Fishery Management Report No. 11-57

2012 Report to the Board of Fisheries on Southeast Alaska/Yakutat Tanner Crab Fisheries

by

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and

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

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

FISHERY MANAGEMENT REPORT NO. 11-57

2012 REPORT TO THE BOARD OF FISHERIES ON SOUTHEAST ALASKA/YAKUTAT TANNER CRAB FISHERIES

by

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The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

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ABSTRACT

This report reviews the commercial fishery for Tanner crab in Region I, which includes Southeast Alaska (Registration Area A) and Yakutat (Registration Area D).

Tanner crab harvests in Region I totaled 891,344 pounds valued at $2.43 million during the last completed season. The average exvessel price per pound for Tanner crab during the 2010/11 season was $2.85, a fifteen year high.

Most of the shellfish fisheries in Region I are fully developed. Tanner crab stocks are assessed in an annual Tanner crab pot survey, and also in the annual red king crab pot survey. There have never been stock assessment surveys for Yakutat Tanner crab stocks. Yakutat stocks of Tanner crab have been designated as collapsed and recovering. The Yakutat Tanner crab fishery will remain closed until signs of recovery are apparent, and until a management plan and stock assessment plans are developed to provide sustainable harvest.

The ability of the department to manage for sustained yields varies among the fisheries due to different levels of development of stock assessment programs and management plans. Southeast Tanner crab has a developing stock assessment program. Over the past decade, Tanner crab stock analyses have changed as survey methods changed and the quantity and quality of data have improved. Dockside sampling and skipper interviews also are routinely conducted in Southeast Alaska.

In January 2009 the Alaska Board of Fisheries adopted an amended proposal from industry that outlined a Tanner crab harvest strategy for Southeast [5 AAC 35.113]. Under the new Tanner crab harvest strategy the commercial Tanner crab season length is in part determined by the number of registered pots at the start of the fishery and the overall mature male abundance estimate. There is also a mature male abundance threshold of 2.3 million pounds built into the harvest strategy.

Key words: Tanner crab, *Chionoecetes bairdi*, Southeast Alaska, Yakutat, Fisheries management, Crab, Invertebrate fisheries, Region I, Harvest statistics

CHAPTER 1: INTRODUCTION TO SOUTHEAST ALASKA/YAKUTAT TANNER CRAB FISHERIES

INTRODUCTION

This report reviews the commercial fisheries for Tanner crab in Region I, which includes Southeast Alaska (Registration Area A) and Yakutat (Registration Area D). Registration Area A encompasses all waters within the Alexander Archipelago and offshore waters from Dixon Entrance to Cape Fairweather, divided into Districts 1 through 16 (Figure 1.1). Registration Area D encompasses state waters from Cape Fairweather to Cape Suckling, divided into Districts 81 through 91. Shellfish fisheries in these areas are primarily in state waters.

This is the second Alaska Board of Fisheries (board) meeting where proposals for all Region I shellfish fisheries are considered in one meeting. In previous years, proposals for Dungeness crab, shrimp, and scallops were combined into one meeting held in Southeast Alaska, while king and Tanner crab proposals were considered separately during the statewide king and Tanner crab board meeting. The reason for including the Southeast king and Tanner crab meeting in the Southeast meeting is to allow for increased participation of stakeholders.

The Tanner crab fishery in Southeast Alaska is fully developed. The Tanner crab fishery in Southeast is prosecuted under limited entry, separate harvest strategies exists in regulation for both the pot and ring net fisheries, and an annual stock assessment survey is conducted by the department. The Tanner crab fishery in Yakutat is much less developed than the Tanner fishery in Southeast Alaska. The Tanner crab fishery in Yakutat has been closed since the 1999/2000 season, was prosecuted as an open access fishery, and has no history of stock assessment. Yakutat Tanner stocks have been designated collapsed and recovering.

The Tanner crab harvest in Southeast Alaska totaled over 890,000 lbs valued at $2.42 million during the last completed season (Table 1.1). Ranking by value based on the last season when a fishery was conducted, the top five fisheries in Southeast Alaska were Dungeness crab, golden king crab, Tanner crab, shrimp pot, and red and blue king crab. Ranking by landed poundage, the top five fisheries in Southeast Alaska were Dungeness crab, Tanner crab, golden king crab, shrimp pot, and red and blue king crab.

TANNER CRAB RESEARCH AND MANAGEMENT

The ability of the Alaska Department of Fish and Game (department) to manage the Southeast Alaska and Yakutat Tanner crab fisheries for sustained yields varies due to the different levels of development of stock assessment programs and management plans. Southeast Tanner crab has a developing stock assessment program and a relatively new harvest strategy in regulation for the pot fishery. There has been a harvest strategy in regulation since 1990 for the Southeast Tanner ring net fishery. Yakutat Tanner crab has no stock assessment program. Also, there is also no harvest strategy or management plan in place for Yakutat Tanner crab. The only regulatory management tool for this fishery is a maximum harvest of 1,000,000 lbs.

Stock assessment surveys currently conducted on Tanner stocks in Southeast Alaska include an annual Tanner crab pot survey, and an annual red king crab pot survey in which Tanner biomass is also assessed. Surveys for Tanner crab are relatively recent additions that have been conducted for fifteen years. In 2004 the department briefly opened the Yakutat Tanner crab fishery with the goal to determine the stock level; however extremely low catches indicated that stock remained in a collapsed status.

Dockside sampling and skipper interviews are routinely conducted in the Southeast Tanner fishery. The objectives of dockside sampling are to gather data and information on size frequency, shell condition, average weight, fishing location, effort levels, and estimates of average catch per unit of effort (CPUE). The collected information allows assessment of the relative strength of various components (e.g. size, recruits) of the commercially exploited component of the population, and a qualitative estimate of stock condition. However, for Yakutat Tanner fisheries even basic port sampling has not been systematically conducted. Harvest and effort data is also collected through the fish ticket system for both Southeast and Yakutat Tanner fisheries.

Logbook information is collected from the Southeast Tanner pot fishery, but is not required in the Southeast Tanner ring net fishery or the Yakutat Tanner pot fishery. This information is particularly useful in calculating standardized CPUE and editing harvest tickets, but could potentially also be used for inseason fishery management.

TASK FORCE STATUS

In 2000, the department began working with the Southeast Alaska King & Tanner Crab Task Force (KTTF). The original intent of this task force was to develop a management plan for Southeast Alaska Tanner crab and develop methods to reduce harvest pressure in core Tanner crab areas. The department and KTTF conduct a joint meeting annually to review stock status of all Southeast Alaska king and Tanner crab and exchange information regarding management activities and plans.

STAFF

All Region I crab, beam trawl shrimp, and scallops fisheries are managed by the regional shellfish management staff. All Region I shellfish stock assessment and research programs, aside from weathervane scallops, are managed by the regional shellfish research staff. The shrimp pot fishery is the only shellfish fishery managed individually by area offices within the region. These fisheries are managed by Area Management Biologists under the supervision of Bill Davidson, Regional Management Coordinator, stationed in Sitka. All other shellfish research (non-salmon) and management is under the supervision of Forrest Bowers, regional Groundfish and Shellfish Fisheries Program Supervisor, stationed in Douglas. The regional stock biology staff conducts dockside sampling and skipper interviews with assistance from the shellfish and area management staffs.

SHELLFISH PROJECT STAFF

Name	Title	Job Class	Location
Forrest Bowers	Region I Groundfish and Shellfish Fisheries Program Supervisor	Fisheries Biologist IV	Douglas
Bill Davidson	Region I Management Coordinator	Fisheries Biologist IV	Sitka
Joe Stratman	Region I Shellfish Management Project Leader	Fisheries Biologist III	Petersburg
Gretchen Bishop	Region I Crab Research Project Leader	Fisheries Biologist III	Douglas
Chris Siddon	Shellfish Biometrician	Biometrician III	Douglas
Adam Messmer	Shellfish Management Biologist	Fisheries Biologist II	Douglas
Quinn Smith	Southeast Regional Shrimp Biologist	Fisheries Biologist II	Douglas
Andrew Olson	Shellfish Research Biologist	Fisheries Biologist II	Douglas
Kellii Wood	Shellfish Technician	Fish and Wildlife Technician IV	Petersburg

CHAPTER 1—TABLES AND FIGURES

Table 1.1–Registration Area A (Southeast Alaska) and Registration Area D (Yakutat) list of shellfish fisheries, harvest, and approximate exvessel values from the last completed season or calendar year.

Area Season	Fishery	Harvest (lbs)	Approximate exvessel Value
Southeast			
2005/2006	Red and blue king crab	209,799	$1,099,000
2010/2011	Tanner crab (*C. bairdi*)	891,344	$2,425,059
2010/2011	Golden king crab	687,505	$4,656,267
2010/2011	Dungeness crab	3,245,265	$5,525,404
2010/2011	Pot shrimp	556,574	$1,519,447[a]
2010/2011	Beam trawl shrimp	132,383	$107,813
	Subtotal	**5,722,870**	**$15,332,990**
Yakutat			
2000/2001	Red and blue king crab	391	$2,960
1999/2000	Tanner crab	[b]	[b]
1999/2000	Dungeness crab	65,386	$133,145
2010/2011	Pot shrimp	[b]	[b]
2004/2005	Otter trawl shrimp	[b]	[b]
2010/2011	Weathervane scallop	160,340	$1,282,720[c]
	Subtotal	**230,499**	**$1,427,272**
	Grand Total	**5,953,369**	**$16,760,262**

[a] Value estimate based on 2010 exvessel price data from Commercial Fisheries Entry Commission.

[b] Confidential data, fewer than three permits fished.

[c] Value estimate based on 2009 exvessel price data.

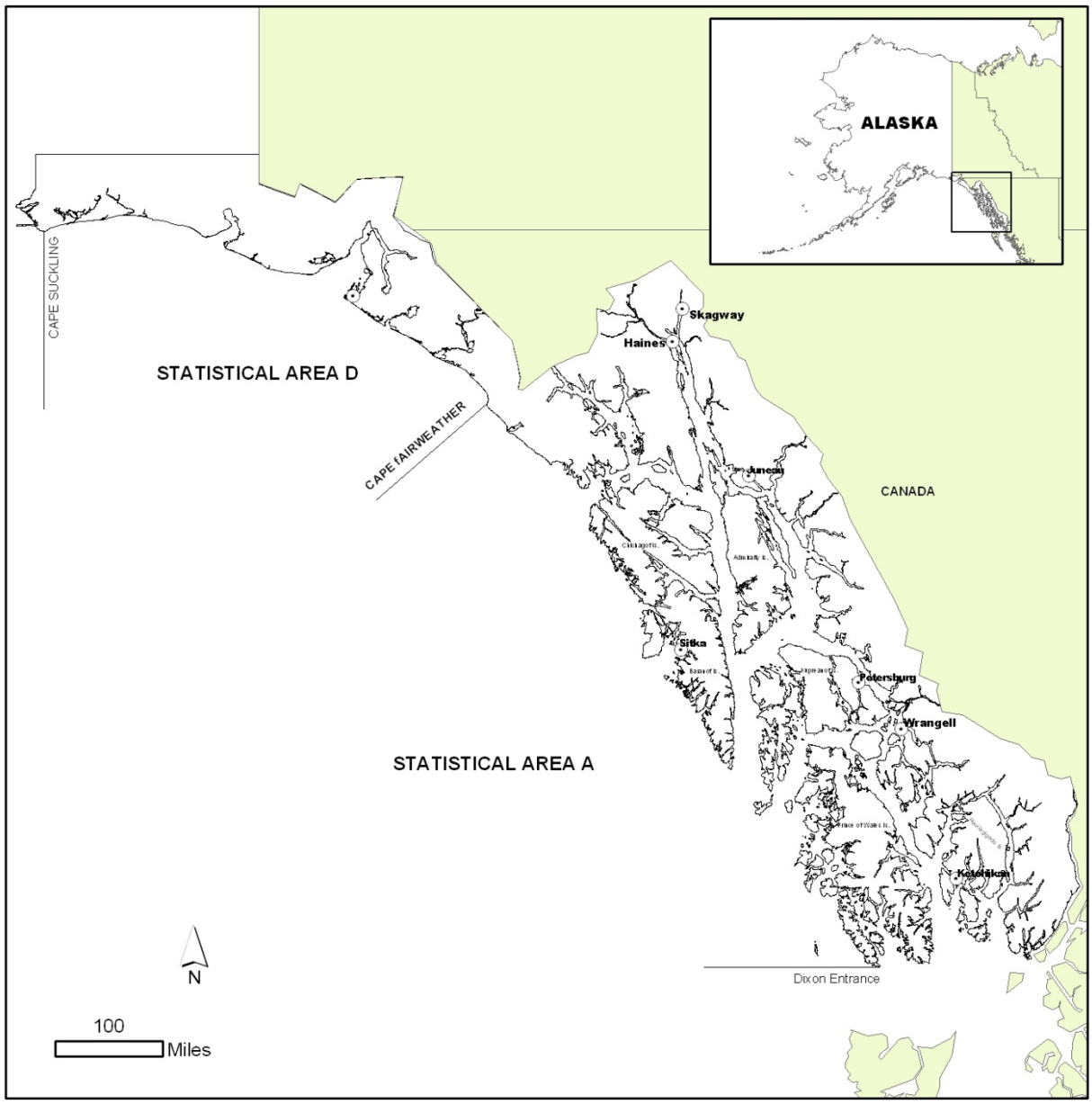

Figure 1.1–Registration Area A (Dixon Entrance to Cape Fairweather) and Registration Area D (Cape Fairweather to Cape Suckling).

CHAPTER 2: SOUTHEAST ALASKA TANNER CRAB FISHERY

INTRODUCTION

LIFE HISTORY

Tanner crab, *Chionoecetes bairdi*, embryos are hatched in late winter through early summer. They are suspended in the water column for about two months through three stages of molts and settle at six to seven mm carapace width (CW) as megalops. This stage can last from one month to a year. The megalops migrate to the ocean floor where they molt into its first instar around 3.5 mm CW. The females are estimated to complete 12 instars in about five yrs before they terminally molt to maturity and males are estimated to complete as many as 18 instars before they molt to maturity at six years (Donaldson et al. 1981).

The first time mating females (pubescent) terminally molt to maturity and mate with smaller males in shallow water from January to May. Females that have reproduced once (primiparous) and more than once (multiparous), mate in deeper water with larger males (April to May). The multiparous female form mating aggregations, which large males migrate towards (Stevens et al. 1994).

Male Tanner crabs become reproductively mature at a size of 80 mm CW (Paul 1992) but the size of functional reproductive maturity is probably closer to 100 mm CW (Stone et al. 2003) and L_{50}, the size at which 50% of the males are morphometrically mature or large clawed in Southeast Alaska is 138 mm. Recently, Tamone et al. (2007) provided evidence that these large males were terminal molts, indicating final growth once the males become large clawed. It is important for large clawed males to be present in the population because it is likely the quality of sperm reserves in small males is reduced. Studies on snow crabs, *Chionoecetes opilio*, suggest that a disproportionate relative abundance of small to large males can cause variability in primiparous female sperm reserves, indicating a reduction in large males may decrease the quality of the sperm reserves rather than the number of females not receiving sperm (Rondeau and Sainte-Marie 2001; Sainte-Marie et al. 2002).

DISTRIBUTION

Although, Tanner crabs are a widely distributed brachyuran (true) crab that inhabits temperate and subarctic waters of the eastern Pacific Ocean from northern California to the Bering Sea. In Southeast Alaska, it is likely the Tanner crab stocks are comprised of several distinct populations within limited geographic areas where most settled crabs make localized movements. For example the entrance into the Glacier Bay is composed mostly of bedrock and it considered a natural habitat barrier for crabs (Taggart et al. 2008). Radio tagged male Tanner crabs made large movements within Glacier Bay, but their general movements were local (Taggart et al. 2008). Other tagging studies have revealed more localized movements in male crabs. In the Kodiak area, a six year tagging study found male Tanner crabs movement contained within several defined geographic areas, irrespective of time of release to capture (one month to 3.8 years) (Donaldson 1985). In fjord habitats of eastern Canada, movements of male snow crabs were restricted by local geomorphology (Brethes and Coulombe 1989; Taylor 1992). In the double fjord system of Bonne Bay, Newfoundland radio-tagged male snow crabs moved several miles in a few days, but generally favored the same spots year to year (Conan et al. 1995).

COMMERCIAL FISHERY

The male-only Tanner crab fishery starts in mid-February, primarily in northern Southeast Alaska. Recently, the most productive fishing grounds have been classified as "core" while the less productive fishing grounds are classified as "non-core" areas. In order to redistribute effort back into less productive fishing areas, different preseason lengths have been set for core and non core areas; this is a significant departure from the historic regional approach to Southeast Tanner crab management.

The policy objectives for biological considerations in this fishery are to minimize sorting of juveniles and females, to avoid fishing during molting periods and to sustain reproductive viability. These objectives are addressed by regulations governing gear, season and the legal size limit. Escape rings or panels of larger mesh to permit the escapement of female and sublegal crabs are required in regulation for Tanner crab pots. Also in regulation, the fishery starts in mid-February and male Tanner crabs molt in late March and early April (Stone 1999). Finally, only male Tanner crab 140 mm (5½ in) or greater in carapace width can be legally harvested, allowing males at least one to two years of breeding before entering the fishery.

The principal management objective of the fishery is to attain the allowable harvest level. Historically, when inseason management was utilized, a rough harvest rate of 60% of legal biomass was targeted by inseason depletion modeling of catch rate data. A guideline harvest level (GHL) of two million lbs was in effect from the 1999/2000 season through the 2008/2009 season. Beginning in the 2009/2010 season, management of the fishery has been effected through a harvest strategy adopted by the board in 2009 [5 AAC 35.113] incorporating an abundance threshold.

The Tanner crab fishery is generally pursued as a secondary, though seasonally important, source of income. Vessels used in the Tanner crab fishery range from smaller vessels from 35–50 ft in length, to limit purse-seiners and a few larger vessels up to about 80 ft. Smaller boats generally participate in the ring net fishery. Almost all of the pot vessels have live-tanking capability. Currently, lighter cone or pyramid nesting pots that occupy less deck space are used more often than the heavier, seven by seven-ft stacking pots, which were originally designed for king crab in the Bering Sea fisheries.

FISHERY DEVELOPMENT AND HISTORY

COMMERCIAL FISHERY HISTORY

Pot Fishery

Although Tanner crab landings have been reported in Southeast Alaska since the early 1960s, they were not deliberately targeted until the early 1970s. Well into the mid-1970s, crab fishermen commonly discarded Tanner crabs incidentally caught with red king crab.

The harvest of Tanner crab in Southeast Alaska in the 1970s averaged 1.5 million lbs (Table 2.1). The 1970s were characterized by gradual fishery development and corresponding managerial response. Seasons during the 1970s averaged 9.7 months in length. Historically, most of the harvest from the major fishing grounds was taken from January through April of each year regardless of the length of the season (Table 2.2).

