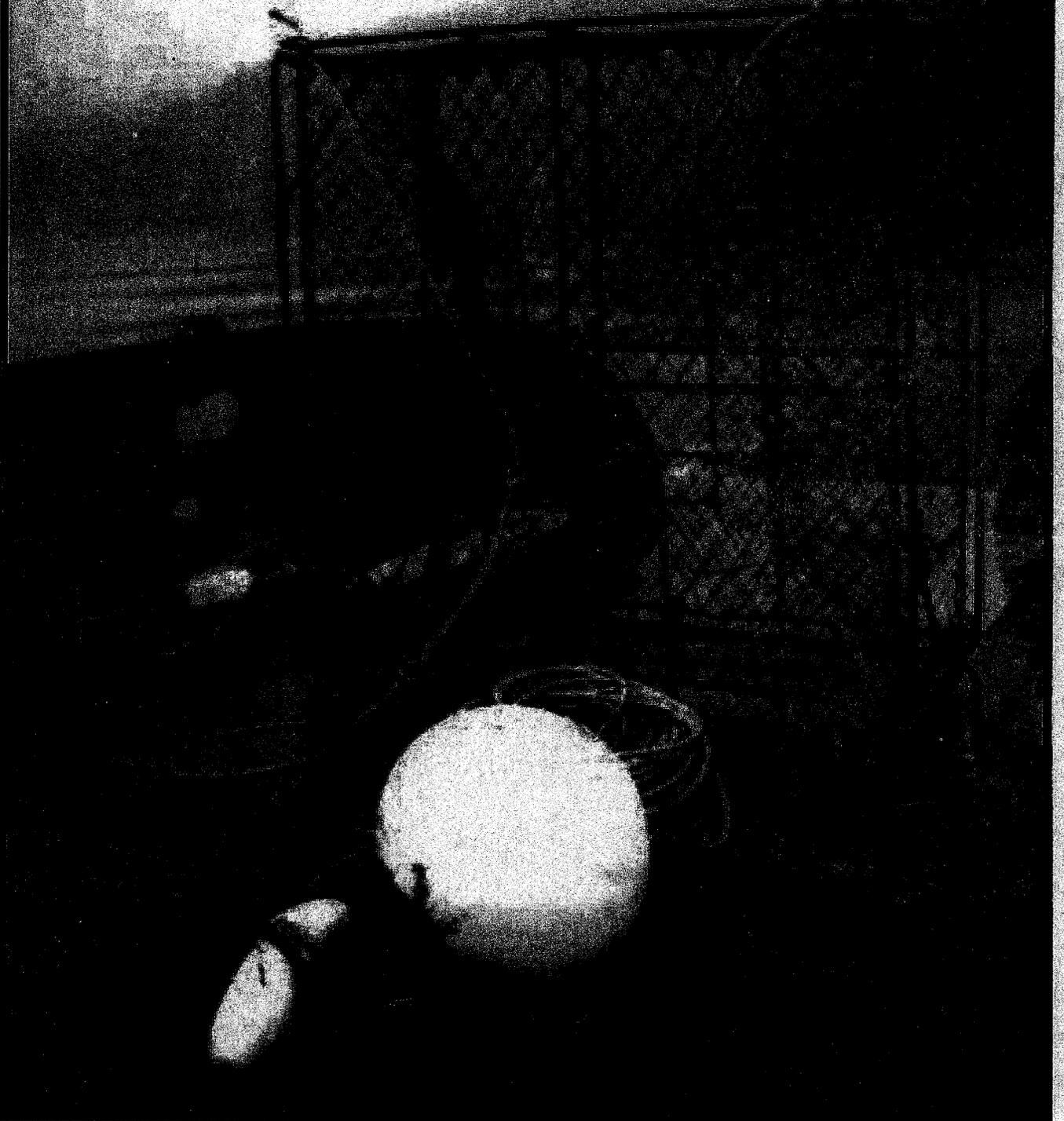


**KING & TANNER CRAB FISHERIES, 1999
REPORT TO THE BOARD OF FISHERIES
REGION I
SOUTHEAST & YAKUTAT**



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Section 1

Introduction to Shellfish Fisheries

REPORT TO THE BOARD OF FISHERIES, 1999

INTRODUCTION TO SHELLFISH FISHERIES



By

Doug Woodby

Regional Information Report¹ No. 1J99-07

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

February 1999

¹ The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data. This information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

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INTRODUCTION

This report reviews the commercial fisheries for shellfish in Region 1, which consists of Southeast Alaska (Registration Area A) and Yakutat (Registration Area D). 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). 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; however, a few fisheries with state management authority, such as weathervane scallops, extend into the Exclusive Economic Zone (EEZ). Data for shrimp, scallops, and miscellaneous fisheries are summarized in this introduction for comparative purposes, but are not described in later chapters.

Regional shellfish harvests in the 1997/98 season totaled nearly 9 million pounds valued at over \$21 million during the last completed season or year (Table 1.1). The highest value fisheries as well as poundages come from the Southeast Alaska portion of Region 1. The top three fisheries in terms of value continue to be (ranked in order) Dungeness crab, Tanner crab and pot shrimp. King crab and sea cucumbers are fourth and fifth most valuable. In terms of poundage, sea urchins ranked first, followed by Dungeness crab, beam trawl shrimp, Tanner crab and sea cucumbers.

Most of the shellfish fisheries are fully developed. Some stocks have been able to sustain consistent and significant harvests, including fisheries for Dungeness crab, Tanner crab, and trawl shrimp. The red king crab fishery reopened in 1993 after eight years of closure and has provided five years of harvests somewhat above the regulatory threshold of 300,000 pounds the fishery was aloud in 1998 due to low stock strength in a few harvest areas.

Limited entry has played a significant role in harvest and effort trends. Recently limited fisheries include Southeast Dungeness crab and pot shrimp. A limited entry program is currently under consideration for the Southeast trawl shrimp fishery.

Shellfish Research and Management

The ability of the department to provide for large and sustained yields varies among the fisheries. Those fisheries with stock assessment programs and management plans are most adequately managed. Of the regional shellfish fishery only red king crab fits in that category. Others lack management plans and stock surveys and are cause for concern. These include fisheries for Dungeness crab and beam trawl shrimp. In between are fisheries having management plans, such as scallops (formal plan), or fisheries having no formal plans but having newly developing assessment programs such as Tanner crab and pot shrimp.

Shellfish surveys include an annual red king crab pot survey in northern Southeast Alaska, pilot surveys for pot shrimp and Tanner crab, and annual sea cucumber and urchin dive surveys mostly in southern Southeast and the Sitka area. A pilot survey for Dungeness crab shell condition was conducted in May of 1996 and 1997. Prior surveys include a trawl survey to estimate stock abundance and size class composition of the Yakutat Bay pink and sidestripe shrimp, which was conducted on seven occasions, last in 1984.

Dockside sampling and skipper interviews are conducted for the crab and trawl shrimp fisheries to gather a consistent time-series of data on size frequency, shell condition, average weight, sex (shrimp only), fishing location, effort levels, and estimates of average harvest per unit of effort (CPUE). These data provide the only biological information for those fisheries lacking stock surveys, which includes Dungeness crab, brown king crab, Tanner crab, shrimp, and scallops. The collected information allows some assessment of relative strength of various portions of the commercially exploited populations, and a qualitative estimate of stock condition. Harvest and effort data is also collected through the fish ticket system.

Logbook information is collected from red king crab, Tanner crab, and sea cucumber fisheries and shrimp trawl fisheries in non-traditional areas. This information is particularly valuable for management of the crab fisheries.

Staff

The management and research programs for crab, trawl shrimp, scallop, octopus, and littleneck clams are the responsibility of the shellfish staff (non-dive fisheries) with occasional participation by area management staff. The program is supervised by Doug Woodby, regional marine fisheries research supervisor, also in Douglas.

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

Season or Year	Fishery	Harvest in Thousands of lb	Approximate Exvessel Value in Thousands of \$\$ ^{a/}
<u>Southeast</u>			
1997/98	Dungeness Crab	4,062.4	9,343.6
1997/98	Pot Shrimp	837.8	2,731.2
1997/98	Beam Trawl Shrimp	3,051.2	776.1
1997/98	Otter Trawl Shrimp	66.4	39.3
1998	Octopus	0.8	0.8
1997/98	Red and Blue King Crab	310.1	1,088.5
1997/98	Tanner Crab (<i>bairdi</i>)	2,701.2	5,267.3
1997/98	Golden King Crab	237.1	865.5
	SUBTOTAL	8,219.1	20,112.3
<u>Yakutat</u>			
1997/98	Dungeness Crab	156.1	359.0
1997/98	Pot Shrimp	9.5	28.5
1997/98	Red and Blue King Crab	4.2	21.8
1997/98	Tanner Crab	9.1	16.6
1998 ^{b/}	Scallops	275.4	1,101.6
		454.3	1,527.5
GRAND TOTAL		8,673.4	21,639.8

^{a/} This column is calculated from the average price per lb of all tickets having values indicated on them.

^{b/} District 16 is included in Statistical Area D for this fishery only.

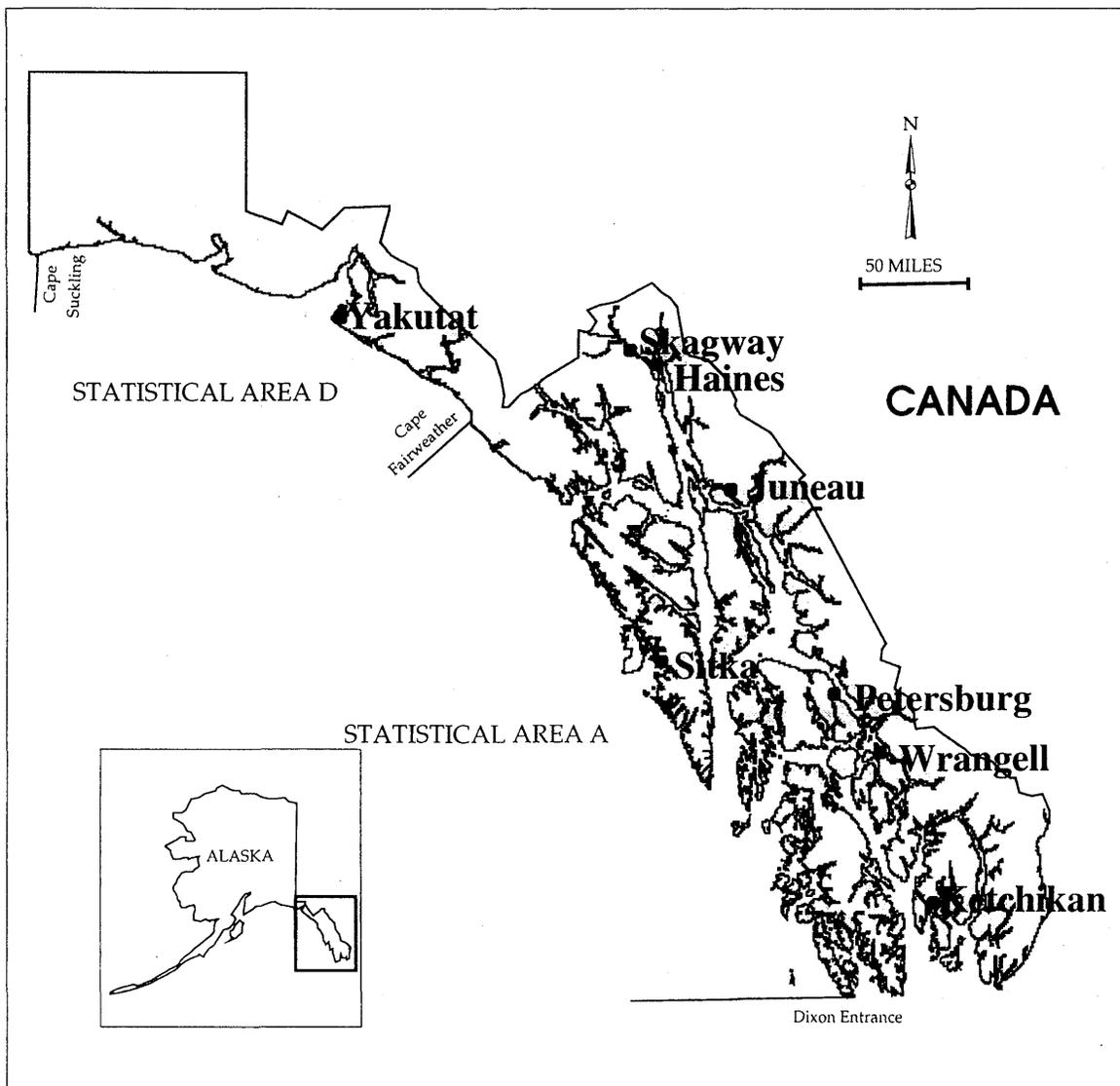


Figure 1.1. Registration Area A (Dixon Entrance to Cape Fairweather) and Registration Area D. (Cape Fairweather to Cape Suckling).

Section 2

Southeast Alaska Red and Blue King Crab Fisheries

REPORT TO THE BOARD OF FISHERIES, 1999

SOUTHEAST ALASKA

RED AND BLUE KING CRAB FISHERIES



By

Timothy Koeneman
and
Catherine A. Botelho

Regional Information Report¹ No. 1J99-07

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

February 1999

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INTRODUCTION

This report presents an overview of the commercial red king crab fishery in Southeast Alaska (Registration Area A) with emphasis on the last two fishing seasons, 1997/98 and 1998/99. Information is presented on historical catch and effort, regulation development, research results, and stock assessment data.

