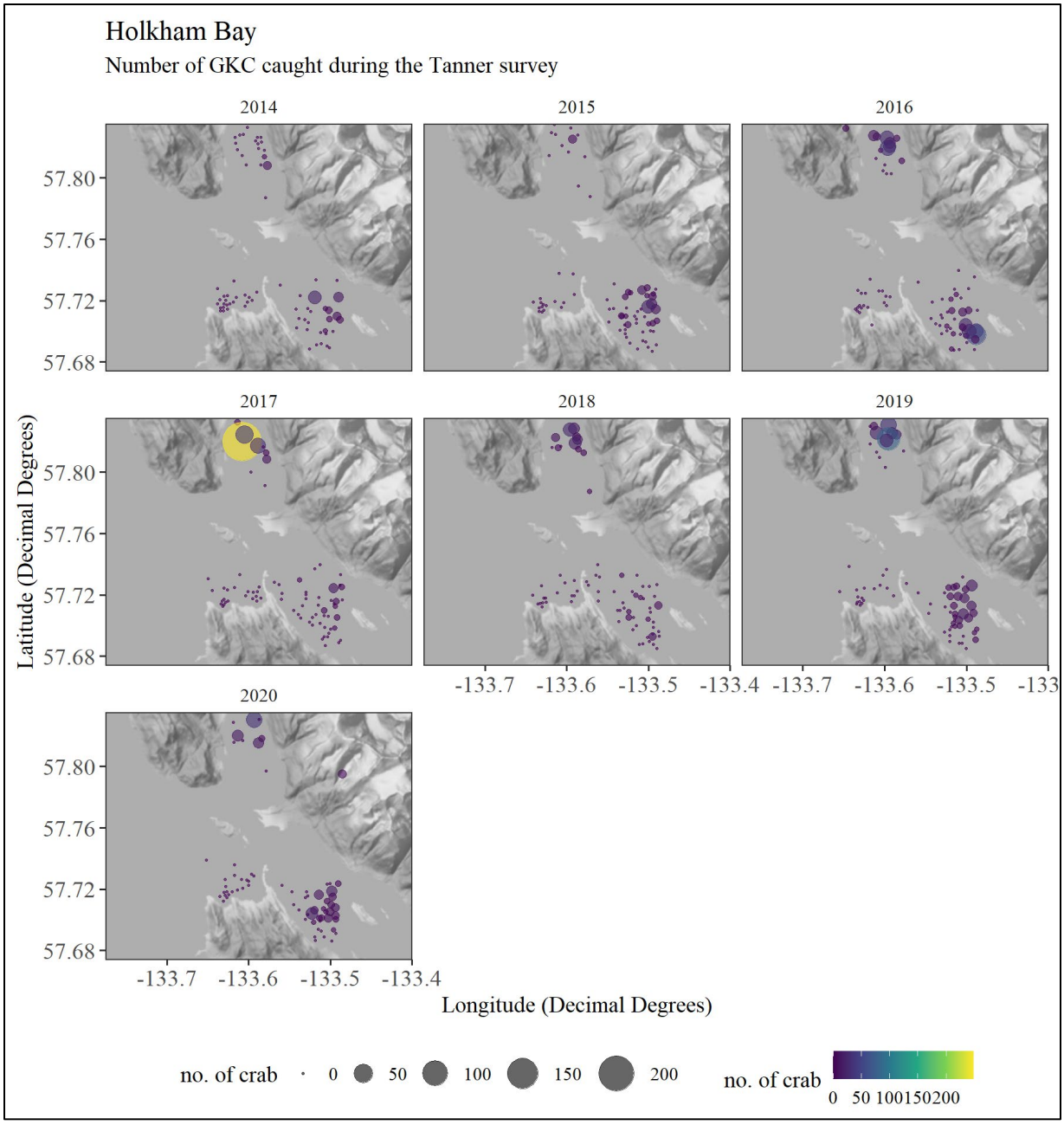

Figure 19.–Number of golden king crab caught during the annual Tanner crab stock assessment survey in Holkham Bay (2014–2020).