Southeast Tanner crab harvest in the 1980s averaged 1.6 million lbs. As fishing pace increased over this period, season length shortened to an average of 1.6 months. During the 1981/1982 season, when 74 vessels landed a record 3.3 million lbs between December 1, 1981 and April 16, 1982 about two-thirds of this total was reportedly caught in Icy Strait, where the previous long-term average harvest had been about 0.73 million lbs. Increasing demand for Tanner crab product, an earlier season opening in Southeast Alaska than in other registration areas to the north and west, open registration, and the record landing in 1981/1982 attracted 97 vessels to the fishery in the 1982/1983 season. Many larger crab vessels on their way to Kodiak and Bering Sea fisheries fished in Southeast Alaska first. The 1982/1983 season was closed after two weeks by an emergency order based on onboard observer catch rate information collected during the first few weeks of the fishery from the Icy Strait fishing grounds. Both the fishing effort and exploitation rates were extremely high. The department could not respond effectively to the influx of effort into the Icy Strait fishery. Although the fishery was closed by emergency order after the shortest season on record up to that time, the stocks were depressed in District 14 for many subsequent years. There was no fishery in calendar year 1983. During the board shellfish meeting early in the year the board changed the season opening date in Southeast Alaska to February 10 in order to match the rest of the state. This action, in itself, discouraged larger vessels from fishing in Southeast Alaska during the 1983/1984 season because more lucrative grounds to the north and west would be opening at the same time.

Inseason management in the 1980s was conducted using depletion modeling. In this method, declines in the catch rate from fish ticket data were used to estimate exploitation rate (the percent of legal crab harvested) inseason. The fishery was then closed after the target exploitation rate was achieved. This method relies on multiple landings by the same vessel during the course of a season. Vessels land crab about once per week, so this management strategy is best applied to fisheries of at least 21 days in length. The limitation of this method was the speed at which catch data could be obtained from the fleet and inseason management of seasons shorter than 21 days was problematic. The last season in which a fishery lasted 21 or more days was 1989/1990. The 1990/1991 season, which opened for 18 days, was barely long enough to allow this kind of management.

The harvest of Tanner crab in the 1990s increased to an average of two million lbs. During this period, the fishery continued to intensify and seasons further shortened to an average of 11.1 days. In association with these shortened seasons, effort became increasingly concentrated on the most productive fishing grounds. Many marginal grounds were ignored as searching for productive areas became increasingly difficult to justify economically with a very short season. Limiting preseason prospecting to more than 30 days in advance of the fishery exacerbated this concentration of effort. Nonetheless, the fleet adapted to short seasons in many ways. The use of tenders, the frequency of leasing larger vessels, crew size, pot pulling frequency, and bait volumes all increased. Thus, the fishery continued to intensify despite the extremely short seasons. The only factor that mitigated the intensity of this fishery was the increasing GHL of the golden king crab fishery.

During the 1990s, inseason management by depletion modeling was no longer possible because the seasons were too short. Thus, beginning with the 1995/1996 season, the closure date was announced preseason based upon the estimated length of time to harvest two million lbs if stock abundance was average. Recognizing the risk of this harvest strategy, the department initiated a Tanner crab stock assessment survey in 1997. The goal of the survey is to establish preseason

GHLs based on catch-survey estimates of stock biomass. The objective of setting and targeting abundance-based preseason GHLs is to allow harvest to be maximized while minimizing the risk of recruitment failure.

The harvest of Tanner crab in the 2000s (1999/2000 through 2010/2011 seasons) has averaged 941,013 lbs (Table 2.1). For most of the 2000s, much like the previous decade, closure dates were announced preseason based upon the estimated length of time to harvest two million lbs if stock abundance was average. By the end of the decade catch survey estimates were refined to the point of setting pre-season GHLs based on those estimates. In the 2007/2008 season, the department set a GHL of 987,000 lbs followed by a GHL of 931,000 lbs during the 2008/2009 season. However, the current fishery regulations did not allow the opportunity for the department to target GHLs inseason, so closure dates were announced preseason based upon the estimated length of time needed to harvest the GHL. The 2009/2010 and 2010/2011 seasons were managed according to Tanner harvest strategy [5 AAC 35.113] adopted at the 2009 board meeting.

Ring Net Fishery

With the beginning of the pot permit moratorium on January 1, 1984, new entrants who wished to commercially harvest Tanner crab were limited to ring net gear, which was also defined in regulation as legal gear. New ring net permits could be obtained because the permit moratorium only limited issuance of permits for pot gear. Use of ring nets is most attractive when the abundance and price of crab is high because their efficiency is limited and their use is labor intensive.

The number of ring net crab fishermen reporting landings increased from five in the 1984/1985 season to peak at 92 in the 1989/1990 season, and gradually declining to 44 by the 1993/1994 season. The total climbed again to 110 for the 1999/2000 season in expectation of higher prices. The number of ring net fishermen has gradually declined to an average of 15 in the past five seasons (Table 2.1).

Total ring net harvest increased from 1,451 lbs in the 1984/1985 season to 101,045 lbs, or 5% of the total harvest, during the 1989/1990 season. In 1990, the board adopted a number of regulations intended to cap the ring net portion of the total Tanner harvest at a maximum of 4%. Since adoption of these restrictions, ring net harvests were consistently below this level until the mid 1990s. Ring net harvest in the 1990s fluctuated between 33,544 and 89,211 lbs, exceeding the four percent cap in the 1996/1997, 1999/2000, and 2000/2001 seasons respectively at 4.3%, 5.2%, and 5.7% of the total harvest. To avoid again exceeding the 4% regulatory limit, the ring net season was shortened to five days relative to a six day pot season for the 2001/2002 season. As effort in the ring net fishery has declined in recent seasons, so has the overall harvest and percent of total harvest. For the five most recent seasons, average harvest in the ring net fishery is 16,130 lbs which represents just over 2% of the total harvest.

EXPERIMENTAL FISHING

Exploratory Tanner Crab Fisheries

In 1988, in response to shorter seasons and requests by crab fishermen, the board adopted regulations for exploratory Tanner and red king crab fisheries so the fishing fleet could help the department assess the status of small stocks that were not fished during the short, regular seasons. In areas from which low harvests or no landings had been reported during the regular

fishery, fishing was allowed from July 1 through March 31, under conditions of a special permit. The board also established procedures for managing these fisheries.

In general, these fisheries were scheduled during periods of the year to minimize overlapping with traditional fisheries for red king and Tanner crab. A major assumption was that these fisheries would be of such low intensity that mortality associated with fishing during known molting and mating periods would be minimal. Special permits and logbooks were required because the primary purpose of this fishery was to provide assessments from areas that were not surveyed by the department.

After two seasons of exploratory fishing, it was obvious that interest in these fisheries was low, harvests were poor, and no major unexploited populations had been found. Also, permit conditions were not always followed and violations of regulations had occurred. As a result, in 1990, the board repealed regulations that provided for these fisheries.

Deepwater Chionoecetes Species Fisheries

Upon request by crab fishermen interested in exploratory fishing for deepwater species related to *Chionoecetes bairdi*, the department issued permits for *C. tanneri* (grooved Tanner crab) and managed a fishery by emergency order from September 16, 1983 through October 31, 1983, and December 5, 1983 through January 24, 1984. Harvest levels did not support development of an economically viable fishery at that time. Requests for permits for grooved Tanner crab and *C. angulatus* (triangle Tanner crab) recurred in 1995, permits were issued for the period from March 5, 1995 through April 30, 1995, and the fishery was managed by emergency order. The fleet expended more effort and more areas were fished, but results were poor. CPUE, pots pulled per hour, and crab meat-fullness were low, precluding the development of a viable fishery. A single permit was issued in 2000, once again with minimal harvest. Interest in this fishery was again expressed in 2003 and a permit was issued, however, no fishing was conducted.

Bitter Crab Syndrome

During the 1984/1985 season processors handling crab from the extreme north end of Southeast Alaska, notably Lynn Canal, were receiving complaints from consumers of bitter tasting meat from some section-packed crab. Department staff initially thought it was associated with a normal pre-molt condition in Tanner crab since the fishery during that historical period partially extended into the initial phases of the annual molt in some areas. However, a few samples of crab blood collected during the 1985/1986 season revealed that the bitterness was closely correlated with presence and concentration of a systemic parasite. This systemic parasite is a highly specialized dinoflagellate of the genus *Hematodinium* (Meyers et al. 1989).

Symptoms associated with bitter crab disease (BCD) had been reported since at least the early 1980s, with some anecdotal references to off-tasting Tanner crabs dating back to the mid-1970s. It has since been reported from most major fishing grounds in Southeast Alaska and sporadically from other areas as well (Meyers et al. 1990). Its definitive identification in Bering Sea Snow crab *C. opilio* stocks, with its economic implications, has accelerated research on *Hematodinium*.

Hematodinium infects all sizes and both sexes of Tanner crab and seems to kill them within one to 1.5 years. It severely reduces the vitality and reproductive capacity of crabs, with egg clutches of infected females being greatly reduced in size (Meyers 1993). The mechanism and seasonal timing of transmission remains unknown (Eaton et al. 1991; Love 1991; Love et al. 1993). The disease may be spread by free-living, infective spores released by dying crabs, or vegetative

stage organisms passively transmitted during periods of crab aggregation, such as immediately before and during seasonal mating periods.

Crabs in later stages of infection cannot be marketed because of the astringent taste and soft, chalky texture of the meat. These crabs can be identified on the fishing grounds by external symptoms such as the abnormal pink or pale coloration of their abdomens and the ventral sides of their walking legs. Infected crabs continue to be transported out of the areas in which they are caught because of the regulatory requirement to retain infected crabs. This appears to have contributed to the spread of this disease.

Currently, the season occurs during a period that is generally felt to be the time of optimum meat condition in the majority of heavily fished stocks. Unfortunately, the season also occurs during a period when crabs infected during the previous year have developed advanced symptoms of the disease, including the characteristic bitter taste.

Sorting rates reportedly as high as 80% from some areas, and recent increases in reported lbs of dead loss (mostly attributable to disposed diseased crab) or specifically indicated bitter crab, simply suggest the actual magnitude of the problem. There are no industry-wide standards, procedures, or regulations for safe disposal of infected crabs. Control measures are limited to voluntary retention of bitter crab for later disposal in upland landfills, heat or chemical disinfections before marine disposal, or hard freezing before marine disposal. Viability of the resource is still being risked by continuing transport and handling of infected crab.

The department has attempted or considered regulatory means to minimize the risks associated with catch and retention of infected crabs. Part of District 15 was closed in l988 to prevent fishing on crabs heavily infected with bitter crab disease. This resulted in reduced fishing opportunity for golden king crab and a total closure has not been imposed on the fishery since then.

In the 1992/1993 season, product transfer restrictions were imposed on vessels fishing in District 15. Any Tanner crabs caught in District 15 could only be shipped live out of the district if they were transferred onto tenders within the district and water from holding tanks on the tenders were not discharged while the crabs were being transported to on-shore processors located in other districts. This requirement was intended to reduce handling of bitter crab and minimize the risk of spreading the infection to stocks between high incidence districts and processors. Enforcement of the restriction was difficult. There have been no similar restrictions to fishing in District 15 since that season.

A very general proposal for development of a fishery to evaluate the feasibility of an earlier season to improve marketability of bitter crab was approved by the board in 1990. The plan was repealed at the following board meeting because it was determined that this fishery would not be manageable and would not provide the information for which it was intended.

Prevalence of BCD does not appear to be diminishing. High percentages of bitter crab, in excess of 40% are observed from some districts and the parasite appears to be expanding its distribution to heretofore-uninfected areas.

REGULATION DEVELOPMENT

The first regulations pertaining specifically to Tanner crabs were adopted in 1954. Prior to 1954, there was no formal regulatory recognition of a commercial fishery for Tanner crab in Southeast Alaska.

FISHING SEASONS AND PERIODS

The season for Tanner crab in Southeast Alaska was first set in 1963 at January 1 through December 31. The season was shortened in some areas in 1969, largely to facilitate management of the red king crab fishery. In 1974 the season was closed by emergency order on May 15.

In 1974, the season starting date was changed to September 1. During much of the 1970s the season started on September 1 and closed by emergency order in April or early May. In 1981 the season started on December 1, 1981 and was closed on April 16, 1982 by emergency order after a record harvest of over three million lbs. In 1982 the season was closed by emergency order in mid-December after two weeks of fishing, because of unprecedented effort and heavy concentration in District 14. In early 1983 the season starting date was changed to February 10.

In 1987 the season starting date was changed to January 15, in part to be consistent with the opening date in most of the rest of the state. The season changed again in 1989, starting on February 15, to reduce conflict with the January food and bait herring fishery in which many crab fishermen participated or tendered herring. Between 1989 and 2005 the season start date was February 15 and the length of the season was progressively shortened to about a week.

Starting with the 2003/2004 season, the department began setting different season lengths in "core" and "non-core" areas. Core areas were defined as those areas that have high levels of effort and Tanner crab catch or significant red king crab populations. Non-core areas have extended fishing time to allow for exploratory fishing into non-traditional fishing grounds. The fishery has been open in core fishing areas from four to six days with an additional four to five days of fishing time in non-core areas. The season start date for the Tanner crab season was changed at the 2005 board meeting to the smallest Juneau tidal range between February 10 and February 17. This was intended to minimize gear loss in the golden king crab fishery which opens concurrently with the Tanner fishery. The core and non-core areas were defined in regulation at the 2009 board meeting with the implementation of the Registration Area A Tanner crab harvest strategy [5 AAC 35.113].

SEX AND SIZE LIMITS

A minimum size of 5½ inches (140 mm) or greater in carapace width was implemented in 1976 for males and persists to the present. This size permits nearly all males at least one, and possibly two seasons of reproductive activity prior to attaining legal size.

QUOTAS AND GUIDELINE HARVEST RANGES

A GHL of 1,750,000 lbs was first set in 1976. It was revised downward to a GHR of 750,000 to 1,500,000 lbs in 1978. In 1979 the GHR was revised to 750,000 to 2,500,000 lbs. In response to locally high harvest rates and the subsequent effects on the stocks in Icy Strait in the early 1980s, the GHR was then revised downward to between 0 and 2 million lbs in 1985. This range was sufficient to provide a relatively stable harvest until the 1997/98 season when an unanticipated shift in effort to non-traditional fishing grounds south of Petersburg and west of Wrangell pushed the

total season harvest to over 2.7 million lbs. If the increased harvest from non-traditional grounds were discounted from the total harvest, the harvest from traditional districts would have totaled a little more than 2.0 million lbs. Following the board meeting in 1990, the GHL was changed to a maximum allowable harvest of 2.0 million lbs. At the 1999 board meeting, the maximum allowable harvest was changed to a GHL of 2.0 million lbs. Although the average Tanner crab harvest in Southeast Alaska for the 1990s was 2.0 million lbs, harvest since the 1999/2000 season has averaged 0.9 million lbs. Simultaneous declines in survey catch rate data indicates that this is due to real declines in abundance. At the 2009 board meeting, the 2.0 million pound GHL was repealed when the Registration Area A Tanner crab harvest strategy was implemented.

INSEASON MANAGEMENT TOOLS

Daily harvest logbooks have been mandatory since the start of the 1993/1994 season. Logbooks were one of the last remaining options left to managers trying to conduct inseason management. At the 1996 meeting of the board the department was directed to assess the feasibility of using daily radio reports of catch and effort from all crab pot fishermen in the 1995/1996 and 1996/1997 seasons to support continuing inseason management based on real-time catch data. The reporting requirement was dropped after two seasons due to technological challenges and low compliance. At the 2002 meeting of the board a regulation was established giving the department the authority to require inseason reporting of Tanner crab logbook data. Inseason reporting of logbook data has not been required since the 2003/2004 season.

FISHING GEAR

Pots

Gear restrictions, first imposed in 1954, permitted use of pots or trawl gear to harvest Tanner crab. Ring nets were added as legal gear in 1960. Scuba diving gear was legalized in 1966. Shrimp beam trawls were specified as legal gear and diving was rescinded in 1969. Although legal, trawl gear was rarely, if ever, used in this fishery during this period. Tanner crab pot gear was further restrictively defined in 1969, with four-inch tunnel heights and buoys having to be marked with the vessel registration number preceded by the letter "T." The next major changes occurred in 1973 when in-water storage restrictions were adopted, the "T" part of the buoy-marking requirement was dropped, and a pot limit of 60 was implemented for all inside waters. In 1974, tunnel heights were increased to five inches.

A major revision of the shellfish regulations was undertaken in 1975. Starting in 1976, escape panels incorporating a biodegradable seam have been required. In Southeast Alaska, south of the latitude of Cape Fairweather, Tanner crab pots had to have an entire vertical seam laced with biodegradable twine. In 1977 a 100-pot limit was put into effect in Southeast Alaska. Trawl gear was dropped as legal gear in 1977 leaving only pots and ring nets as options. In 1978 the vertical seam requirement was modified to be more flexible and applicable to different types of gear and tunnel eye definitions were clarified. Buoy stickers have been required since 1979 to facilitate enforcement of pot limits. In 1985, two 4 3/4 inch diameter escape rings were required in each Tanner crab pot to reduce retention and sorting of small males and females and a moratorium on new pot permits was implemented. In 1987 escape rings were to be located within eight-inches of the bottom of pots. Due in part to shorter soak times becoming prevalent in the fishery, the escape ring requirement was repealed in 1988. In 1996, the board adopted an 80-pot limit, implemented starting in the 1997 season.

At the 2002 meeting of the board escape rings or panels of large mesh to permit the escapement of female and sublegal Tanners were again required in Tanner crab pots in Registration Area A only.

Ring Nets

Between the mid-1980s and 1990 use of ring nets grew because pot permits entry was under moratorium. In 1990 the board adopted a comprehensive set of regulations to control the increasing use of ring net gear by people who did not receive limited entry permits for the pot fishery. The number of ring nets was limited to 20 per vessel, and ring net marking requirements were defined. Ring nets were also defined in more detail, with limits set on their size, and longlining of ring nets was prohibited. The allowable ring net harvest was capped at four percent of the total harvest. Vessels could not concurrently be registered for both ring nets and pots. Regulations prevent use of ring net gear to conduct preseason test fishing under subsistence or personal use fishing terms.

GEAR STORAGE AND OPERATION OF OTHER POT GEAR

Since 1981 in-water pot storage was permitted for 72 hours after the season closure. In 1984 fishing with pots or storing pots in the water during the 10 days before the start of the season was prohibited. In 1985, the preseason fishing prohibition was lengthened to 14 days. Also in 1985 post-season pot storage was extended to seven days after closure of the entire registration area or 72 hours after closure of a portion of the area. Starting in 1986 a 10-day preseason, in-water storage period was allowed with some restrictions. Since 1987 preseason gear storage for a period of 10 days before the start of the season has been permitted under some conditions. In 2010, the post season storage time was lengthened to five days to allow for more time to safely retrieve stored pots if weather or poor tidal current became an obstacle.