Red king crab *Paralithodes camtschatica* are harvested primarily in the protected bays, inlets, and adjacent shorelines of straits and sounds of the waters of northern Southeast Alaska; few red king crab are harvested from the southern portion of Southeast Alaska. Red king crab generally inhabit depths of less than 150 fathoms. Important red king crab fishing grounds are located in bays opening into Frederick Sound, Stephens Passage, Seymour Canal, Icy Strait, and Peril Strait. Small quantities of blue king crab *P. platypus* are harvested incidentally during the red king crab fishery and during concurrent golden king crab *Lithodes aequispina* and Tanner crab *Chionoecetes bairdi* fisheries.

Commercial vessels participating in the red king crab fishery are primarily salmon tenders, salmon purse seine vessels, and larger drift gillnet boats. Fishing gear has gradually evolved to include side-loading king crab pots (7' x 7' x 30") and top-loading pyramid or conical-style pots with 5' to 8' bases.

Management of the commercial red king crab fishery is based on a conservative management plan and policies that have been reviewed and approved by the Board of Fisheries (Board). Primary elements of the plan are:

1. seasons that avoid fishing during sensitive life history stages and when stocks congregate in shallow water during molting and mating;
2. harvest of only male crab with a minimum legal carapace width of seven inches;
3. limits of 20 to 50 pots per vessel depending on stock abundance; and
4. guideline harvest levels (GHL) based on conservative harvest rates and stock assessment survey results.

FISHERY DEVELOPMENT AND HISTORY

Commercial Fishery History

Commercial king crab fishing in Southeast Alaska waters was initially documented in 1960 when a small harvest occurred in the Petersburg-Wrangell Management Area. From 1961 through 1968, catches averaged less than 800,000 pounds per year with an average of nine permit holders participating (Table 2.1). The peak catch of 2,199,772 pounds was taken by 19 permit holders in 1968. In 1969, effort increased to 39 permit holders but the resulting catch declined to 1,899,930 pounds. These high catches were due to liberal gear and season regulations, a smaller minimum legal size (6.5 inches), catches that included a combination of red, golden, and blue king crab, and the lack of reasonable guideline harvest levels (GHL) or quotas.

In 1970 the department began collecting information on the species composition of the commercial king crab catch in Southeast Alaska through the dockside sampling and skipper interview programs. From 1970/71 through the 1975/76 seasons, catches averaged 435,609 pounds of red king crab and effort averaged 23 permit holders (Table 2.1). The first emergency order closure occurred in January 1971 when the catch for the 1970/71 fishing season totaled only 221,369 pounds after 4.5 months of fishing by 20 permit holders. The minimum legal size was subsequently increased to seven inches in carapace width during the 1971 Board meeting.

Accurate species composition information was required on fish tickets beginning in January 1976. From the 1976/77 through the 1984/85 fishing seasons, an average of 52 permit holders caught an average of 407,387 pounds of red king crab. The average ex-vessel value of the red king crab catch during this period was approximately \$1.0 million (adjusted to 1990 CPI). The peak catch of 657,917 pounds was taken by 38 permit holders during the 1979/80 season. Fishing effort peaked during the 1983/84 season when 97 permit holders caught only 280,681 pounds of red king crab (Table 2.1). During the 1984/85 season, 95 permit holders caught 270,495 pounds during a seven-day fishery in October. The commercial fishery was then closed for eight consecutive fishing seasons (1985/86 through 1992/93) when department survey results indicated low stock abundance. The fishery was reopened for the 1993/94 season after department survey data indicated red king crab stocks had rebuilt to levels sufficient to support a commercial harvest above the minimum threshold of 300,000 pounds. The fishery continued during the next four seasons, with an average catch of 310,534 pounds by about 79 permit holders. Exvessel value of recent seasonal catches averaged approximately \$1.40 million.

Stock Assessment Surveys

The department has conducted a survey of red king crab abundance in Southeast Alaska since 1979. The survey provides an index of crab abundance in terms of crabs per pot per day. The survey is conducted in districts 10 through 15 in areas where the majority of the red king crab catch occurs (Table 2.2). Crab

abundance is estimated with a population model, which uses time series of survey catch rate and catch data (commercial and personal use). This model, in use since 1993, provides estimates of abundance of legal crabs since 1979 for each district.

The trend in all districts has been a decline in abundance of legal males from peaks in the late 1970s and early 1980s to a low extending from 1985 to 1990. Abundance then increased in the early 1990s to levels which were considered adequate to support a sustainable fishery from 1993/94 through 1997/98. Declines in the abundance of legal crabs in Pybus Bay, Gambier Bay, and Peril Straits over the past two years resulted in an allowable harvest below the minimum threshold level for the 1998/99 fishing season; hence the fishery was closed.

Experimental Fishing

In 1976 the department received funds to survey portions of Southeast Alaska that were not normally fished by the commercial fleet. The purpose was to find additional stocks to help support the commercial fishery. Three commercial fishers were contracted to fish for 10 days each in Districts 3 and 4 during February and March. February and March were selected because of the propensity for crab stocks to congregate in bay areas during egg-hatch, molting, and mating in the late winter and spring months. While some small isolated stocks of red king crab were identified, the numbers of legal crab available were very few and insufficient to support a commercial fishery. Catch rates were less than 0.01 legal crab per pot.

During the winter 1988 meeting, the Board of Fisheries provided regulations allowing for experimental fishing in non-traditional areas by commercial king crab permit holders. These regulations required mandatory logbook completion. This experimental fishing effort was an attempt to find new and significant stocks to reach the minimum GHLL and reopen the commercial fishery. During the 1988/89 and 1989/90 seasons, the department issued experimental permits to 19 permit holders who fished at various times from July through January. Of the 19 permits issued, 7 resulted in landings. The total number of pounds landed was 2,061. Thirty-six subdistricts were fished, with catches reported from ten subdistricts. After two seasons of exploratory fishing, it was obvious that interest in these fisheries was low, catches were poor, and no major unexploited populations of either species had been found. Also, flagrant abuses of permit conditions and violations of regulations had occurred. As a result, the Board decided during its winter meeting in 1990 to revoke the regulations that provided for these fisheries.

Dockside Sampling and Logbook Program

Carapace length and shell condition data have been collected by department personnel from landings at ports throughout the region since the late 1960s. Resulting data are used to estimate recruitment trends and relative contribution from various size-classes of crab to the total stock. Staff members began collecting average weight data from landings in 1975. Average weight data provides additional insight into stock dynamics. Skipper interviews began in 1985 to provide an estimate of catch per unit of effort (CPUE) that could be used to estimate stock abundance. Beginning with the 1993/94 fishing season, a mandatory

logbook program was established to obtain detailed CPUE information from the entire fleet. This information is used to gauge fleet efficiency and to estimate the appropriate length of subsequent fishing seasons.

REGULATION DEVELOPMENT

Fishing Seasons

From 1961 through 1968 there was no closed season for the commercial king crab fishery. Prior to the 1969/70 fishing season, a closed season was established from March 16 through August 14. A fishing season of September 1 through January 31 was established in 1971 to provide a closure during the molting and mating season, during a portion of the aggregation period prior to the molting and mating season, and during the major growth period when meat recovery rates are low. The current season extends from November 1 through January 24. Since 1979, actual open fishing periods have been set based on estimates of population size and predicted fishing effort necessary to achieve the GHL. During the past two open seasons, fishing periods have been limited to fewer than seventeen days.

Sex and Size Limits

From its inception, the king crab fishery has been restricted to harvesting only male crab in order to protect the reproductively important female crab. From 1961 through 1968, a minimum legal size of 6.5 inches in carapace width was in place. The minimum legal carapace width was increased to 7 inches in 1969 following apparent stock declines. This size limit was based on growth and size at maturity information collected from Gulf of Alaska red king crab stocks and the size frequency distribution of Southeast Alaska stocks. The larger minimum size limit was implemented to increase reproductive potential by providing additional protection to mature male crab for approximately two seasons prior to recruitment.

A regulation was adopted in 1990 allowing the harvest of any king crab infected with the parasitic barnacle *Briarosaccus callosus*, regardless of the sex or size of the crab. Crab infected with this parasite are incapable of reproduction and experience reduced growth. Removal of infected crab may improve stock reproduction and growth.

Quotas and Guideline Harvest Ranges

A quota of 1.5 million pounds was provided for king crab (all species combined) in 1970. Separate red and golden king crab fisheries were recognized with the adoption of distinct seasons and quotas in 1971. From 1971 through the 1978/79 season, the red king crab quotas or guideline harvest levels (GHL) were based upon historic catch and limited size distribution information. The first red king crab quota was set in 1971 at 400,000 pounds per season. This was increased to 600,000 pounds in 1974, then reduced to 400,000 pounds in 1977.

Quotas were replaced by guideline harvest ranges (GHR) after 1977. The first GHR of 200,000 to 400,000 pounds was established in 1978. The GHR was increased to 300,000 to 600,000 pounds in 1979 based on industry recommendations. Since the 1980/81 season, allowable catches, expressed as either GHLs or GHRs, have been based on results from the red king crab index of abundance survey. The available harvest surplus is currently computed using a harvest rate approach. Current regulations specify that a minimum of 300,000 pounds of surplus legal sized crab must be available before the commercial fishery will be opened.

Fishing Gear

There were no restrictions on the amount or type of gear that could be fished by a vessel participating in the king crab fishery from 1961 through 1967. A limit of 40 pots per vessel was established for Southeast Alaska waters in 1968. The maximum number of pots per vessel was increased to 60 in 1974 and to 100 in 1978. This limit continued through the 1987/88 season. In 1988, the Board required a 40 pot limit per vessel for GHL's between 300,000 and 400,000 pounds and a 100 pot limit for GHL's above 400,000 pounds. Based on information provided by the department, the Board reduced the 40 pot limit to 20 pots in 1993. Current regulations provide for 20 to 50 pots per vessel based on a "sliding scale" system, which depends upon the allowable surplus harvest or GHL.

There is no minimum mesh size requirement for king crab pots. Regulations require degradable twine or a timed galvanic release device in case the pot is lost. Tunnel height on standard side loading pots must be a minimum of eight inches in the vertical dimension. There are restrictions on pot storage before and after fishing seasons and each pot must be independently buoyed and marked. Ring nets were eliminated as legal gear for king crab in 1990. Marking requirements for pot buoys include sequentially numbered stickers which are purchased from the department.

Management Plan

At the 1993 statewide shellfish meeting, the Board adopted a comprehensive management plan for red king crab in Southeast Alaska. This management plan was designed to be consistent with the Board's policy on "King and Tanner Crab Resource Management." Major elements of the plan include:

1. provisions to maintain an adequate abundance of various size classes of males and females necessary to provide for sustained harvests and stock conservation;
2. application of a harvest rate based on both legal males and mature males;
3. a guideline harvest level based on stock conditions for each fishing district;
4. a minimum harvest threshold of legal males;
5. conduct of an orderly fishery; and
6. conservative management when information is lacking.

Additional elements used to manage the fishery are included in regulations concerning allocation between commercial and personal use fishers in Section 11-A, lawful gear, and closed waters.

Limited Entry

A limited entry program was established for the king and Tanner crab pot fisheries in Southeast Alaska by the Commercial Fisheries Entry Commission (CFEC) in January, 1984. The CFEC adopted a maximum effort level of 61 permits for the red king crab fishery. Currently there are 96 permits eligible to participate in the red king crab fishery. Some of these permits may not be eligible to fish after the adjudication process is completed.

1997/98 SEASON SYNOPSIS

Red King Crab Survey Results

A stock assessment survey in June and July 1997 indicated the overall abundance and relative health of red king crab stocks were adequate to allow a commercial fishery. The allowable surplus harvest, or GHL, was estimated at 322,000 pounds and represented a harvest rate of 0.27 of legal crab. Generally, crab stocks in bay areas bordering Icy Strait, Lynn Canal, and upper Stephens Passage were in better condition than those bays opening into Frederick Sound, Lower Stephens Passage, and Peril Strait.

Declines in abundance of legal and mature male red king crab appear to have occurred over a two to three-year period in bays opening into Frederick Sound, lower Stephens Passage, and Peril Strait (Figure 2.1). The legal male red king crab population in Pybus Bay and Seymour Canal was comprised of primarily postrecruits. The legal male red king crab segment in Gambier Bay was mostly recruits. Pots were set in Deadman Reach to try and locate prerecruits that were normally present. Very few prerecruits were found in Deadman Reach.

Conversely, increases in abundance of legal and mature male red king crab occurred over a three to seven year period in bays adjacent to Icy Strait, Lynn Canal, and upper Stephens Passage (Figure 2.2). The Juneau area (Section 11-A) and Lynn Canal had significant and healthy numbers of recruits and postrecruits. In Excursion Inlet and Port Frederick a large proportion of the mature stock was comprised of prerecruits, boding improvement in future numbers of legal crab, given normal survival and growth.

Commercial Fishery Summary

Prior to the opening date of November 1, 1997, all permit holders and processors were mailed information on registration, reporting, and gear marking requirements. All permit holders were required to pre-register prior to fishing, and to complete mandatory logbooks during the fishery. A 20-pot limit per vessel restriction was in effect for the fourth consecutive season because the GHL (322,000 pounds) was less than 400,000 pounds.