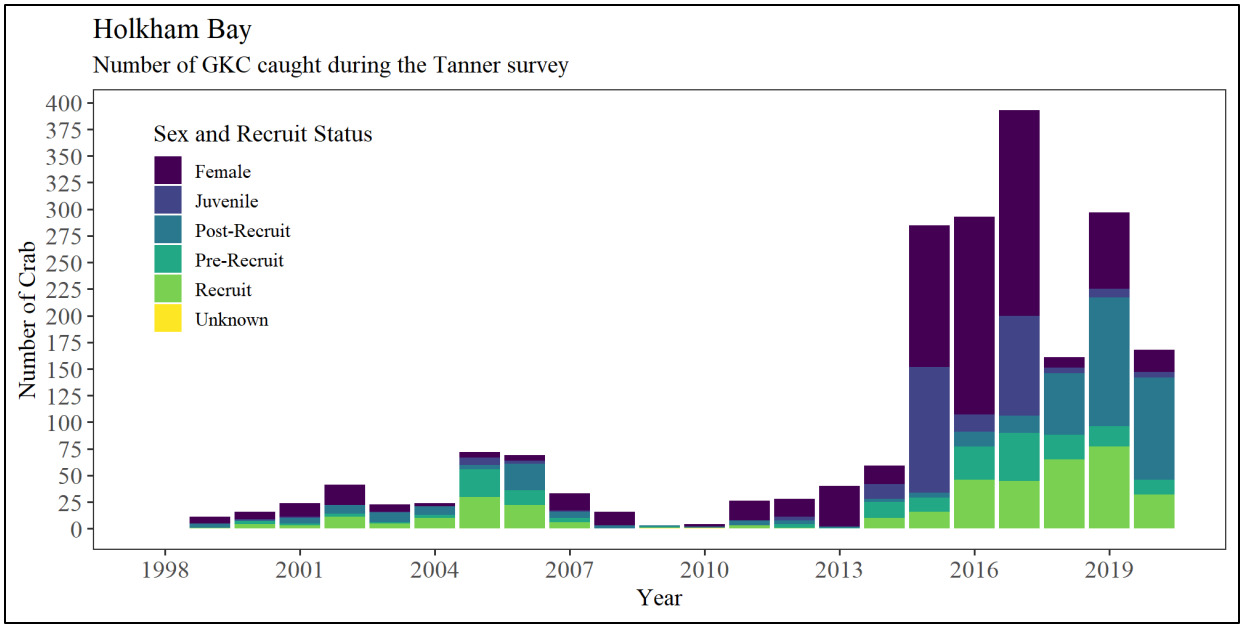

Figure 20.–Number of golden king crab caught during the annual Tanner crab stock assessment survey in Holkham Bay by sex and recruit status (1999–2020).

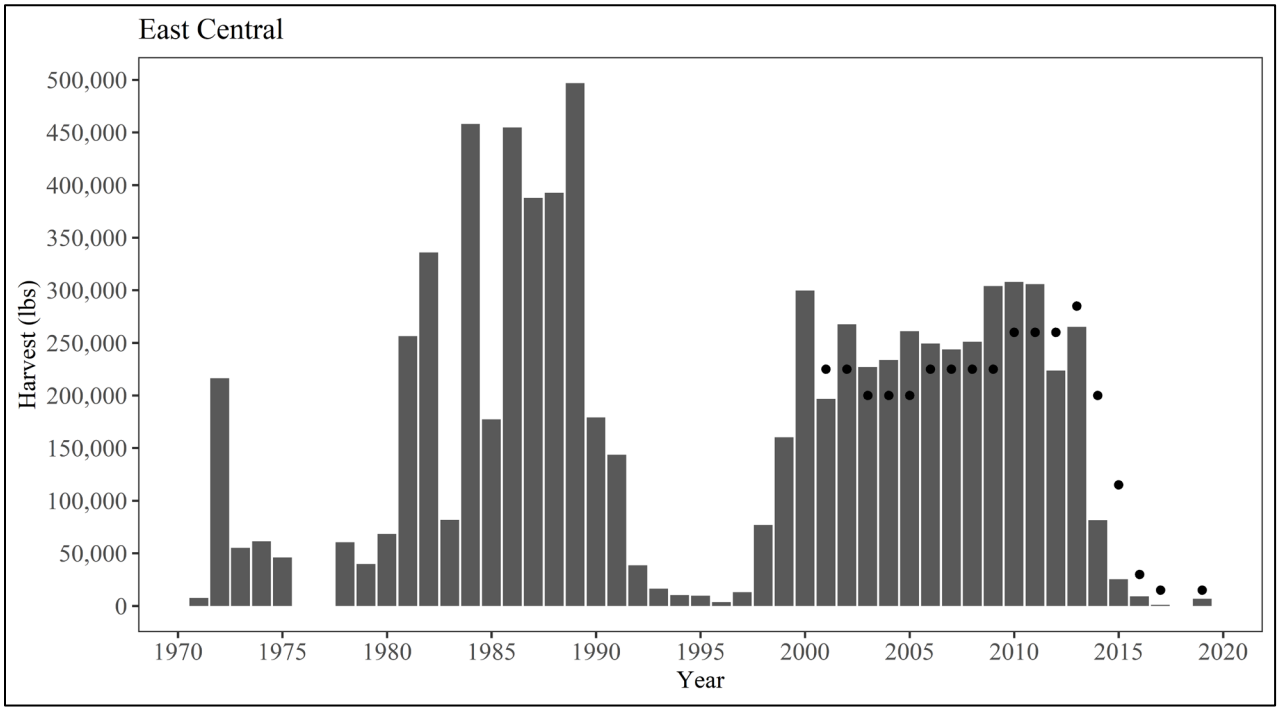

Figure 21.–Commercial GKC fishery harvest from the East Central management area. Dots represent the GHL in a given year (2001–Present).