Beginning with the 1999/2000 season, vessels and persons registered for the commercial Tanner crab fishery could not fish with any commercial, sport, subsistence, or personal use gear except for commercial Dungeness and shrimp pot gear for 30 days prior to the start of the season. At the 2009 board meeting, the board carried a proposal extending pot storage from 72 hours to five days after the closure of a portion of the registration area.

LIMITED ENTRY

In response to a request by locally based vessel operators and processors, the Commercial Fisheries Entry Commission (CFEC) initiated a permit moratorium for the king and Tanner crab fisheries in Southeast Alaska on January 1, 1984.

The CFEC instituted a complex system of combined permits for the three species of king crab and Tanner crab. The full impact of the moratorium was not felt until the 1985/1986 season because many prospective entrants to the 1984/1985 fishery had exercised the two-year option on permit renewals and obtained their permits prior to January 1, 1984, which was the cutoff date for the moratorium on new permit issuance. Moreover, CFEC was forced by their regulatory guidelines to set the maximum number of permits to be issued at 83, which was a relatively high level relative to historic participation levels. This has proved to have long-term implications, such as progressively shortened seasons as the efficiency of the fleet improved.

The Tanner crab pot fishery in Southeast Alaska was the first Tanner fishery in the state to be placed under limited entry. As of September 2011, a total of 79 permits have been issued (CFEC permit category K49, K59, K69, and T19) , of those 74 are permanent permits, and an additional

five are interim-entry permits. There are 78 active permanent and interim permits issued that could potentially register a vessel in the pot fishery. Ring net gear (CFEC permit category T10) is also legal in Southeast Alaska and is not under limitation.

REGISTRATION AND DELIVERY REQUIREMENTS

In 1974, Southeast Alaska and Yakutat were combined into a single nonexclusive registration area and in 1975 preseason hold inspections and vessel registrations were required. A preseason registration deadline was in effect in 1978. A registration deadline of 30 days prior to the season start was implemented in 1979. Also in 1979, the hold inspection requirement was dropped because it was considered unnecessary in Southeast Alaska and Yakutat.

Southeast Alaska was designated a superexclusive registration area during the spring board meeting in 1985. This was in reaction to the 1982/1983 season and was intended to discourage operators of larger vessels, whose primary sources of income were from crab fisheries in other registration areas, from fishing in Southeast Alaska. Vessels registered to fish for Tanner crab in Southeast Alaska cannot fish in any other registration area in Alaska for Tanner crab during the same registration year (August 1–July 31).

In 1986 the board adopted a regulation to restrict the boundaries of Registration Area A to those waters of the state between Dixon Entrance and Cape Fairweather. A new registration area, Registration Area D, was established for those waters between Cape Fairweather and Cape Suckling. Major restructuring of the Alaska Administrative Code was necessary to accommodate this change, which was first published in the 1988 shellfish regulation book.

It is unclear when the 30-day registration deadline was repealed but it was put back into regulation beginning in 2000.

In 1981 crab had to be delivered within 24 hours of the close of the season. In 1983 fishermen had 72 hours to deliver crabs after the season closure. In 1986 this period was shortened to 24 hours.

MANAGEMENT CONCERNS

MANAGEMENT PLAN

For most of its history, there has been no management plan or harvest strategy outlined in regulation for Southeast Alaska Tanner crab stocks. From the 1990/1991 through 1998/1999 seasons, there was a maximum allowable harvest of 2.0 million lbs in regulation. At the 1999 board meeting, this maximum allowable harvest was changed to a 2.0 million pound GHL. Since the 2.0 million pound GHL went into effect, this level of harvest has never been reached.

Declines in survey abundance during the past ten years indicate that current stocks cannot sustainably support a 2.0 million pound harvest. Recent advances in stock assessment survey modeling have created the opportunity for abundance based management approaches. Still needed are biological thresholds for critical stock components, set along with identifying appropriate harvest rates for varying stock sizes. Advances in survey modeling, along with assessing Tanner stocks by also using Tanner catch in the annual red king crab survey, led to GHLs being produced and targeted in the 2007/2008 and 2008/2009 seasons.

In 2009 the board board adopted an amended proposal from industry that specified a Tanner crab harvest strategy for Southeast Alaska [5 AAC 35.113]. Under this harvest strategy a regional GHL is no longer targeted. The harvest strategy includes a mature male abundance threshold that

is one-half of the long term average. Under the new Tanner crab harvest strategy, the commercial Tanner crab season length is in part determined by the mature male abundance estimate, and the number of registered pots at the start of the fishery.

FISHING EFFORT

Current pot limits for the fishery are set at 80 pots per vessel and although vessel effort has declined in recent years, it is not possible to manage the fishery inseason given the quick pace of the fishery. Season length is set prior to the season opening based on mature male abundance and the number of pots registered at the start of the fishery. Weather and tides also influence the pace of the fishery. In the last decade, managers have taken weather conditions into consideration by postponing the start of the Tanner crab fishery in the 2007/2008 and 2010/2011 seasons. Delaying the start of the Tanner crab fishery, and the concurrent golden king crab fishery, provided for fair starts and more orderly fisheries during both seasons in which delays were implemented. Other regions of the state have adapted to the quickening pace of Tanner fisheries by lowering pot limits based on targeted GHLs and in some cases have gone to daylight fishing hours which limits when pots can be set and retrieved. These measures along with mandatory or voluntary daily call-ins have allowed managers in those areas to use real-time fishery data to manage the fisheries inseason.

STOCK ASSESSMENT

Tanner crab stock assessment has evolved continually over the past 20 years. Prior to 1997, stock assessment analyses consisted of simple summary statistics and trends (Clark et al. 2001) based solely on fishery-dependent data from dockside sampling, logbooks and fish tickets. With the beginning of the Tanner crab survey in 1997, through its maturation in 2006, relative abundance was determined for survey areas as Tanner crab or red king crab survey CPUE. A catch-survey model (CSA) was developed from survey data in 2005 (Zheng et al. 2006). Along with commercial logbook data, this model was used to estimate mature Tanner crab biomass for the 2006/2007 season (Siddon et al. 2009). The 2007/2008 season was the first for which the CSA alone was used to provide an estimate of mature male Tanner crab biomass. After expansion of the biomass estimate to account for the proportion of harvest which comes from unsurveyed areas (29% on average), tiered harvest rates of 0, 5, 10, 15 or 20% of mature males or a maximum of 50% of legal males, depending upon stock health, are used to determine the harvestable surplus. Improvements to the survey and modeling methods will continue as the time series lengthens.

SURVEYS

Surveys are conducted in 14 separate survey areas throughout Southeast Alaska (Figure 1.2). Six areas are surveyed to explicitly target Tanner crab, and eight to target red king crab. The red king crab survey (RKCS) areas have a significant bycatch of Tanner crab. Surveyed areas correspond with commercial fishing grounds that account for over 65% of the total Tanner crab harvest (25-year average). Methods are very similar between the two surveys and are detailed elsewhere, by Bednarski et al (2008) for the Tanner crab survey (TCS) and Clark et al. (2003) for the red king crab survey. Each area is divided into one to five strata. For the RKCS, strata boundaries are determined based on historic RKC survey CPUE (Clark 2008). Pot locations are determined using a stratified random sampling design with the number of pots (the sampling unit) allocated as a function of crab density and strata area (km^2) (Neyman design). The primary differences between the TCS and RKCS methods are in timing and bait; the TCS is conducted in October

and uses bait of half a round pink salmon in addition to chopped herring, while the RKCS is conducted in June and July, and uses only chopped herring bait.

SAMPLING

Commercial Tanner crab fishery landings are sampled dockside at Juneau, Petersburg, Sitka, Wrangell, and Hoonah and on the grounds by tender riders, primarily in Icy Strait. Separate sampling goals in terms of the number of deliveries are set for four areas; Icy Strait (District 14), Lynn Canal/Upper Stephens Passage (combined Districts 11 and 15), Frederick Sound/Lower Stephens Passage (combined Districts 8, 9, and 10), and Other Grounds (all other areas). Carapace width is measured and shell condition determined for 75-crab samples as crabs are delivered to processors. Crab average weight is also determined for each delivery sampled and skippers are interviewed to determine fishing location and effort. Recruit composition of the harvest can be determined from carapace width and shell condition frequency.

Limited onboard sampling was conducted sporadically in the 1980s to collect specific inseason information needed for management. Since then, available personnel have concentrated more on collecting dockside sampling information.

LOGBOOKS

Logbooks are mandatory for pot boats and provide information on Tanner crab catch and effort by statistical area and date.

REGIONAL OVERVIEW

A Registration Area A Tanner Crab Harvest Strategy (Title 5 Alaska Administrative Code 35.113) went into effect beginning in the 2009/2010 season following board action during the 2009 board meeting. For the 2008/2009 through 2010/2011 commercial seasons the biomass estimate exceeded the harvest strategy closure threshold of 2.3 million lbs mature males and fisheries were opened for each of those seasons..

For the 2008/2009 season, Tanner crab biomass was estimated at 4.86 million lbs mature males and 2.79 million lbs legal males (Table 2.3) and stock health was poor for 5, moderate for 9 and healthy for 0 survey areas (Tables 1.4 and 1.5). Applying harvest rates consistent with stock health criteria to each area the harvestable surplus was recommended at 0.42 million lbs (Table 2.3). During this year which proceeded the new harvest strategy implementation, managers used a 20% harvest rate approach and the GHL was set at 0.93 million lbs.

Biomass for the 2009/2010 season decreased to 3.55 million lbs mature male and 2.42 million lbs legal male (Table 2.3). Beginning in this season, stock health categories were increased from three (poor, moderate, and healthy) to five (poor, below average, moderate, above average, and healthy). Using this system, stock health was poor for 0, below average for 7, moderate for 7, above average for 0, and healthy for 0 survey areas (Tables 1.4 and 1.5). Applying harvest rates consistent with stock health criteria to each area the harvestable surplus was recommended at 0.28 million lbs (Table 2.3). Under this new harvest strategy targeted GHLs were no longer required or developed by managers and this harvest recommendation is provided to evaluate fishery performance in context with stock health categories and may be of use a more information becomes available concerning the applicability and utility of the new harvest strategy.

The stock biomass estimate declined again in the 2010/2011 season to 2.89 million lbs of mature male and 1.82 million lbs legal male crabs. Stock health was poor for 0, below average for 6,

moderate for 7, above average for 1, and healthy for 0 survey areas (Tables 1.4 and 1.5). Applying harvest rates consistent with stock health criteria to each area the harvestable surplus was recommended at 0.24 million lbs, (Table 2.3), again under the new harvest strategy targeted GHLs were no longer required or developed by managers.

The number of below average or poor areas has declined and the harvestable surplus has decreased, this is because biomass is generally declining for Tanner crab survey areas which are the most productive commercial grounds, but slightly increasing for the less productive red king crab survey areas (Figure 1.3). The harvestable surplus is further reduced by unmarketable bitter crab in Stephens Passage, Port Frederick, Excursion Inlet, Thomas Bay, and Holkham Bay survey areas. Standardized commercial CPUE for 2008/2009 through 2010/2011 season remained low (Figure 1.4). The slight increase in harvest for 2009/2010 and 2010/2011 may be a result of the increased season length provided for in the new harvest strategy (Figure 1.4). If these trends continue the harvest strategy closure threshold of 2.3 million lbs may be met, requiring reevaluation of the current harvest approach.

RECENT SEASONS

2008/2009 SEASON SUMMARY

The 2008/2009 season opened at 12:00 noon, on February 15, 2009. In a preseason news release, the department set the season length at six days in core fishing areas which closed at 12:00 noon on February 21, 2009. The non-core fishing areas closed after 11 days on February 26, 2009. District 16 remained closed for the 2008/2009 Tanner crab season.

Preseason survey information indicated that stocks remained low and season length was set accordingly. Harvest was not expected to reach the two million pound GHL. Season length was set to target a 931,000 pound GHL. Daily logbooks remained mandatory and fishermen were required to submit logbooks to the department with each fish ticket.

A total of 612,550 lbs of Tanner crab were caught by 41 permit holders (Table 2.1). The major discard class was bitter crab, which accounted for 53,759 lbs followed by deadloss which totaled 8,969 lbs. It was probable that the actual bitter crab catch was much higher, since an unknown amount were sorted and discarded on the fishing grounds. At $1.78/pound, marketable product had a total exvessel value of $1.09 million.

Of the 41 permits that participated in the fishery, 31 were pot permits and the remaining 10 were for ring nets. Pot gear accounted for 97.9% of the total harvest or 599,745 lbs while ring net fishermen caught at total of 12,805 lbs (Table 2.1).

A summary of the harvest by fishing area indicated that about 534,283 lbs (87.2%) of the total season's harvest was taken from the three major fishing areas; Icy Strait, Lynn Canal/Stephens Passage, and Frederick Sound (Table 2.6).

PORT SAMPLING DATA

Port sampling information summarized for the registration area indicated that the overall size of crab harvested averaged 151.5 mm CW, or 2.5 lbs, similar to the previous season (Tables 2.7 and 2.8). The percent of the catch that was newly recruited crabs was 73.8%, up from the previous season’s 60.8% (Table 2.7). CPUE was estimated at 13.0 crabs per pot, up from the previous season (Table 2.8).

Crabs from Icy Strait had an average size of 150.0 mm CW or 2.4 lb. The percent recruit of 82.2% was higher than the previous season and the percent of post-recruits was half of the previous season at 17.8% (Tables 2.9 and 2.10). Crabs in Lynn Canal were larger, with an average size of 156.0 mm CW or 2.6 lb and had a greater percent recruit of 84.2% than previous seasons (Tables 2.11 and 2.12). Lynn Canal percent recruit was also lower than any other area. Average size for Frederick Sound area Tanners was 151.7 mm CW or 2.5 lb, similar to the previous seasons, while percent recruit was higher at 71.3%, than the previous seasons (Tables 2.13 and 2.14).

2009/2010 SEASON SUMMARY

The 2009/2010 season was the first in which the new harvest strategy [5 AAC 35.113] was used. The mature male biomass of 3.55 million lbs (Table 2.3) exceeded the 2.3 million lb threshold in regulation, and the season length was determined by the mature male biomass estimate and the number of pots registered in the fishery. The 2009/2010 season opened at 12:00 noon, on February 15, 2010. The season closed after eight days in the core fishing areas on February 23, 2010 and after thirteen days in the non-core areas on February 28, 2010. District 16 remained closed for the 2009/2010 commercial Tanner crab season.

At the end of both the core and non-core fishing periods, 878,650 lbs of marketable crab, plus 83,540 lbs of deadloss and bitter crab, totaling 961,681 lbs had been landed (Table 2.1). As in the past, the major discard class was bitter crab, which accounted for 80,652 lbs of the total deadloss. It is probable that a large amount of the bitter crab was sorted and discarded on the fishing grounds but not reported as 'discard at sea'. At almost $1.63/pound (Table 2.1), marketable product was worth at least $1.44 million exvessel. The economic loss represented by the deadloss was conservatively set at $131,463. .

A total of 44 pot and ring net permits reported landings during the season. The 33 pot permit crab fishermen landed 944,639 lbs of crab, of which 861,716 lbs were marketable. A total of 17,042 lbs, or about 1.8% of the total Tanner crab harvest, was reported landed by 11 ring net permit holders (Table 2.1). Marketable crab comprised 16,932 lbs of the total ring net harvest.

A summary of the harvest by fishing area indicated that about 879,079 lbs or 91% of the total season's harvest was taken from the three major fishing areas; Icy Strait, Lynn Canal/Stephens Passage, and Frederick Sound (Table 2.6).

PORT SAMPLING DATA

The overall percentage of crabs harvested that were recruits decreased to 66.8%, while the average size increased slightly to 152.5 mm CW or 2.5 lbs during the 2009/2010 season (Tables 2.7 and 2.8). Catch per unit effort was estimated at 15.9 crabs per pot, an increase from the previous two seasons (Table 2.8).

The average crab size in the Icy Strait area, at 152.2 mm CW and 2.5 lbs was up from the previous season, and percentage of crabs that were recruits was down from the previous season at 80.8% (Tables 2.9 and 2.10). The average size of crabs in Lynn Canal decreased slightly to 154.6mm CW or 2.6 lbs, while the percentage of recruit decreased to 65.7% (Tables 2.11 and 2.12). Frederick Sound area crabs were also virtually unchanged in size from the previous season at 152.0 mm CW and 2.5 lbs, although the percent recruit decreased to 62.5% (Tables 2.13 and 2.14).

2010/2011 SEASON SUMMARY

The 2010/11 season was the second in which the new harvest strategy [5 AAC 35.113] was used. The mature male biomass of 2.89 million lbs (Table 2.3) exceeded the 2.3 million lb threshold in regulation, and the season length was determined by the mature male biomass estimate and the number of pots registered in the fishery. The 2010/2011 season was set to open at 12:00 noon, on February 18, 2011. The season start date was subsequently delayed three days due to poor weather forecasted throughout the region. The season closed in core fishing areas after seven days on February 25, 2011 and closed in non-core areas after twelve days on March 2, 2011. District 16 remained closed for the 2010/2011 Tanner crab season.

A total of 891,344 lbs of crab were harvested during the 2011 season (Table 2.1). This consisted of 832,941 lbs of marketable commercial; 384 lbs of personal use; 1,042 lbs of soft shelled crab; 1,965 lbs of dead loss; and 55,012 lbs of bitter crab. As in the past, an unknown additional amount of bitter crab were sorted and discarded on the fishing grounds. At $2.85/pound (Table 2.1), marketable product had an exvessel value of $3.37 million.

A total of 64 pot and ring net permits reported landings during the season. The 48 pot permit crab fishermen landed 867,252 lbs of crab. A total of 9,505 lbs of the total Tanner crab harvest was landed by 16 ring net permit holders (Table 2.1).

A summary of the harvest by fishing area indicated that about 795,526 lbs, 89%, of the total season's harvest was taken from the three major fishing areas; Icy Strait, Lynn Canal/Stephens Passage, and Frederick Sound (Table 2.6).

PORT SAMPLING DATA

The overall crab size during the 2010/2011 season was similar to last season at 152.9 mm CW or 2.6 lbs, and the percent of recruits was down to its lowest point since the late 1970s at 57.8% (Tables 2.7 and 2.8). Catch rate was estimated at 12.7 crabs per pot (Table 2.8).

