Regional Information Report No. 1J25-30

2024–2025 Southeast Alaska Red King Crab Stock Assessment and Management Plan

by

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November 2025

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

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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 3 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 2-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

REGIONAL INFORMATION REPORT NO. 25-30

2024–2025 SOUTHEAST ALASKA RED KING CRAB STOCK ASSESSMENT AND MANAGEMENT PLAN

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November 2025

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This document should be cited as follows:
Reich, A., C. Stern, A. Messmer, and J. Rumble. 2025. 2024–2025 Southeast Alaska red king crab stock assessment and management plan. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 1J25-30, Douglas.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

This document presents the annual stock assessment and management plan for Southeast Alaska red king crab. In 2024, regional biomasses increased by 20% and legal biomasses increased by 26% compared to 2023. Stock health status was *healthy* for the Juneau Area (Section 11-A), *below average* for Lynn Sisters and Gambier Bay, *moderate* for Seymour Canal, and *poor* for Excursion Inlet, Pybus Bay, and Peril Strait. Stock health considers all aspects of the population (mature males, juveniles, and females). The Juneau Area, Gambier Bay, and Seymour Canal were the only areas with an increase in both legal and mature male biomass from 2023; Lynn Sisters showed an increase in legal but not mature biomass. Both the Juneau area and Lynn Sisters had a notable drop in survey CPUE for all male size classes. The commercial fishery did not open in 2024 because there was not a harvestable surplus above the 200,000 lb threshold in 2024.

Keywords: red king crab, *Paralithodes camtschaticus*, stock assessment, catch per unit effort, CPUE, Southeast Alaska.

OVERVIEW

The Alaska Department of Fish and Game (ADF&G) annually evaluates stock status and establishes the guideline harvest levels (GHLs) for the Southeast red king crab (RKC) and blue king crab (BKC) fishery using data from fishery-independent surveys (pot gear), commercial fishery catch per unit of effort (CPUE), and biological data (length, weight, and shell condition) collected from the surveys and the fishery. The Southeast Alaska management area (Registration Area A) consists of all waters defined in 5 AAC 34.100 (Figure 1).

For the 2024–2025 season, the estimate of regional legal male biomass was 1.65 million lb and regional mature male biomass was 2.46 million lb. These values were determined using mark–recapture adjustments and the historical expansion factor applied to the non-surveyed areas. These values were substantially below the baseline level which is defined as the average biomass from 1995–2007, suggesting the regional stock remained in a low or depressed state. The 2024–2025 Southeast commercial RKC fishery GHL was 117,653 lb of legal male RKC and was less than the 200,000 lb minimum threshold [5 AAC 34.113] required to open a commercial fishery; therefore, the commercial fishery did not open for the 2024–2025 season.

The personal use RKC and BKC fishery opened July 1, 2024, in non-surveyed areas with a daily bag and possession limit of 1 RKC or BKC per person. Results from the annual stock assessment survey in the Juneau Area indicated that overall stock health status was healthy, with both legal and mature biomass estimated to be above the long-term average; however, there was considerable uncertainty in that biomass estimate. The personal use summer fishery in Section 11-A opened on August 19, 2024, for 7 days with a seasonal household limit of 3 crab and daily bag and possession limit of 3 crab to target 17,914 lb (2,416 crab) of legal male RKC.

2024 SOUTHEAST RED KING CRAB STOCK ASSESSMENT

SUMMARY OF STOCK STATUS

The Southeast RKC stock assessment regional biomass estimates for the 2024–2025 season were 1.65 million lb of legal male crab and 2.46 million lb of mature male crab, using the historical expansion factor (Table 1). The 2024 legal biomass estimate increased 20% and the mature biomass increased 26% from the previous year's point estimates (Figure 2).

Survey area biomass was estimated using a 3-stage catch survey analysis model (CSA) and adjusted using the mark–recapture expansions where available (Stratman et al. 2019). The *legal*

crab component is composed of both recruit and postrecruit crab and defined as those greater than or equal to 178 mm in carapace width. *Mature* crab are defined as prerecruit, recruit, and postrecruit crab, or those crab greater than 129 mm in carapace length. Biomass estimates from the survey areas were expanded based on assumptions of how representative these areas are to the entire population in Southeast (Table 1, Figure 3). Port Frederick and Holkham Bay have not been surveyed since 2014 due to reductions in survey funding and therefore were not included in determining survey biomass estimates.

In 2024, 3 of the 7 surveyed areas (Juneau Area, Gambier Bay, and Seymour Canal) had increases in both legal and mature biomass, while Lynn Sisters had increases in legal but not mature biomass, and Pybus Bay, Excursion Inlet, and Peril Strait had decreases in both legal and mature biomass (Figures 4–17). Both the Juneau Area and Lynn Sisters had increases in the CSA-modeled legal and mature biomass but notable decreases in observed survey CPUE for all male size classes. After the last commercial fishery in 2017–2018, legal biomass has increased an average of 1% annually and mature biomass has increased an average of 5% annually.

Examining previous trends, both mature and legal surveyed biomass declined an average of 7.0% annually from 2001 to 2013 (Figure 2). In 2015, legal and mature biomass showed regionwide increases for the first time since 2008 and continued to increase until 2017. In 2017, the commercial fishery opened. Regionwide stock then decreased until 2022. In 2023 and 2024, regional legal and mature biomass both increased.

The 2024 CPUEs of both juvenile males and females were not significantly different from the long-term average in 2 of 7 areas surveyed (Gambier Bay and Seymour Canal) and below the long-term average in 4 of the 7 areas surveyed (Pybus Bay, Lynn Sisters, Excursion Inlet, and Peril Strait; Appendix A1). The Juneau area had juvenile male CPUE non-significantly different from the average and juvenile female CPUE above the long-term average (Appendix A1). Juvenile CPUEs below the long-term average may indicate low recruitment in the future, although the survey is not designed to target juveniles.

The CPUE values for some or all of the mature male size/sex classes were below average for Excursion Inlet, Gambier Bay, Pybus Bay, Seymour Canal, and Peril Strait. Excursion Inlet, Pybus Bay, and Peril Strait had significantly low CPUE values for all mature male recruit classes. Gambier Bay had CPUE values significantly below the long-term averages for 2 of 3 mature male recruit classes. Seymour Canal and Lynn Sisters had CPUE values class significantly below the long-term average for 1 mature male recruit class (Appendix A1). The Juneau Area postrecruit CPUE was above the long-term average and the other mature male CPUEs were not significantly different from the long-term averages.

In 2024, recruitment—in the form of prerecruit CPUE—was significantly below average levels for 3 of the survey areas (Pybus Bay, Excursion Inlet, and Peril Strait; Appendix A1). Only Gambier Bay, Seymour Canal, Lynn Sisters, and Juneau were at the long-term average for prerecruit CPUE, and no areas were significantly above the long-term average. This trend suggests that regionwide improvements to mature and legal male biomass are still underway even with the absence of fishing in most of the survey areas. Prerecruit biomass in 2024 was low compared to the 1990s and early 2000s, which is visualized as the relatively small difference between mature and legal biomass in some of the areas (Figures 4–17).

We used a matrix of stock health indicators to provide an objective and repeatable evaluation of the survey data (Table 2). The methods used to calculate stock health indicators are described in

Siddon et al. (2009). Note that stock health score categories changed after 2008 (Table 3). Specific stock health by survey area is discussed below.

MARK–RECAPTURE EXPERIMENT ADJUSTMENTS

All survey areas (Excursion Inlet, Lynn Sisters, Peril Strait, Pybus Bay, Gambier Bay, and Seymour Canal; Figure 3)—except Juneau, due to its expansive area—have a biomass adjustment that is calculated from mark–recapture studies (Table 4). Two of the 6 survey areas have a single mark–recapture event, while the other 4 have 2 events; therefore, the estimate of biomass using this method does not take into account extensive interannual variability or variability in population size for all areas and should be applied with caution. ADF&G completed work on a second mark–recapture estimate for the 4 larger survey areas and does not plan currently to continue with additional mark–recapture studies. Mark–recapture attempts in 2013 and 2014 (Lynn Sisters and Excursion Inlet) did not have sufficient sample sizes to produce usable biomass estimates (Robson and Regier 1964). The following areas were successfully resampled: Pybus Bay in 2014, Seymour Canal in 2015, Excursion Inlet in 2016, and Gambier Bay in 2017.

In 3 of the cases, resampling efforts yielded an adjustment factor similar to the first estimate (Table 4). For each area, a weighted average of the 2 sampling events was used to determine the mark–recapture adjustment applied to the 2024 CSA. The biomass estimates presented in this analysis are the 2024 CSA model estimates adjusted by these values.

EXPANSION OPTION FOR NON-SURVEYED AREAS

Regional biomass was estimated from the 7 survey areas and extrapolated to the entire region using an expansion factor defined as the proportion of the population that lies within the non-surveyed areas (Table 1, Figure 2). In 2015, the surveyed areas were adjusted because surveys in Port Frederick and Holkham Bay were discontinued due to reduced funding. The removal of Port Fredrick from the survey was accounted for by placing it in the non-surveyed area designation. A biomass estimate has never been produced for Holkham Bay due to the inconsistency of the data. Holkham Bay has always been included as a non-surveyed area, and thus no changes to the biomass estimation were needed in removing Holkham Bay from the survey.

The expansion factor—an estimate of the percentage of the population found in the non-surveyed areas using historical harvest data—has not been consistent over time (Palof and Stratman 2020). In the past, 2 expansion factors have been used that represented historical harvests from 1974–1984 (with 47.2% of the harvest coming from the non-surveyed areas), and harvests in a more modern time during the formerly used baseline years 1993–2007 (with 36.1% of the harvest coming from the non-surveyed areas). Both options involve assumptions about the spatial distribution of the RKC population and the spatial effort of the fleet. The baseline time frame represents both a high and low period in the RKC biomass. However, this time frame is influenced by management actions, such as spatial closures, which can change the spatial effort of the fleet. The historical harvest time frame (1974–1984) was chosen to be the most appropriate for the 2024 assessment because it includes harvest years before management actions dictated spatial closure or shaped fleet behavior. However, this time frame assumes that the spatial distribution of the RKC in Southeast Alaska has remained consistent over time (specifically since 1974) despite varying population sizes.

Expanding to the non-surveyed areas using the historical harvest time frame results in a regional biomass of 1.63 million lb for legal crab and 2.47 million lb for mature crab (Table 1).

HARVEST RATES

The final decision about harvest rates is made by management staff. A study of appropriate harvest rates for RKC in Southeast Alaska provides 2 approaches that serve as guidelines for recommended harvest rates, one with higher risk of leading to population decline and one with a lower risk (Palof and Stratman 2020). This guideline range recognizes the difficulty of determining appropriate harvest rates for the different survey areas given inconsistent recruitment and varying population health. The harvest rates used in 2024 (Table 1) fall within the recommended range.

SURVEY AREA STOCK STATUS AND HARVEST RATE RECOMMENDATION

STOCK STATUS BY SURVEY AREA

Reviewing the data, long-term or short-term trends with $p < 0.05$ were considered significant. Long-term trends compared the current year's mean to the long-term baseline value (1995–2007). Short-term trends regressed the last 4 years of survey data to determine if a significant increasing or decreasing trend was present. Estimates of legal and mature mark–recapture biomass (adjusted legal and adjusted mature) for the entire biomass time series for each area were added to the legal biomass graphs, along with their associated long-term baseline estimates (1995–2007; Figures 4–17). Raw sample sizes for each area are reported in Table 5. Graphs for each area show biomass estimates from the 2024 CSA model.

Pybus Bay (poor)

Pybus Bay stock health remained at *poor* status (Table 2, Figures 4 and 5). All size and sex class CPUEs were significantly below their long-term averages (Appendix A1). The only significant short-term trend was a decrease in mature female CPUE (Appendix A2). Legal male biomass decreased 34% from the 2023 model estimate and mature male biomass decreased 29%. Both biomass estimates remained low compared to historical levels in this area. Female egg percentage was at a normal level, and the percentage of poor clutches was significantly below the baseline value. The mature male biomass estimate was 89% below the baseline value and the legal biomass estimate was 88% below the baseline value.