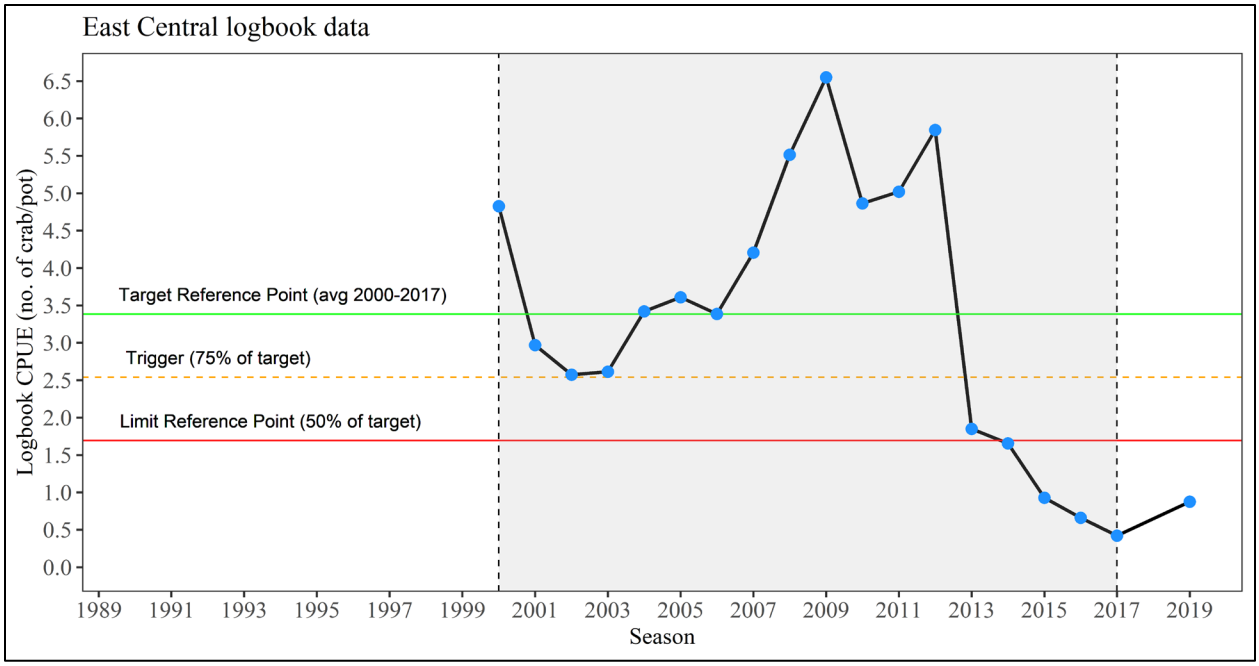

Figure 22.–East Central management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE

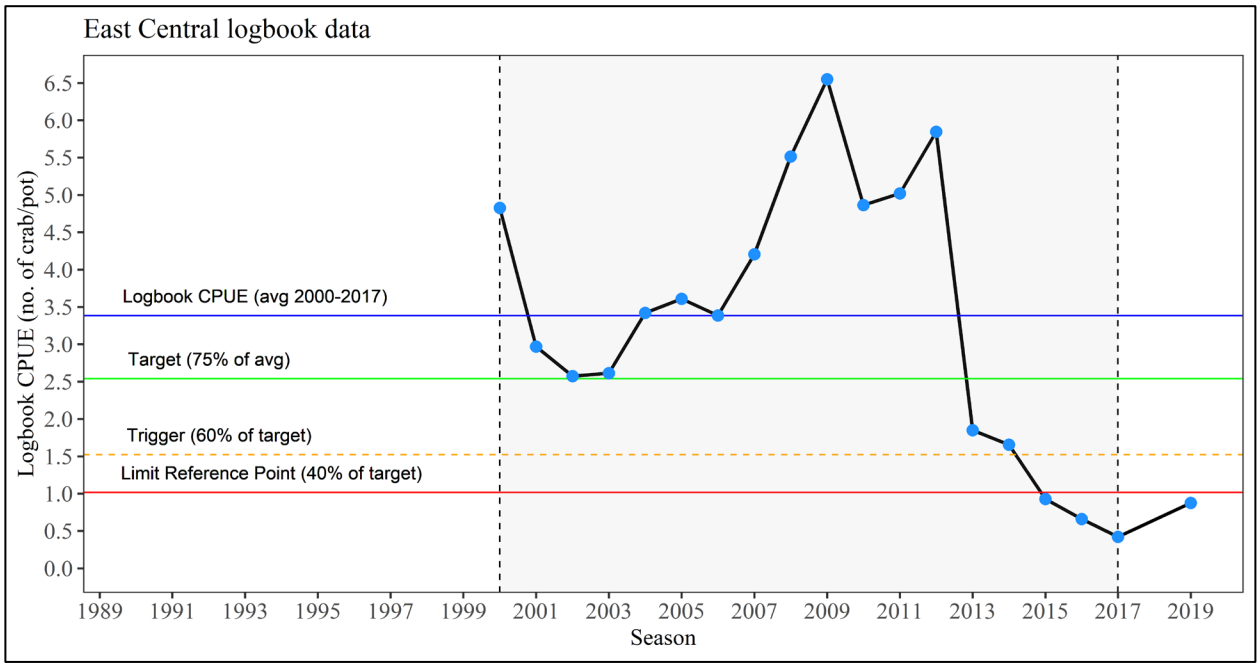

Figure 23.–East Central management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