Dockside sampling data for Icy Strait crabs were mixed with the average size decreasing to 151.0 mm CW, whereas the average weight increased to 2.8 lbs. A corresponding decrease was seen in the percent recruit at 71.9% (Tables 2.9 and 2.10). The catch rates were above the ten year average for Icy Strait at 21.8 crabs per pot. The size of Lynn Canal area crabs increased to 155.9 mm CW or 2.8 lbs while the percent recruit continued to decline at 60.3%. Catch rates in Lynn Canal were down from the previous season at 19.0 crabs per pot (Tables 2.11 and 2.12). Frederick Sound crab size and percent recruit were up slightly at 152.5 mm CW and 2.6 lbs and the percentage of recruit crab decreased to 61.3% (Tables 2.13 and 2.14). The Frederick Sound area catch rate also down from the previous season at 11.8 crabs per pot (Table 2.13).

2011/2012 OUTLOOK

The annual Tanner crab survey was conducted in October 2011. Once completed, Tanner catch from the Tanner crab survey, and Tanner catch in the red king crab survey, will be analyzed. An announcement will be issued in December to state whether the minimum threshold for a commercial was reached. If the minimum threshold is reached, subsequent announcements will further explain fishery details and season length based on mature male biomass and amount of pots registered in the fishery.

CHAPTER 2—TABLES AND FIGURES

Table 2.1–Traditional commercial Tanner crab pot and ring net harvest information for Registration Area A, 1968/69 to present.

	Pot Fishery					Ring Net Fishery			Combined Gears				
Year/ Season	Permits Fished	Number of Crabs	Total Pounds	Pots Lifted	CPUE	Permits Fished	Number of Crabs	Total Pounds	Permits Fished	Number of Crabs	Total Pounds	Average Weight	Price/ Pound
1968/69	29	70,892	177,825						29	70,892	177,825	2.5	
1969/70	31	251,295	660,337						31	251,295	660,337	2.6	
1970/71	12	62,704	167,378						12	62,704	167,378	2.7	
1971/72	25	258,080	656,661						25	258,080	656,661	2.5	
1972/73	31	614,443	1,597,838						31	614,443	1,597,838	2.6	
1973/74	52	531,114	1,309,673						52	531,114	1,309,673	2.5	
1974/75	51	340,361	863,751						51	340,361	863,751	2.5	
1975/76	32	868,815	2,149,397						32	868,815	2,149,397	2.5	
1976/77	55	1,078,454	2,563,710						55	1,078,454	2,563,710	2.4	
1977/78	44	835,928	2,142,409						44	835,928	2,142,409	2.6	
1978/79	38	589,781	1,559,769						38	589,781	1,559,769	2.6	
1979/80	51	729,812	1,781,175						51	729,812	1,781,175	2.4	
1980/81	59	851,281	2,013,276						59	851,281	2,013,276	2.4	
1981/82	73	1,406,267	3,305,857						73	1,406,267	3,305,857	2.4	
1982/83	95	446,283	1,101,630			2	[a]	[a]	97	446,449	1,101,630	2.5	
1983/84	100	644,002	1,593,468						100	644,002	1,593,468	2.5	$1.20
1984/85	78	472,669	1,129,473			5	660	1,451	83	473,329	1,130,924	2.4	$1.20
1985/86	72	422,678	1,006,396			11	1,153	2,609	83	423,831	1,009,005	2.4	$1.87
1986/87	67	462,702	1,120,373			7	1,605	3,601	74	464,307	1,123,974	2.4	$2.01
1987/88	71	548,854	1,317,887			13	5,484	12,598	84	554,338	1,330,485	2.4	$2.20
1988/89	77	631,705	1,583,711			63	25,501	62,621	140	657,206	1,646,332	2.5	$2.32
1989/90	81	769,601	1,908,624			92	42,421	101,045	173	812,022	2,009,669	2.5	$1.91
1990/91	72	850,706	2,182,813			36	23,728	58,780	108	874,434	2,241,593	2.6	$1.45
1991/92	83	783,499	2,073,353			41	20,649	49,568	124	804,148	2,122,921	2.6	$1.72
1992/93	83	614,958	1,536,143			51	13,771	33,544	134	628,729	1,569,687	2.5	$1.51
1993/94	81	760,273	1,964,380	48,794	16	44	15,607	37,146	125	775,880	2,001,526	2.6	$1.97
1994/95	91	940,233	2,433,571	55,771	17	82	29,685	73,576	173	969,918	2,507,147	2.6	$3.21
1995/96	94	733,210	1,969,394	45,711	16	74	21,539	50,642	168	754,749	2,020,036	2.7	$1.89
1996/97	94	688,431	1,818,884	41,898	16	70	33,974	81,935	164	722,405	1,900,819	2.6	$1.73
1997/98	92	981,437	2,614,166	41,332	24	93	35,154	87,156	185	1,016,591	2,701,322	2.7	$1.60

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Table 2.1–Page 2 of 2.

Year/ Season	Pot Fishery					Ring Net Fishery			Combined Gears				
	Permits Fished	Number of Crabs	Total Pounds	Pots Lifted	CPUE	Permits Fished	Number of Crabs	Total Pounds	Permits Fished	Number of Crabs	Total Pounds	Average Weight	Price/ Pound
1998/99	93	757,545	2,086,672	36,872	21	87	31,161	77,459	180	788,706	2,164,131	2.7	$2.06
1999/00	92	588,428	1,616,945	34,432	17	110	34,276	89,211	202	622,704	1,706,156	2.7	$2.13
2000/01	81	447,043	1,221,668	32,187	14	80	30,784	74,012	161	477,827	1,295,680	2.7	$1.93
2001/02	83	356,704	935,026	29,035	12	57	12,312	29,810	140	369,016	964,836	2.6	$1.71
2002/03	67	300,453	776,687	22,937	13	44	12,008	27,547	111	312,461	804,234	2.6	$2.05
2003/04	68	328,814	811,647	23,463	14	30	8,049	20,511	98	336,863	832,158	2.5	$2.13
2004/05	60	313,281	787,625	18,248	17	21	6,886	16,410	81	320,167	804,035	2.5	$1.96
2005/06	53	341,115	866,037	18,839	18	19	8,376	20,484	72	349,491	886,521	2.5	$1.42
2006/07	57	360,820	911,515	22,332	16	19	6,741	16,385	76	367,561	927,900	2.5	$1.67
2007/08	49	235,789	594,735	16,295	14	18	3,948	10,327	67	239,737	605,062	2.5	$1.69
2008/09	31	239,616	599,745	16,268	14	10	5,169	12,805	41	244,785	612,550	2.5	$1.78
2009/10	33	365,525	944,639	18,871	19	11	7,212	18,871	44	372,737	961,681	2.6	$1.63
2010/11	48	334,254	867,252	19,640	17	16	9,505	24,092	64	343,759	891,344	2.6	$2.85
5-year avg.	44	307,201	783,577	18,681	16	15	6,515	16,496	58	313,716	799,707	2.5	$1.92

Source: Number of crabs and pot lifts for pot fishery from 1993/94 to present are from logbooks, all other information from fish tickets.

[a] Fewer than 3 permits were fished; information is confidential.

Table 2.2–Traditional commercial Tanner crab harvest in thousands of pounds, by month and season in Registration Area A, 1968/69 to present.

Season	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
1968/69	0	0	0	0	10,008	8,277	13,137	60,424	34,999	34,195	[a]	8,595	177,825
1969/70	24,421	30,619	17,488	18,695	19,691	97,188	214,401	149,620	21,002	[a]	[a]	[a]	660,337
1970/71	913	[a]	6,694	7,079	21,265	41,440	56,239	[a]	0	0	0	0	167,378
1971/72		29,914	30,951	39,046	29,367	17,946	91,576	203,460	148,496	58,539	[a]	1,034	656,661
1972/73	5,359	39,096	83,806	86,733	50,707	140,770	376,634	554,558	228,712	26,617	[a]	[a]	1,597,838
1973/74	29,402	91,781	94,821	87,290	69,476	126,267	314,656	416,168	89,811				1,309,673
1974/75	[a]	77,220	70,645	56,565	71,647	74,368	180,565	225,790	102,605				863,751
1975/76	13,256	110,312	125,429	107,128	159,655	367,402	634,649	460,031	171,535				2,149,397
1976/77	3,861	76,151	277,031	209,229	338,272	393,722	695,293	458,008	112,143				2,563,710
1977/78	29,434	162,649	139,499	176,005	149,876	303,768	592,475	504,744	83,959				2,142,409
1978/79	6,590	47,585	76,675	91,665	200,058	189,220	465,356	422,280	60,340				1,559,769
1979/80	60,702	55,748	74,471	61,002	153,949	440,029	615,468	282,356	37,450				1,781,175
1980/81	26,144	52,621	48,540	60,071	315,911	504,091	627,344	350,454	28,110				2,013,276
1981/82				870,816	597,721	712,698	809,360	315,187					3,305,857
1982/83				1,102,009									1,102,009
1983/84						866,004	727,464						1,593,468
1984/85						531,064	599,860						1,130,924
1985/86						577,662	426,397						1,009,005
1986/87					635,358	488,616							1,123,974
1987/88					787,725	524,760							1,330,485
1988/89						1,087,935	552,783						1,646,332
1989/90						1,233,415	740,708						2,009,669
1990/91						1,598,811	642,782						2,241,593
1991/92						1,730,820	392,101						2,122,921
1992/93						1,268,195	301,492						1,569,687
1993/94						1,559,853	441,673						2,001,526
1994/95						2,507,147							2,507,147
1995/96						2,020,036							2,020,036
1996/97						1,900,819							1,900,819
1997/98						2,701,322							2,701,322
1998/99						2,164,131							2,164,131

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Table 2.2–Page 2 of 2.

Season	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
1999/00						1,704,408							1,704,408
2000/01						1,295,680							1,295,680
2001/02						964,836							964,836
2002/03						804,234							804,234
2003/04						832,158							832,143
2004/05						804,035							804,035
2005/06						886,521							886,521
2006/07						927,900							927,900
2007/08						605,062							605,062
2008/09						612,550							612,550
2009/10						961,681							961,681
2010/11						891,344							891,344

[a] Fewer than 3 permits were fished; information is confidential.

Table 2.3–Biomass estimates, and recommended exploitation rates, and guideline harvest levels (GHLs) for 14 surveyed areas, 2008/09 through 2010/11 seasons. See the stock health determination matrix in Table 2.4 for a more detailed look at the data behind stock status determination. Recommended exploitation rates (ER) are 0% of estimated mature male biomass for poor stock status, 5% for below average, 10% for average, 15% for above average, and 20% for healthy stock health. An expansion factor of 71% (29% for non-surveyed areas) was used to determine total regional crab biomass. This expansion factor was based on the percent of commercial catch harvested in surveyed areas from 1980 to 2000.

Survey area	Estimated						Recommended								
	Mature biomass			Legal biomass			Mature ER			Legal ER			Recommended harvest		
	08/09	09/10	10/11	08/09	09/10	10/11	08/09	09/10	10/11	08/09	09/10	10/11	08/09	09/10	10/11
Icy Strait	107,340	118,933	76,538	54,741	72,476	45,525	0%	5%	5%	0%	8%	8%	0	5,947	3,827
Glacier	1,384,180	512,172	346,303	672,242	310,743	194,183	10%	5%	5%	21%	8%	9%	138,418	25,609	17,315
Stephens	362,981	352,690	259,463	265,246	290,894	183,957	10%	10%	10%	14%	12%	14%	36,298	35,269	25,946
Thomas	207,714	107,720	110,673	134,170	72,178	67,594	10%	5%	5%	15%	7%	8%	20,771	5,386	5,534
Holkham	179,684	197,852	133,162	83,048	143,307	67,038	10%	10%	10%	22%	14%	20%	17,968	19,785	13,316
Camden	42,830	55,965	107,273	17,417	27,913	43,066	0%	5%	5%	0%	10%	12%	0	2,798	5,364
Seymour	389,527	386,839	276,646	280,500	252,817	213,128	10%	10%	5%	14%	15%	6%	38,953	38,684	13,832
N. Juneau	163,694	153,846	177,326	115,603	128,819	115,791	10%	5%	10%	14%	6%	15%	16,369	7,692	17,733
Excursion	230,800	242,555	258,409	123,534	148,180	156,736	0%	10%	15%	0%	16%	25%	0	24,256	38,761
Pybus	178,169	184,008	128,025	128,383	137,057	98,085	10%	10%	10%	14%	13%	13%	17,817	18,401	12,802
Gambier	73,544	75,150	51,555	37,102	51,668	40,165	10%	5%	10%	20%	7%	13%	7,354	3,758	5,156
Peril	59,219	60,024	69,479	22,852	28,897	33,136	0%	10%	10%	0%	21%	21%	0	6,002	6,948
Lynn	51,367	44,153	30,325	33,316	37,199	22,975	10%	5%	5%	15%	6%	7%	5,137	2,208	1,516
P. Fred.	16,593	28,964	14,412	13,570	15,430	10,496	0%	10%	10%	0%	19%	14%	0	2,896	1,441
Non-surveyed	1,408,193	1,029,652	838,772	809,436	701,546	527,446							281,639	81,155	69,229
Total	4,855,836	3,550,523	2,892,318	2,791,159	2,419,124	1,818,781							421,248	279,845	238,720

Table 2.4–Tanner crab stock health scores, 2008/09–2010/11 seasons for Tanner crab survey areas. Negative scores are significantly below the long-term average or trending significantly down and vice versa. The long-term average is defined from available data 1997–2007. Short-term trends are based on individual regression analyses over the past 4 years including the current year. Total score is the sum of scores (+1, 0, -1 for long-term; +.25, 0, -.25 for short-term) for each response variable. Stock health < -3.25 = poor, -3.25 to -1.26= below average-1.25 to 1.25 = moderate, 1.26 to 3.25 above average, and > 3.25 = healthy.

Survey area	Season	Large / mature females				Prerecruits		Recruits		Post-recruits		Total score	Stock health
		Clutch		CPUE									
		l-t	s-t	l-t	s-t	l-t	s-t	l-t	s-t	l-t	s-t		
Icy Strait	08/09	-1	-0.25	-1	0	0	-0.25	-1	-0.25	-1	-0.25	-5	Poor
	09/10	0	0	0	0	-1	-0.25	-1	-0.25	0	-0.25	-2.75	Below Ave
	10/11	0	0	0	0	-1	0	-1	0	-1	0	-3	Below Ave
Glacier Bay	08/09	1	0	0	0	0	0	0	0	0	0	1	Moderate
	09/10	1	0	-1	0	-1	0	-1	0	-1	0	-3	Below Ave
	10/11	1	0	-1	0	-1	0	-1	0	0	0	-2	Below Ave
Stephens Passage	08/09	0	0	-1	0	0	0	0	0	0	0	-1	Moderate
	09/10	1	0	-1	0	0	0	-1	0	0	0	-1	Moderate
	10/11	1	0	0	0	0	0	-1	0	-1	0	-1	Moderate
Thomas Bay	08/09	1	0	0	0	0	0	0	0	0	-0.25	0.75	Moderate
	09/10	1	-0.25	0	0	-1	0	-1	0	-1	-0.25	-2.5	Below Ave
	10/11	0	0	-1	0	-1	0	-1	0	0	0	-3	Below Ave
Holkham Bay	08/09	0	0	0	0.25	0	0.25	-1	0	0	0	-0.5	Moderate
	09/10	1	0	-1	0	0	0	0	0.25	-1	0	-0.75	Moderate
	10/11	1	0	0	0	0	0	0	0.25	-1	0	0.25	Moderate
Port Camden	08/09	0	0	-1	0	0	0	-1	0	0	0	-2	Poor
	09/10	0	0	-1	0	0	0	-1	0	-1	0	-3	Below Ave
	10/11	0	0	-1	0	0	0	-1	0	-1	0	-3	Below Ave

Table 2.5–Tanner crab stock health scores, 2008/09–2010/11, red king crab survey areas. Negative scores are significantly below the long-term average (l-t) or trending significantly down and vice versa. The l-t average is defined from available data 1997 to 2007. Short-term (s-t) trends are based on regression analyses over the most recent 4 years. Total score is the sum of scores (+1, 0, -1 for l-t; +.25, 0, -.25 for s-t). Stock health < -3.25 = poor, -3.25 to -1.26= below average-1.25 to 1.25 = moderate, 1.26 to 3.25 above average, and > 3.25 = healthy.

Survey area	Season	Large / mature females				Prerecruits		Recruits		Post-recruits		Total score	Stock health
		Clutch		CPUE									
		l-t	s-t	l-t	s-t	l-t	s-t	l-t	s-t	l-t	s-t		
Seymour Canal	08/09	0	0	0	0	0	0	-1	0	0	0	-1	Moderate
	09/10	0	-0.25	0	0	1	-0.25	-1	-0.25	0	0	-0.75	Moderate
	10/11	0	0	0	-0.25	0	0	-1	0	-1	0	-2.25	Below Ave
North Juneau	08/09	0	0	0	0	0	0	0	0.25	-1	0	-0.75	Moderate
	09/10	0	0	0	0	-1	0	-1	0	0	0.25	-1.75	Below Ave
	10/11	1	0	0	0	0	0	-1	0	-1	0	-1	Moderate
Excursion Inlet	08/09	0	0	0	0	0	0	0	0	-1	-0.25	-1.25	Poor
	09/10	0	0	0	0	0	0	0	0	0	-0.25	-0.25	Moderate
	10/11	1	0	0	0	0	0	0	0.25	0	0	1.25	Above Ave
Pybus Bay	08/09	0	0	0	0	1	0	0	0	0	0	1	Moderate
	09/10	0	0	0	0	1	0	0	0	0	0	1	Moderate
	10/11	0	0	0	0	0	-0.25	0	0	0	-0.25	-0.5	Moderate
Gambier Bay	08/09	0	0	0	0	0	0.25	-1	0	0	0	-0.75	Moderate
	09/10	0	0	0	0.25	0	0	-1	0	-1	0	-1.75	Below Ave
	10/11	1	0	0	0	-1	0	-1	0	0	0	-1	Moderate
Peril Strait	08/09	0	0	0	0	0	0	-1	0	-1	-0.25	-2.25	Poor
	09/10	0	0	0	0	0	0	0	0	-1	-0.25	-1.25	Moderate
	10/11	0	0	1	0	0	0	0	0	0	0	1	Moderate
Lynn Sisters	08/09	0	0	0	0.25	0	0	0	0	0	0	0.25	Moderate
	09/10	0	0	0	0	-1	0	-1	0	0	0	-2	Below Ave
	10/11	0	0	-1	0	0	0	0	0	-1	0	-2	Below Ave
Port Frederick	08/09	0	0	-1	0	-1	0.25	-1	0.25	0	0	-2.5	Poor
	09/10	1	0	0	0.25	0	0	-1	0	0	0	0.25	Moderate
	10/11	0	0	-1	0	0	0	0	0	0	0	-1	Moderate

Table 2.6–Traditional commercial Tanner crab harvest in pounds by season, by fishing area in Registration Area A, 1971/72 to present.