Due to the low stock biomass in Pybus Bay, there was no harvestable surplus, and therefore no harvest was recommended for the 2024–2025 season (Table 1).

Gambier Bay (below average)

Gambier Bay stock health decreased to *below average* status (Table 2, Figures 6 and 7). Recruit males, postrecruit males, and mature female CPUEs were significantly below their long-term averages (Appendix A1). The CPUE values for juvenile males, juvenile females, and male prerecruits were not significantly different from their long-term averages. There were significant short-term increasing trends in male prerecruit and recruit CPUEs and a significant decreasing trend in postrecruit CPUE (Appendix A2).

Prerecruit and recruit male biomass and CPUEs have been trending up for this population in recent years (Figure 6). The low proportion of poor clutches and high clutch fullness indicated that the female component of the stock was healthy. Legal male biomass increased 52% and mature male biomass increased 27% from the 2023 model estimate. Biomass estimates were still low compared

to historical levels for this area. The mature male biomass estimate was 42% below the baseline value and the legal male biomass estimate was 55% below the baseline value.

Stock health was below average, although indications of improvement were noted. No harvest was recommended for the 2024–2025 season (Table 7).

Seymour Canal (moderate)

The overall stock health for Seymour Canal improved to *moderate* from *below average* in 2023 (Table 2, Figures 8 and 9). Juvenile male and female, prerecruit male, and recruit male CPUEs were not significantly different from the long-term averages; mature female and postrecruit male CPUEs were significantly below their long-term averages (Appendix A1). Prerecruit and recruit male CPUEs had significant short-term increasing trends (Appendix A2). Indicators of female stock health were good, with a high mean clutch size and low percentage of poor clutches.

In 2024, sample sizes were higher than in recent years, in which undersampling had been a concern (Table 5). Estimated legal male biomass increased 75% and mature male biomass increased 165% from the 2023 model estimates. The mature male biomass estimate was 64% below and the legal male biomass estimate 81% below the baseline value.

Despite the increase in stock health in Seymour Canal, male biomass estimates were still well below baseline values. Due to concern for the low level of the stock biomass in Seymour Canal, no harvest was recommended for the 2024–2025 season (Table 7).

Peril Strait (poor)

In 2024, the stock status for Peril Strait was *poor* (Table 2, Figures 10 and 11). This rating was down from *below average* in 2022. Peril Strait was not surveyed in 2023, as this area has been moved to a biennial survey schedule. CPUE values for all size/sex classes of crab in Peril Strait were significantly below their long-term averages (Appendix A1). Juvenile male, prerecruit male, and postrecruit male CPUEs had short-term decreasing trends, while juvenile female, mature female, and recruit male CPUEs had no significant short-term trends (Appendix A2). Female clutch health decreased notably in 2024, with a mean clutch fullness of 36% and a mean poor clutch percentage of 33% (Figure 11).

Estimate legal male biomass decreased 44% and mature male biomass decreased 65% from the 2022 model estimates. The mature male biomass estimate was 82% and the legal male biomass estimate 64% below the baseline value. Due to recent concerns about Peril Strait stock status, no harvest was recommended for the 2024–2025 season (Table 1).

Juneau (healthy)

The stock status for the Juneau area remained *healthy* in 2024 (Table 2, Figures 12 and 13). Prerecruit males, recruit males, postrecruit males, juvenile males, and juvenile female CPUEs were not significantly different from the long-term averages; mature female, postrecruit male, and juvenile females CPUEs were significantly above their long-term averages (Figure 13). There were significant short-term increasing trends in mature female, prerecruit male, and recruit male CPUEs, and a significant short-term decreasing trend in juvenile male CPUE (Appendix A1). When compared to the 2023 model estimate, legal male biomass increased 15.8%, while mature male biomass increased 3.1%. Indicators of female stock health remained good as indicated by the low proportion of poor clutches and high clutch fullness. Both legal and mature male biomass were above their long-term baseline values, with mature male biomass 36% above the baseline and legal

male biomass 48% above the baseline. However, due to the mismatch in the biomass and CPUE trends in 2024, the Juneau biomass estimates had high uncertainty and may have been overestimates (Figure 12).

The annual Section 11-A RKC stock assessment survey found that both the legal and mature male biomass increased compared to 2023. Male CPUEs decreased from the 2023 survey. Due to opposite trends in the biomass estimates and the survey CPUEs, the decision was made in July to set the harvest rate at 8.0% of the legal male biomass for the 2024–2025 season (Table 1).

Lynn Sisters (below average)

Stock health in the Lynn Sisters area declined to *below average* status in 2024 (Table 2, Figures 14 and 15). CPUEs for juvenile males and females and postrecruit males were below their long-term averages, while none of the other size and sex class CPUEs were significantly different from the long-term averages (Appendix A1). The only significant short-term trend was a decrease in postrecruit male CPUE (Appendix A2). Indicators of female stock health were good, as seen by the low proportion of poor clutches and high clutch fullness. Legal male biomass increased 1%, while mature male biomass decreased 26% from the 2023 model estimates. Both legal and mature male biomass were above their long-term baseline values, with mature male biomass 51% above the baseline value and legal biomass 102% above the baseline value.

Lynn Sisters had been on a positive trajectory in stock health until 2024, when stock health decreased. Legal and mature male biomass estimates were both above long-term baselines, but the model did not fit the observed survey CPUEs well. Mature females, prerecruit males, and recruit males were near their long-term CPUE averages, while postrecruit males and juveniles of both sexes were below their long-term CPUE averages. Positive trends in stock health were evident after an eight-year closure to all fishing, but the adjusted legal male biomass estimate was smaller than those for all other areas surveyed in 2024 with the exception of Excursion Inlet (Tables 1, 2, and 7).

Excursion Inlet (poor)

The stock health of Excursion Inlet did not improve from *poor* status (Table 2, Figures 16 and 17). CPUEs of all sex and size classes were significantly below their long-term averages (Appendix A1). There were significant short-term decreases in prerecruit and recruit male CPUEs, and no short-term trends for the other size and sex classes (Appendix A2). Females had a low proportion of poor clutches and lower clutch fullness (59%) than previous year. Estimated legal biomass decreased 34%, while mature biomass decreased 37% from the 2023 model estimates. The mature male biomass estimate was 89% and the legal male biomass estimate was 77% below the baseline value.

CPUEs of all mature male size classes were below long-term baselines for the 6th consecutive season. Mature and legal male biomass estimates decreased, and both were below long-term baselines. There were no short-term increasing trends. No harvest of RKC in Excursion Inlet was recommended for the 2024–2025 season (Table 1).

Port Frederick (unknown since 2014)

Port Frederick was removed as a survey area in 2015 due to budget constraints and has since been considered part of the non-surveyed areas in Table 1. From 1979 to 2004 (the years used to expand the survey biomass to the non-surveyed areas), Port Frederick contributed 2.4% of the harvest. The

previous percent expansion of 65.2% survey areas and 34.8% non-surveyed areas was adjusted. Excluding Port Frederick, 62.8% of the harvest is from survey areas and 37.2% from non-surveyed areas. Adjusting the expansion factor allows for consistency between previous year estimates and the current year; all comparisons regionally were performed with a time series of estimates that were adjusted to not include Port Frederick. Port Frederick is considered part of the non-surveyed areas for regional biomass estimation (Table 1).

Holkham Bay (unknown since 2014)

Holkham Bay was removed as a survey area in 2015 due to budget constraints. The decision to drop Holkham Bay from the survey was based on difficulties in interpreting survey results from this location. Holkham Bay had consistently been surveyed since 2002, however, the data were not always adequate to use in the CSA to produce a biomass estimate. The survey results were only useful as an index of biomass and the model estimates were never included in the regionwide biomass estimate. Holkham Bay continues to be part of the non-surveyed areas (Table 1).

Non-Surveyed Areas

Information used to assess non-surveyed areas for the 2024–2025 commercial fishery recommendation included the current CSA and historical harvest data, by statistical area, from fish tickets. The percentage of historical harvest that occurred within the surveyed areas from the 1974–1975 season to the 1984–1985 season was used to expand the harvestable surplus from the surveyed area to non-surveyed areas. Since 2015, when Port Frederick was removed from the survey, a historical harvest of 52.8% from surveyed areas has been used, while the remaining 47.2% of harvest is targeted from the non-surveyed areas. Summing up the mature male biomass estimates for the surveyed areas and applying this 52.8%/47.2% ratio yields an adjusted legal male biomass estimate of 773,514 lb for non-surveyed areas. A 10% harvest rate was applied to the non-surveyed areas based on historically observed harvest rates. Applying this factor produces a commercial harvestable surplus of 76,351 lb of legal crab in the non-surveyed areas (Table 1).

2024–2025 RKC MANAGEMENT ACTIONS

The total management-recommended regional RKC commercial GHL was 118,091 lb (Table 1). This GHL was less than the 200,000 lb commercial threshold specified in regulation [5 AAC 34.113], so the commercial fishery did not open in the 2024–2025 season.

POORLY RATED AREAS: PYBUS BAY, PERIL STRAIT, EXCURSION INLET

Stock status in Pybus Bay, Peril Strait, and Excursion Inlet was rated *poor*, with details mentioned previously for each area. Therefore, no harvest was recommended in these areas for the 2024–2025 season.

GAMBIER BAY (BELOW AVERAGE)

Prerecruit and recruit male biomass was increasing within Gambier Bay. Male recruits and postrecruits were below their long-term averages with male postrecruits showing a significant decreasing trend. Legal and mature male biomasses were increasing yet are still low compared to historical levels. For the GHL calculation, management recommended using a conservative harvest rate of 4% for the 2024–2025 season (Table 1).

SEYMOUR CANAL (MODERATE)

Prerecruit and recruit male CPUEs showed a significant short-term increasing trend in Seymour Canal (Figure 8). Both legal and mature male biomasses showed increases in the short term. Seymour Canal has caused sampling concerns in the past due to 1) the wide area of suitable habitat, 2) the Dungeness crab fishery that takes place during the survey period, which may lead to pot competition, and 3) the large expansion factor from the mark–recapture study. For the GHL calculation, management recommended using a 10% harvest rate for the 2024–2025 season (Table 1).

JUNEAU (HEALTHY)

The annual Section 11-A RKC stock assessment survey found both the legal and mature male biomass increased in the Juneau area compared to last year. Male CPUEs decreased from the 2023 survey. Due to poor model fit to the survey CPUEs, the decision was made in July to set the harvest rate at 8.0% of the legal male biomass (for the personal use and commercial fisheries combined) in the 2024–2025 season. Section 11-A is managed following the Section 11-A red and blue king crab management and allocation plan [5 AAC 34.111] These factors resulted in a 3.2% commercial harvest rate for the 2024–2025 season for the GHL calculation (Table 1).

LYNN SISTERS (BELOW AVERAGE)

Both legal and mature male biomass estimates were above their long-term baseline values in Lynn Sisters, although mature male biomass decreased from the 2023 model estimate. For the guideline harvest level calculation, management recommended using a 9% harvest rate for the 2024–2025 season (Table 1).

NON-SURVEYED AREAS

For the 2024–2025 GHL calculation, management used the ratio of 52.8%/47.2% (surveyed to non-surveyed) and a harvest rate of 10% (Table 1).

FISHERY MANAGEMENT CONCERNS

The commercial fishery and personal use fishery for red and blue king crab are managed separately outside of Section 11-A, and there are no regulatory thresholds or allocations that combine estimated harvest for both user groups. Personal use harvest outside of Section 11-A is not considered when calculating the commercial GHLs for each area to determine whether the total commercial GHL meets the 200,000 lb threshold in regulation for a commercial fishery. The permit system for the personal use fishery, implemented in 2018, will provide managers with better information on the level of personal use harvest outside of Section 11-A. This added data will improve future CSA estimates and inform potential Alaska Board of Fisheries decisions.