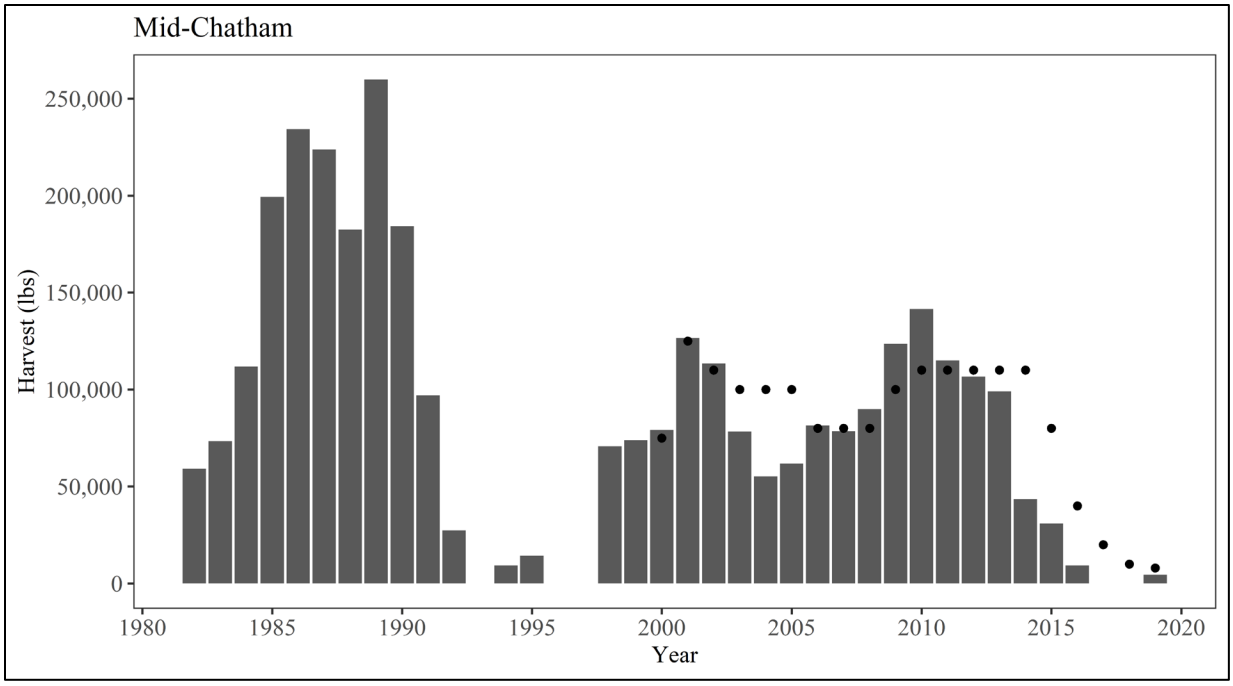

Figure 24.–Commercial GKC fishery harvest from the Mid-Chatham Strait management area. Dots represent the GHL in a given year (2001–Present).