Season	Lynn Canal/Upper Stephens Passage[a]		Icy Strait[b]		Frederick Sound/LowerStephens Passage[c]		Other[d]		Total
	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	
1971/72	13,440	2.0	310,803	47.3	200,854	30.6	131,564	20.0	656,661
1972/73	177,661	11.1	505,203	31.6	443,106	27.7	471,868	29.5	1,597,838
1973/74	377,190	28.8	404,347	30.9	396,400	30.3	131,736	10.1	1,309,673
1974/75	19,116	2.2	371,115	43.0	289,758	33.5	183,762	21.3	863,751
1975/76	782,127	36.4	505,089	23.5	406,565	18.9	455,616	21.2	2,149,397
1976/77	599,719	23.4	1,034,577	40.4	529,849	20.7	399,565	15.6	2,563,710
1977/78	394,041	18.4	762,491	35.6	648,802	30.3	337,075	15.7	2,142,409
1978/79	308,765	19.8	655,043	42.0	511,769	32.8	84,192	5.4	1,559,769
1979/80	330,221	18.5	391,185	22.0	907,178	50.9	152,591	8.6	1,781,175
1980/81	321,594	16.0	682,736	33.9	634,425	31.5	374,521	18.6	2,013,276
1981/82	384,252	11.6	2,102,755	63.6	428,259	13.0	390,591	11.8	3,305,857
1982/83	92,055	8.4	816,016	74.0	108,918	9.9	85,020	7.7	1,102,009
1983/84	298,975	18.8	656,496	41.2	468,461	29.4	169,536	10.6	1,593,468
1984/85	366,496	32.4	225,044	19.9	365,395	32.3	173,989	15.4	1,130,924
1985/86	421,236	41.7	182,316	18.1	282,490	28.0	122,963	12.2	1,009,005
1986/87	410,674	36.5	242,010	21.5	317,528	28.3	153,762	13.7	1,123,974
1987/88	458,190	34.4	239,194	18.0	459,709	34.6	173,392	13.0	1,330,485
1988/89	476,600	28.9	349,098	21.2	628,454	38.2	192,180	11.7	1,646,332
1989/90	386,754	19.2	621,277	30.9	709,733	35.3	291,905	14.5	2,009,669
1990/91	442,952	19.8	798,460	35.6	617,839	27.6	382,342	17.1	2,241,593
1991/92	617,885	29.1	800,184	37.7	442,200	20.8	262,652	12.4	2,122,921
1992/93	452,466	28.8	490,117	31.2	433,002	27.6	194,102	12.4	1,569,687
1993/94	253,543	12.7	517,397	25.9	888,117	44.4	342,469	17.1	2,001,526

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Table 2.6–Page 2 of 2.

Season	Lynn Canal/Upper Stephens Passage[a]		Icy Strait[b]		Frederick Sound/LowerStephens Passage[c]		Other[d]		Total
	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	
1994/95	409,187	16.3	735,200	29.3	1,051,899	42.0	310,861	12.4	2,507,147
1995/96	314,961	15.6	725,970	35.9	704,529	34.9	274,576	13.6	2,020,036
1996/97	293,328	15.4	673,305	35.4	490,752	25.8	443,434	23.3	1,900,819
1997/98	418,743	15.5	692,620	25.6	517,500	19.2	1,072,459	39.7	2,701,322
1999/00	468,373	27.5	440,239	25.8	536,957	31.5	258,839	15.2	1,704,408
2000/01	412,435	31.8	298,607	23.0	391,751	30.2	192,887	14.9	1,295,680
2001/02	346,676	35.9	265,940	27.6	228,773	23.7	123,447	12.8	964,836
2002/03	311,273	38.7	226,527	28.2	192,255	23.9	74,179	9.2	804,234
2003/04	237,442	28.5	263,533	31.7	249,000	29.9	82,183	9.9	832,158
2004/05	189,323	23.5	319,875	39.8	224,851	28.0	69,986	8.7	804,035
2005/06	162,500	18.3	386,736	43.6	280,586	31.7	56,699	6.4	886,521
2006/07	152,729	16.5	363,656	39.2	294,745	31.8	116,770	12.6	927,900
2007/08	135,312	22.4	230,612	38.1	176,516	29.2	62,622	10.3	605,062
2008/09	154,634	25.3	239,294	39.1	140,355	22.9	78,267	12.7	612,550
2009/10	291,627	30.3	296,623	30.8	290,829	30.2	82,602	8.7	961,681
2010/11	227,605	25.5	231,424	26.0	336,497	37.8	95,818	10.7	891,344

[a] Includes all of District 15 and Subdistricts 111-30 through 111-99.

[b] Includes all of District 14.

[c] Includes all of District 10, Subdistricts 111-01 through 111-29, and Subdistricts 108-40 through 108-60.

[d] Includes all other areas of Southeast Alaska.

Table 2.7–Summary of traditional commercial Tanner crab size frequency and shell condition data collected during dockside sampling in Registration Area A, 1970/71 to present.

	Number sampled		Carapace width (mm)		Recruitment	
Season	Boats	Crab	Mean	Range	% Recruits[a]	% Postrecruits[b]
1970/71	1	99	157.0	137–177	76.5	23.5
1971/72	4	235	144.5	121–180	81.4	18.6
1972/73	3	429	156.9	128–183	88.1	11.9
1973/74	9	1,658	153.0	111–190	80.9	19.1
1974/75	4	616	157.9	127–190	74.7	25.3
1975/76	12	1,663	154.1	116–190	75.7	24.3
1976/77	25	3,753	154.4	124–192	60.6	39.4
1977/78	34	4,786	155.3	124–192	28.2	71.8
1978/79	26	3,273	154.9	129–198	48.1	51.9
1979/80	43	4,509	154.6	128–193	70.5	29.5
1980/81	45	4,223	152.1	125–192	71.0	29.0
1981/82	59	6,556	149.7	129–193	71.1	28.9
1982/83	55	5,808	150.8	123–185	78.8	21.2
1983/84	24	2,444	152.0	135–187	81.6	18.4
1984/85	23	3,211	152.6	135–197	82.4	17.6
1985/86	50	5,453	151.0	128–191	80.1	19.9
1986/87	61	6,984	152.2	133–188	79.9	20.1
1987/88	104	10,933	150.8	134–186	72.4	27.6
1988/89	93	10,030	152.9	133–194	65.1	34.9
1989/90	121	12,806	150.8	129–185	67.5	32.5
1990/91	133	13,050	152.3	131–193	79.7	20.3
1991/92	110	11,568	154.9	129–190	67.5	32.5
1992/93	99	11,175	151.9	130–192	71.1	28.9
1993/94	127	14,731	150.1	130–190	79.6	20.4
1994/95	149	18,235	151.7	99–191	79.6	20.4
1995/96	119	15,085	153.7	132–189	77.4	22.6
1996/97	129	13,123	152.4	132–196	77.2	22.8
1997/98	152	11,345	153.8	127–190	74.1	25.9
1998/99	121	9,306	154.2	125–193	65.1	34.9
1999/00	138	9,345	155.0	69–193	68.5	31.5
2000/01	116	9,096	154.7	134–197	64.3	35.7
2001/02	126	9,194	152.9	118–197	75.1	24.9
2002/03	111	7,864	152.7	133–190	77.8	22.2
2003/04	96	6,925	152.1	131–189	74.7	25.3
2004/05	92	6,767	150.9	127–192	65.4	34.6
2005/06	85	6,268	151.6	126–185	73.4	26.6
2006/07	84	6,200	152.4	129–190	69.4	30.6
2007/08	65	4,761	151.5	132–186	60.8	39.2
2008/09	46	3,350	151.5	136–185	73.8	26.2
2009/10	60	4,486	152.5	136–195	66.8	33.2
2010/11	48	3,583	152.9	135–188	57.8	42.2

[a] Recruits = all new and soft shell crab ≥140 mm and ≤164 mm carapace width.

[b] Postrecruits = all new and soft shell crab ≥165 mm and old and very old shell crab ≥140 mm carapace width.

Table 2.8–Tanner crab catch rate and weights in Registration Area A, 1974/75 to present. Data were collected during dockside sampling and interviews. [a]

Season	Number of			Mean no. per pot	Range of no. per pot	Weight (lb)		Estimated no. crab harvested [b]	Percent of harvest sampled [c]
	Boats inter-viewed	Pots lifted	Crab captured			Mean	Range		
1974/75	2					2.7	2.1–3.2	324,648	0.2
1975/76	10					1.9	1.7–2.1	1,153,110	0.1
1976/77	20	58	1,400	24.1	24.1–24.1	2.5	2.0–3.0	1,014,551	0.4
1977/78	40	270	6,805	25.2	16.0–43.1	2.5	1.6–3.1	840,881	0.6
1978/79	20	4,096	122,784	30.0	17.2–48.6	2.6	2.3–2.8	610,816	0.5
1979/80	25	8,047	306,017	38.0	7.7–93.0	2.3	2.1–2.8	777,310	0.6
1980/81	34	4,113	59,620	14.5	2.3–27.1	2.4	2.1–3.2	833,775	0.5
1981/82	33	6,266	197,787	31.6	8.1–111.6	2.3	2.0–2.5	1,424,520	0.5
1982/83	57	2,043	30,321	14.8	4.9–29.2	2.3	1.9–3.0	474,611	1.2
1983/84	18	680	7,380	10.9	6.9–14.0	2.5	2.3–2.7	638,523	0.4
1984/85	19	1,555	17,326	11.1	3.9–16.5	2.6	2.3–3.0	435,249	0.7
1985/86	50	6,990	94,784	13.6	1.8–47.2	2.4	1.8–3.1	415,708	1.3
1986/87	61	15,452	191,786	12.4	2.9–32.0	2.5	2.1–2.8	451,523	1.5
1987/88	99	23,497	278,085	11.8	1.1–32.9	2.4	2.0–2.7	558,059	2.0
1988/89	106	26,288	389,997	14.8	0.4–42.7	2.5	2.1–3.1	652,278	1.5
1989/90	126	35,352	389,983	11.0	0.2–34.6	2.4	1.6–3.0	823,038	1.6
1990/91	135	41,706	604,723	14.5	0.9–40.3	2.5	2.1–3.1	883,237	1.5
1991/92	115	33,978	411,104	12.1	0.8–99.2	2.7	2.1–3.1	799,838	1.4
1992/93	95	28,569	307,225	10.8	0.5–31.7	2.5	2.0–3.0	625,073	1.8
1993/94	127	28,408	355,379	12.5	0.3–47.5	2.4	1.9–2.9	824,186	1.8
1994/95	144	27,846	369,490	13.3	0.3–59.5	2.5	2.0–3.0	1,002,415	1.8
1995/96	115	22,426	461,886	20.6	0.5–284.8	2.6	2.1–3.2	771,905	2.0
1996/97	128	20,799	332,706	16.0	0.4–65.8	2.5	2.1–3.1	745,996	1.8
1997/98	151	28,592	564,853	19.8	0.4–91.6	2.6	2.0–3.9	1,028,370	1.1
1998/99	121	25,736	442,061	17.2	0.3–60.6	2.6	2.1–3.3	823,499	1.1
1999/00	139	25,526	326,463	12.8	0.3–62.5	2.7	2.1–6.2	636,523	1.5
2000/01	116	26,821	319,114	11.9	0.1–32.6	2.7	2.2–3.4	484,896	1.9
2001/02	126	28,194	299,031	10.6	0.3–64.9	2.6	2.1–3.1	371,710	2.5
2002/03	111	20,469	248,123	12.1	0.2–44.6	2.5	1.8–3.0	323,381	2.4
2003/04	96	19,223	247,274	12.9	0.5–41.3	2.5	2.1–3.1	334,054	2.1
2004/05	92	18,783	247,799	13.2	0.6–41.5	2.4	2.0–2.9	329,784	2.1
2005/06	85	20,311	334,479	16.5	0.5–63.0	2.5	2.2–3.0	357,983	1.8
2006/07	84	25,262	367,483	14.5	0.6–57.3	2.5	1.9–2.9	371,697	1.7
2007/08	63	13,212	147,907	11.2	0.4–34.6	2.5	1.9–3.0	246,722	1.9
2008/09	46	10,948	142,871	13.0	0.6–31.4	2.5	2.1–3.0	243,176	1.4
2009/10	60	14,893	236,303	15.9	0.8–47.0	2.5	2.1–2.9	382,679	1.2
2010/11	48	8,046	102,392	12.7	0.4–36.2	2.6	2.3–3.0	348,553	1.0

[a] Summary tables of all dockside sampling data includes data from Tables 2.9, 2.11, and 2.13 plus data collected that could not be assigned to a fishing area.

[b] Calculated by dividing fish ticket weight data from Table 2.6 by dockside sampling mean weight per crab data.

[c] Calculated by dividing number of crab sampled for size frequency by estimated number of crab caught.

Table 2.9–Tanner crab catch rate and mean weight in Icy Strait, 1975/76 to present. Data were collected during dockside sampling and interviews.

Season	Number sampled			Mean no. per pot	Range of no. per pot	Weight (lb)		Estimated no. crab harvested [a]	Percent of harvest sampled [b]
	Boats interviewed	Pots lifted	Crab captured			Mean	Range		
1977/78	3				0.0–0.0	2.8	2.8–2.9	270,387	0.31
1978/79	1				0.0–0.0	2.7	2.7–2.7	247,186	0.08
1979/80	1	100	9,300	93.0	93.0–93.0		0.0–0.0		
1980/81									
1981/82	19	3,535	91,832	26.0	8.4–71.6	2.3	2.0–2.5	918,234	0.29
1982/83	25	1,656	24,130	14.6	4.9–36.5	2.4	2.2–2.8	334,433	0.90
1983/84	8				0.0–0.0	2.5	2.4–2.7	260,514	0.31
1984/85	1				0.0–0.0	2.3	2.3–2.3	97,845	0.32
1985/86	1	98	811	8.3	8.3–8.3		0.0–0.0		
1986/87	4	350	4,411	12.6	12.6–12.6	2.4	2.3–2.5	102,083	0.48
1987/88	13	1,958	20,421	10.4	1.1–40.3	2.2	2.1–2.4	107,977	0.94
1988/89	20	6,125	68,178	11.1	0.4–30.4	2.6	2.3–2.8	128,608	1.38
1989/90	25	8,277	93,291	11.3	0.2–32.4	2.5	2.2–2.8	240,777	1.07
1990/91	36	10,721	133,519	12.5	4.2–40.3	2.5	2.2–2.7	317,299	1.13
1991/92	29	8,668	100,652	11.6	1.1–24.0	2.7	2.4–3.1	300,147	0.83
1992/93	33	9,325	96,280	10.3	2.7–28.7	2.6	2.3–3.0	183,498	1.80
1993/94	35	9,055	108,432	12.0	0.8–39.1	2.5	2.1–2.9	205,405	1.52
1994/95	40	10,791	154,190	14.3	0.9–40.0	2.5	2.0.–2.3	293,401	1.47
1995/96	31	6,212	103,571	16.7	0.1–56.8	2.7	2.3–3.2	270,125	1.13
1996/97	40	9,526	167,253	17.6	0.4–65.8	2.5	2.3–2.8	265,024	1.49
1997/98	29	8,848	136,226	15.4	0.4–56.8	2.6	2.4–3.0	258,280	0.83
1998/99	27	5,619	114,969	20.5	1.1–60.6	2.7	2.4–3.1	259,305	0.83
1999/00	26	5,208	82,812	15.9	0.2–62.5	2.7	2.1–3.0	163,041	1.07
2000/01	20	7,307	92,424	12.7	2.3–33.7	2.5	2.2–2.7	120,188	1.00
2001/02	24	7,057	79,708	11.3	2.0–27.3	2.7	2.4–2.9	99,725	1.57
2002/03	15	3,317	44,675	13.5	1.9–37.5	2.6	2.2–2.8	85,527	0.99
2003/04	18	3,587	58,624	16.3	3.3–48.8	2.5	2.3–3.0	106,421	1.07
2004/05	18	4,943	113,504	23.0	2.5–48.8	2.4	2.2–2.5	132,845	1.01
2005/06	30	7,172	156,833	21.9	2.4–63.0	2.5	2.2–2.7	153,794	1.02
2006/07	22	5,447	103,307	19.0	2.6–57.3	2.6	2.3–2.9	139,089	0.81
2007/08	18	4,030	56,682	14.1	1.0–35.8	2.5	2.2–3.0	92,471	1.22
2008/09	12	2,885	57,591	20.0	1.5–26.7	2.4	2.3–2.6	98,475	0.69
2009/10	9	3,404	83,246	24.5	7.2–69.4	2.5	2.4–2.6	118,176	0.32
2010/11	3	913	19,928	21.8	3.3–26.5	2.8	2.8–2.8	83,849	0.27

[a] Calculated by dividing fish ticket weight data for Icy Strait from Table 2.6, by dockside sampling mean weight data.

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

Table 2.10.–Icy Strait summary of traditional commercial Tanner crab size frequency and shell condition, 1971/72 to present. Data was collected during dockside sampling.

	Number sampled		Carapace width (mm)		Recruitment	
Season	Boats	Crab	Mean	Range	% Recruits[a]	% Postrecruits[b]
1976/77[c]	1	101	155.2	140–179	82.2	17.8
1977/78	4	828	157.6	126–190	24.7	75.3
1978/79	1	200	156.0	138–182	82.5	17.5
1979/80	2	207	152.6	138–179	71.4	28.6
1980/81	1	104	149.4	137–175	90.3	9.7
1981/82	21	2,626	149.0	130–181	68.4	31.6
1982/83	29	3,002	151.0	129–178	78.9	21.2
1983/84	8	803	152.4	137–181	73.6	26.4
1984/85	2	309	146.6	136–165	59.8	40.2
1985/86	1	118	148.3	138–180	85.6	14.4
1986/87	4	485	148.4	136–176	44.4	55.6
1987/88	10	1,017	149.0	137–184	70.4	29.6
1988/89	17	1,770	152.1	135–184	72.7	27.3
1989/90	25	2,576	151.1	135–183	76.3	23.7
1990/91	34	3,572	149.9	132–180	86.8	13.2
1991/92	25	2,496	154.8	132–187	78.3	21.7
1992/93	31	3,301	152.1	135–189	80.3	19.7
1993/94	28	3,114	151.1	131–185	87.8	12.2
1994/95	37	4,324	150.6	135–190	91.8	8.2
1995/96	28	3,061	152.8	137–185	89.7	10.3
1996/97	37	3,954	151.2	133–186	89.0	11.1
1997/98	29	2,153	154.1	130–190	87.4	12.7
1998/99	26	2,158	154.8	133–187	85.7	14.3
1999/00	22	1,743	154.2	135–189	84.4	15.6
2000/01	16	1,197	151.4	138–183	90.1	9.9
2001/02	21	1,563	153.8	137–182	88.6	11.4
2002/03	12	842	153.3	136–178	85.3	14.7
2003/04	16	1,210	150.7	135–182	91.3	8.7
2004/05	16	1,348	149.6	128–177	69.3	30.8
2005/06	21	1,575	151.0	134–174	83.8	16.2
2006/07	15	1,122	153.7	138–184	76.6	23.4
2007/08	15	1,124	151.5	132–181	64.5	35.5
2008/09	9	675	150.0	139–175	82.2	17.8
2009/10	5	375	152.2	138–188	80.8	19.2
2010/11	3	225	151.0	135–172	71.9	28.1

[a] Recruits = all new and soft shell crab ≥140 mm and ≤164 mm carapace width.