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TABLES AND FIGURES

Table 1.–2024 Southeast Alaska commercial RKC fishery guideline harvest level (GHL) calculations for the surveyed areas and non-surveyed areas.

Survey area	Legal biomass (adjusted lb)	Mature biomass (adjusted lb)	Legal harvest rate	Total GHL (lb)	PU harvest (lb)	Commercial GHL (lb)
Pybus Bay	44,728	50,477	0.00	0	0	0
Gambier Bay	79,431	143,742	0.04	3,177	0	3,177
Seymour Canal	191,673	406,976	0.10	19,167	0	19,167
Peril Strait	23,474	23,515	0.00	0	0	0
Juneau Area	456,519	578,217	0.08	36,522	21,913	14,609
Lynn Sisters	48,326	66,665	0.09	4,349	0	4,349
Excursion Inlet	21,136	21,658	0.00	0	0	0
BKC	9,172	13,687	0.00	0	0	438
Other areas	773,514	1,154,299	0.10	77,351	1,000	76,351
Total	1,647,972	2,459,237		140,566	22,913	118,091

Table 2.–Southeast Alaska red king crab stock health designations and scores 2020-2024 by survey area.

Survey area	2020	2021	2022	2023	2024
Pybus Bay	Below average (-2.50)	Below average (-4.00)	Below average (-2.50)	Poor (-5.75)	Poor (-5.25)
Gambier Bay	Poor (-6.25)	Below average (-2.75)	Moderate (0.75)	Moderate (1.25)	Below average (-2.75)
Seymour Canal	Below average (-3.50)	Poor (-5.00)	Below average (-4.00)	Below average (-3.00)	Moderate (-0.5)
Peril Strait	Below average (-4.25)	Below average (-2.25)	Below average (-2.75)	Unsurveyed	Poor (-7)
Juneau Area	Moderate (-0.50)	Above average (3.50)	Healthy (5.00)	Healthy (7.75)	Healthy (4.5)
Lynn Sisters	Moderate (1.50)	Moderate (1.25)	Moderate (1.00)	Above average (3.25)	Below average (-2.5)
Excursion Inlet	Poor (-4.75)	Poor (-5.00)	Poor (-6.00)	Poor (-5.75)	Poor (-5.5)

Table 3.–Southeast Alaska red king crab stock health scores and associated categories used for the previous, 2006–2008, and current, since 2008, seasons.

Score	Previous categories	Current categories
-7.00 to -4.50	Poor	Poor
-4.25 to -1.75	Poor	Below average
-1.50 to 1.50	Moderate	Moderate
1.75 to 4.25	Healthy	Above average
4.50 to 7.00	Healthy	Healthy

Note: scores are calculated in 0.25 increments.

Table 4.–Southeast Alaska red king crab legal crab biomass adjustments to catch–survey analysis (CSA) based on Chapman mark–recapture estimates.

Survey area	Study years	Adjustment
Lynn Sisters	2009	1.75
Pybus Bay	2010, 2014	3.08
Gambier Bay	2010, 2017	3.93
Excursion Inlet	2010, 2016	2.95
Seymour Canal	2011, 2015	9.17
Peril Strait	2011	2.75
Port Frederick	2011	4.27

Table 5.–2024 Southeast Alaska red king survey crab sample sizes by area.

	Peril Strait	Excursion Inlet	Gambier Bay	Juneau Area	Lynn Sisters	Pybus Bay	Seymour Canal
Juvenile males	1	3	586	1,652	51	9	186
Small females	4	6	573	1,563	31	2	370
Large females	30	8	163	2,420	207	2	227
Prerecruits	0	1	196	807	71	12	263
Recruits	2	6	72	599	30	8	140
Postrecruits	5	6	24	759	18	15	36
Number of pots	53	82	77	218	28	69	70

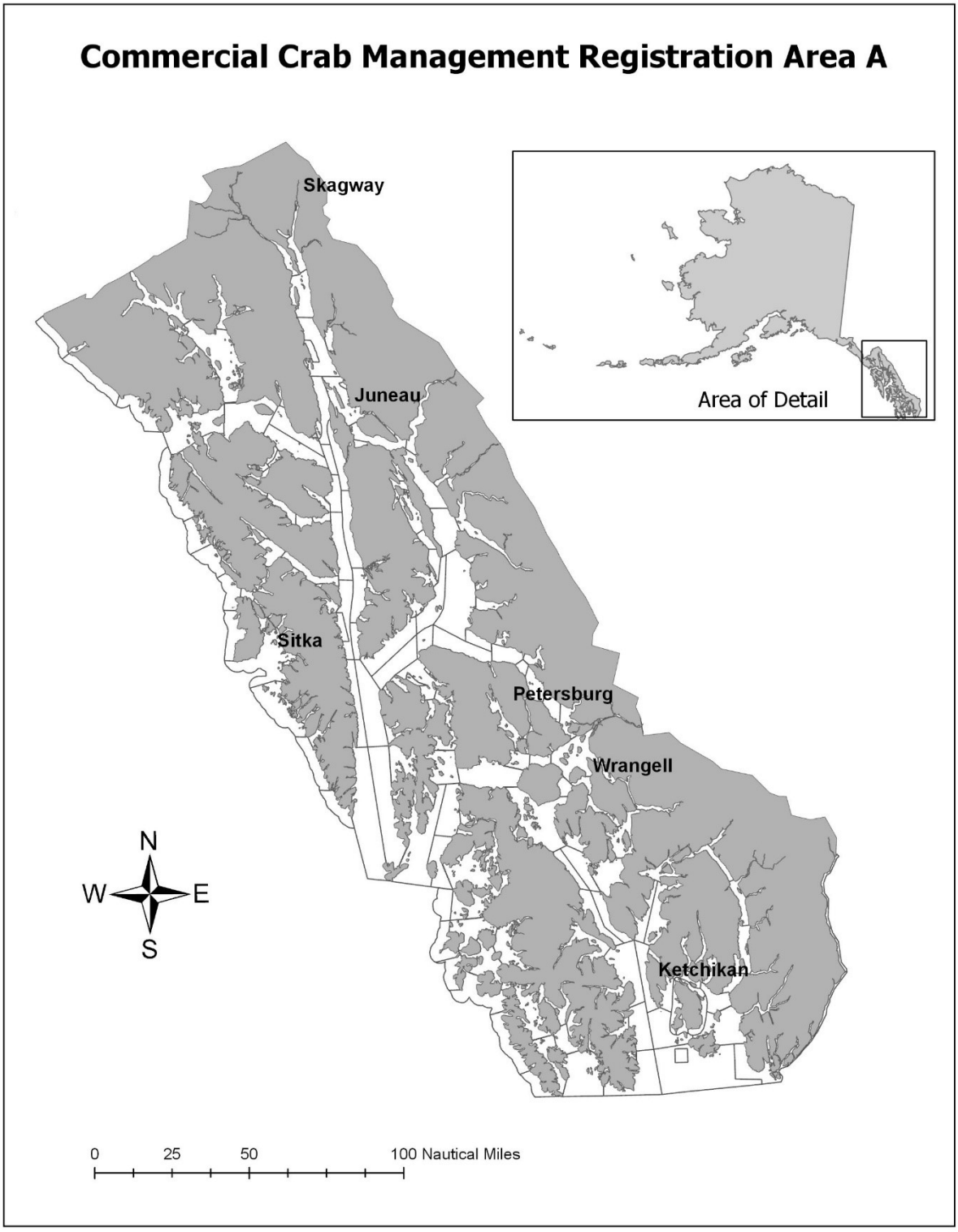

Figure 1.–Southeast Alaska (Registration Area A) commercial fishery boundaries.

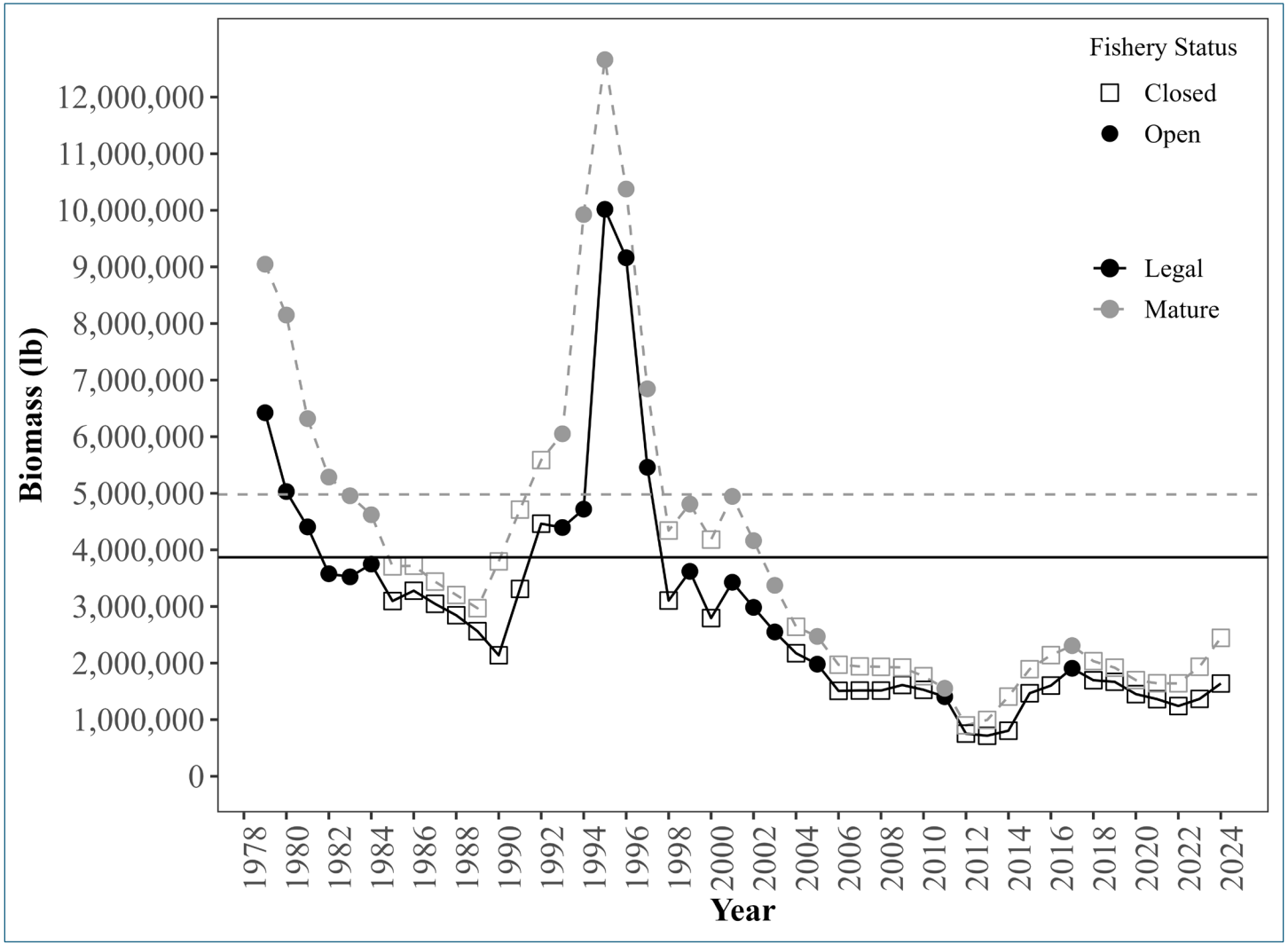

Figure 2.–Southeast Alaska red king crab total biomass estimates (expanded regional estimates) of mature male (gray points and line) and legal male crab (black points and line). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