Because of the stock decreases noted above, fishing time was restricted in Pybus Bay to four days and Gambier Bay for eight-fishing days. The open portion of Section 11-A was fished for eleven days, closing three days prior to the end of the Registration Area A fishing season. This reduction in fishing days was made to stay within the guidelines for allocation to personal use and commercial fishers. Most of the Juneau area personal use harvest of 3,900 crab had already occurred by the time the commercial fishery occurred.

The commercial fishery was closed by emergency order on November 15, 1997 after 76 permit holders made 184 landings totaling 307,832 pounds (Table 2.1). Based on a sample of 111 landings, the average size was 164.4 mm in carapace length (Table 2.3) and the average weight was 8.31 pounds per crab (Table 2.4). Approximately 28 percent of the landed crab were recruit crab, and 44 percent postrecruit 1s. Thus, the majority of the catch was comprised of crab that recruited into the fishery during the past two seasons. The distribution of the catch indicates that Districts 10 and 13 provided less than one-half the quantity of crab contributed during the previous two seasons (Table 2.2).

1998/99 SYNOPSIS

Red King Crab Survey Results

The 1998 stock assessment survey was conducted during June and July 1998 using the R/V *Medeia*. Survey results indicated that the overall abundance and relative health of red king crab stocks had declined, and stocks were not adequate to allow a commercial harvest. The allowable harvest surplus, or GH, was estimated at 265,000 pounds to provide a harvest rate of 0.27 on legal size crab. Once again, bay areas bordering Icy Strait, Lynn Canal, and upper Stephens Passage were in good condition and bays opening into Frederick Sound, lower Stephens Passage, and Peril Strait were in poor condition. Declines in abundance of legal and mature male red king crab appear to have happened over a two to four-year period in those areas (Figure 2.1). The legal male red king crab segment is comprised primarily of postrecruits in Pybus Bay and Seymour Canal, and of recruits in Gambier Bay. Large numbers of prerecruits were not evident in these three bay areas. Additional pots were set in Pybus and Gambier Bays in an attempt to locate legal and prerecruit crab but this effort was unsuccessful.

Conversely, increases in abundance of legal and mature male red king crab occurred over a three to seven year period in bays adjacent to Icy Strait, Lynn Canal, and upper Stevens Passage (Figure 2.2). King crab populations in these bays appear very healthy. The Juneau area (Section 11-A) and Lynn Canal bays had significant and healthy numbers of both recruit and postrecruits. In Excursion Inlet, Lynn Canal, and the Juneau area, large numbers of prerecruits were also present.

Commercial Fishery

Survey results indicated that the overall abundance and relative health of red king crab stocks were not adequate to allow a commercial fishery this past season. The allowable harvest surplus, or GH, estimated at 265,000 pounds of legal crab was below the regulatory threshold of 300,000 pounds; hence, the fishery was closed by emergency order, and the closure was announced to the public through the news release system. Personal use harvests in Pybus Bay, Gambier Bay, Peril Strait, and Rodman Bay were also closed by emergency order and news release.

1999/2000 OUTLOOK

The department will conduct the 1999 red king crab survey during June and July, using the R/V Medeia. Results of that survey will determine whether or not a commercial fishery occurs in November 1999. Significant improvement in the abundance of legal and prerecruit crab in Pybus Bay, Gambier Bay, Seymour Canal, Peril Strait, Ushk Bay, and Rodman Bay must occur, to provide for a commercial fishery in Southeast Alaska next season. If stocks continue to decline, the department will also look at the effect current personal use regulations have on stock health.

Table 2.1. Registration Area A (Southeast Alaska) red king crab catch, number of landings, and number of permits by year or season, 1960 to present.

Year/ Season ^{a/}	Total Catch ^{b/}	Number of ^{c/} Landings	Number of ^{d/} Permits
1960	3,424		
1961	*	*	*
1962	1,289,550		8
1963	1,112,200		8
1964	820,530		9
1965	579,300		7
1966	105,899		8
1967	599,078		7
1968	2,199,722		19
1969	1,899,930	122	39
1969/70	1,438,226	401	33
1970/71	221,369	151	20
1971/72	391,623	213	18
1972/73	476,761	161	17
1973/74	640,369	207	27
1974/75	537,189	201	28
1975/76	346,341	170	25
1976/77	328,145	175	35
1977/78	234,494	138	34
1978/79	443,639	165	34
1979/80	657,917	228	38
1980/81	532,844	194	35
1981/82	524,109	171	46
1982/83	394,157	111	57
1983/84	280,681	119	97
1984/85	270,495	121	95
1985 Thru 1992	-----Fishery Closed-----		
1993/94	202,384	180	83
1994/95	256,267	246	84
1995/96	357,639	201	73
1996/97	428,549	218	79
1997/98 ^{e/}	307,832	184	76
1998/99	-----Fishery Closed-----		
1999/00	298,194	227	77

^{a/} Data for years 1960 through the 1969/70 season are from management reports and informal fish ticket logs.

^{b/} 1960 through 1969 data is for all three species of king crab combined (red, brown, and blue king crab). Data for years 1960 through 1975/76 contains small and inconsistent harvest of red and blue kings from the Yakutat area.

^{c/} Total landings are the number of unique fish tickets reporting king crab landings in any combination in a season.

^{d/} Total permits are the number of unique CFEC numbers that made landings in a season.

^{e/} Most recent season data is considered preliminary.

Table 2.2. Registration Area A (Southeast Alaska) traditional red king crab catch in thousands of pounds by district and season, 1970/71 to present.

Year	District																Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1970/1971								3.2	45.2	118.3	130.8	48.6	1.1	0.8	53.8		221.4
1971/1972								7.0	21.7	231.4	164.4	57.8	95.4	46.2	17.5		391.6
1972/1973						2.1		16.8	11.2	183.0	109.1	19.0	34.5	95.4		1.3	476.8
1973/1974					0.1	0.8	0.3	4.3	21.2	273.4	114.3	25.1	78.4	87.9	34.6		640.4
1974/1975	0.3					1.5	0.1	7.6	30.2	124.5	74.1	64.6	102.2	117.0	8.5		537.2
1975/1976												53.4	97.5	103.7	6.7		346.4
1976/1977			1.8	0	4.3	6.5		16.7	17.5	49.3	82.0	*	*	63.8	24.7		328.1
1977/1978	*				*	*		*		43.0	64.5	8.3	68.8	18.5	*		234.5
1978/1979								*		118.5	122.9	14.1	112.5	40.2	28.9		443.6
1979/1980	*				*	*	*	*	*	168.4	220.2	39.5	79.4	89.1	11.8		657.9
1980/1981	*					*	*	27.6	11.8	163.7	179.2	8.0	73.4	21.0	39.9		532.8
1981/1982					*	*	*	6.6	*	114.4	135.4	32.7	116.7	32.8	52.8		524.1
1982/1983					7.3		*	*	*	77.4	53.8	79.6	70.8	79.5	20.5		394.2
1983/1984	*		*		*	*	*		*	79.5	35.2	30.2	46.7	50.8	1.9		280.7
1984/1985	*		*						0.6	58.7	89.9	14.2	51.9	48.9	6.2		270.5
1985-1992	----- FISHERY CLOSED -----																
1993/1994						*		0.7	2.4	29.6	76.9	38.9	22.7	10.3	21.0		202.4
1994/1995					*			*	*	69.5	113.5	24.8	21.8	13.4	6.6		256.3
1995/1996								3.2	2.4	169.7	142.0	2.6	13.1	18.5	6.3		357.6
1996/1997								0.5	1.5	176.8	206.2	2.2	18.3	18.0	5.1		428.5
1997/1998									1.4	76.7	184.2	6.2	6.5	25.3	7.5		307.8
1998/1999	----- FISHERY CLOSED -----																

* Where number of permits is less than three, the information is considered confidential.

Table 2.3. Registration Area A (Southeast Alaska) summary of commercial red king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruits ^{d/}	Recruitment				Skip Molts ^{f/}
			Average	Range		% PR +1 ^{b/}	%PR +2 ^{c/}	% PR +3 ^{d/}	%PR +4 ^{e/}	
1970/71	29	2264	161.0	138-201	40.24	39.6	18.3	1.9	0.0	28.5
1971/72	10	742	160.2	134-203	47.7	33.0	14.9	4.1	0.3	24.4
1972/73	30	3032	158.7	133-205	53.5	32.5	11.5	2.4	0.1	20.5
1973/74	15	1,438	161.6	140-208	27.6	52.5	17.6	2.1	0.2	39.7
1974/75	20	2181	166.3	137-200	27.6	47.4	21.3	3.8	0.0	18.6
1975/76	21	1969	160.3	135-207	49.0	29.6	16.6	4.7	0.2	22.2
1976/77	18	1,460	160.6	115-204	50.1	33.0	11.9	4.5	0.6	21.4
1977/78	32	3161	156.7	136-203	29.7	40.2	20.4	9.5	0.2	67.9
1978/79	18	1712	155.4	137-202	61.5	28.7	8.5	1.1	0.1	22.9
1979/80	30	3082	156.1	137-193	55.5	31.0	11.6	1.9	0.0	29.1
1980/81	49	4103	156.3	134-196	53.0	34.7	10.8	1.4	0.0	29.5
1981/82	37	3425	158.8	123-199	47.1	35.0	15.4	2.5	0.0	30.6
1982/83	30	2,821	159.4	137-200	46.0	33.6	15.5	4.9	0.0	30.5
1983/84	42	3521	158.4	137-196	51.9	33.9	11.7	2.6	0.0	24.9
1984/85	36	3,641	159.6	139-196	48.3	37.9	12.3	1.5	0.0	22.6
1985 thru 1992						-----Fishery Closed-----				
1993/94	116	8601	162.9	103-209	30.5	46.5	19.4	3.6	0.0	30.3
1994/95	124	7974	162.8	90-209	34.5	33.1	23.4	9.0	0.1	36.9
1995/96	73	5882	159.4	96-204	56.2	30.1	9.5	4.2	0.1	17.8
1996/97	132	7744	161.5	113-212	38.6	44.0	12.9	4.4	0.2	28.8
1997/98	111	5919	164.4	122-207	28.2	44.0	23.4	4.5	0.0	33.6
1998/99						-----Fishery Closed-----				

^{a/}Recruits = all new and soft shell crab ≥ 145 mm and ≤ 161 mm carapace length.

^{b/}PR + 1 = all new and soft shell crab ≥ 162 mm and ≤ 178 mm, and old shell crab ≥ 145 mm and ≤ 161 mm, carapace length.

^{c/}PR + 2 = all new and soft shell crab ≥ 179 mm and ≤ 195 mm, and old crab ≥ 162 mm and ≤ 178 mm, and very old ≥ 145 mm and ≤ 161 mm, carapace length.

^{d/}PR + 3 = all new and soft shell crab ≥ 196 mm and all old ≥ 179 mm and ≤ 195 mm, and very old ≥ 162 mm and ≤ 178 mm, carapace length.

^{e/}PR + 4 = all old and very old where carapace length ≥ 196 mm.

^{f/}Skip molts = all old and very old crab.

Table 2.4. Registration Area A (Southeast Alaska) summary of commercial red king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season Sampled	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (pounds)		Estimated No. of Crab Caught	Percent of Catch Sampled
						Average	Range		
1970/71	1					8.60	8.60-8.60		
1971/72									
1972/73									
1973/74									
1974/75									
1975/76	2					8.36	7.49-9.22	10,129	19.4
1976/77	5					8.03	7.34-10.10	40847	3.6
1977/78	15					7.47	6.85-9.88	31397	10.1
1978/79	8					7.18	6.29-8.67	61775	2.8
1979/80	4					7.40	6.62-7.94	88918	3.5
1980/81	41	5345	29897	5.6	1.0-14.47	7.17	6.38-8.16	74331	5.5
1981/82	19	600	900	1.50	1.50-1.50	7.21	6.45-8.73	72684	4.7
1982/83	23	1,542	6,449	4.18	1.30-7.63	7.65	6.61-8.51	52410	5.4
1983/84	29	3693	4165	1.13	0.16-4.33	6.98	5.51-8.54	40031	8.8
1984/85	27	1334	3893	2.92	1.60-6.30	7.43	6.66-8.53	35813	10.2
1985 thru 1992					Fishery Closed				
1993/94	114	10158	17749	1.75	0.03-6.21	8.06	5.84-9.60	25110	34.25
1994/95	120	9087	15063	1.66	0.05-7.77	8.03	6.15-10.33	31905	25.0
1995/96	73	5350	16676	3.12	0.48-9.60	7.47	5.54-8.72	47877	12.29
1996/97	129	11958	36449	3.05	0.35-11.45	7.84	6.26-9.59	54667	14.17
1997/98	111	8236	24079	2.92	0.32-12.00	8.31	5.68-9.82	37030	16.0
1998/99					Fishery Closed				

Table 2.5. Registration Area A (Southeast Alaska) blue king crab catch, number of landings, and number of permits by season, 1976/77 to present.

Year/Season	Total Catch	Number of Landings	Number of Permits
1976/77	*	*	*
1977/78	3,709	8	5
1978/79	*	*	*
1979/80	*	*	*
1980/81	2,017	7	6
1981/82	4,159	11	9
1982/83	46,639	52	28
1983/84	38,330	40	30
1984/85	5,436	25	17
1985/86	1,886	18	16
1986/87	1,179	15	13
1987/88	1,506	35	18
1988/89	3,186	15	9
1989/90	501	14	8
1990/91	597	11	8
1991/92	1,037	14	9
1992/93	929	11	9
1993/94	2,124	30	15
1994/95	5,334	62	25
1995/96	3,397	43	20
1996/97	1,248	30	16
1997/98 ^{a/}	2,287	21	11

^{a/} Most recent season data is considered preliminary.