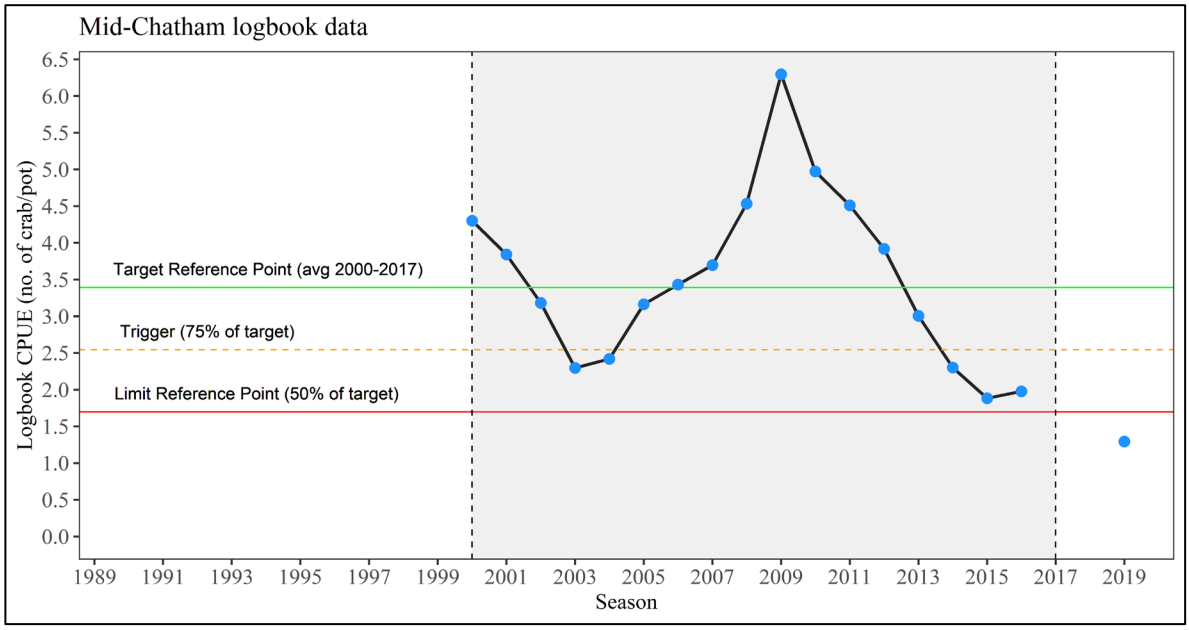

Figure 25.–Mid-Chatham Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

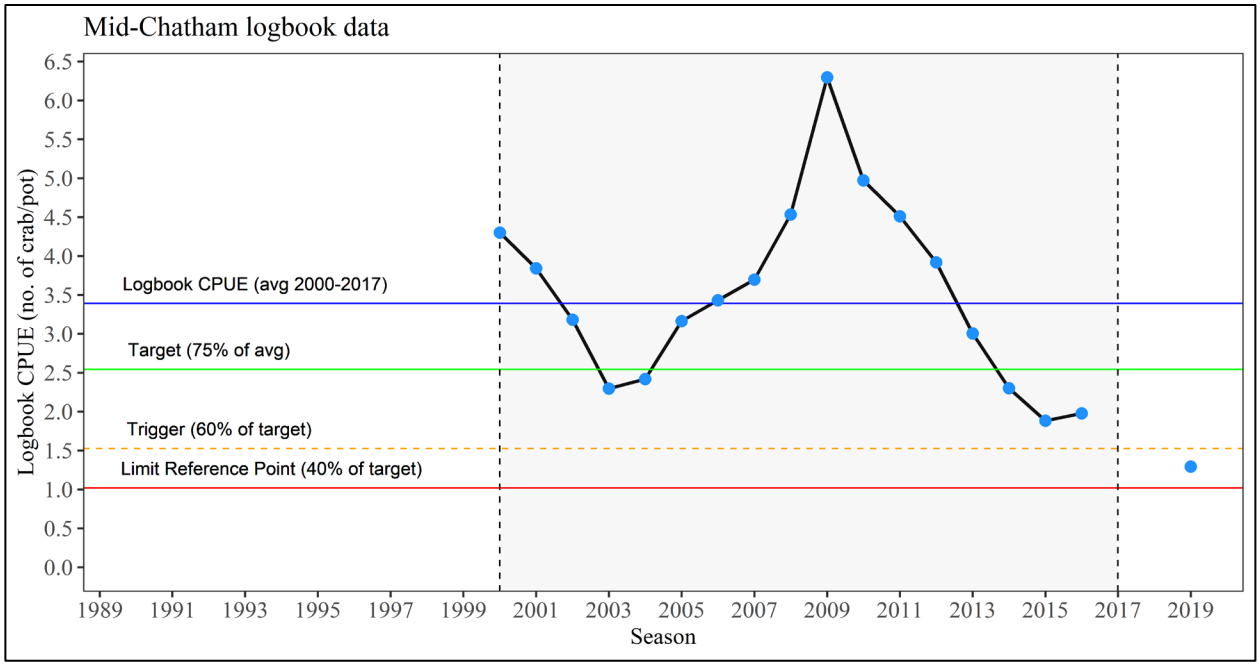

Figure 26.–Mid-Chatham Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

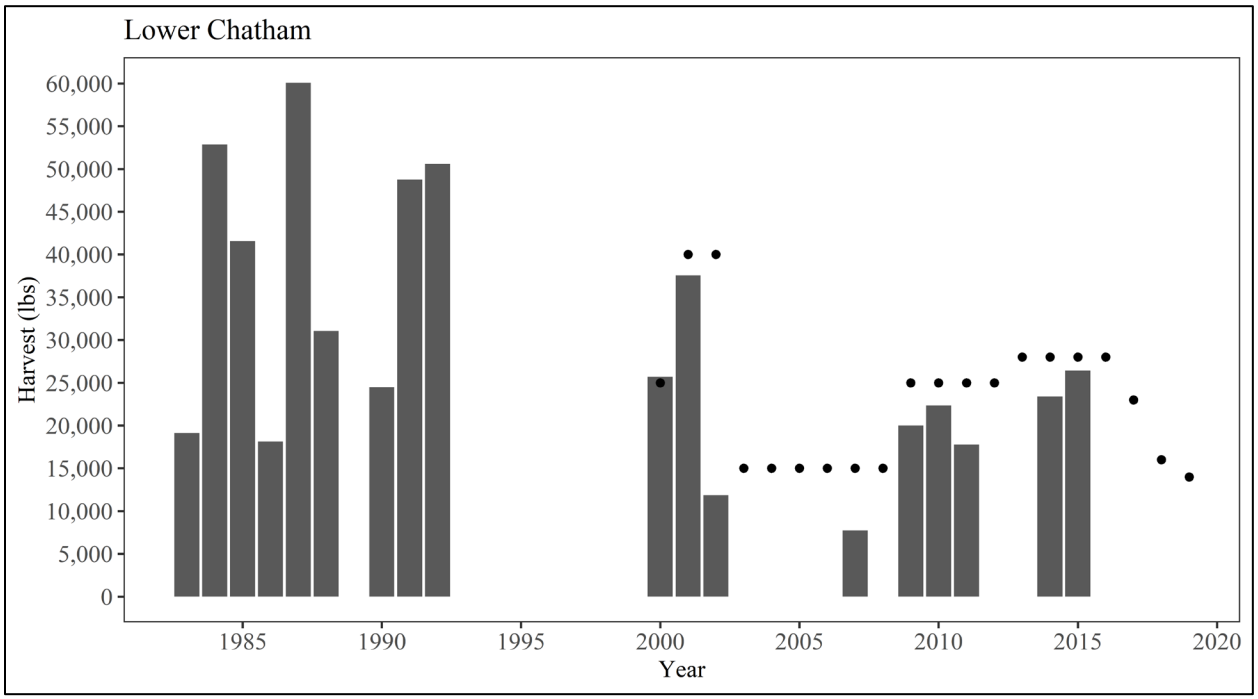