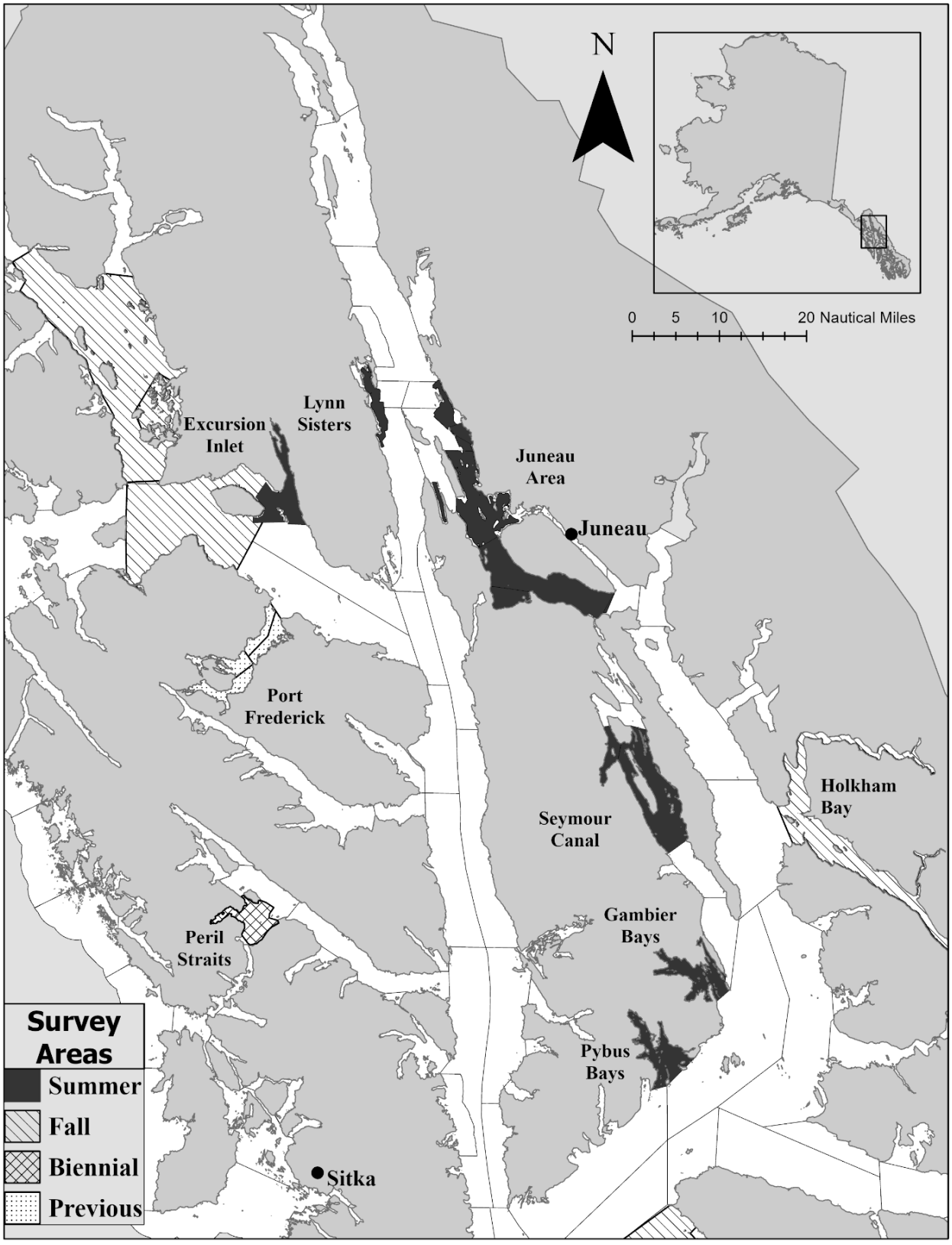

Figure 3.–Southeast Alaska (Registration Area A) summer and fall survey areas for Tanner and red king crab.

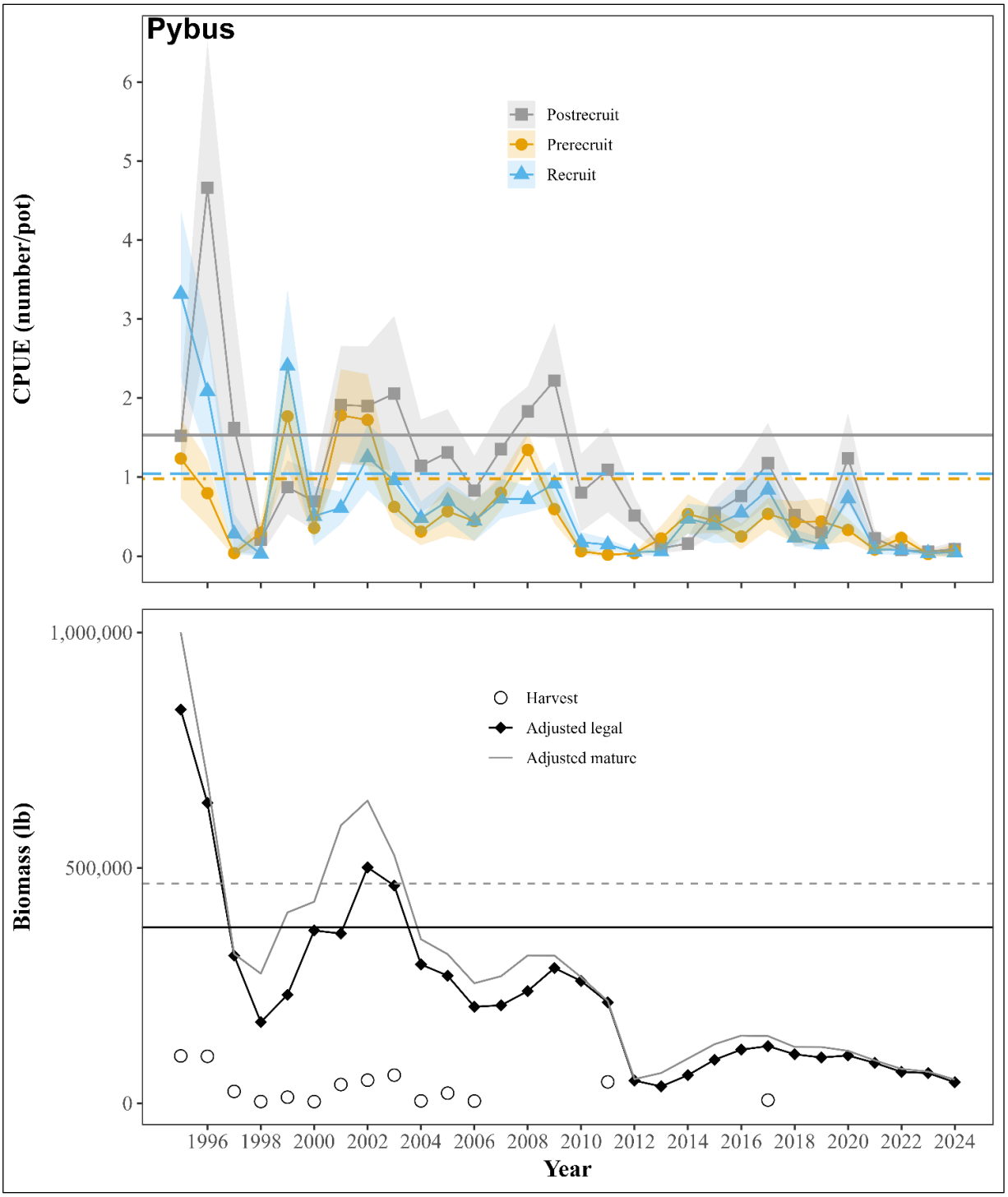

Figure 4.–Pybus Bay CPUEs for male size/sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

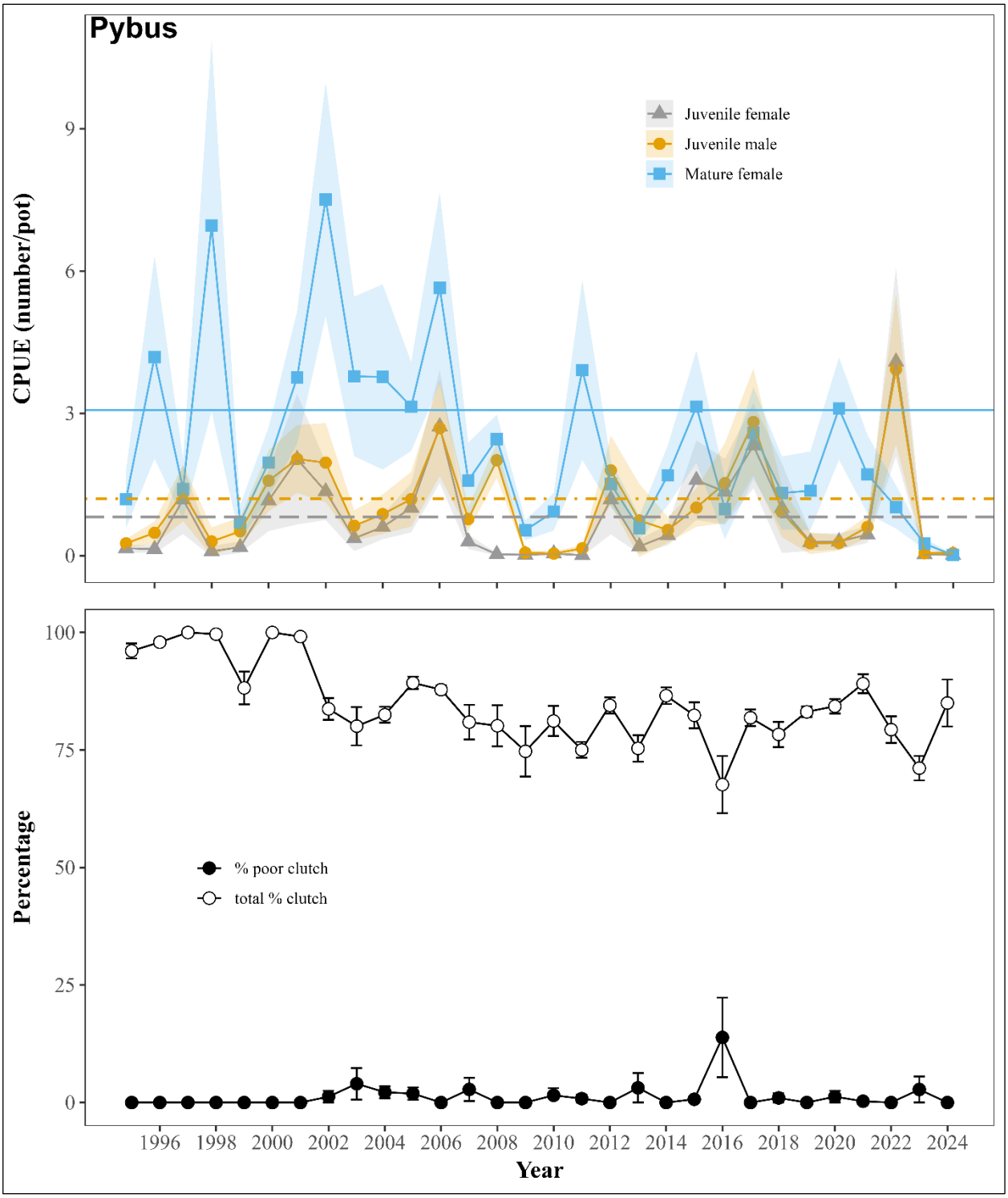

Figure 5.–Pybus Bay CPUEs for female and juvenile male size/sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