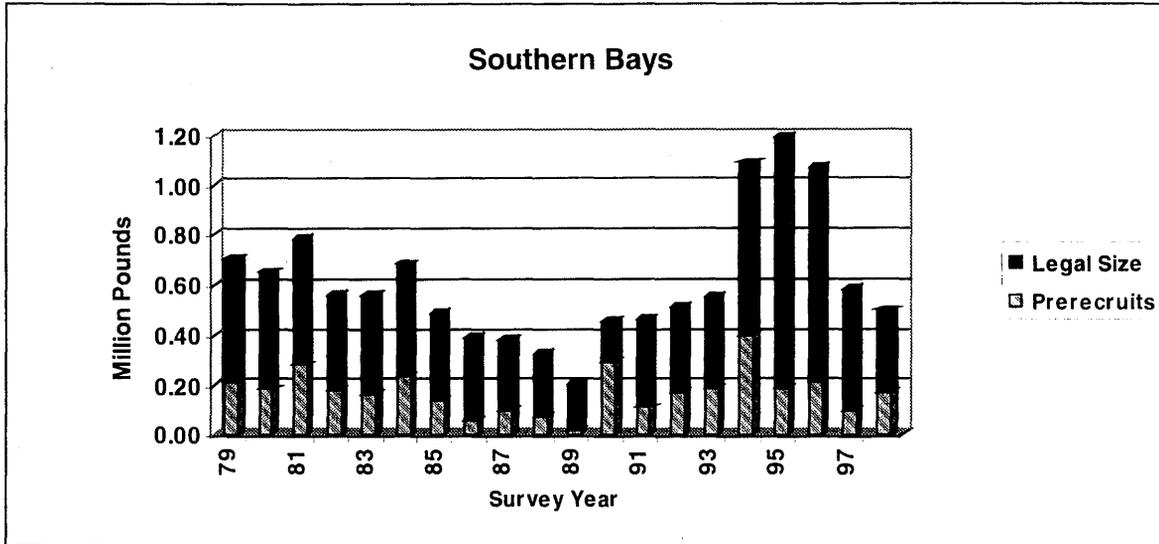


Figure 2.1. Estimated biomass of mature male red king crab in bays opening into Frederick Sound, lower Stephens Passage, and Peril Strait.

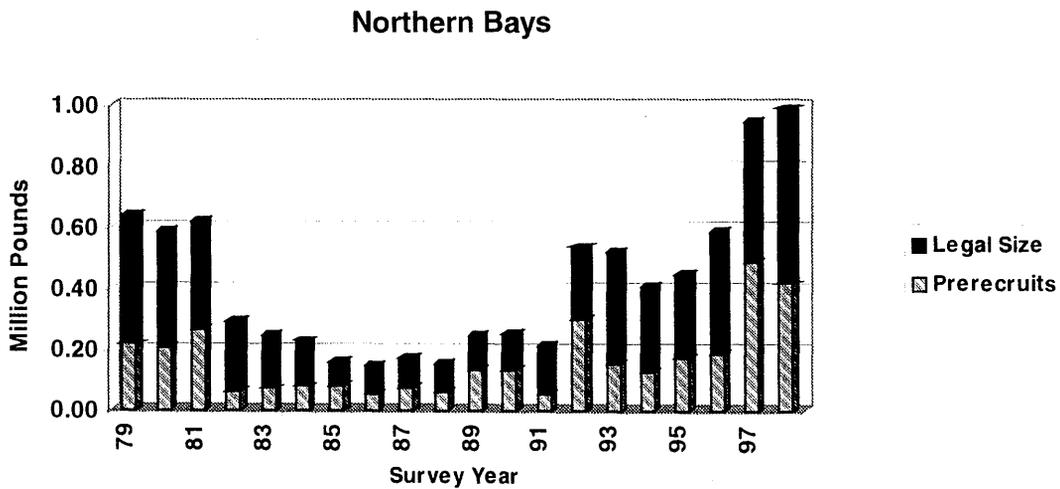


Figure 2.2. Estimated biomass of mature male red king crab in bays adjacent to Icy Strait, Lynn Canal, and upper Stephens Passage.

Section 3

Southeast Alaska Golden King Crab fisheries

REPORT TO THE BOARD OF FISHERIES, 1999

SOUTHEAST ALASKA

GOLDEN KING CRAB FISHERIES



By

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INTRODUCTION

This report presents an overview of the commercial golden (brown) king crab fishery in Southeast Alaska (Registration Area A) with emphasis on the 1997/98 fishing season. Information is presented on historical catch and effort, regulation development, and available dockside sampling data. Stock assessment surveys are not conducted for this fishery, but stock status can be roughly inferred using fishery trend and dockside survey data.

Golden king crab *Lithodes aequispina* are taken from the deeper waters of northern Southeast Alaska between 100 and 350 fathoms. Few golden king crab are harvested from the southern portion of Southeast Alaska. Important golden king crab fishing grounds are located at the confluence of Icy Strait, Lynn Canal and Chatham Strait; where Chatham Strait and the western portion of Frederick Sound meet; and where Stephens passage and Frederick Sound meet. From the fishers perspective, the golden king crab fishing conditions are more demanding than the red king crab *Paralithodes camtschatica* or the Tanner crab *Chionoecetes bairdi* fisheries because of the difficulties associated with grounds more exposed to adverse weather conditions, greater depths, strong tidal exchanges, and heavy currents.

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

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

- 1) seasons that open concurrently with the Tanner crab fishery;
- 2) the harvest of only male crab with a minimum legal carapace width of 7 inches;
- 3) gear limits of 100 pots per vessel;
- 4) separate stock management (five fishing areas); and
- 5) quotas based on historic harvest levels by fishing areas that consider stock dynamics (level of recruitment).

FISHERY DEVELOPMENT AND HISTORY

Commercial Fishery History

Commercial king crab fishing in Southeast Alaska waters was initially documented in 1960 when a small catch was taken in the Petersburg-Wrangell Management Area. From 1961 through 1968, catches averaged less than 800,000 pounds per year with an average of nine permit holders participating. Nineteen permit holders took the peak catch of 2,199,772 pounds in 1968. In 1969, effort increased to 39 permit holders but the resulting catch declined to 1,899,930 pounds. These high catches were due to very liberal gear and season regulations, a smaller minimum legal size, and catches that included a combination of red, blue *Paralithodes platypus* and golden king crab.

The department began collecting species composition information from the commercial king crab catches in Southeast Alaska in 1970. Reliable golden king crab catch data has been available since the 1972/73 fishing season. From the 1972/73 through the 1975/76 seasons, catches averaged 129,680 pounds of golden king crab and an average of 9 permits fished (Table 3.1).

Accurate species composition information was required on fish tickets beginning in January 1976. From the 1976/77 through the 1979/80 fishing seasons, an average of 12 permit holders caught an average of 94,688 pounds of golden king crab each season. Adjusted to the 1990 consumer price index (CPI), the average exvessel value of the golden king harvest during this period was approximately \$220,000. Effort and catches increased significantly after the 1979/80 fishing season.

During the seasons 1980/81 through 1989/90, the average number of permits fished was 65 and this effort level resulted in an average catch of 823,330 pounds worth approximately \$1.9 million, adjusted to 1990 CPI. At current prices, this average catch would be worth about \$2.3 million. These relatively high catches coincided with a period of good recruitment that started in 1984 and ended by 1988 (Table 3.4). Fishing effort peaked during the 1984/85 season when 124 permits fished for a catch of 848,818 pounds. The catch peaked two seasons later during the 1986/87 season when only 51 permits fished for a catch of 1,016,011 pounds. Recruitment in the golden king crab fishery has been very low since the 1988/89 season. Although effort and catches declined through the 1995/96 season, they have increased since then in response to increasing recruitment.

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

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

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

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

The fourth phase began with the 1985/86 fishing season and extended through the 1995/96 fishing season. The peak catch of slightly more than one million pounds occurred during the 1986/87 season and has declined since, due to lack of recruitment and overexploitation. The fishery was separated into five management areas with guideline harvest ranges established in each area in an attempt to prevent further overexploitation in any single area or serial depletion of a number of fishing areas. The department has used the emergency order authority to close the fishery early each season, when data indicate that substantial recruitment had not entered the fishery and stocks were not strong enough to support significant catches. The effort and catch declined for seven seasons, to a low of 15,718 pounds in 1995/96.

The fifth, and current phase, began with the 1996/97 fishing season. Effort and catches increased in response to the development of a live market with improved prices and as a result of increases in the availability of recruit size crab. Anecdotal information from pot shrimp fishers in Frederick Sound and Clarence Strait during previous years indicated a very significant increase in the number of small golden king crab. By the 1996/97 season the small crab had grown to legal size, survived at relatively high levels, and currently make-up the greatest proportion of the commercial harvest.

Dockside Sampling and Skipper Interviews

Department personnel have collected shell condition and carapace length data from landings at various ports throughout the region since 1970 (Table 3.4). Resulting data are used to estimate recruitment trends and relative contribution from various size-classes of crab. Department personnel began collecting average weight data from landings in 1975 (Table 3.5). Average weight data provides additional insight into stock dynamics. In 1985, skipper interviews were initiated to provide an estimate of catch per unit of effort (CPUE) that may be useful for determination of fishing mortality.

REGULATION DEVELOPMENT

Fishing Seasons

Regulation development in the golden king crab fishery has generally paralleled that of the red king and Tanner crab fisheries. Biological information which identifies specific molting and mating periods, or other sensitive life history periods when fishing should be curtailed have not been collected for golden king crab. Available information from other registration areas suggests that molting may occur throughout the year, with no specific peak activity. The presence of eggs in all stages of development throughout the year supports the conclusion of no distinct molting or mating period. As a result, fishing seasons have been liberal. From 1961 through 1968 there was no closed season. Closures have been primarily established to provide fair start opportunities during red king crab and Tanner crab fisheries. Fishing has started on dates ranging from August 1 through October 1. The fishery currently starts on February 15, concurrently with the start of the commercial Tanner crab fishery, and continues through January 29, unless the season is closed earlier by emergency order due to resource conservation concerns or the attainment of established guideline harvest ranges. In recent seasons, the fishery has closed in May or June, depending upon effort, harvests, harvest rates, and recruitment levels.

Sex and Size Limits

From its inception, the golden king crab fishery has been restricted to harvesting only male crab in order to protect the reproductively important female crab. From 1961 through 1968, a minimum legal size of 6 1/2 inches in carapace width was in place. The minimum legal size was established to protect sexually mature male king crab from harvest during the early years of sexual maturity. The minimum legal carapace width was increased to 7 inches in 1969. This size limit was based on growth and size at maturity information collected from Gulf of Alaska red king crab stocks. The larger minimum size limit was implemented to increase reproductive potential by providing additional protection to mature male crab.

Average size at maturity for male golden king crab in Southeast Alaska is unknown. With the absence of this important piece of biological information, it has been assumed that size of maturity for male golden king crab is the same as for male red king crab, based on red king crab data from Kodiak. This assumption was made because growth information for Southeast Alaska and Kodiak red king crab is very similar, and because growth increments for both species in Southeast Alaska are almost identical. Known regression formulae relating carapace length to carapace width for golden king crab in Southeast Alaska were used to establish the legal width measurement.

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

Quotas and Guideline Harvest Ranges

In 1970, a quota of 1.5 million pounds was provided for king crab (all species combined). In 1971, separate red and golden king crab fisheries were recognized with the adoption of distinct seasons, and a quota of 600,000 pounds was established for the golden king crab fishery. This quota remained in regulation through 1977. After 1977, guideline harvest ranges (GHRs) replaced quotas. The first GHR of 50,000 to 200,000 pounds was established in 1978. The GHR was increased to 200,000 to 500,000 pounds in 1981 based on industry recommendations. This GHR remained in regulation through the 1986/87 fishing season.

Due to the propensity of the fleet to concentrate fishing effort only in the most productive fishing grounds, and in order to prevent overexploitation on any single fishing ground, separate GHRs were established in 1987. Initially only three areas (Frederick Sound, Icy Strait, and Lower Chatham Strait) were assigned GHRs. Five defined fishing areas and GHRs exist in regulation today. They are:

(1) Frederick Sound Area	0 to 350,000 pounds;
(2) Icy Strait Area	0 to 250,000 pounds;
(3) Chatham Strait Area	0 to 150,000 pounds;
(4) Cape Ommaney Area	0 to 100,000 pounds;
(5) Clarence Strait Area	0 to 25,000 pounds.

Fishing Gear

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

There is no minimum mesh size requirement for king crab pots. Regulations require degradable twine or a timed galvanic release device in case the pot is lost. Tunnel height on standard side loading pots must be a minimum of eight inches in the vertical dimension. There are restrictions on pot storage before and after fishing seasons and each pot must be independently buoyed and marked. Ring nets were eliminated as legal gear for king crab in 1990.

Limited Entry

The Commercial Fisheries Entry Commission (CFEC) in January, 1984 established a limited entry program for the king and Tanner crab pot fisheries in Southeast Alaska. The CFEC adopted a maximum effort level of 57 permits for the golden king crab fishery. Currently there are 70 permits eligible to participate in the golden king crab fishery. Some of these permits may not be eligible to fish once the adjudication process is completed.