[b] Postrecruits = all new and soft shell crab ≥165 mm and old and very old crab ≥140 mm carapace width.

[c] The first season that legal size was 5 1/2-inch (140 mm) carapace width.

Table 2.11.–Tanner crab catch rate and mean weight in Lynn Canal/Stephens Passage, 1976/77 to present. Data was collected during dockside sampling and interviews.

	Number Sampled					Weight (lb)			
Season	Boats inter-viewed	Pots lifted	Crab captured	Mean no. per pot	Range of no. per pot	Mean	Range	Estimated no. crab harvested [a]	Percent of harvest sampled [b]
1976/77	10	58	1,400	24.1	24.1–24.1	2.6	2.5–3.0	230,661	0.93
1977/78	7				0.0–0.0	2.7	2.6–2.9	146,484	0.87
1978/79	6	196	3,922	20.0	17.2–22.4	2.7	2.6–2.8	115,211	0.88
1979/80	3	175	8,350	47.7	7.0–86.4	2.7	2.7–2.7	122,304	0.45
1980/81	2	125	289	2.3	2.3–2.3	2.9	2.9–3.2	109,386	0.14
1981/82	3	720	8,744	12.1	12.1–12.2	2.3	2.3–2.3	165,626	0.25
1982/83	7	387	3,394	8.8	5.5–13.7	2.4	2.4–2.5	38,064	2.90
1983/84	2				0.0–0.0	2.6	2.5–2.7	115,434	0.18
1984/85	6	505	3,536	7.0	7.5–14.0	2.6	2.5–2.7	143,163	0.52
1985/86	28	2,773	40,787	14.7	5.9–30.7	2.4	1.8–3.1	173,655	1.82
1986/87	36	3,872	50,842	13.1	5.0–32.0	2.5	2.1–2.8	164,210	2.58
1987/88	45	4,410	46,198	10.5	3.0–33.0	2.4	2.0–2.7	188,165	2.65
1988/89	41	6,035	81,886	13.6	4.5–37.4	2.6	2.2–3.1	181,944	1.98
1989/90	35	4,828	59,152	12.3	3.1–35.6	2.5	2.1–2.8	154,834	2.55
1990/91	33	6,911	119,110	17.2	1.0–52.5	2.5	2.1–2.8	175,039	1.82
1991/92	38	5,496	79,116	14.4	0.8–99.2	2.7	2.2–3.1	226,080	1.57
1992/93	23	5,797	60,156	10.4	0.9–34.5	2.6	2.2–3.0	172,040	1.64
1993/94	13	2,724	29,000	10.7	1.2–23.7	2.4	2.2–2.6	105,533	1.23
1994/95	28	2,184	33,189	15.2	5.1–46.8	2.5	2.2–3.0	160,951	2.36
1995/96	25	2,726	36,514	13.4	0.6–40.4	2.8	2.1–3.1	113,305	2.92
1996/97	27	1,836	33,536	18.3	7.3–42.7	2.7	2.3–3.1	107,923	2.20
1997/98	36	3,913	86,103	22.0	11.7–46.3	2.8	2.3–3.0	151,596	1.77
1998/99	19	2,385	63,005	26.4	11.7–60.6	3.0	2.9–3.3	112,339	1.13
1999/00	24	3,458	91,701	26.5	2.3–52.3	2.9	2.5–3.2	161,223	1.34
2000/01	35	6,347	89,096	14.0	0.8–36.7	2.8	2.4–3.2	144,459	1.47
2001/02	44	6,557	95,146	14.5	1.0–64.9	2.6	2.3–3.1	133,400	2.20
2002/03	36	4,787	83,123	17.4	1.6–43.6	2.5	2.2–2.9	123,133	2.10
2003/04	32	6,043	77,552	12.8	2.9–44.0	2.4	2.2–2.8	96,428	2.30
2004/05	18	3,695	53,834	14.6	0.8–23.3	2.5	2.3–2.6	75,762	1.68
2005/06	18	3,349	56,820	17.0	3.8–31.2	2.5	2.2–2.9	64,166	1.75
2006/07	19	7,611	63,477	8.3	2.7–24.5	2.4	1.9–2.7	62,707	1.99
2007/08	13	2,420	38,988	16.1	6.0–37.2	2.4	1.9–2.8	55,781	1.48
2008/09	6	937	16,627	17.7	7.2–32.7	2.6	2.5–2.7	61,767	0.49
2009/10	17	2,377	58,887	24.8	8.7–44.8	2.6	2.4–2.9	119,464	0.88
2010/11	14	2,420	45,921	19.0	2.3–49.1	2.8	2.5–3.0	89,327	1.18

[a] Calculated by dividing fish ticket weight data for Lynn Canal/Stephens Passage from Table 2.6, by dockside sampling mean weight data.

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

Table 2.12.–Lynn Canal/Stephens Passage summary of traditional commercial Tanner crab size frequency and shell condition, 1970/71 to present. Data was collected during dockside sampling.

	Number of sampled		Carapace width (mm)		Recruitment	
Season	Boats	Crab	Mean	Range	% Recruits[a]	% Postrecruits[b]
1975/76	4	555	155.7	126–182	54.8	45.2
1976/77[c]	14	2,149	154.6	124–191	54.0	46.0
1977/78	9	1,281	155.7	131–187	23.9	76.1
1978/79	8	1,013	154.4	129–191	55.0	45.0
1979/80	5	555	153.3	128–186	81.7	18.3
1980/81	4	155	149.9	136–182	47.6	52.4
1981/82	4	416	150.9	131–176	79.5	20.5
1982/83	11	1,103	151.0	135–177	82.2	17.8
1983/84	2	204	153.8	139–177	74.1	25.9
1984/85	7	750	153.6	136–183	86.9	13.1
1985/86	29	3,166	151.6	135–191	77.6	22.4
1986/87	38	4,232	152.8	133–188	81.1	18.9
1987/88	49	4,979	151.8	135–185	77.4	22.6
1988/89	33	3,595	155.0	133–194	85.5	14.5
1989/90	35	3,945	151.9	129–185	74.4	25.6
1990/91	30	3,181	153.8	134–188	80.3	19.7
1991/92	36	3,539	157.0	129–190	62.3	37.7
1992/93	26	2,830	155.3	135–192	61.7	38.3
1993/94	12	1,296	151.7	130–190	72.8	27.2
1994/95	29	3,803	152.7	131–191	76.7	23.4
1995/96	23	3,310	155.9	136–189	66.6	33.4
1996/97	25	2,372	156.2	134–196	60.1	39.9
1997/98	35	2,679	157.9	136–189	62.2	37.8
1998/99	18	1,275	159.7	125–193	59.1	40.9
1999/00	23	2,157	157.9	129–188	55.2	44.8
2000/01	30	2,128	158.1	136–197	45.9	54.1
2001/02	40	2,993	152.8	118–197	67.2	32.9
2002/03	34	2,545	155.4	133–190	74.7	25.3
2003/04	30	2,219	152.7	131–189	72.5	27.5
2004/05	17	1,275	153.4	136–190	67.5	32.5
2005/06	15	1,106	153.1	130–180	69.6	30.4
2006/07	17	1,250	152.9	137–188	69.2	30.9
2007/08	12	899	153.3	135–181	59.2	40.8
2008/09	4	300	156.0	136–183	84.2	15.8
2009/10	14	1,050	154.6	137–195	65.7	34.3
2010/11	14	1,050	155.9	137–188	60.3	39.7

[a] Recruits = all new and soft shell crab ≥140 mm and ≤164 mm carapace width.

[b] Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old shell crab ≤140 mm carapace width.

[c] The first season that the regulatory size was 5 1/2-inch (140 mm) carapace width.

Table 2.13.–Frederick Sound summary of traditional commercial Tanner crabs CPUE and Mean weight, 1974/75 to present. Data was collected during dockside sampling and interviews.

Season	Number Sampled			Mean no. per pot	Range of no. per pot	Weight (lb)		Estimated no. crab harvested [a]	Percent of harvest sampled [b]
	Boats inter-viewed	Pots lifted	Crab captured			Mean	Range		
1974/75	1					3.2	3.2–3.2	89,987	0.57
1975/76							0.0–0.0		
1976/77	4					2.6	2.4–2.8	206,167	0.40
1977/78	14					2.7	2.5–3.1	236,789	0.79
1978/79	5					2.5	2.6–2.9	188,150	0.88
1979/80	1					2.8	2.8–2.8	323,992	1.15
1980/81	8						2.2–2.8	253,770	1.17
1981/82	6					2.4	2.2–2.5	176,238	1.22
1982/83	5					2.7	2.4–3.0	42,053	1.87
1983/84	4					2.4	2.3–2.6	192,782	0.38
1984/85	8					2.7	2.3–3.0	135,754	0.63
1985/86	15	2,992	21,651	7.2	1.8–47.2	2.5	2.1–2.7	115,041	1.32
1986/87	10	2,179	17,323	8.0	2.9–17.0	2.5	2.1–2.9	129,076	0.89
1987/88	34	8,103	76,247	9.4	2.4–32.0	2.4	2.2–2.7	190,676	1.33
1988/89	34	6,619	107,571	16.3	2.8–59.6	2.4	2.3–2.8	245,835	1.40
1989/90	48	9,423	83,539	8.9	1.0–36.0	2.5	1.6–3.0	269,714	1.63
1990/91	47	11,310	122,867	10.9	0.9–28.9	2.6	2.2–3.0	231,054	1.81
1991/92	30	7,876	71,863	9.1	0.8–20.0	2.7	2.3–3.0	158,978	1.56
1992/93	27	5,931	66,961	11.3	1.4–31.7	2.5	2.1–2.8	173,208	1.28
1993/94	56	11,608	175,553	15.1	0.6–68.3	2.4	1.9–2.9	356,388	1.82
1994/95	51	8,252	79,355	9.6	0.4–59.5	2.5	2.0–3.0	401,831	1.41
1995/96	49	7,020	158,017	22.5	0.5–284.8	2.7	2.1–2.9	258,073	2.19
1996/97	39	4,286	57,385	13.4	3.8–32.0	2.6	2.1–2.9	186,461	1.79
1997/98	35	4,366	86,792	19.9	0.5–54.6	2.5	2.2–3.1	196,591	1.25
1998/99	25	7,378	112,153	15.2	1.1–54.9	2.5	2.1–2.9	211,257	0.85
1999/00	51	11,948	148,149	12.4	0.5–69.2	2.6	2.2–3.3	190,398	1.81
2000/01	44	9,448	106,877	11.3	0.2–32.9	2.8	2.3–3.3	137,832	2.50
2001/02	39	8,371	76,916	9.2	0.6–38.0	2.7	2.1–3.1	80,771	3.00
2002/03	37	8,371	71,339	8.5	0.5–44.6	2.6	1.8–3.0	69,523	3.51
2003/04	36	7,009	88,212	12.6	0.7–34.0	2.6	2.2–3.1	92,872	2.81
2004/05	34	6,699	88,029	13.1	0.5–34.0		2.1–2.9	88,410	2.62
2005/06	28	7,001	102,133	14.6	1.1–39.6		2.2–3.0	107,979	1.80
2006/07	25	7,227	103,586	14.3	0.6–31.1		2.2–3.0	113,916	1.44
2007/08	16	4,271	46,987	11.0	1.3–18.5		2.1–3.0	68,935	1.63
2008/09	20	4,165	54,315	13.0	1.0–34.4		2.1–2.8	55,602	1.98
2009/10	29	6,527	101,912	15.6	0.8–47.0		2.3–2.9	114,115	1.51
2010/11	22	3,426	40,486	11.8	0.4–29.7		2.3–2.8	131,865	0.96

[a] Calculated by dividing fish ticket weight data for Frederick Sound from Table 2.6, by dockside sampling mean weight data.

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

Table 2.14–Frederick Sound summary of traditional commercial Tanner crab size frequency and shell condition, 1971/72 to present. Data was collected during dockside sampling.

	Number of sampled		Carapace width (mm)		Recruitment	
Season	Boats	Crab	Mean	Range	% Recruits[a]	% Postrecruits[b]
1971/72	2	148	147.4	121–180	67.8	32.2
1972/73	3	429	156.9	128–183	88.1	11.9
1973/74	9	1,652	153.0	111–190	80.9	19.2
1974/75	4	515	157.9	127–190	74.7	25.3
1975/76	3	401	154.8	116–183	81.5	18.5
1976/77[c]	7	820	155.3	129–192	75.7	24.3
1977/78	15	1,866	156.2	124–192	38.0	62.0
1978/79	14	1,652	155.8	131–198	47.2	52.8
1979/80	36	3,739	155.0	134–193	68.9	31.1
1980/81	29	2,960	153.1	125–192	74.6	25.4
1981/82	21	2,148	151.0	130–193	67.7	32.3
1982/83	8	785	153.4	135–185	77.6	22.4
1983/84	7	733	152.3	135–187	86.2	13.8
1984/85	8	853	155.7	135–197	76.4	23.6
1985/86	14	1,524	151.5	131–188	85.8	14.2
1986/87	10	1,146	151.8	136–187	86.6	13.4
1987/88	25	2,537	150.7	135–186	69.6	30.5
1988/89	33	3,434	151.9	133–182	47.9	52.2
1989/90	43	4,393	151.0	132–185	63.8	36.2
1990/91	41	4,178	154.0	131–193	77.5	22.5
1991/92	25	2,487	154.6	134–189	70.8	29.2
1992/93	22	2,223	149.4	133–185	75.9	24.1
1993/94	50	6,470	150.0	130–186	82.4	17.6
1994/95	49	5,658	152.8	115–188	80.6	19.4
1995/96	41	5,648	154.0	135–188	75.8	24.2
1996/97	37	3,331	153.7	132–195	75.3	24.7
1997/98	31	2,444	152.3	127–186	76.3	23.8
1998/99	21	1,798	153.9	135–188	74.2	25.8
1999/00	49	3,572	154.4	131–193	74.0	26.0
2000/01	39	3,448	155.1	134–188	66.1	33.9
2001/02	33	2,422	153.9	132–192	73.7	26.3
2002/03	33	2,443	153.7	134–185	78.6	21.4
2003/04	35	2,608	153.5	134–187	75.6	24.4
2004/05	32	2,318	151.6	135–192	73.8	26.2
2005/06	26	1,947	152.7	126–183	72.0	28.0
2006/07	22	1,637	153.2	136–190	67.6	32.4
2007/08	15	1,122	152.0	137–183	57.4	42.6
2008/09	15	1,103	151.7	137–178	71.3	28.7
2009/10	23	1,725	152.0	137–187	62.5	37.5
2010/11	17	1,270	152.5	136–186	61.3	38.7

[a] Recruits = all new and soft shell crab ≥140 mm and ≤164 mm carapace width.

[b] Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old crab ≤ 140 mm carapace width.

[c] The first season that the regulatory legal size was 5 1/2-inch (140 mm) carapace width.

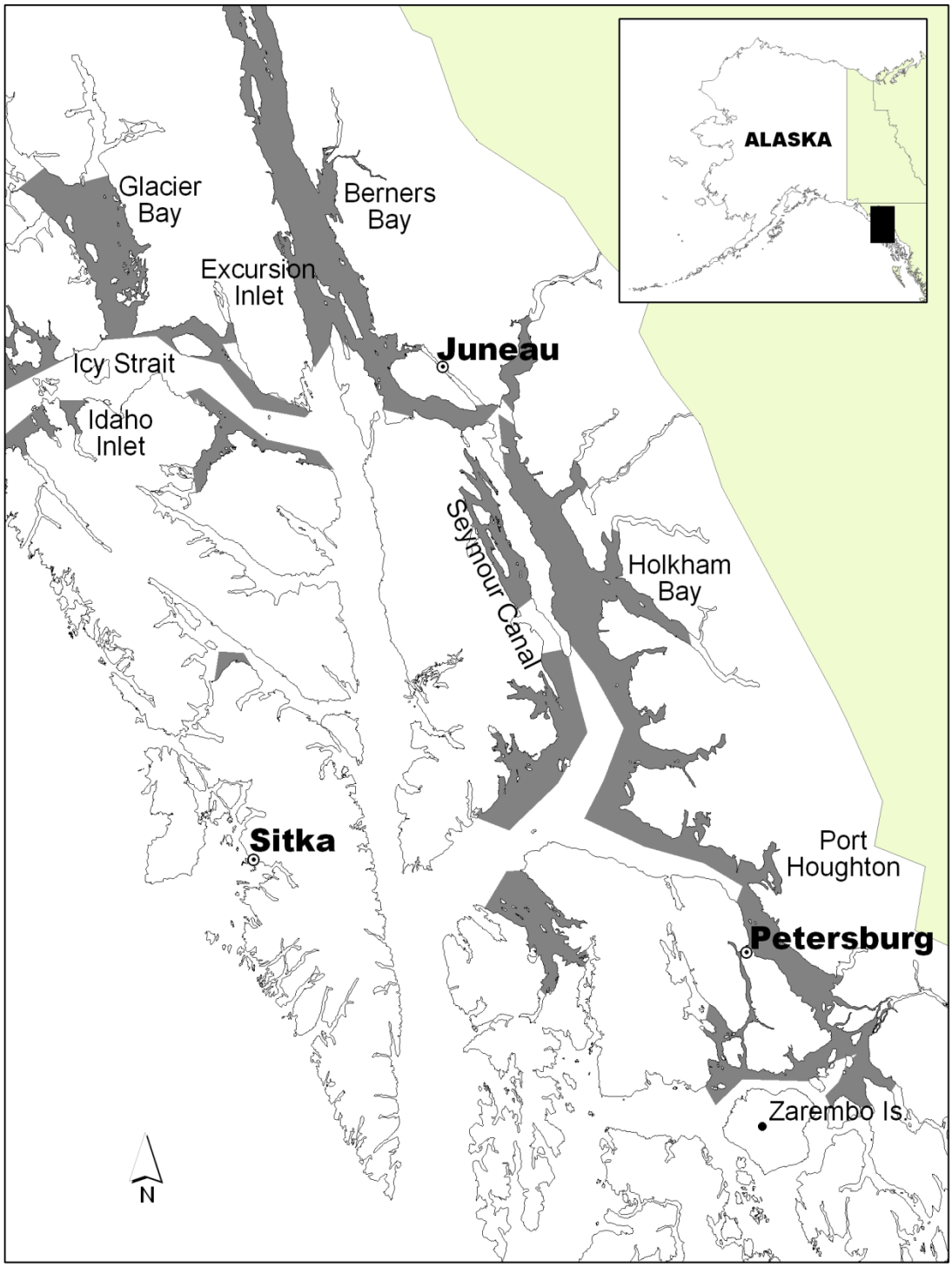

Figure 2. 1–Map showing major Tanner fishing grounds in Southeast Alaska.