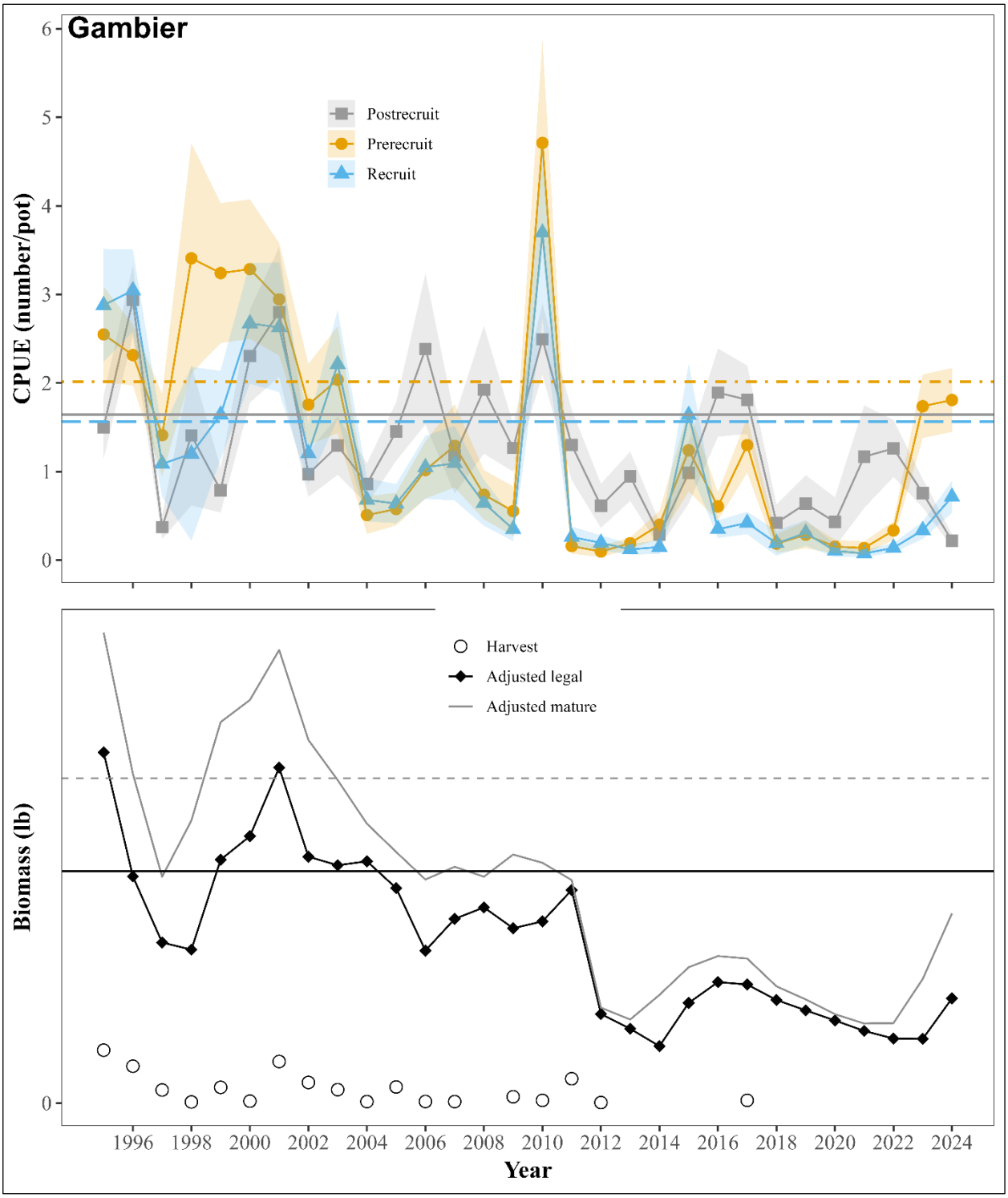

Figure 6.–Gambier Bay CPUEs for male size/sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

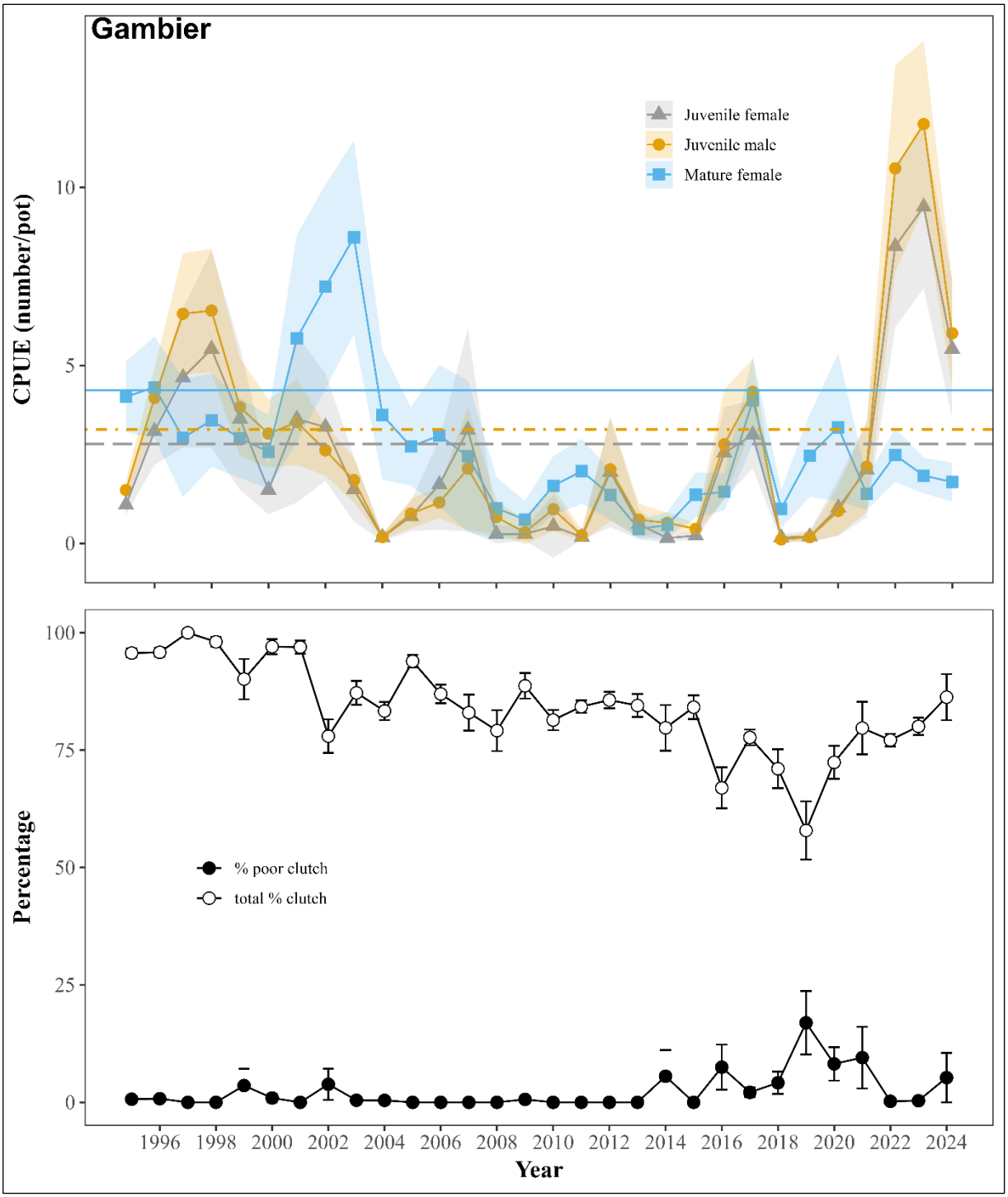

Figure 7.–Gambier Bay CPUEs for female and juvenile male size/sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

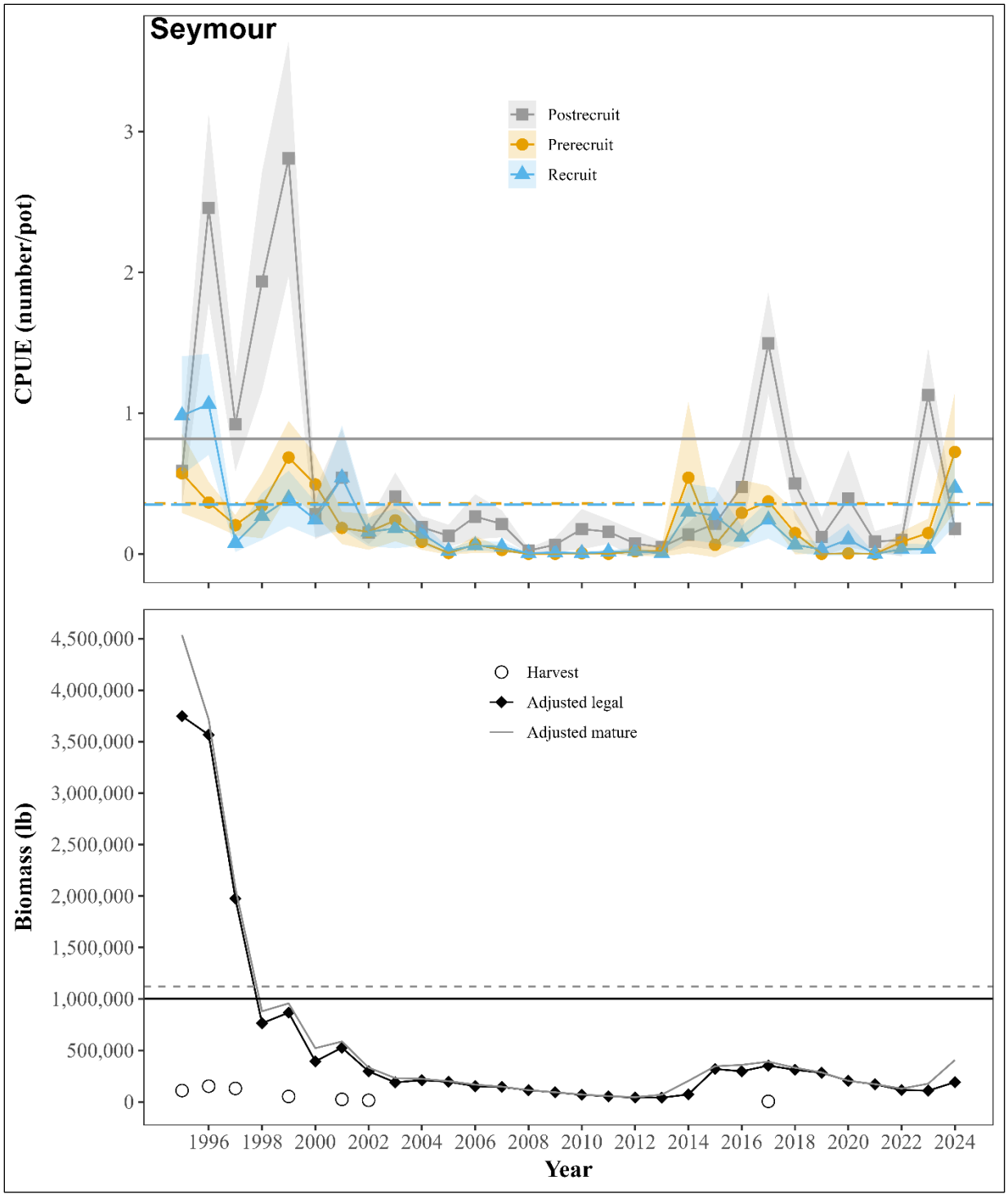

Figure 8.–Seymour Canal CPUEs for male size/sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). Gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black refers to the legal biomass.