1997/98 SEASON SYNOPSIS

The 1997/98 golden king crab fishery opened concurrent with the commercial Tanner crab fishery on February 15, 1998. The department announced expected guideline harvest levels by fishing area through a news release. Fishing was monitored through fish tickets, fleet contacts, and dockside interviews during landings. Fishing seasons were closed by area using emergency orders. The first two fishing areas closed on April 21, and the last area closed on June 21. Throughout the season only a few boats had live markets and a high exvessel price. Exvessel prices for sectioned crab were only moderate, deterring some fishers from participating. During the season 18 permits were fished and 237,122 pounds of crab were caught from all five fishing areas (Table 3.1). Most of the catch occurred during March and April (Table 3.2). Frederick Sound, Chatham Strait, and Icy Strait produced the majority of the catch (Tables 3.6-3.10.). Little effort targeted on golden king crab while the Tanner crab fishery was open.

Dockside sampling data from commercial landings indicated that 38 percent of the crab were recruit crab and the average size was 166.0 mm in carapace length. These data are quite similar to good recruitment events, which supported the fishery in the early to mid-1980s (Table 3.4). The average weight of 6.57 pounds per crab was low, and the average CPUE of 3.75 crab per pot lift was high (Table 3.5). Forty-five percent of the crab landed were postrecruit 1's (Table 3.4), indicating increased recruitment during the preceding seasons. In combination, these data suggest that significant recruitment has entered the fishery over the past few seasons and stock abundance is increasing.

1998/99 OUTLOOK

Fish ticket and dockside sampling data provide a postseason analysis of stock condition, and a limited estimate of future stock conditions. Some differences in data quantity exist between fishing areas, but the same general pattern emerges for all five fishing areas. Stock abundance throughout the region has increased during the past two seasons due to an increase in newly recruited crab.

The department has announced a GHL of 250,000 pounds for the 1998/99 season, apportioned to the five fishing areas. The fleet anticipates that golden king crab stock abundance will increase, and this expectation will result in increased effort. As long as CPUE remains high, the percentage of recruit crab remains level or increases, and favorable market conditions prevail, sufficient effort should be available to achieve the announced GHLs. Our intention is to collect size frequency and shell condition information to confirm or deny continued recruitment, view the resulting size frequency and shell condition data in conjunction with fish ticket data and voluntary logbook CPUE data, and either close the fishery when the GHLs have been achieved or earlier if a conservation concern develops. Each of the five fishing areas will be managed as separate stocks of crab.

Table 3.1. Registration Area A (Southeast Alaska) commercial golden king crab catches, number of landings, permits and pounds per landing by accounting season (October through September), 1972/73 to present.

Season	Total Catch	Number of Landings	Number of Permits	Pounds Landing
1972/73	265,310	113	10	2,348
1973/74	179,520	92	14	1,951
1974/75	34,451	35	7	984
1975/76	39,439	21	5	1,878
1976/77	75,046	30	6	2,501
1977/78	83,407	54	14	1,544
1978/79	52,476	66	10	795
1979/80	167,823	82	20	2,046
1980/81	704,622	158	30	4,459
1981/82	651,980	253	53	2,576
1982/83	794,860	282	70	2,818
1983/84	973,100	307	89	3,169
1984/85	848,818	277	124	3,064
1985/86	698,188	210	60	3,324
1986/87	1,016,011	222	51	4,576
1987/88	949,205	235	56	4,039
1988/89	967,611	226	58	4,281
1989/90	628,903	256	61	2,456
1990/91	426,877	220	39	1,940
1991/92	225,927	151	33	1,496
1992/93	103,781	80	18	1,297
1993/94	30,318	51	13	594
1994/95	39,344	65	19	605
1995/96	15,718	38	11	413
1996/97	66,455	58	16	1,145
1997/98 ^{u/}	237,122	85	18	2,789

^{u/} Most recent season data is considered preliminary.

Table 3.2. Registration Area A (Southeast Alaska) commercial golden king crab catches by season (October through September), by month, 1972/73 to present.

Season	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Total	Landings	Permits Fished
1972/73	18.1	43.7	18.6	22.0	26.3	19.5	35.6	11.0	6.0	11.1	9.6	43.8	265.3	113	10
1973/74	25.6	21.4	15.6	16.5	12.2	24.6	30.9	15.5	0.0	0.0	3.2	13.9	179.4	92	14
1974/75	8.9	4.9	3.2	4.5	1.4	2.8	3.8	0.0	0.0	0.0	0.0	5.0	34.5	35	7
1975/76	16.1	4.8	7.9	*	*	13.2	1.7	*	0.0	0.0	*	*	39.4	21	5
1976/77	*	9.1	*	*	*	9.1	7.5	*	0.0	0.0	0.0	*	75.0	30	6
1977/78	*	*	*	14.2	10.0	11.7	14.3	0.0	0.0	0.0	0.0	*	83.4	54	14
1978/79	*	4.4	8.7	9.7	5.9	5.9	3.7	*	0.0	0.0	*	3.3	52.5	66	10
1979/80	4.7	8.2	4.9	9.0	16.5	34.8	44.9	10.4	*	8.8	0.0	18.7	167.8	82	19
1980/81	36.2	43.2	18.2	79.3	178.3	171.0	87.7	*	*	*	*	14.0	704.6	158	30
1981/82	43.0	41.7	44.0	17.9	65.8	80.9	70.5	20.9	81.1	70.0	55.8	60.4	652.0	253	53
1982/83	164.5	77.5	58.7	0.0	115.8	168.3	15.0	46.8	27.5	36.6	59.8	24.0	794.9	283	70
1983/84	23.7	50.6	11.0	33.7	152.7	303.5	287.8	53.4	32.2	11.0	6.9	6.6	973.1	307	89
1984/85	166.9	250.8	19.9	14.9	117.8	172.5	22.3	19.6	24.9	*	19.1	11.9	848.8	277	124
1985/86	39.9	53.8	41.1	32.1	240.9	249.1	8.6	4.5	14.7	*	*	*	698.2	210	60
1986/87	147.5	80.2	46.3	326.2	136.5	70.5	67.9	39.3	39.0	*	27.8	17.3	1,016.0	222	51
1987/88	13.2	15.2	10.3	264.6	297.4	80.2	64.0	79.0	63.8	29.3	20.1	12.2	949.2	235	56
1988/89	*	*	*	*	220.9	329.2	122.6	101.1	63.0	44.3	41.8	35.0	967.6	226	58
1989/90	78.3	28.3	6.5	5.9	71.1	145.3	68.2	60.3	55.7	42.2	23.3	43.7	628.9	256	61
1990/91	51.3	14.0	8.4	*	38.1	89.3	67.9	60.0	52.0	14.3	*	11.6	426.9	220	39
1991/92	18.7	17.7	16.0	10.8	8.7	44.6	56.2	29.6	*	*	*	*	225.9	151	33
1992/93	*	*	*	*	2.9	28.2	22.3	13.9	8.6	*	*	0.0	103.8	80	18
1993/94	0.0	0.0	0.0	0.0	2.6	9.0	13.1	5.6	0.0	0.0	0.0	0.0	30.3	51	13
1994/95	0.0	0.0	0.0	0.0	6.3	14.5	15.2	3.4	0.0	0.0	0.0	0.0	39.3	65	19
1995/96	0.0	0.0	0.0	0.0	2.2	*	5.0	*	*	0.0	0.0	0.0	15.7	38	11
1996/97	0.0	0.0	0.0	0.0	6.4	26.0	12.6	12.7	8.8	0.0	0.0	0.0	66.5	58	16
1997/98 ^{u/}	0.0	0.0	0.0	0.0	14.5	81.0	95.2	40.3	*	0.0	0.0	0.0	237.1	85	18

^{u/} Most recent season data is considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 3.3. Registration Area A (Southeast Alaska) commercial golden king crab catches by district and season (October through September), 1972/73 to present.

District	Season											
	1972/ 1973	1973/ 1974	1974/ 1975	1975/ 1976	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982	1982/ 1983	1983/ 1984
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	3.2
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
8	0.4	0.1	0.1	0.0	0.0	*	0.0	1.1	1.2	6.1	*	5.4
9	10.5	0.5	14.9	0.0	*	*	0.0	0.0	*	48.8	109.3	135.4
10	186.5	149.2	12.3	*	*	74.4	39.5	61.3	204.6	248.2	186.5	222.7
11	36.2	24.6	0.7	0.0	*	7.3	6.6	21.8	29.8	48.8	44.6	24.6
12	5.8	0.0	5.2	*	*	*	1.3	61.8	169.7	92.0	228.7	438.2
13	0.0	0.6	0.0	*	0.0	*	0.0	0.0	*	6.2	3.3	*
14	2.6	4.1	1.4	0.0	0.0	0.0	*	*	236.9	152.4	151.7	46.5
15	23.4	0.4	0.1	*	*	*	*	21.5	55.9	49.4	39.3	91.7
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	265.3	179.5	34.7	39.4	75.0	83.4	52.5	167.8	704.6	652.0	794.9	973.1

-continued-

Table 3.3. (page 2 of 2)

District	Accounting Year													
	1984/ 1985	1985/ 1986	1986/ 1987	1987/ 1988	1988/ 1989	1989/ 1990	1990/ 1991	1991/ 1992	1992/ 1993	1993/ 1994	1994/ 1995 ^{a/}	1995/ 1996	1996/ 1997	1997/ 1998 ^a
1	0.0	*	*	0.0	0.0	*	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
2	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	*	18.2	10.1	*	*	*	*	*	*	0.0	*	0.0	*	*
7	14.1	*	*	*	*	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	*
8	*	4.6	*	*	10.3	*	*	*	*	0.0	0.0	0.0	*	*
9	192.3	234.0	609.3	298.0	413.6	229.8	213.3	137.8	74.7	15.9	22.3	10.3	*	143.6
10	375.9	324.4	298.8	318.6	338.1	146.0	83.2	13.1	6.7	3.8	*	0.0	3.9	18.6
11	34.5	35.6	43.8	36.9	9.1	6.8	18.5	20.6	11.2	5.6	9.0	3.0	15.6	21.0
12	153.3	23.3	*	195.7	140.5	204.5	82.9	35.1	*	*	2.8	*	0.0	13.0
13	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	52.8	24.8	1.5	16.4	37.5	30.2	19.4	9.2	*	*	*	*	0.0	*
15	13.7	25.5	16.2	66.6	12.0	8.8	8.7	4.0	0.0	0.0	*	0.0	0.0	*
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	848.8	698.2	1,016.0	949.2	967.6	628.9	426.9	225.9	103.8	30.3	39.3	15.7	66.5	237.1

^{a/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Table 3.4. Registration Area A (Southeast Alaska) commercial golden king crab size frequency and shell condition data collected during dockside sampling, 1969/70 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruits ^u	Recruitment				% Skip Molts ^v
			Average	Range		% PR +1 ^w	% PR +2 ^x	% PR +3 ^y	% PR +4 ^z	
1969/70	4	72	173.5	154-202	30.56	44.4	22.2	2.8	0.0	12.5
1970/71	19	1151	174.6	142-214	25.7	48.9	20.7	3.2	1.5	12.2
1971/72	21	1705	175.1	150-211	19.9	47.6	27.4	4.5	0.7	23.5
1972/73	11	1040	174.7	149-208	24.2	50.2	21.6	3.3	0.8	13.0
1973/74	8	604	173.0	146-210	26.8	39.4	28.8	4.2	0.8	28.8
1974/75	2	201	169.5	151-204	40.3	47.8	10.0	2.0	0.0	11.9
1975/76	9	837	172.1	145-208	35.1	43.2	18.5	3.0	0.2	10.8
1976/77	2	153	168.8	152-205	46.4	39.2	12.4	1.3	0.7	16.3
1977/78	8	727	170.0	149-201	23.7	37.6	30.0	8.1	0.7	55.4
1978/79	6	498	171.0	145-201	35.4	39.6	23.2	1.6	0.2	20.6
1979/80	6	478	169.8	145-203	37.7	35.6	19.0	7.4	0.4	32.8
1980/81	20	1354	171.6	140-206	31.6	45.8	18.6	3.7	0.3	20.2
1981/82	6	533	176.4	148-214	24.0	43.7	23.8	6.6	1.9	18.2
1982/83	18	1567	169.8	146-204	35.7	43.1	17.7	3.5	0.1	24.0
1983/84	10	703	169.6	150-196	40.9	41.3	15.2	2.6	0.0	15.8
1984/85	12	1368	165.3	148-196	58.3	31.9	9.0	0.7	0.0	16.0
1985/86	17	1765	166.6	148-198	51.1	40.4	7.8	0.8	0.0	12.4
1986/87	43	4609	168.0	143-210	42.1	41.4	13.1	3.2	0.2	22.5
1987/88	66	5726	173.2	148-214	21.1	48.0	24.1	6.9	0.2	26.6
1988/89	78	7320	172.8	142-210	25.6	46.5	24.0	3.8	0.2	24.1
1989/90	91	8378	176.6	146-211	16.3	46.2	31.3	5.9	0.4	22.8
1990/91	80	7108	175.4	147-214	23.0	40.5	28.3	7.2	1.1	24.7
1991/92	61	5157	172.8	146-213	31.1	38.1	22.0	7.4	1.5	26.9
1992/93	18	1454	171.8	148-211	34.9	40.8	18.6	4.6	1.0	20.5
1993/94	13	1080	171.1	133-206	30.7	52.7	14.2	2.3	0.1	16.2
1994/95	13	1037	171.1	137-208	34.0	43.6	16.9	5.1	0.5	22.1
1995/96	15	351	172.2	146-208	36.1	40.5	19.7	2.9	0.9	12.7
1996/97	19	1585	165.9	143-206	54.6	33.8	10.2	1.3	0.1	16.0
1997/98	32	2490	166.0	147-212	38.2	45.0	15.0	1.7	0.0	33.9

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

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

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

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

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

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

Table 3.5. Registration Area A (Southeast Alaska) commercial golden king crab CPUE and average weight data collected during dockside sampling and interviews, 1973/74 to present.