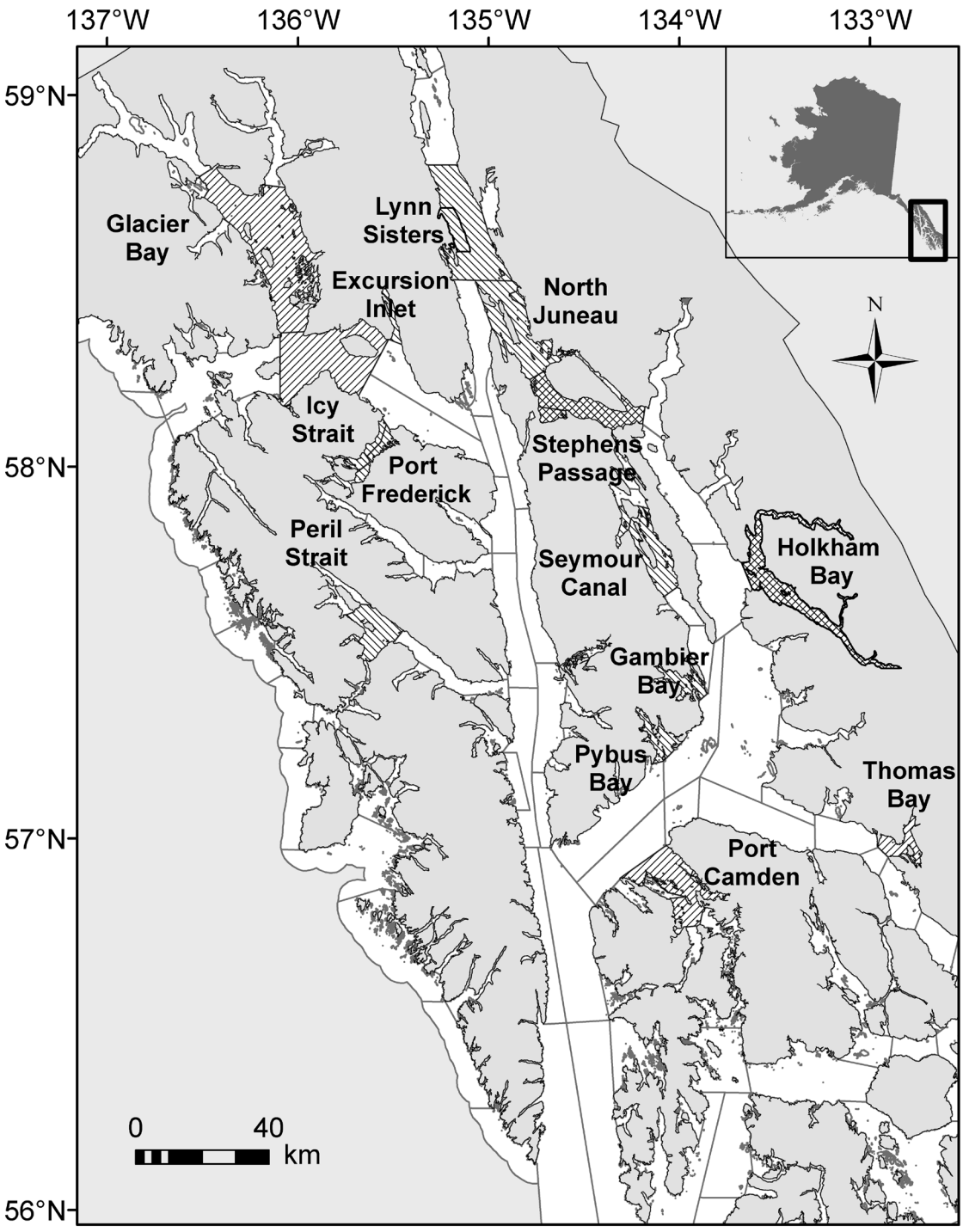

Figure 2. 2–Red king and Tanner crab survey areas in Southeast Alaska, ADF&G Registration Area A.

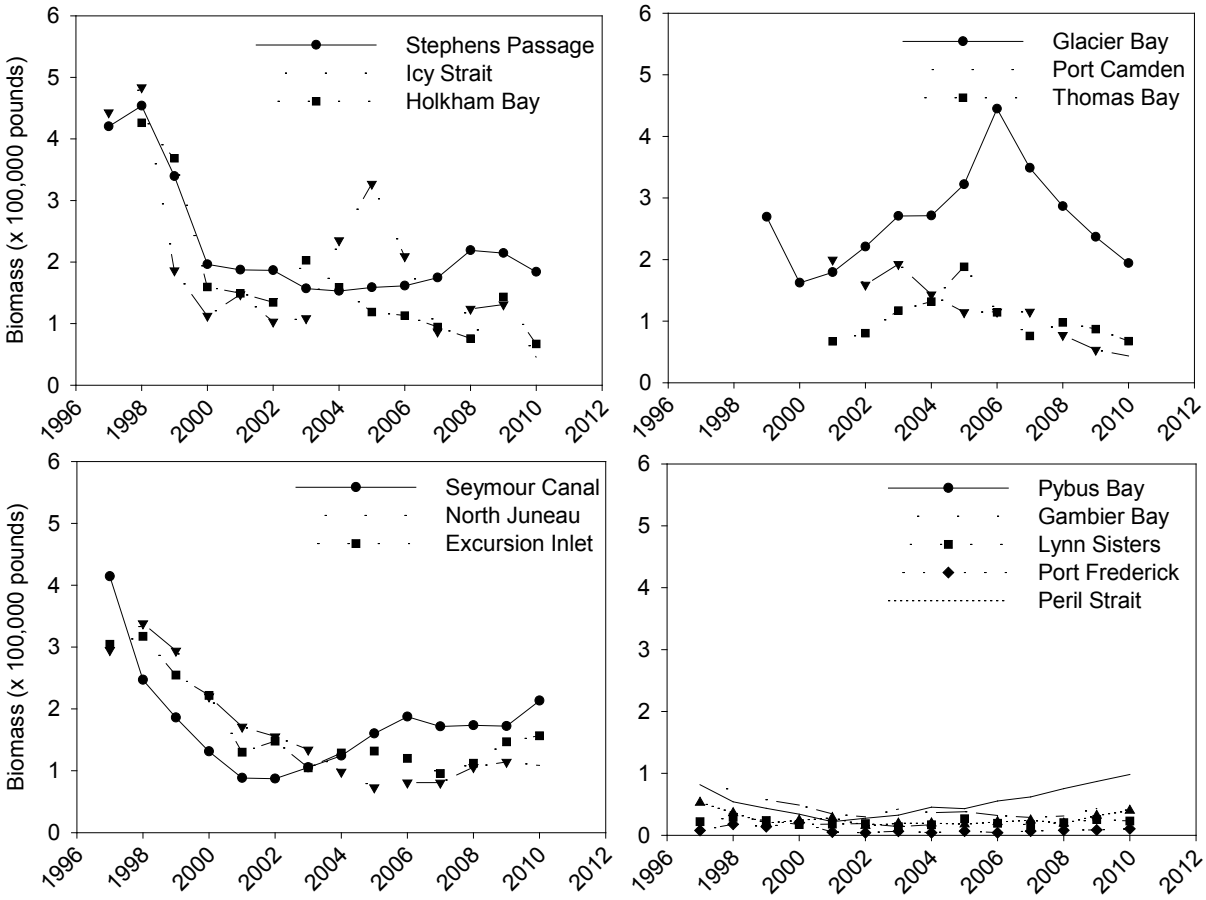

Figure 2.3.–Tanner crab legal biomass estimates from catch-survey modeling of red king crab and Tanner crab survey data for 14 survey areas from 1997 to 2010.

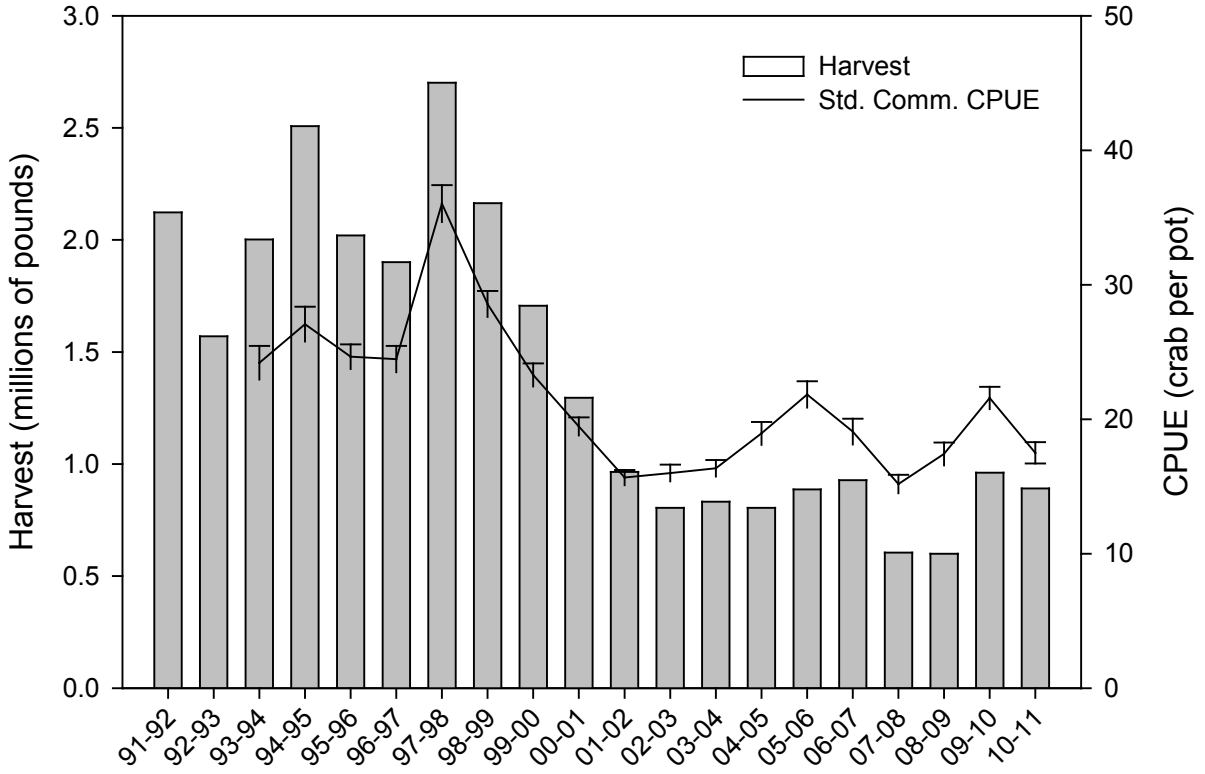

Figure 2.4.–Tanner crab harvest and standardized CPUE for 1991/92 through 2010/11 commercial seasons.

CHAPTER 3: YAKUTAT TANNER CRAB FISHERY

INTRODUCTION

Tanner crabs are a widely distributed brachyuran (true) crab that inhabits temperate and subarctic waters of the eastern Pacific Ocean from northern California to the Bering Sea.

COMMERCIAL FISHERY

The Yakutat Tanner crab fishery occurs in both the relatively protected major bays in the area, Icy Bay and Yakutat Bay, as well as in portions of the more exposed outside coast between Cape Fairweather and Cape Suckling. Most of the fishing occurs out to the 100-fathom contour. For reporting purposes, this area is divided into four major districts, 181, 183, 189, and 191. Districts 181, 183, and 191 encompass state waters within three miles of shore, and District 189 includes waters under state management jurisdiction between three and 200 miles offshore.

Yakutat is a nonexclusive registration area for Tanner crab, which means that a vessel fishing there may also fish in other nonexclusive registration areas in the same registration year (August 1 through July 31). The Yakutat fishery is also open to entry to any properly licensed, permitted, and registered participant.

Despite many indications of poor recruitment and low abundance, continued fishing was permitted throughout the late 1990s so that harvest data with which to assess stock condition was available. It was thought that a low level of fishing activity was tolerable as long as it did not significantly exceed that of recent seasons. However, a period of low harvest level persisted since the early 1980s to 2000. Since continued fishing on reduced brood stock could increase the length of recovery period, a decision was made to close the fishery until stock recovery could be demonstrated. The Yakutat Tanner crab stock was designated as a "Collapsed and Recovering Fishery" (ADF&G 1999) prior to the January 2000 board meeting.

FISHERY DEVELOPMENT AND HISTORY

During the open seasons from 1995/1996 through 1999/2000, the fishery had been conducted either by smaller vessels based in Yakutat, fishing mainly in Yakutat Bay, or by larger vessels based in other ports that range widely throughout the registration area. Most of the vessels had live tanks, although some of those on the smaller vessels are simple drop-in tanks intended for day fishing. Most of the smaller vessels are used primarily for other fisheries during the rest of the year and winter crabbing for Tanner and other crabs is generally pursued as a secondary source of income. No more than six vessels of various sizes normally fished in any given season.

Lightweight cone or pyramid-shaped pots had been more commonly used than the heavier, 7-foot square pots originally designed for king crab. An additional factor favoring the lighter gear in Yakutat is the area-wide prohibition on the use of side-loading pots.

Regulations in Yakutat include harvest of only male Tanner crab larger than 5 1/2 inches (140 mm) carapace width during a January 15–May 1 season. Also, a guideline harvest ceiling of 1,000,000 lbs, based on historic harvest trends, has been established for this area. Actual stock composition can only be inferred because no preseason stock assessments are conducted.

Port sampling of Tanner crab from Yakutat has been limited by the widespread, low-level nature of the fishery and limited staffing and funding. Available information demonstrates that Yakutat crabs are smaller, more often skip-molts, and generally less robust than those harvested in more productive areas to the east (Southeast Alaska) and west (Kodiak). These characteristics have

been assumed to indicate more marginal habitat or environmental conditions for Tanner crabs in Yakutat than other areas. Seasonal effort and total catch in the 1980s and 1990s have been an order of magnitude less than the 1970s harvests.

It was not until the early 1970s that significant Tanner crab fisheries developed in the Yakutat area (Table 13.1). As the overall market for Tanner crabs slowly grew, landings from the Yakutat area also rose, averaging about 1,500,000 lbs per season between the 1972/1973 and 1979/1980 seasons. Following the record 2,435,000-pound catch during the 1979/80 season the harvest steadily declined through most of the 1980s. Peak catches consistently occurred between the months of February and April (Table 13.2), although the season had extended from September 1 to May 15 during most of the early years of the fishery.

During the 1970s, this fishery attracted large, long-ranging vessels with live tanks in which many tons of crabs could be kept alive for extended periods. Landings from this period suggest that much of the area was heavily fished (Table 13.3). Many of these vessels also participated in shellfish fisheries in other areas of Alaska.

The stocks could not sustain the levels of harvest of the 1970s and crashed between the 1979/1980 and 1980/1981 seasons. The early 1980s saw the use of side-loading pots prohibited, the starting date of the season changed to mid-winter, and a continued decline in the number of vessels, the catch per vessel, and the total catch. Catch during the 1980s averaged about 130,000 lbs per season. Many of the larger vessels left the fishery. Those remaining fishermen were forced by regulation to switch to top-loading conical or pyramidal pots. By the 1983/1984 and 1984/1985 seasons, only small, local vessels, operated by residents of Yakutat, were participating in this fishery. Reported landings were limited to the immediate vicinity of Yakutat Bay (Table 13.3).

In the 1985/1986 season, two larger crabbers entered the fishery. The larger vessels experienced uniformly poor catches despite extensive exploratory fishing. In the 1986/1987 season, five large vessels based in Kodiak, Valdez, and Pelican registered for the fishery, along with the local fleet in Yakutat. Only two of the larger vessels actively participated in the fishery, and their poor landings discouraged the remaining three from entering the fishery. In the 1987/1988 season, only one large vessel and several of the smaller vessels fishing around Yakutat Bay reported any landings. During the 1988/1989 season, one large vessel and several smaller vessels based in Yakutat reported Tanner crab landings from the Yakutat area. Much of the detailed data from this fishery is considered confidential because of the few vessels that fished in this area.

During the 1989/1990 season, only a few local vessels, limited to the waters of Yakutat Bay, participated in the fishery. From the 1989/1990 season to the closure in 1999/2000 season, the consistent fishing pattern was for one or two larger vessels a season to prospect throughout much of the area and land most of the catch while smaller vessels based in Yakutat fished Yakutat Bay. Catch averaged 80,000 lbs annually.

Because the Tanner crab stocks in the Yakutat area have not recovered since the decline of the early 1980s, the fishery was designated as ‘collapsed and recovering’ at the January 2000 board meeting.

REGULATION DEVELOPMENT

FISHING SEASONS AND PERIODS

Regulatory season dates in Yakutat started in the 1973/1974 season. By regulation, the season started on September 1 and ended on May 20, 1974. For most of the 1970s, the seasons started on September 1 and extended through May 15 of the following year.

The 1979/1980 and 1980/1981 seasons were shorter, closing by emergency order on April 20 in the 1979/1980 season and by regulation on May 1, 1981, respectively. Stocks began crashing in the 1980/1981 season, and subsequent changes to the season resulted in reduced fishing time. In 1981/1982 and 1982/1983, the season started on February 1 and closed on May 15. The season was further shortened in early 1982, starting on February 10 for the 1983/1984 season and ending on May 1, 1984. Increasing catch resulted in adoption of a 1984/1985 season that extended from January 15 to May 1, 1985. This season has remained in effect until the fishery was closed by emergency order on January 31, 2000.

SEX AND SIZE RESTRICTIONS

Size restrictions permitting harvest of only male crabs over 5.5 inches in carapace width were first implemented in the 1976/1977 season and have remained the same since then.

QUOTAS AND GUIDELINE HARVEST RANGES

A 3,000,000-pound Guideline Harvest Ceiling was instituted in 1976/1977 in response to the rapidly escalating fishery. It was amended to a GHR in 1978/1979, of between 500,000 and 3,000,000 lbs. This range remained unchanged through the 1983/1984 season. The range was revised for the 1984/1985 season to 200,000 to 1,000,000 lbs. This was further revised for the 1986/1987 season to ceiling of 1,000,000 lbs and has remained unchanged since. The last revision reduced the lower end of the GHR to zero lbs and provided for closures if stock conditions did not support any harvest.