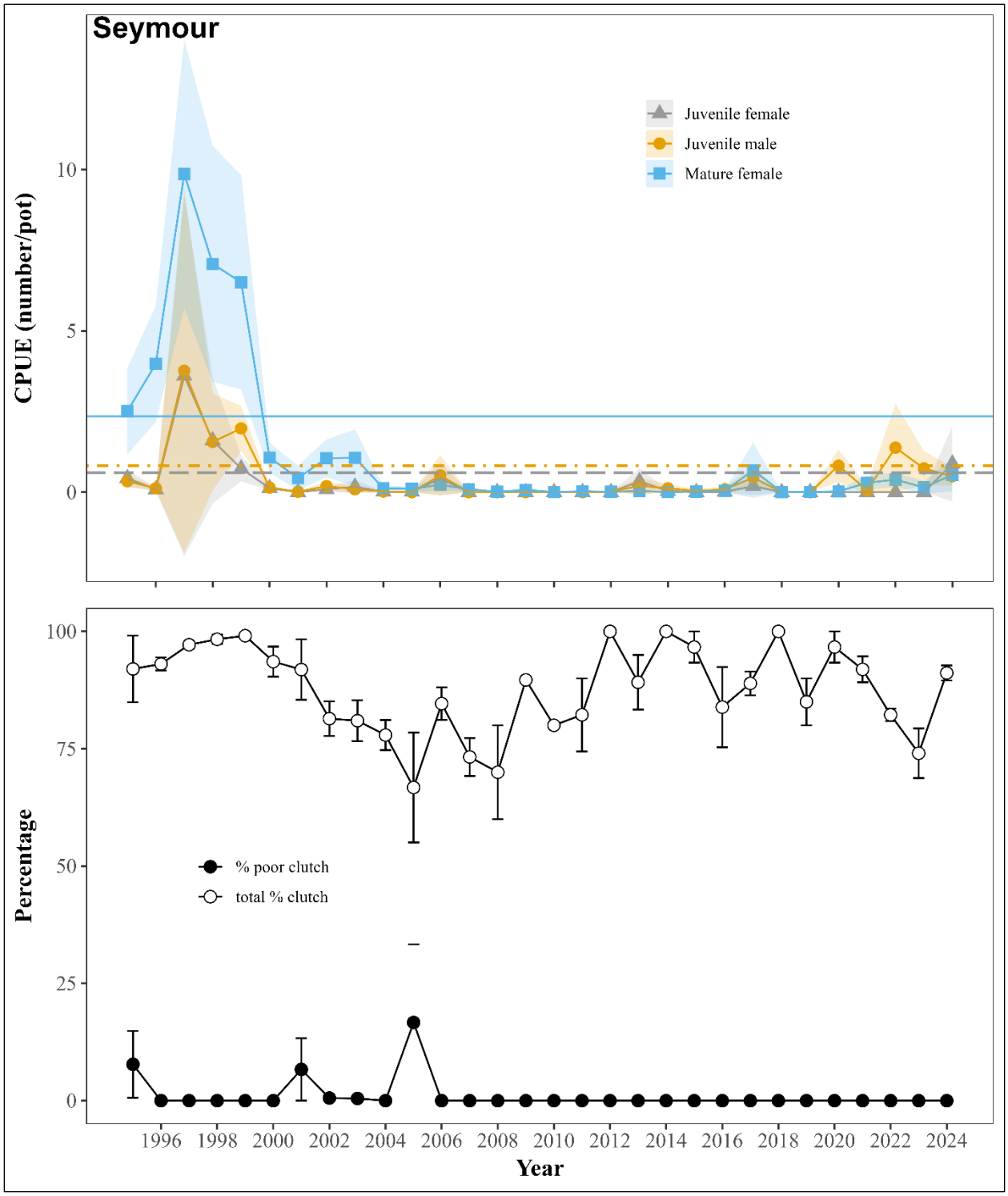

Figure 9.–Seymour Canal CPUEs for female and juvenile male size/sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

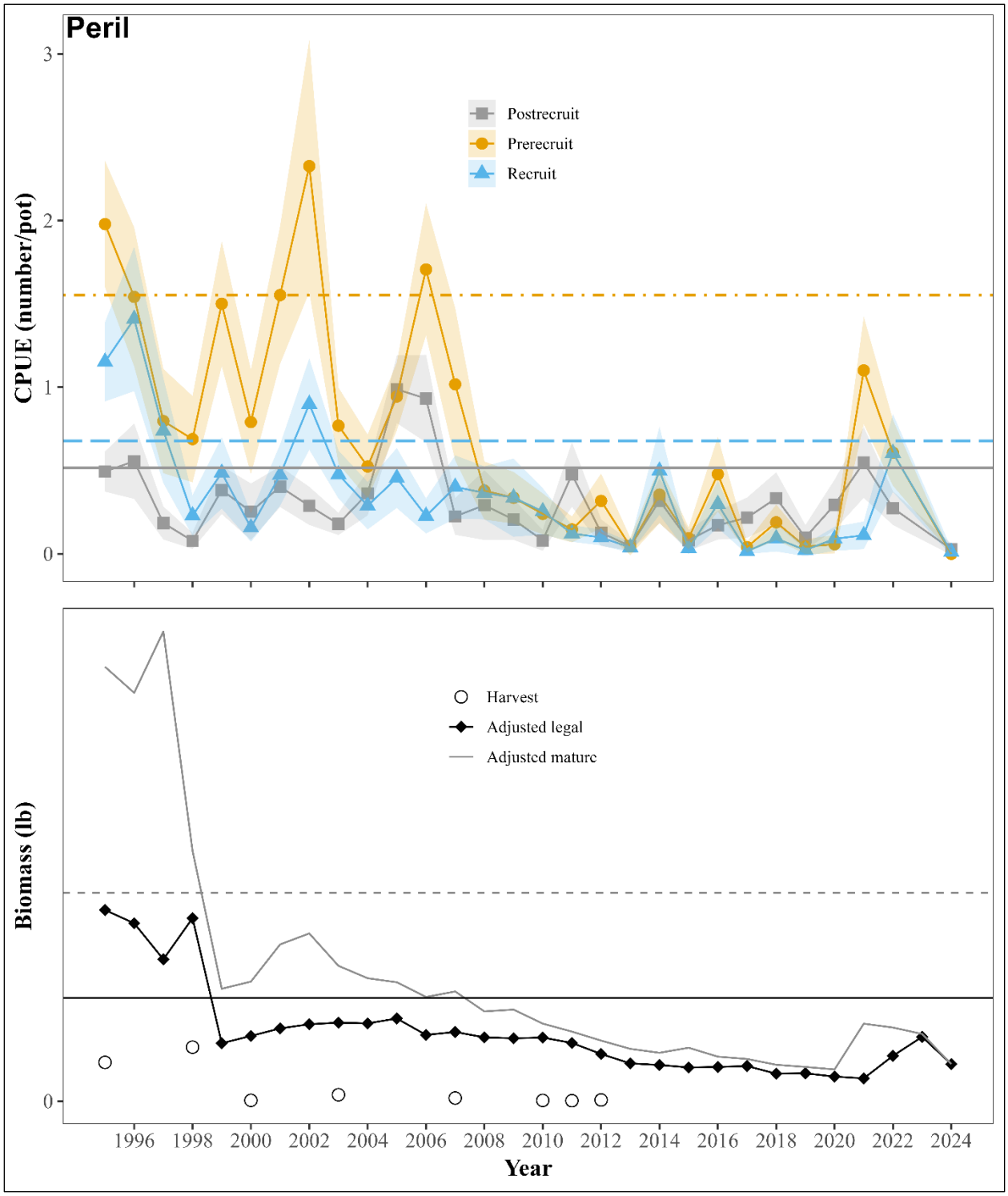

Figure 10.–Peril Strait CPUEs for male size and sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

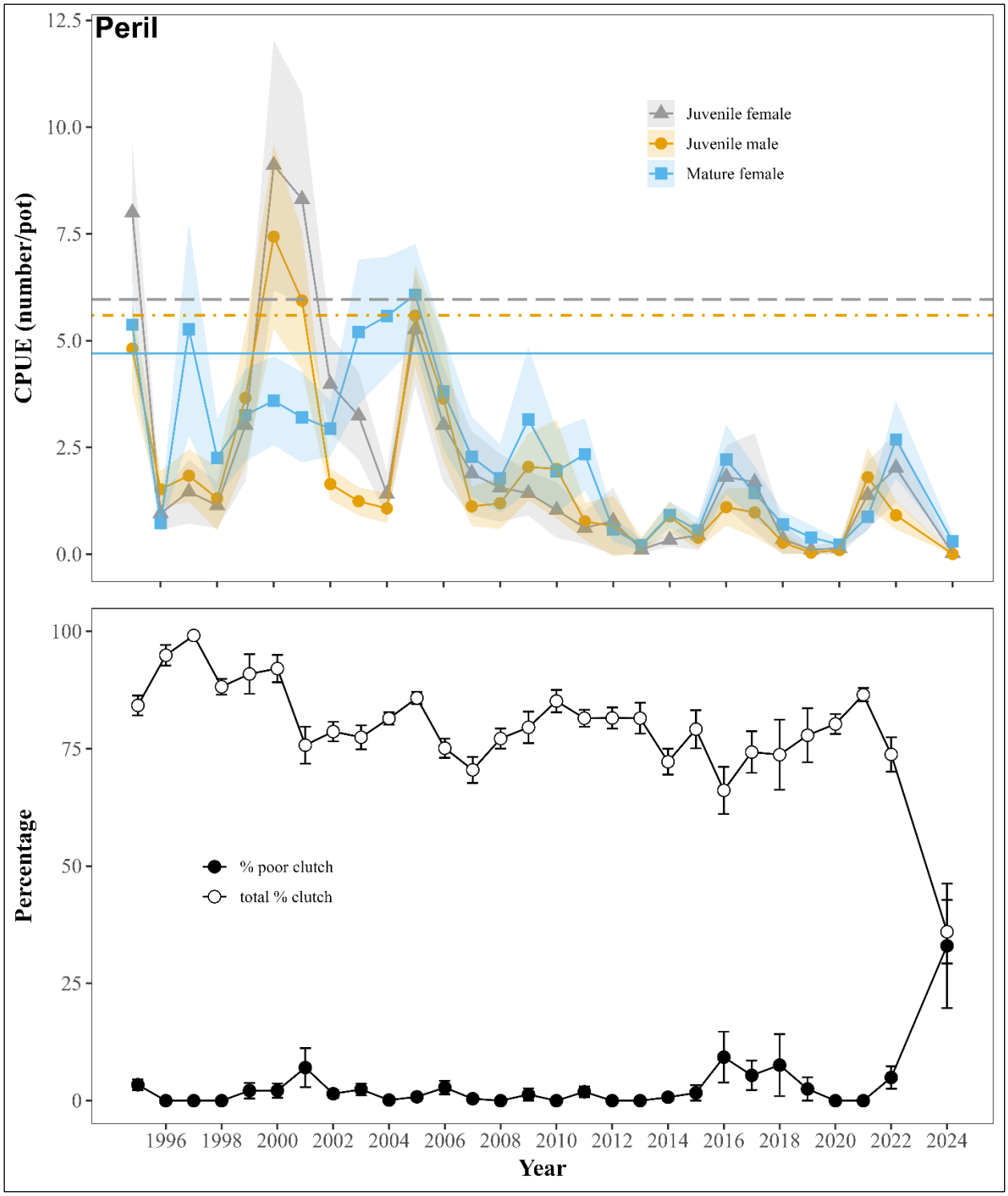

Figure 11.–Peril Strait CPUEs for female and juvenile male size and sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