Season	Number of Boats Sampled	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{iv}	Percent of Catch Sampled ^{iv}
						Average	Range		
1973/74	1					6.91	6.91-6.91		
1974/75	0								
1975/76	1					8.75	8.75-8.75	4507	18.57
1976/77	0								
1977/78	2					7.47	7.20-7.58	11161	6.51
1978/79	0								
1979/80	1					8.75	8.75-8.75	19179	2.49
1980/81	9					7.75	6.55-8.78	90887	1.49
1981/82	2	50	1368	27.36	27.36-27.36	7.36	6.53-7.78	88762	0.60
1982/83	15	1697	3482	2.05	1.09-5.32	7.05	6.48-7.94	114172	1.37
1983/84	8	300	900	3.00	3.00-3.00	7.06	6.28-7.63	137809	0.51
1984/85	12					6.44	5.74-7.28	131757	1.04
1985/86	17	2471	11743	4.75	1.58-7.51	6.58	5.98-8.47	106072	1.66
1986/87	40	9023	35064	3.89	1.57-16.4	6.86	6.16-8.46	148123	3.11
1987/88	62	14365	52275	3.64	0.09-12.69	7.31	6.50-10.58	129676	4.42
1988/89	78	23811	83295	3.50	0.43-8.98	7.23	5.75-8.68	133144	5.50
1989/90	90	18068	40560	2.24	0.32-8.71	8.03	6.45-9.40	78566	10.66
1990/91	80	14544	29877	2.05	0.31-8.84	7.79	6.50-10.99	54790	12.97
1991/92	61	9850	19072	1.94	0.18-6.58	7.44	6.30-9.78	30347	16.99
1992/93	18	2507	6627	2.64	0.52-4.88	7.36	6.38-8.19	14107	10.31
1993/94	13	1425	2771	1.94	0.65-3.42	7.16	6.51-8.27	4232	25.52
1994/95	13	1389	2164	1.56	0.51-2.67	7.25	6.55-9.15	5428	19.10
1995/96	15	835	208	0.25	0.01-1.06	7.19	6.03-8.50	2202	15.94
1996/97	19	2782	5284	1.90	0.30-3.28	6.61	5.90-8.00	10164	15.59
1997/98	31	4665	17503	3.75	0.08-6.67	6.57	5.81-7.67	36095	6.90

ⁱⁱⁱ Calculated by dividing fish ticket weight data by dockside sampling average weight per crab data.

^{iv} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 3.6. Frederick Sound management area golden king crab catches by pounds, landings, permits, and pounds per landing, 1974/75 to present.

Season	Total Catch Pounds	Number of Landings	Number of Permits	Pounds Landing
1974/75	*	*	*	*
1975/76	*	*	*	*
1976/77	*	*	*	*
1977/78	81,814	50	11	1,636
1978/79	45,116	47	6	959
1979/80	82,005	53	12	1,547
1980/81	219,792	59	11	3,725
1981/82	293,924	113	16	2,601
1982/83	244,918	79	24	3,100
1983/84	271,081	92	30	2,946
1984/85	427,454	113	54	3,782
1985/86	418,755	99	32	4,229
1986/87	486,810	81	32	6,010
1987/88	409,744	66	33	6,208
1988/89	499,751	100	40	4,997
1989/90	189,561	108	42	1,755
1990/91	159,956	118	25	1,355
1991/92	58,480	61	20	958
1992/93	26,998	44	13	613
1993/94	15,825	43	10	368
1994/95	18,588	46	14	404
1995/96	6,525	29	10	225
1996/97	28,344	46	15	616
1997/98 ^{u/}	96,691	42	14	2,302

^{u/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Table 3.7. Lower Chatham management area golden king crab catches by pounds, landings, permits, and pounds per landing, 1981/82 to present.

Season	Total Catch Pounds	Number of Landings	Number of Permits	Pounds Landing
1981/82	*	*	*	*
1982/83	89,870	22	9	4,085
1983/84	78,271	12	4	6,522
1984/85	112,704	24	11	4,696
1985/86	163,694	37	13	4,424
1986/87	412,789	86	16	4,799
1987/88	181,679	39	8	4,658
1988/89	224,211	42	7	5,338
1989/90	184,327	44	6	4,189
1990/91	111,348	42	5	2,651
1991/92	52,419	29	5	1,807
1992/93	*	*	*	*
1993/94	*	*	*	*
1994/95	*	*	*	*
1995/96	*	*	*	*
1996/97	*	*	*	*
1997/98 ^{a/}	70,709	19	4	3,721

^{a/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Table 3.8. Icy Strait/Lynn Canal management area golden king crab catches by pounds, landings, permits, and pounds per landing, 1975/76 to present.

Season	Total Catch Pounds	Number of Landings	Number of Permits	Pounds Landing
1975/76	8,286	14	4	591
1976/77	*	*	*	*
1977/78	*	*	*	*
1978/79	7,360	19	6	387
1979/80	85,818	29	11	2,959
1980/81	484,830	99	23	4,897
1981/82	305,569	127	40	2,406
1982/83	423,573	165	54	2,567
1983/84	584,830	187	64	3,125
1984/85	223,269	104	67	2,146
1985/86	82,557	49	23	1,684
1986/87	45,228	36	18	1,256
1987/88	287,778	115	37	2,502
1988/89	191,084	85	26	2,248
1989/90	243,611	108	29	2,255
1990/91	111,313	61	20	1,824
1991/92	48,799	37	11	1,318
1992/93	8,189	10	4	818
1993/94	5,092	8	4	636
1994/95	4,307	12	8	358
1995/96	*	*	*	*
1996/97	0	0	0	0
1997/98 ^{u/}	39,378	18	6	2,187

^{u/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Table 3.9. Cape Ommaney management area golden king crab catches by pounds, landings, permits, and pounds per landing, 1981/82 to present.

Season	Total Catch Pounds	Number of Landings	Number of Permits	Pounds Landing
1981/82	*	*	*	*
1982/83	19,124	7	4	2,732
1983/84	30,756	9	4	3,417
1984/85	61,644	13	10	4,741
1985/86	*	*	*	*
1986/87	47,136	17	7	2,772
1987/88	54,264	21	7	2,584
1988/89	46,076	14	4	3,291
1989/90	*	*	*	*
1990/91	44,260	24	4	1,844
1991/92	61,007	31	5	1,967
1992/93	*	*	*	*
1993/94	*	*	*	*
1994/95	0	0	0	0
1995/96	0	0	0	0
1996/97	0	0	0	0
1997/98 ^{u/}	*	*	*	*

^{u/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Table 3.10. Clarence Strait management area golden king crab catches by pounds, landings, permits, and pounds per landing, 1981/82 to present.

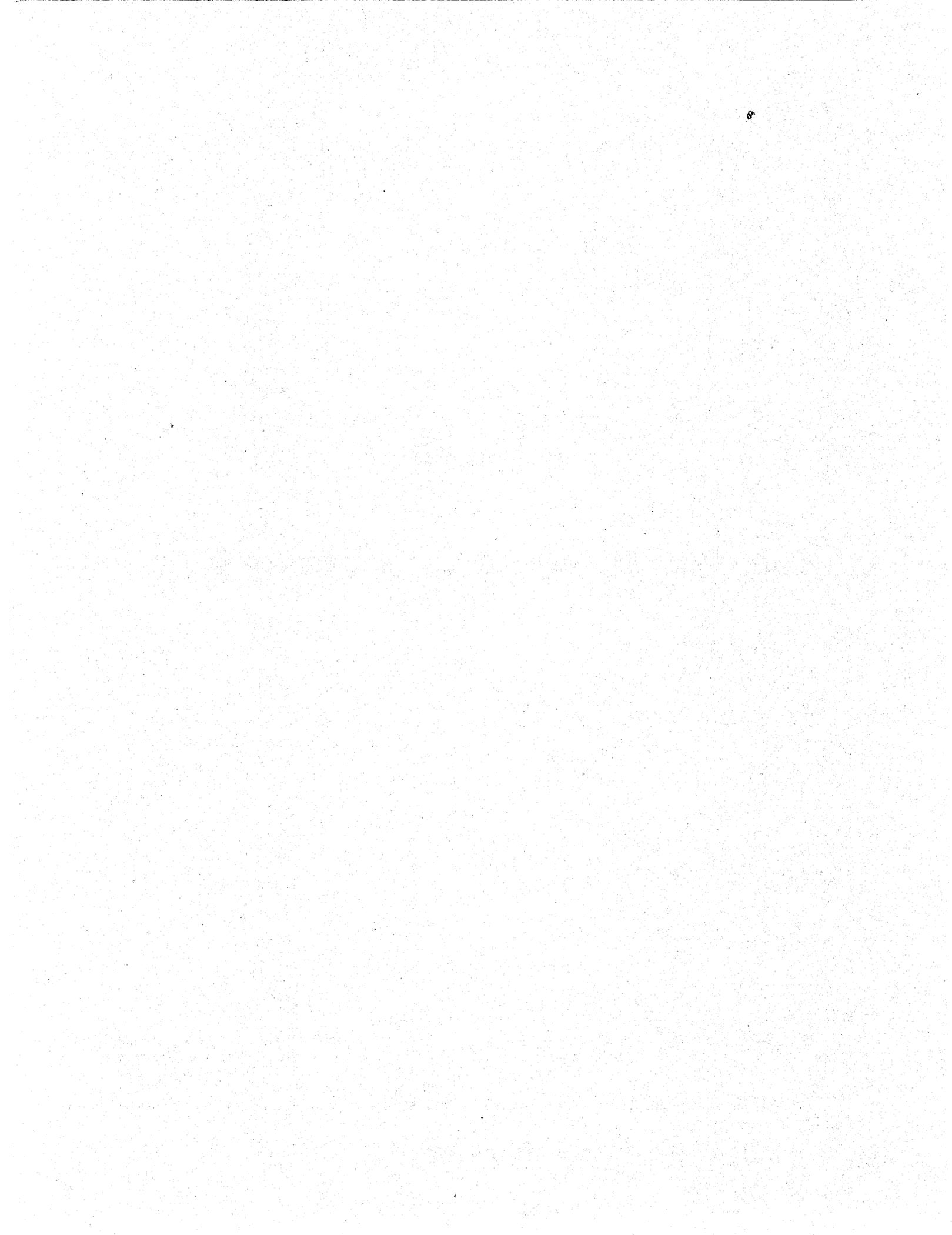
Season	Total Catch Pounds	Number of Landings	Number of Permits	Pounds Landing
1981/82	*	*	*	*
1982/83	17,375	13	4	1,336
1983/84	*	*	*	*
1984/85	23,747	23	5	1,032
1985/86	26,466	25	4	1,058
1986/87	*	*	*	*
1987/88	*	*	*	*
1988/89	*	*	*	*
1989/90	*	*	*	*
1990/91	0	0	0	0
1991/92	*	*	*	*
1992/93	*	*	*	*
1993/94	0	0	0	0
1994/95	*	*	*	*
1995/96	0	0	0	0
1996/97	*	*	*	*
1997/98 ^{a/}	*	*	*	*

^{a/} Most recent season data is considered preliminary.

* When the number of permits participating is less than three, information is confidential.

Section 4

Southeast Alaska Tanner Crab Fisheries



REPORT TO THE BOARD OF FISHERIES, 1999

SOUTHEAST ALASKA

TANNER CRAB FISHERIES



By

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INTRODUCTION

The Tanner crab *Chionoecetes bairdi* is a brachyuran (true) crab that inhabits temperate and subarctic waters of the eastern Pacific Ocean from northern California to the Bering Sea. *C. bairdi* and the closely-related snow crab *C. opilio* support significant Alaskan commercial fisheries, but only *C. bairdi* is known to be present in Registration Area A (Southeast Alaska) of Region 1. The Southeast Alaska fishery occurs primarily in the more northern waters of the region.

Southeast Alaska has been a superexclusive registration area for Tanner crab since 1985. 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).

The Tanner crab pot fishery in Southeast Alaska was the first Tanner fishery in the state to be placed under limited entry. Thirty-seven permanent permits have been assigned, with 70 interim-use permits still being evaluated for inclusion under the permanent 83 permit limit. Ring net gear (CFEC permit category T10) is also legal in Southeast Alaska and is not under limitation.

Until the late 1980s, most of the participants in this fishery used pot gear, and smaller vessels between 35 to 50 feet in length, though there were a few vessels up to about 80 feet, too. Since then, the intensifying fishery has promoted use of larger vessels by pot fishers and the entry of more small-boat participants using ring nets. Almost all the pot vessels have live-tanking capability. Winter crabbing for Tanner and other crabs is generally pursued as a secondary, though seasonally important, source of income.

Currently, lighter cone or pyramid nesting pots that occupy less deck space are more often used than the heavier, seven by seven foot stacking pots originally designed for king crab in the Bering Sea fisheries. The choice of gear may be predicated on the species to be targeted during mixed-species fisheries for Tanner and golden king crab, with the use of conical or pyramid pots favored for Tanner crab.