Figure 27.–Commercial GKC fishery harvest from the Lower Chatham Strait management area. Dots represent the GHL in a given year (2001–Present).

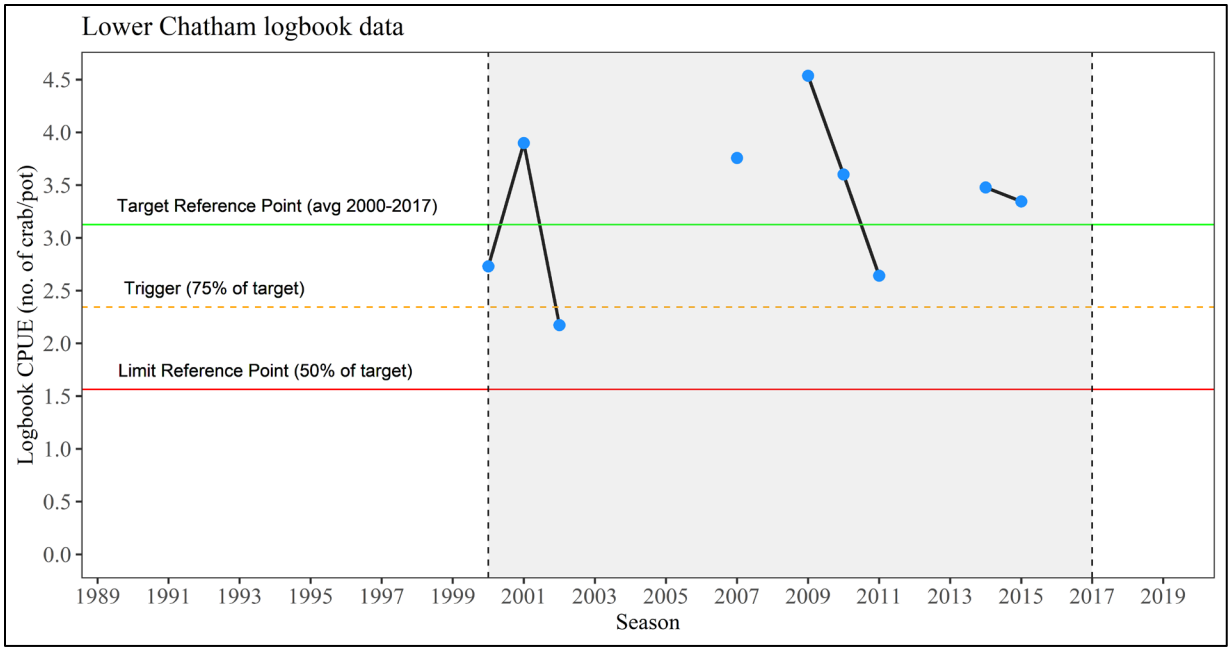

Figure 28.–Lower Chatham Strait management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