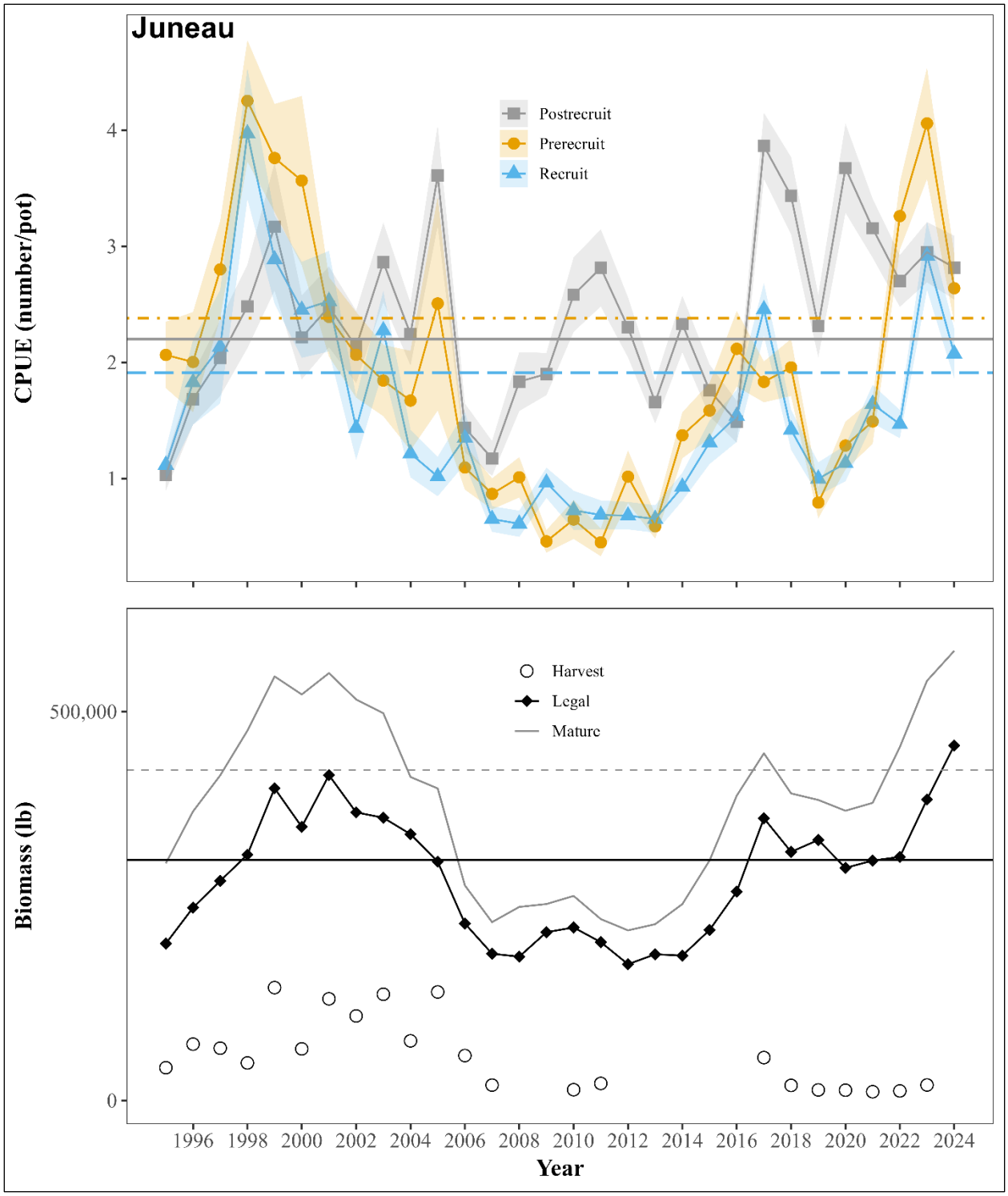

Figure 12.–Juneau CPUEs for male size and sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

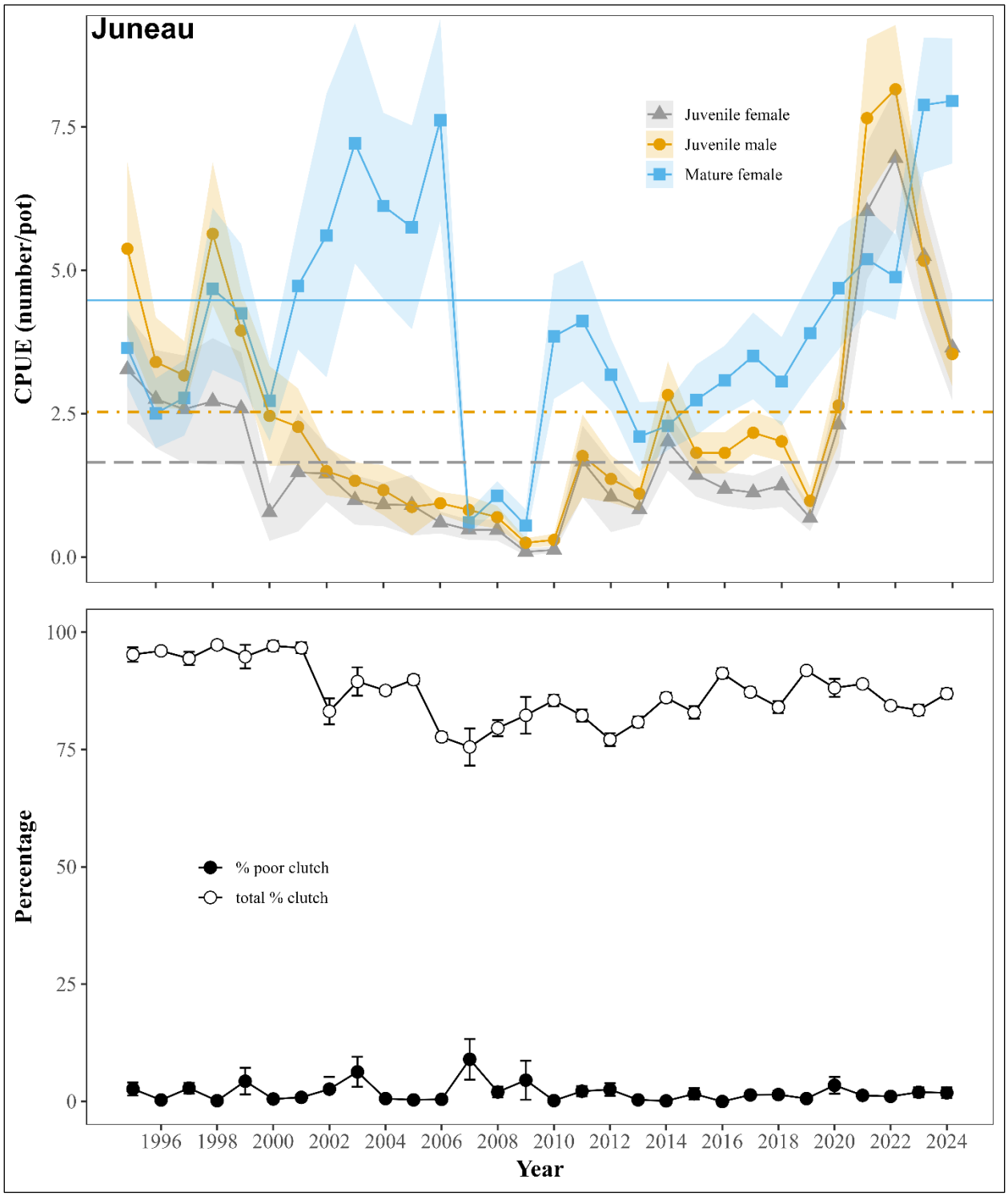

Figure 13.–Juneau CPUEs for female and juvenile male size and sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

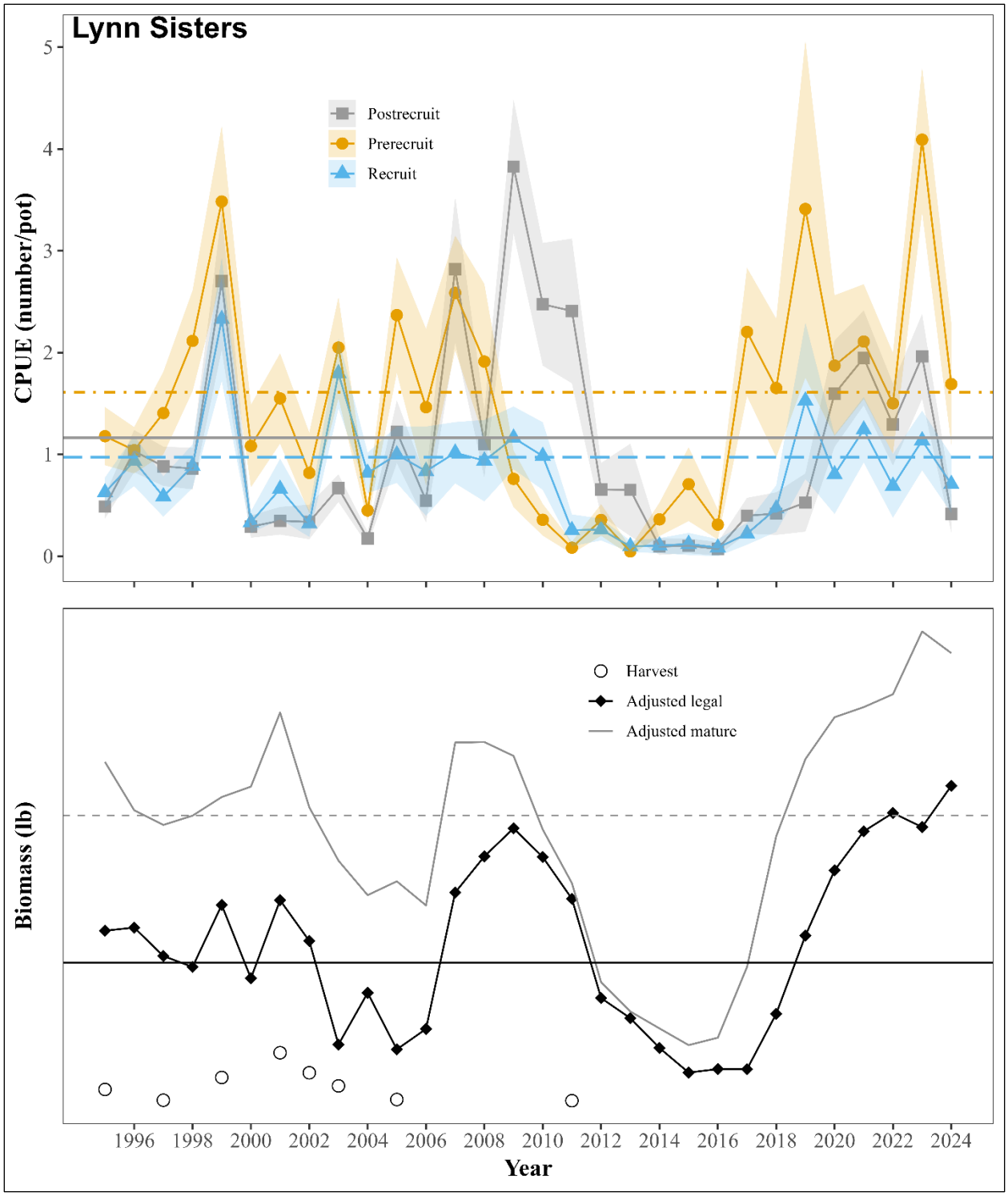

Figure 14.–Lynn Sisters CPUEs for male size/sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). The gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black line refers to the legal biomass.