Current regulations in Southeast Alaska allow harvest of only male Tanner crab larger than 5 1/2 inches (140 mm) in carapace width during a winter season (starting on February 15) late in the seasonal biological harvest window for this species. A guideline harvest range (GHR) of 0 to 2,000,000 pounds effectively caps the seasonal harvest. The underlying management strategy is abundance-based, to allow harvest of males considered surplus to the reproductive needs of this species.

Limited pilot studies of stock composition and abundance estimates were conducted during the summers of 1997 and 1998. At the current time, actual abundance can only be inferred because only a few of the major fishing areas have been surveyed and estimation by removal by the commercial fleet is limited to only the legal portion of the stock. Comprehensive, annual surveys of all the major fishing grounds will be required for reliable management using preseason survey methods.

The Tanner crab fishery depends heavily on recruits (all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width), typically harvesting over half the available crab in the same season that they molt to legal size. For a species that contributes to the catch for two or three seasons after reaching legal size, this is a fairly high harvest rate during the recruitment year. The estimated exploitation rate, which is the percentage of all legal crab caught in a season, has exceeded 60 percent since 1984. This is on the higher end of the generally acceptable range for this species in this state, and other species with similar life histories in general. An additional consideration is that the trend during this period has been toward a general increase in the exploitation rate.

As a result of management's current inability to assess the strength of annual recruitment and the risk of simply allowing the maximum harvest level, the target harvest level for many seasons since the early 1980s was set lower than the 2,000,000 pound ceiling set by regulation. The fishery could probably sustain higher harvest levels during some seasons, but the risk of allowing consistently higher catches each season is unacceptably high.

Principal management objectives for this fishery are to attain the allowable catch level, to minimize sorting of juveniles and females, and to avoid fishing during molting and mating periods. If a major district needs to be closed for any of these reasons, the entire registration area is closed. This prevents pulse fishing, wherein a fleet moves from areas being closed into fewer and fewer remaining open areas. Pulse fishing tends to concentrate increasing effort onto stocks that have already been heavily fished. Avoidance of pulse fishing is a secondary management objective.

Inseason Management Activities

In-season management activities include an extensive port sampling program. Size and shell condition data are taken for legal male crab as they are delivered to processors. Skippers are interviewed to collect fishing location and effort information. By the end of the first week of a season, port sampling provides good indications of size composition of the legal segment of the population and percent of the fishery comprised of the recruit class. Port sampling is the main management activity undertaken during the season.

At least one aerial overflight is conducted during the first few days of the fishery to map the distribution of the fleet and to document the effort on the most heavily fished grounds. By the end of the second fishing day, effort is generally concentrated on the most productive grounds. The distribution of vessels and gear indirectly indicates the relative importance of an area to the overall catch and provides checks on fish ticket and logbook data reported by crabbers.

When seasons were longer than about three weeks, fish ticket data could be used to estimate catch rate (daily catch per vessel) and exploitation rate (the percent of legal crab taken by the fleet). The 1990/91 season, which opened for 18 days, was barely long enough to allow this kind of management. This method of estimating overall exploitation rate relies on multiple landings by the same vessel during the course of the season. Since vessels land crab about once per week, this management strategy is best applied to fisheries at least 21 days. There is also a limitation in the speed at which catch data can be obtained from the fleet that complicates in-season management of seasons shorter than about 21 days. The last season in which a fishery lasted 21 or more days was in 1989/90.

Mandatory logbooks detailing daily fishing activities and catch per pot were initiated in 1993/94 to try to obtain better exploitation rate estimates. Starting in the 1995/96 season, mandatory daily reporting was attempted to expedite transfer of catch data from the fishing fleet to the resource managers. Reporting was conducted by radiotelephone, cellular phones, satellite phones, single side-band radio, and via relay from catcher boats through tenders to processors. Although the program was continued for two seasons and reporting was mandatory, compliance was spotty, at best, and enforcement was difficult. Daily reporting was dropped in the 1997/98 season, since it had proven to be expensive and ineffective.

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

As the fishery has intensified, management has been forced to set a predetermined season length before the start of the season. Season length is currently based on the estimated number of days it will take the fleet to reach a maximum exploitation rate of 60 percent and a total season catch ceiling of 2,000,000 pounds, whichever is less. With recent seasons shortened to less than 10 days, inseason management based on actual exploitation rates is no longer possible. Inseason management activities are currently limited to port sampling for size and shell condition of crabs delivered to processors and limited aerial overflights of major fishing grounds.

Management by Major Fishing Ground

In the past, harvest and sampling data were both summarized by district. However, major fishing grounds do not often coincide with district boundaries. To better reflect observed and reported fishing patterns, three major, geographically distinct fishing grounds and one general category for all other areas in Southeast Alaska were defined. These were designated Icy Strait, Lynn Canal/Upper Stephens Passage, and Frederick Sound/Lower Stephens Passage, and Other grounds. These grounds correspond approximately to District 14, combined districts 11 and 15, and combined districts 8, 9, and 10, respectively. If resources to conduct surveys by fishing grounds eventually become available, it may be possible to establish harvest rates and quotas by ground. This would permit harvests at, or near, the most appropriate rate for each fishing ground. Conceivably, this would allow a higher total harvest and more management flexibility.

To outline proposed future management direction and needs, a draft comprehensive management plan was first presented to the Board of Fisheries in 1993. The Board declined to consider it at that time because of technical legalities.

FISHERY DEVELOPMENT AND HISTORY

General Traditional Pot Fishery

Although Tanner crab landings have been reported in Southeast Alaska since the early 1960s (Table 4.1), they were not deliberately targeted until the early 1970s. Tanner crab, incidentally caught with red king crab, were commonly discarded by crabbers well into the mid-1970s.

Since the 1968/69 season, the Southeast Alaska fishery has produced an average of 1,630,730 pounds per season. Regardless of the length of the seasons (the fishery was open all year prior to 1973), most of the

harvest was historically taken between January through April of each year from the major fishing grounds (Table 4.3). The 1970s were characterized by gradual fishery development and corresponding managerial response. In retrospect, these were the good old days.

Fishing pace increased with the shortened 1981/82 season, when 74 vessels landed a record 3,302,211 pounds 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 725,000 pounds. Climbing demand for Tanner crab, an earlier season opening in Southeast Alaska than in other registration areas to the north and west, open registration, and the record landing in 1981/82, attracted 97 vessels to the fishery in the 1982/83 season. Many larger crab vessels on their way to Kodiak and Bering Sea fisheries fished in Southeast Alaska first.

The 1982/83 season was closed after two weeks by emergency order, based on onboard observer catch rate information collected during the first weeks of the fishery from the Icy Strait fishing grounds. Both the fishing effort and exploitation rates were extremely high. Management could not respond effectively to the huge 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 its shellfish meeting early in the year, the Board of Fisheries changed the season opening date in Southeast Alaska to February 10 to match the rest of the state. This action, in itself, discouraged larger vessels from fishing in Southeast Alaska during the 1983/84 season, because more lucrative grounds to the north and west would be opening at the same time.

Locally based vessel operators and processors also requested limited entry status for the king and Tanner crab fisheries in Southeast Alaska. In response, the Commercial Fisheries Entry Commission (CFEC) initiated a permit moratorium 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 1985/86 season because many prospective entrants to the 1984/85 fishery had exercised the two-year option on permit renewals and obtained their permits prior to January 1, 1984, the cutoff date for the moratorium on new permit issuance. Moreover, the CFEC was forced by their regulatory guidelines to set the maximum number of permits to be allowed at 83, which was a relatively high level. This proved to have long-term implications, such as progressively shortened seasons as the efficiency of the fleet improved.

Southeast Alaska was designated a superexclusive registration area during the spring Board meeting in 1985. This action was in continued reaction to the frantic 1982/83 season. It 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.

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, and implementation of the Board's action was delayed until early in 1987.

The catch has fluctuated between 1,900,819 and 2,701,162 pounds during the past five seasons (Table 4.1). Catch analysis during recent seasons suggested that these levels of harvest generally resulted in

overall harvest rates above 60% (82.6 percent in 1995/96, 74.1 percent in 1996/97, and 76.8 percent in 1997/98), which staff considers sustainable only if recruitment levels are high in at least one or two of the most heavily fished grounds. Continued harvest at these levels without a comprehensive field program is risky because it is impossible to detect recruitment failure until it is demonstrated by depressed catch rates during the initial stages of the commercial fishery. Since the daily catch rates during recent seasons have risen and the openings become so short, the risk of stock failure has greatly increased.

Recent seasons have resulted in a concentration of effort on the most productive grounds. Many marginal grounds are ignored, as searching for productive areas becomes increasingly difficult to justify economically during the first few productive days of the season. The fleet has adapted to short seasons in many ways. In recent seasons, extensive, preseason prospecting has resulted in effort shifts to the most promising grounds, some of which have not been historically productive. Capitalizing on prospecting data and the increasing availability of tenders, the fleet has generally been able to increase daily production to compensate for shorter seasons.

Management is responding by developing a preseason assessment program. In time, perhaps within five years, preseason survey data may support more flexible management based on stock composition and abundance.

Experimental Pot Fishery

Exploratory Tanner Crab Fisheries

In 1988, in response to shorter seasons and requests by fishers, 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 catches 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 when overlaps with traditional fisheries were minimal; that is, between the traditional fishing seasons 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, catches were poor, and no major unexploited populations had been found. Also, flagrant abuses of permit conditions and violations of regulations had occurred. As a result, the Board decided during its winter meeting in 1990 to revoke the regulations that provided for these fisheries.

Deepwater *Chionoecetes* Species Fisheries

Upon request by crabbers interested in exploratory fishing for deepwater species related to *Chionoecetes bairdi*, the department issued permits for *C. tanneri* 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 *C. tanneri* and *C. angulatus* recurred in 1985, permits were issued for a period from March 5, 1995 through April 30, 1995, and the fishery was managed by emergency order. More effort was expended by the fleet and more areas were fished, but results were discouraging because the deepwater species were too fragile to support a viable fishery.

Ring Net Fishery

With the beginning of the pot permit moratorium on January 1, 1984, newcomers who wished to commercially harvest Tanner crab were limited to ring net gear, which was also defined in the regulations 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 price of crab is high; their efficiency is limited and their use is labor-intensive.

The number of ring net fishers reporting landings increased from five in the 1984/85 season, peaked at 89 in the 1989/90 season, and gradually declined to 44 by the 1993/94 season. The total climbed again to 82 for the 1994/95 season in expectation of higher prices. In the 1997/98 season, 92 ring net permit holders reported landings.

Total ring net catch increased from 1,451 pounds in the 1984/85 season to 100,896 pounds, or 5.11% of the total catch, during the 1989/90 season. During the 1990 winter meeting, the Board passed a number of restrictive regulations intended to cap the ring net portion of the total Tanner catch at a maximum of four percent. Since adoption of these restrictions, ring net catches have consistently been below this level. Ring net catch has since fluctuated between 33,544 and 86,119 pounds and has exceeded the four percent cap only in the 1996/97 season, when ring net harvest was 4.3% of the total overall catch. In retrospect, the regulations passed by the Board in 1990 have been very effective in limiting ring net catches to less than four percent.

Bitter Crab Syndrome

By the 1984/85 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. Most management staff 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 1985/86 season, revealed that bitterness was closely correlated with presence and concentration of a systemic parasite, a highly specialized dinoflagellate of the genus *Hematodinium*.

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. 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: egg clutches of infected females being greatly reduced in size. The mechanism and seasonal timing of transmission remains unknown. 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 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 many vessel operators simply retain all legal crab for the buyer to sort.

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 pounds of deadloss (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 disinfection 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.

A partial solution to the transport and disposal problem might be to schedule the season during an earlier stage of the course of infection. Presumably, there should be a period during October or early November when most crab infected during the previous year have died and the majority of the newly infected crab have not yet developed an unpleasant taste. A harvest period between October and November is acceptable from a biological standpoint for the harvest of Tanner crab. Preliminary analysis of crab samples from some bays indicate meat recoveries high enough for crabs to be marketable during this period. Small scale openings or test fisheries may be an appropriate means of harvesting and utilizing crab from areas with high infection rates.

Although symptoms of the disease are less pronounced from October to early November, they are not absent. Meat recovery is lower during October and November than in February. Crabs are not as readily caught because they are deeper and less aggregated during October and November than later in the winter. Despite the disadvantages, a season that minimizes waste and possibly hazardous disposal of infected crab may be preferable to the current season.

The state 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 1988 to prevent fishing on crabs heavily infested 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 1992/93 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 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 of Fisheries meeting because it was determined that this fishery would not be manageable and would not provide the information for which it was intended.

The bitter crab problem does not appear to be diminishing. High percentages of bitter crab, in excess of 40% from some districts, are beginning to encourage processors to explore alternate processing or product options for bitter crab. A cooperative study in the early 1990s by a processor and various state agencies on seasonality of bitter crab rates and intensity suggested that it might be possible to process less-infected bitter crab for alternate product or value-added marketing.

REGULATION DEVELOPMENT

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

Fishing Seasons and Periods

Prior to 1963, there were no seasons designated for Southeast Alaska. Tanner crab could be caught at any time during the year. In 1963, the season was set at January 1 through December 31. The season was first shortened in some areas in 1969, largely to facilitate management of the red king crab fishery.

In 1974, the season starting date was changed to September 1 and the season was closed by emergency order on May 15, 1974. 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 3.0 million pounds. In 1982, the season was closed by emergency order in mid-December, after two weeks of fishing, because of

unprecedented effort and its 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 crabbers participated or tendered herring. Since 1989, the season starting date has been February 15 and the length of the season has progressively shortened to about a week.