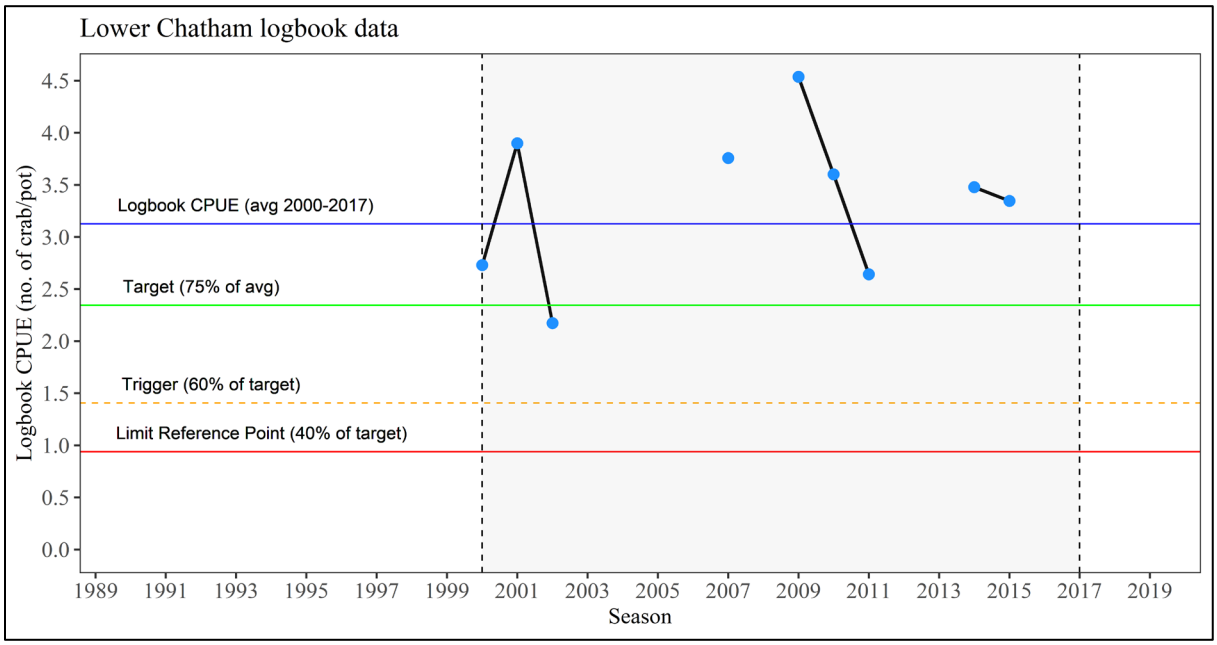

Figure 29.–Lower Chatham Strait management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

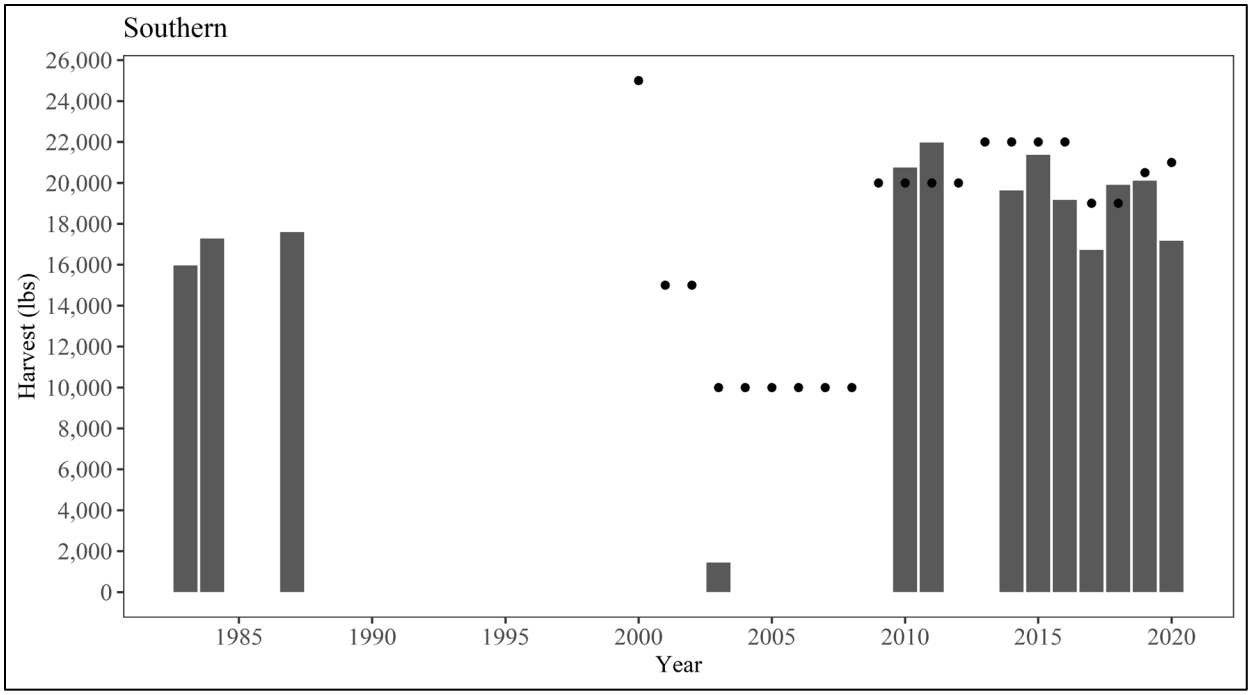

Figure 30.–Commercial GKC fishery harvest from the Southern management area. Dots represent the GHL in a given year (2001–Present).