GEAR RESTRICTIONS

There were no gear restrictions during the 1973/1974 season. Between the 1974/1975 and 1976/1977 seasons, pots, ring nets, and shrimp trawls were legal. In 1976/1977, a pot limit was imposed for waters within Yakutat Bay. Only 60 pots could be used for king and Tanner crabs within the bay when both seasons overlapped. During the closed season for Tanner crab, only 100 pots could be used for king crabs. Starting in 1977/1978, gear was limited to either pots or ring nets and the pot limit in Yakutat Bay was changed to allow 100 pots for both Tanner and king crab fisheries. Tanner pots had to have a tunnel eye opening with a maximum height of 5 inches and a tunnel eye perimeter of greater than 30 inches. This distinguished Tanner pots from Dungeness pots. Buoy stickers for fishing in Yakutat Bay were required. In 1980/1981, the 100-pot restriction area was expanded to an area in Yakutat Bay east of a line from Cape Sitkagi to Ocean Cape, essentially including all productive waters within Yakutat Bay. Side-loading pots were prohibited from the entire registration area for the 1982/1983 season to reduce halibut bycatch. Consequently, some vessels that had been using side-loading king crab pots with Tanner boards were discouraged from entering the fishery. Two, 4¾-inch diameter escape rings were required for each pot during the 1984/1985 season. Starting in 1985/1986, gear storage was restricted to a period of seven days after the season closure. Escape rings were repealed for the

1988/1989 fishery. Ring nets were prohibited starting with the 1991/1992 fishery, as a consequence of board action restricting their use in the state to Southeast Alaska.

OTHER RESTRICTIONS

Starting in 1979/1980, formal hold inspections and certifications were repealed. Starting in 1985/1986, preseason prospecting during a period 14 days before the season opening was prohibited and vessels were required to be at a processing plant within 24 hours after the closure of the season.

STOCK ASSESSMENT

There have never been stock assessment surveys for the Yakutat Tanner crab stock and dockside sampling effort has been extremely limited. The fishery was re-opened for a 14-day fishing period within the waters of Yakutat Bay and 30-day period elsewhere during the 2003/2004 season. Although participation was very limited, there was no evidence of stock recovery.

RECENT SEASONS

The Yakutat Tanner fishery has been closed since the 1999/2000 season. The only sources of information on current status of this stock are the ADF&G Sport Fish Division Statewide personal use and sport harvest survey, bycatch of juvenile Tanner crab from the Yakutat scallop observer program, and anecdotal information from crabbers passing by Yakutat who set personal use pots. None of these sources indicate that the stock has begun to recover. The department does not intend to open the commercial Tanner crab fishery in the Yakutat Area until stock status improves.

CHAPTER 3—TABLES AND FIGURES

Table 3.1.–Commercial Tanner crab catches in pounds, number of vessels, pounds per permit, number of landings and pounds per landing in Registration Area D, 1972/73 season to present.

Year/Season	Number			Pounds per permit	Average weight
	Permits	crabs	Pounds		
1972/73	7	74,636	222,441	31,777	3.0
1973/74	11	934,100	1,872,357	170,214	2.0
1974/75	13	876,889	1,972,752	151,750	2.2
1975/76	5	861,569	1,762,589	352,518	2.0
1976/77	7	433,994	966,650	138,093	2.2
1977/78	8	437,542	1,003,116	125,390	2.3
1978/79	15	753,248	1,691,941	112,796	2.2
1979/80	23	1,089,820	2,435,123	105,875	2.2
1980/81	14	289,880	642,608	45,901	2.2
1981/82	7	32,521	71,302	10,186	2.2
1982/83	10	72,784	151,621	15,162	2.1
1983/84	4	4,958	11,142	2,786	2.2
1984/85	5	1,728	3,665	733	2.1
1985/86	5	1,185	2,379	476	2.0
1986/87	3	23,575	48,877	16,292	2.1
1987/88	2	[a]	[a]	[a]	
1988/89	5	73,179	155,528	31,106	2.1
1989/90	5	35,135	76,816	15,363	2.2
1990/91	7	19,260	41,749	5,964	2.2
1991/92	4	18,493	39,495	9,874	2.1
1992/93	5	53,167	116,718	23,344	2.2
1993/94	11	154,921	364,365	33,124	2.4
1994/95	14	45,749	107,010	7,644	2.3
1995/96	7	12,352	27,828	3,975	2.3
1996/97	8	7,686	16,733	2,092	2.2
1997/98	4	4,330	9,559	2,390	2.2
1998/99	5	3,742	8,528	1,706	2.3
1999/00	1	[a]	[a]	[a]	
2000–2003			Season Closed		
2003/04			[a] [a]	[a]	
2004–2011			Season Closed		

[a] Fewer than 3 permits were fished; information is confidential.

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Table 3.2.–Commercial Tanner crab catch in pounds by month and season in Registration Area D, 1972/73 to present.

Season	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
1972/73		[a]	[a]					[a]	122,912	[a]		17,224	222,441
1973/74					[a]	[a]	313,787	990,247	558,047				1,872,357
1974/75					[a]	[a]	592,145	839,397	481,855				1,972,752
1975/76				[a]	[a]	[a]	661,843	456,738	[a]				1,762,589
1976/77					[a]	[a]	486,130	[a]					966,650
1977/78		[a]	14,537	31,555	161,674	206,022	254,174	279,030	53,124				1,003,116
1978/79	[a]	[a]		[a]	63,661	185,056	412,844	766,267	238,068				1,691,941
1979/80		10,242	16,442	27,877	56,929	524,077	1,220,869	572,219	[a]				2,435,123
1980/81				[a]	6,157	181,891	392,739	60,836					642,608
1981/82							16,390	47,076	7,836				71,302
1982/83						50,187	73,934	27,500					151,621
1983/84						[a]	5,848	3,580					11,142
1984/85								3,665					3,665
1985/86					[a]	[a]	1,117	[a]					2,379
1986/87						[a]	48,151	[a]					48,877
1987/88						[a]	[a]	[a]	[a]				[a]
1988/89					[a]	[a]	70,291	36,772	47,102				155,528
1989/90					[a]	29,204	37,493	7,369					76,816
1990/91					[a]	8,663	14,109	15,887			[a]		41,749
1991/92				[a]	18,882	14,237	5,803						39,495
1992/93						[a]	81,964	31,574	[a]				116,718
1993/94					7,604	207,315	109,399	30,966	9,081				364,365
1994/95					54,039	35,653	7,336	7,405	2,577				107,010
1995/96					12,958	6,693	4,283	3,894					27,828
1996/97					2,325	4,735	1,877	4,503	[a]				16,733
1997/98					[a]	4,481	2,153	[a]	[a]				9,559
1998/99					1,080	[a]	[a]	2,708					8,528
1999/00					[a]								[a]
2000-2011	Season Closed / No Harvest												

[a] Fewer than 3 permits were fished; information is confidential.

Table 3.3.–Commercial Tanner crab, catch in thousands of pounds by district and season in Registration Area D, 1972/73 season to present.

Season	District						
	181	**182**	**183**	**185**	**189**	**191**	**Total**
1972/73	120,230		102,211				222,441
1973/74	963,274	[a]	292,603		615,959		1,872,357
1974/75	1,329,936		[a]		[a]	428,043	1,972,752
1975/76	1,448,504		[a]		[a]	[a]	1,762,589
1976/77	513,935		452,715				966,650
1977/78			1,003,116				1,003,116
1978/79	718,047		404,571	[a]		544,013	1,691,941
1979/80	1,330,149		153,995		112,794	838,185	2,435,123
1980/81	163,965		150,992		65,372	262,279	642,608
1981/82			51,201			[a]	71,302
1982/83	8,399		83,821		[a]	[a]	151,621
1983/84			11,142				11,142
1984/85			3,665				3,665
1985/86			2,379				2,379
1986/87	[a]		[a]				48,877
1987/88			[a]			[a]	[a]
1988/89	[a]		7,878		[a]	[a]	155,528
1989/90	27,915		[a]			[a]	76,816
1990/91	16,193		25,556				41,749
1991/92	[a]		13,972				39,495
1992/93	[a]		53,318				116,718
1993/94	320,574		28,573		15,218		364,365
1994/95	77,436		29,574				107,010
1995/96	10,181		17,647				27,828
1996/97	[a]		11,866				16,733
1997/98			9,559				9,559
1998/99			8,528				8,528
1999/00			[a]				[a]
2000-2011	Season Closed / No Harvest						

[a] Fewer than 3 permits were fished; information is confidential.

Table 3.4–Tanner crab size frequency and shell condition in Yakutat Area D, 1974/75 to present. Data collected during dockside sampling.

Season	Number of sampled		Carapace width (mm)		Recruitment	
	Boats	Crab	Average	Range	% Recruits[a]	%Postrecruits[b]
1974/75	3	516	141.4	110–174	87.3	12.7
1975/76	11	1,079	140.7	96–179	39.3	60.7
1976/77[c]	0	0				
1977/78	9		145.1	122–171	65.0	35.0
1978/79	15	1,616	147.8	128–172	57.3	42.7
1979/80	22	2,509	147.3	131–174	22.5	77.5
1980/81	22	2,505	147.3	107–172	2.7	97.3
1981/82	1	99	146.6	137–165	75.0	25.0
1982/83	17	1,894	145.9	131–173	81.9	18.1
1983/84	1	100	149.9	139–170	44.9	55.1
1984/85	0	0				
1985/86	0	0				
1986/87	4	520	144.0	130–166	14.3	85.7
1987/88	2	548	145.4	136–169	59.2	40.8
1988/89	6	611	148.4	135–177	35.8	64.2
1989/90	5	779	147.0	137–174	4.1	95.9
1990/91	0	0				
1991/92	4	0	148.5	137–178	8.7	91.3
1992/93	0					
1993/94	4	654	147.0	436–171	71.1	28.9
1994/95	0	0				
1995/96	0	0				
1996/97	0	0				
1997/98	0	0				
1998/99	0	0				
1999/00	2	206	147.7	139–175	88.3	11.7
2000-2011	Season Closed / No Harvest					

[a] Recruits = all new and soft shell crab >140 mm and <164 mm carapace width.

[b] Postrecruits = all new and soft shell crab >165 mm and old and very old crab >140 mm carapace width.

[c] The first season that the regulatory legal size was 5 1/2-inches (140 mm) carapace width.

Table 3.5.–Summary of commercial Tanner crab CPUE and average weight in Yakutat Area D, 1975/76 to present. Data collected during dockside sampling and interviews.

Season	Number of			Average catch/pot	Range of catch/pot	Weight (lb)		Estimated no. of crab caught[a]	Percent of catch sampled[b]
	Boats interviewed	Pots lifted	Crab captured			Average	Range		
1975/76	11					1.9	1.7–2.1	947,628	0.1
1976/77[c]	2					2.1	2.0–2.2	460,310	
1977/78	4					2.2	2.0–2.5	451,854	0.5
1978/79	7	3,810	160,164	34.1	20.1–48.6	2.3	2.3–2.4	729,285	0.2
1979/80	21	8,802	322,624	40.9	7.7–79.0	2.3	2.1–2.4	1,082,277	0.2
1980/81	12	3,688	51,765	17.8	10.2–27.1	2.3	2.1–2.7	280,615	0.9
1981/82	0								
1982/83	16					2.1	1.9–2.2	72,895	2.6
1983/84	0								
1984/85	1					2.4		1,521	
1985/86	0								
1986/87	3	1,460	18.629	15.5	10.0–19.8				
1987/88	2	840	17,850	23.3	18.6–28.0	2.1			
1988/89	5	705	12,429	9.8	1.4–38.1	2.1		74,061	0.8
1989/90	4	142	1,621	11.3	7.9–16.3	2.2	2.1–2.3	35,076	2.2
1990/91	0								
1991/92	5	597	8,335	7.6	1.2–16.6	2.3		16,168	3.5
1992-1999	No information								
1999/00	2	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]
2000-2011	Season Closed / No Harvest								

[a] Calculated by dividing fish ticket weight data by dockside sampling average weight per crab data.

[b] Calculated by dividing number of crab sampled for size frequency by estimated number of crab catch.

[c] The first season that the regulatory legal size was 5 1/2-inches (140 mm) carapace width.

[d] Fewer than 3 permits were fished; information is confidential.

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 1999. Preliminary report to the Alaska Board of Fisheries. Collapsed or recovering shellfish fisheries in the State of Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J02-06, Juneau.

Bednarski, J., G. Bishop, and C. Siddon. 2008. Tanner crab pot survey methods for Southeast Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J08-02, Juneau.

Brethes, J. C., and F. Coulombe. 1989. Oriented movements of tagged male snow crabs (*Chionoecetes opilio O. Fabr.*) off the north shore of the Gulf of St. Lawrence. Pages 193–206 [*In*] Proceedings of the International Symposium on King and Tanner Crabs, AK-SG-90-04. Alaska Sea Grant College Program, Anchorage.

Clark, J. E. 2008. Restratification of the red king crab stock assessment survey in Southeast Alaska. Alaska Department of Fish and Game, Fisheries Data Series No. 08-54, Juneau.

Clark, J. E., K. K. Imamura, and T. M. Koeneman. 2001. The 1997 and 1998 Southeast Alaska Tanner crab stock assessment surveys. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J01-06, Juneau.

Clark, J. E., T. Koeneman, C. A. Botelho, S. Merkouris, and D. Woodby. 2003. Estimation of red king crab (*Paralithodes camtschaticus*) abundance and available harvest in Southeast Alaska for the 2001/2002 season using a pot survey. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J03-25, Juneau.

Conan, G. Y., M. Starr, M. Comeau, J. Therriault, -C, F. X. M. Hernandez, and G. Robichaud. 1995. Life history strategies, recruitment fluctuations, and management of the Bonne Bay fjord Alantic snow crab (*Chionoecetes opilio*). Pages 59–97 [*In*] High latitude crabs: Biology, Management, and Economics, AK-SG-96-02. University of Alaska Sea Grant College Program, Anchorage.

Donaldson, W. E. 1985. Movements of tagged males of Tanner crab *Chionoecetes bairdi* Rathbun off Kodiak Island, Alaska. Journal of Shellfish Research 3(2):195–201.

Donaldson, W. E., R. T. Cooney, and J. R. Hilsinger. 1981. Growth, age and size at maturity of Tanner crab, *Chionoecetes bairdi* M.J. Rathbun, in the Northern Gulf of Alaska (Decapoda, Brachyura). Crustaceana 40(3):286–302.

Eaton, W. D., D. C. Love, C. A. Botelho, T. R. Meyers, K. K. Imamura, and T. M. Koeneman. 1991. Preliminary results on the seasonality and life cycle of the parasitic dinoflagellate causing bitter crab disease in Alaskan Tanner crabs (*Chionoecetes bairdi*). Journal of Invertebrate Pathology 57:426–434.

Love, D. C. 1991. Bitter crab disease studies: Observations on seasonality, mortality, species susceptibility and life history. Masters thesis. University of Alaska Fairbanks.

Love, D. C., S. D. Rice, D. A. Moles, and W. D. Eaton. 1993. Seasonal prevalence and intensity of bitter crab dinoflagellate infection and host mortality in Alaskan Tanner crabs *Chionoecetes bairdi* from Auke Bay, Alaska. Diseases of Aquatic Organisms 15:1–7.

Meyers, T. M., C. A. Botelho, T. M. Koeneman, S. Short, and K. K. Imamura. 1990. Distribution of bitter crab dinoflagellate syndrome in Southeast Alaskan Tanner crabs, *Chionoecetes bairdi.* Diseases of Aquatic Organisms 9:37–43.

Meyers, T. R. 1993. Bitter crab syndrome in Alaskan Tanner crabs: Importance and management considerations. Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement and Development (FRED) Division, Report to the Board of Fisheries, Juneau.

Meyers, T. R., B. Eaton, S. Short, C. Botelho, T. M. Koeneman, A. Sparks, and F. Morado. 1989. Bitter crab dinoflagellate disease: Overview of the causative agent and its importance and distribution in the Alaskan Tanner crab (*Chionoecetes bairdi*, *C. opilio*) fisheries. Pages 405–406 [*In*] Proceedings of the International Symposium on King and Tanner Crabs, Alaska Sea Grant College Program Report No. 90-04.

Paul, A. J. 1992. A review of size at maturity in male Tanner (*Chionoecetes bairdi*) and king (*Paralithodes camtschaticus*) crabs and the methods used to determine maturity. American Zoologist 32(3):534-540.

REFERENCES CITED (Continued)

Rondeau, A., and B. Sainte-Marie. 2001. Variable mate-guarding time and sperm allocation by male snow crabs (*Chionoecetes opilio*) in response to sexual competition, their impact on the mating success of females. Biological Bulletin 201:204–217.

Sainte-Marie, B., J. M. Sevigny, and M. Carpentier. 2002. Interannual variability of sperm reserves and fecundity of primiparous females of the snow crab (*Chionoecetes opilio*) in relation to sex ratio. Canadian Journal of Fisheries and Aquatic Sciences 59 (12):1932–1940.

Siddon, C., J. Bednarski, and G. H. Bishop. 2009. Southeast Alaska Tanner crab 2006 stock assessment and recommendations for the 2007 commercial fishery. Alaska Department of Fish and Game, Fishery Data Series 09-18, Juneau.

Stevens, B. G., J. A. Haaga, and W. E. Donaldson. 1994. Aggregative mating of Tanner crabs, *Chionoecetes bairdi*. Canadian Journal of Fisheries and Aquatic Sciences 51(6):1273–1280.

Stone, R. P. 1999. Mass molting of Tanner crabs *Chionoecetes bairdi* in a Southeast Alaska estuary. Alaska Fishery Research Bulletin 6(1):19–28.

Stone, R. P., M. M. Masuda, and J. E. Clark. 2003. Growth of male Tanner crabs *Chionoecetes bairdi* in a Southeast Alaska estuary. Alaska Fishery Research Bulletin 10(2):137-148.

Taggart, S. J., J. M. Mondragon, A. G. Andrews, and J. K. Nielsen. 2008. Spatial patterns and movements of red king and Tanner crabs: Implications for the design of marine protected areas. Marine Ecology Progress Series 365:151–163.

Tamone, S. L., S. J. Taggart, A. G. Andrews, J. Mondragon, and J. K. Nielsen. 2007. The relationship between circulating ecdysteroids and chela allometry in male Tanner crabs: Evidence for a terminal molt in the genus *Chionoecetes*. Journal of Crustacean Biology 27(4):635–642.

Taylor, D. M. 1992. Long-term observations on movements of tagged male snow crabs in Bonavista Bay, Newfoundland. North American Journal of Fisheries Management 12:777–782.

Zheng, J., J. M. Rumble, and G. H. Bishop. 2006. Estimating Southeast Alaska Tanner crab abundance using pot survey and commercial catch data. Alaska Fisheries Research Bulletin 12(2):196–211.