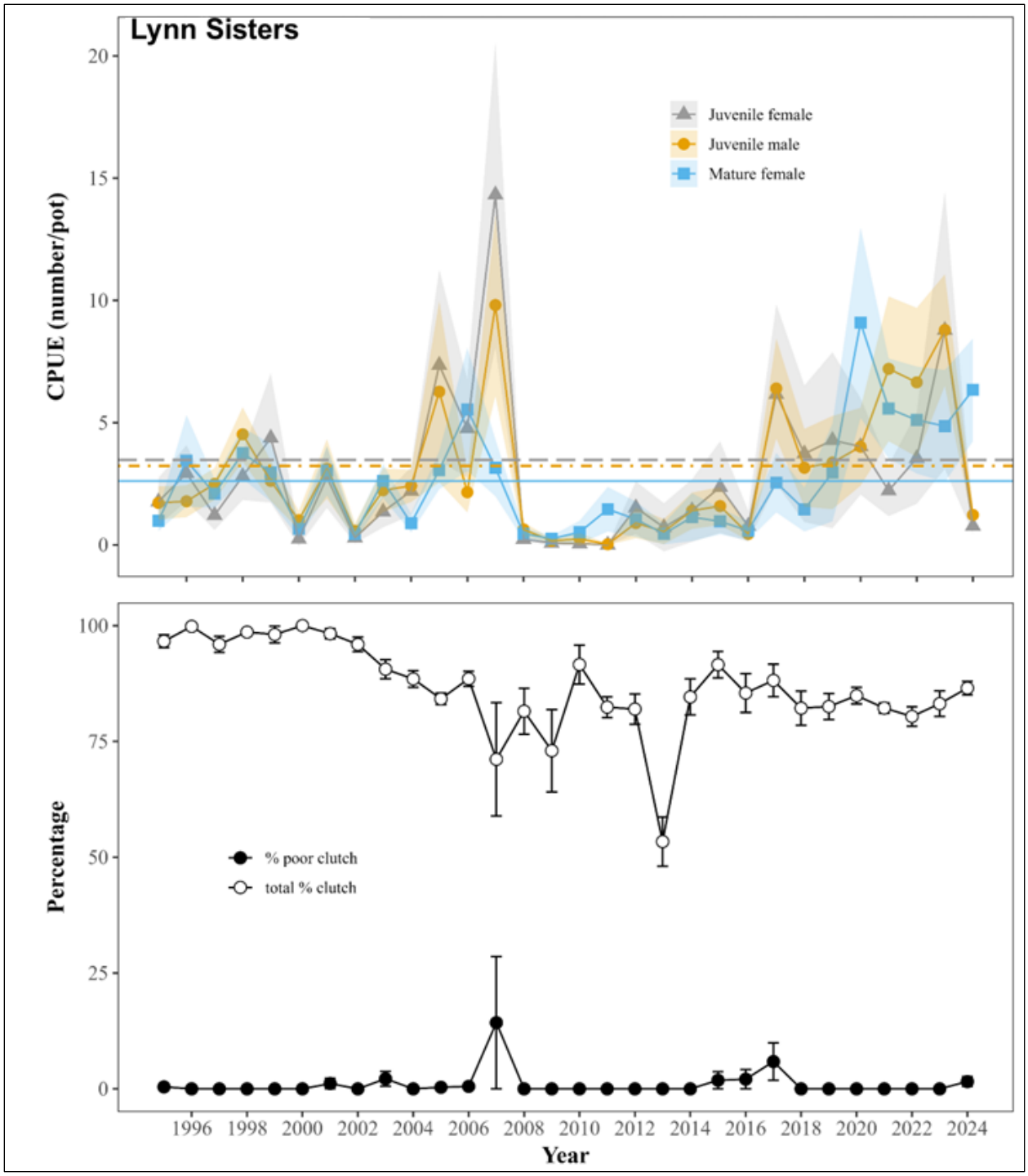

Figure 15.–Lynn Sisters CPUEs for female and juvenile male size/sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

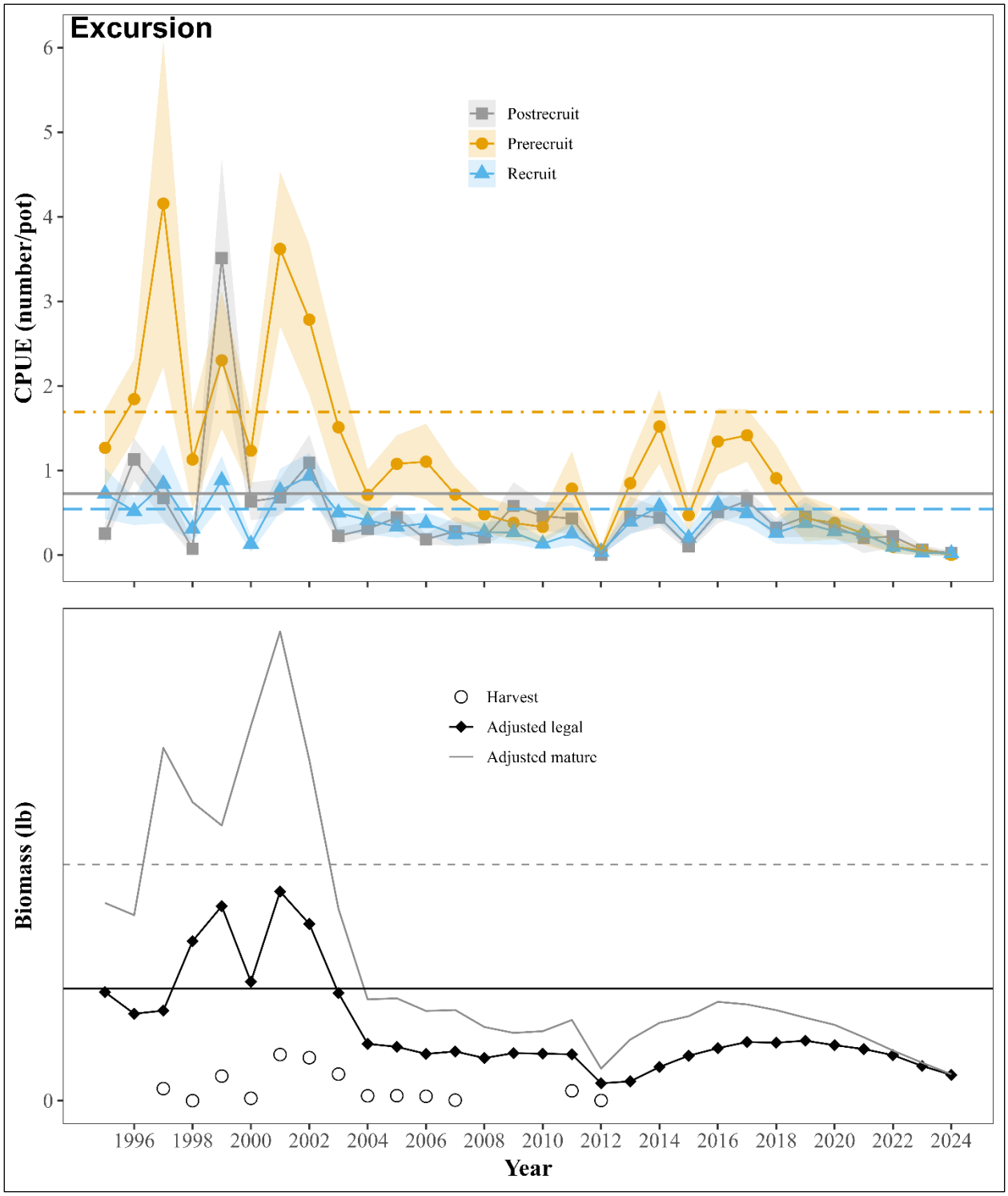

Figure 16.–Excursion Inlet CPUEs for male size/sex classes of red king crab, biomass estimates from the current year's CSA model, and harvest data. Reference lines represent long-term baselines for each male maturity class (1995–2007). Gray dotted reference line in the biomass figure represents the long-term baseline for mature biomass, while the solid black refers to the legal biomass.

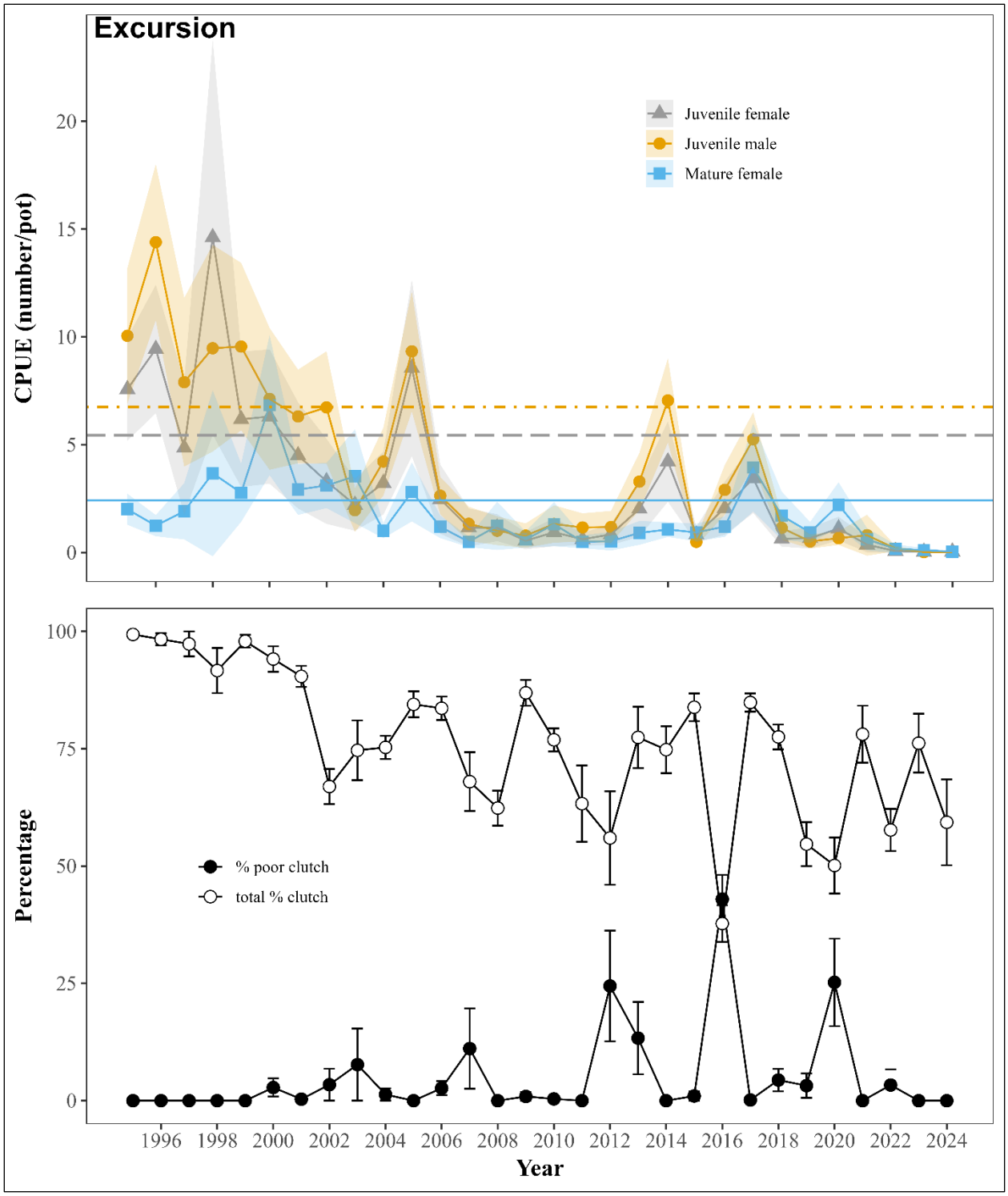

Figure 17.–Excursion Inlet CPUEs for female and juvenile male size/sex classes of red king crab, clutch fullness, and proportion of poor clutches. Reference lines represent long-term baselines for each size/sex class (1995–2007).

APPENDIX A

Appendix A1.–Comparisons of 2024 survey CPUE values to long-term averages by size/sex class and survey area.

Location	Juvenile male	Juvenile female	Mature female	Prerecruit	Recruit	Postrecruit
Pybus Bay	-1	-1	-1	-1	-1	-1
Gambier Bay	0	0	-1	0	-1	-1
Seymour Canal	0	0	-1	0	0	-1
Juneau	0	1	1	0	0	1
Lynn Sisters	-1	-1	0	0	0	-1
Excursion Inlet	-1	-1	-1	-1	-1	-1
Peril Strait	-1	-1	-1	-1	-1	-1

Note: 1 = significantly above long-term average; 0 = not significantly different from long-term average; -1 = significantly below long-term average.

Appendix A2.–Short-term trends in survey CPUE by size/sex class and survey area.

Location	Juvenile male	Juvenile female	Mature female	Prerecruit	Recruit	Postrecruit
Pybus Bay	0	0	-1	0	0	0
Gambier Bay	0	0	0	1	1	-1
Seymour Canal	0	0	0	1	1	0
Juneau	-1	0	1	1	1	0
Lynn Sisters	0	0	0	0	0	-1
Excursion Inlet	0	0	0	-1	-1	0
Peril Strait	-1	0	0	-1	0	-1

Note: 1 = significantly positive trend; 0 = no significant trend; -1 = significantly negative trend.