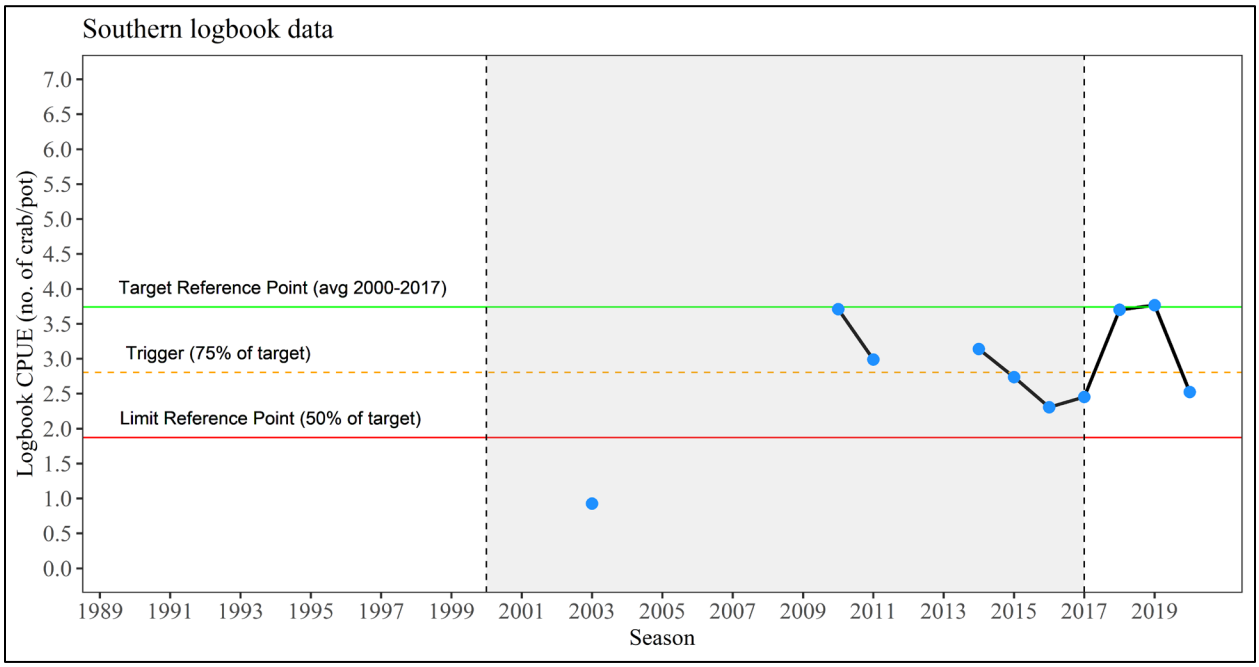

Figure 31.–Southern management area reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.

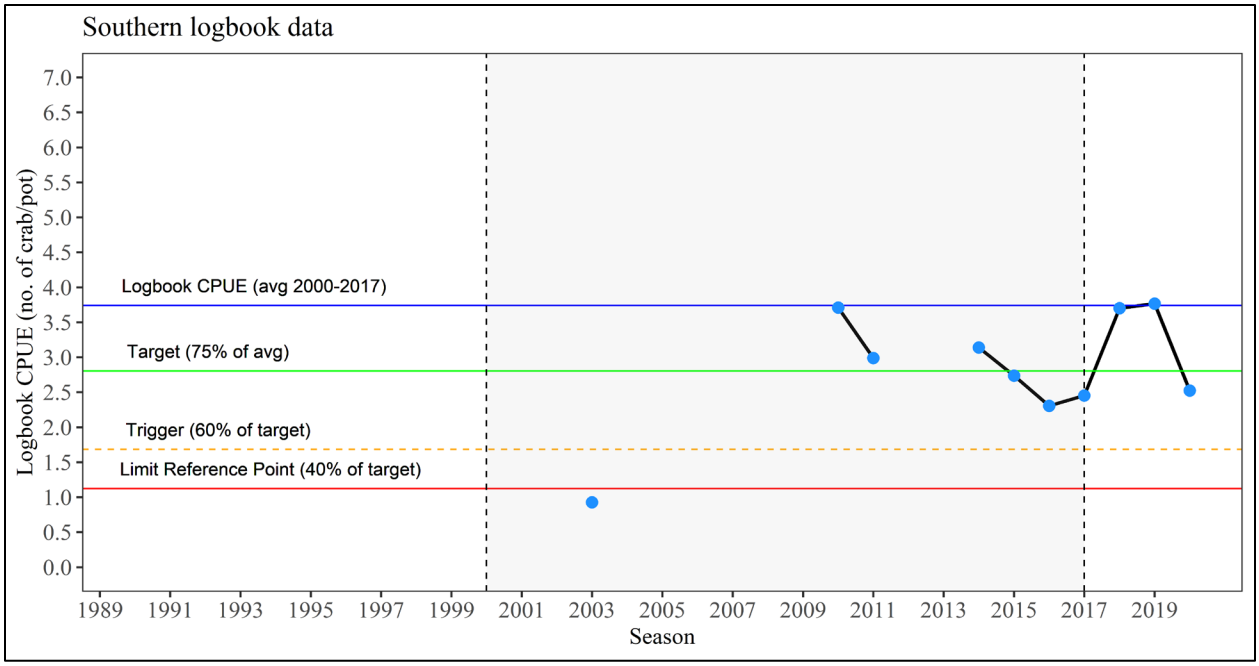

Figure 32.–Southern management area industry requested reference points (Target, Trigger, and Limit) and fishery performance utilizing logbook CPUE.