Size Restrictions

A minimum size of 5.5 inches carapace width was implemented in 1976 for males and persists to the present. This size permits nearly all males at least one season, and possibly two, of reproductive activity prior to attainment of legal size.

Quotas and GHRs

A Guideline Harvest Level (GHL) of 1,750,000 pounds was first set in 1976. It was revised downward to a GHR of 750,000 to 1,500,000 pounds in 1978. In 1979, the GHR was revised to 750,000 to 2,500,000 pounds. In response to the 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 2,000,000 pounds in 1985. This range has been sufficient to provide a relatively stable harvest up to the most recent season, when an unanticipated shift in effort to non-traditional fishing grounds south of Petersburg and west of Wrangell pushed the total season catch to over 2.7 million pounds. If the increased harvest from non-traditional grounds were discounted from the total catch, the harvest from traditional districts would have totaled a little more than 2.0 million pounds.

Gear Restrictions

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 while diving was rescinded in 1969. Although legal, trawl gear was rarely, if ever, used in this fishery during this period. Tanner 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 and Southeast and Yakutat were combined into a single registration area. In 1996, the pot limit was reduced to 80 pots, and the limit was implemented starting in the 1997 season.

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.

Since 1981, long-term, in-water storage of gear has been prohibited. In 1985, four and 3/4 inch diameter escape rings (two per pot) were required in each Tanner pot to reduce retention and sorting of small males and females. Pre-season gear storage was prohibited. Vessels and persons registered for the commercial Tanner fishery could not fish with any non-commercial gear for 14 days prior to the start of the season. Since 1987, pre-season gear storage for a period of 10 days before the start of the season was permitted under some conditions. 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.

Between the mid-1980s and 1990, use of ring nets grew because pot permits were under moratorium. In 1990, the number of ring nets was limited to 20 per vessel, ring net marking requirements were defined, and long-lining of ring nets was prohibited. Vessels could not concurrently be registered for both ring nets and pots. Wording was incorporated to prevent use of ring net gear to conduct preseason test fishing under the guise of subsistence fishing. Ring nets were also defined in more detail and limits set on their size.

Other Regulations

Retention of soft-shelled crab was expressly prohibited from 1954 through 1968. Hold inspections were initiated in 1974. Also in 1974, Southeast Alaska and Yakutat were combined into a single nonexclusive registration area. In 1975, preseason hold inspections and vessel registrations were required. A preseason registration deadline was in effect in 1978. The first allocative area closure of the commercial fleet in favor of the personal use fishery was in Gastineau Channel. Chemical baits or lures were permitted to attract shellfish. In 1979, the hold inspection requirement was dropped because it was considered unnecessary in Southeast Alaska and Yakutat.

In 1981, Tanner crab had to be landed within 24 hours of the season closure and in-water pot storage was permitted for 72 hours after the closure. Fritz Cove and Auke Bay were closed to commercial fishing. In 1982, the commercial closure was repealed, along with the closure of Gastineau Channel. In 1983, the Board passed proposals establishing Southeast Alaska and Yakutat as a superexclusive registration area, and a moratorium on new permits was requested by permit holders in the Southeast Alaska fishing districts. Vessels could have only one legal limit aboard, in storage, or fishing during the season and had 72 hours to deliver crabs after the season closure. Gastineau Channel was closed again to commercial fishing. In 1984, fishing with pots or storing pots in the water 10 days before the start of the season was

prohibited. A moratorium on new pot permits was implemented in 1985. The preseason fishing prohibition was lengthened to 14 days. The delivery period was shortened to 24 hours after the close of the season. Post-season pot storage was allowed for 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 pre-season, in-water storage period was allowed, with some restrictions.

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 major changes limited ring nets to 20 per vessel and capped the allowable ring net catch at four percent of the total catch. During the spring of 1991, Southeast Alaska and Yakutat were designated separate registration areas, A and D, respectively. By the mid-1990s, effort in the fishery had effectively increased because processors started sending tenders to distant fishing grounds to support their fishing fleets, crabbers were using larger vessels and more were using full limits of gear. Efficiency and intensity increased as seasons grew progressively shorter. Starting in the 1993/94 season, daily harvest logbooks have been mandatory. Logbooks were one of the last remaining options left to managers trying to conduct in-season management based on exploitation rate. When the season length shortened to less than two weeks in 1994/95, in-season management became increasingly untenable and a lower pot limit proposal was prepared for presentation to the BOF in 1995.

The Board adopted a reduction in pot limit to 80 pots, although the department had requested a limit of 50 pots. The Board directed the department to assess the feasibility of using daily radio reports of catch and effort from all pot crabbers in the 1995/96 and 1996/97 seasons to support continuing in-season management based on real-time catch data. The reporting requirement was dropped after two seasons as it became apparent that even daily reports could not be input and evaluated fast enough to support in-season management.

1995/96 SEASON SYNOPSIS

The 1995/96 season opened at 12:00 noon AST, on February 15, 1996. The fleet was put on notice, via a preseason news release, that it was unlikely that the season would extend beyond February 24, 1996. This assessment was based on historical catch rates during recent seasons, assuming similar overall stock conditions during this period. As announced, the fishery closed by Emergency Order (1-C-8-96) nine days later at 12:00 noon AST, on February 24, 1996. When the closure time was announced on February 20, the known catch stood at slightly more than one million pounds, as reported on fish tickets. Estimates derived from the daily reporting system were also about a million pounds. At the end of the opening, 1,911,080 pounds of marketable crab, plus 108,956 pounds of deadloss, for a total of 2,020,036 pounds, had been caught. This catch level could not be verified by fish ticket data, processor reports, or daily reporting summaries until the end of the first week in March, almost two weeks after the fishery closed.

Reported deadloss was not separated into soft, bitter, or dead crab components, but most of it was attributable to rejected bitter crab. At almost \$2.00/pound, marketable product was worth at least \$3,822,000, ex-vessel. The economic loss represented by the deadloss was conservatively set at \$218,000. Extensive sorting was conducted on the fishing grounds and the reported bitter crab deadloss is probably a small fraction of the unmarketable crab actually handled by the fleet.

The total reported catch was close to the 2,000,000 pound GHR ceiling. Catch rates and total catch were a clear indication that the fleet was fully capable of reaching the harvest ceiling in nine days. Daily catch reporting by individual vessels was an overall failure because reporting was sporadic, resulting in no improvement in daily catch tracking. This was unfortunate, because some crabbers and processors went to great efforts to comply.

A total of 168 permits reported landed catches during the season. They included 95 pot permits landing 1,969,435 pounds of crab, of which 1,862,859 pounds were marketable. A total of 50,601 pounds, or about 2.5% of the total catch, was reported landed by 73 ring net permit holders. Marketable crab comprised 48,221 pounds of the total ring net catch and 2,380 pounds were deadloss, mostly due to bitter crab.

A summary of the catch by fishing area indicated that about 1,745,161 pounds (86.4%) of the total season's harvest was taken from the three major fishing areas; Icy Strait, Stephens Passage, and Frederick Sound (Table 4.3). The success or failure of the fishery now hinges on catches from increasingly crowded, heavily fished areas. Trends in landings by district over the past few seasons suggest that the effort cycles between these major areas as the fleet adjusts to changes in relative stock abundance.

Port sampling data from the traditional areas (Table 4.4) suggest that the fishery harvested slightly larger crab than the ten-year average. Since the fishery continued to adapt to shorter seasons, how the higher average size and lower percentage of recruits relate to overall stock viability was difficult to surmise. However, the rising percentage of post recruits in the total harvest may indicate that the fleet is not targeting as many recruit crabs as during previous seasons, or that recruitment declined.

Aerial surveys were flown over many of the fishing grounds in Frederick Sound and lower Stephens Passage on February 18, 1996, to document effort and location of fishing vessels. About half the fleet was fishing in these areas.

Nine processors conducted primary on-shore processing. One catcher-seller reported sales this season. The threat of sections-only processing requirements, prompted by PSP testing by ADEC, and the probability of a very short season may have deterred other catcher-seller activities. The major portion of the catch was handled by processors based in Petersburg, with purchases also reported by plants in Hoonah, Juneau, Sitka, Pelican, and Gustavus..

As has been the case for the past few seasons, most of the product was processed "green," which consisted of butchering, cleaning, rinsing, dipping in anti-oxidant, and freezing raw sections. The anti-oxidant used to prevent discoloration of the crab blood in uncooked section packs is not approved for domestic use. Most of the product was shipped to Japanese and other Asian markets. A small amount of crab was sectioned, cooked, and frozen for surface shipment to domestic and foreign markets.

Port Sampling Data

Combined port sampling information for the entire region indicated that at 153.7 mm, the average size of crabs was above the ten-year average of 152.0 mm. The percent of recruits (67.0 percent), representing crabs entering the fishery for the first time, was very close to the ten-year average of 67.9 percent (Table 4.4). Catch per unit effort was higher this season than the ten-year average (Table 4.5). Average weight was the second highest since the start of the “modern” era in the early 1980s.

Port sampling information summarized by fishing grounds in Frederick Sound, Icy Strait, and Stephens Passage (boundaries detailed in footnotes in Table 4.3) indicate that average sizes and weights were higher than average; data for all other areas were combined for reporting purposes (Tables 4.6-4.11).

1996/97 SEASON SYNOPSIS

The 1996/97 season opened at 12:00 noon AST, on February 15, 1997. It closed by Emergency Order (1-C-3-97) eight days later at 12:00 noon AST, on February 23, 1997. Weather was not a major consideration or impediment to the fishery this season. At the end of the opening, 1,795,900 pounds of marketable crab, plus 104,919 pounds of undifferentiated discard, for a total of 1,900,819 pounds, had been caught. Most of the reported discard was attributable to rejected bitter crab. At an average price per pound of \$1.80, the marketable product was worth about \$3,233,000, exvessel. The economic loss represented by the deadloss was conservatively set at \$188,900. The documented bitter crab segment of the total deadloss was probably a fraction of the unmarketable crab encountered by the fleet.

A total of 164 permits were fished during the season. They included 94 pot permits and 70 ring net permits. A total of 81,935 pounds (4.3% of the total Tanner crab catch), were reported landed with ring net gear. This was the first time the ring net catch exceeded four percent of the total commercial catch since the Board established that ring net catch ceiling in 1990.

A summary of the catch by fishing area indicated that about 1,475,200 pounds (76.7%) of the total season's harvest was taken from the three major fishing areas; Icy Strait, Stephens Passage, and Frederick Sound (Table 4.3). The recent recovery of the golden king crab stocks, the fishery for which is open concurrently with the Tanner crab fishery has alleviated some effort on Tanner crabs. Multiple-species permit holders, eligible to fish for either species, could start the concurrent Tanner and golden king crab season by fishing for golden king crab, rather than Tanner crab.

Fifteen processors conducted onshore, primary processing with most product being processed “green” in uncooked sections. Three catcher-sellers, permit holders who sold whole crab to the general public, were severely constrained by shorter seasons. Over one-half of the total catch was processed by three processors based in Petersburg. The remainder was processed in Sitka, Hoonah, Juneau, Wrangell, and Gustavus.

Logbooks were mandatory and summary by fishing area indicated a similar pattern to previous seasons. The only change has been a higher catch per pot at the end of the first full fishing day during more recent seasons. The catch per pot typically falls rapidly after the first day to less than half the initial catch rate by the third day of the season.

A preseason news release announced that daily call-in reporting would be mandatory for the season. However, as in the previous season, compliance was intermittent and sporadic. Many crabbers and processors went to great pains to report, but the extent of reporting was so low that the data was not applicable to in-season management. The rate of reporting was not significantly improved over the previous season, the first season for this requirement.

Aerial surveys conducted during the first half of the fishery indicated that most of the fishing effort was occurring in the expected, historically productive, traditional fishing areas in Frederick Sound, Stephens Passage, and Icy Strait.

Initial, small-scale, preseason assessment surveys, conducted in districts 11 and 14 during the summer of 1997, produced encouraging results. Eventually, as a time series of data is accumulated, the department plans to use results of a preseason assessment survey to establish appropriate catch levels for the fishery.

Port Sampling Data

Combined port sampling information for the entire region indicated that the average width of crabs, at 152.4 mm, was very close to the ten-year average of 152.1 mm. The percent of recruits, at 71.2 percent, representing crabs entering the fishery for the first time, was above the ten-year average of 67.8 percent (Table 4.4). Catch per unit effort was higher this season than the ten-year average (Table 4.6). When port sampling information was summarized by fishing grounds, all three of the traditional, heavily utilized grounds demonstrated average widths and recruitment levels well within the range of values for the past decade (Tables 4.6-4.11). All other areas were combined for reporting purposes and the percentage of catch from this group was elevated well above the ten-year average.

1997/98 SEASON SYNOPSIS

The 1997/98 season opened at 12:00 noon AST, on February 15, 1998. In a preseason news release, the department set the season length at seven days, with the closure scheduled for noon on February 22. The department estimated that an opening of seven days would result in a catch of 2,000,000 pounds or less, depending on the actual stock abundance, which was unknown. This conclusion was based on historical catch rates, assuming overall stock conditions were similar to those of the past few seasons. As announced, the fishery closed by Emergency Order (1-C-4-98). After poor overall compliance with the daily reporting system during the previous two seasons, the mandatory daily reporting requirement was dropped for the 1997/98 season.

At the end of the opening, 2,564,275 pounds of marketable crab, plus 136,887 pounds of deadloss, for a total of 2,701,162 pounds, had been caught. This catch level could not be verified by fish ticket data or processor reports until mid-March. For the first time, revised fish tickets allowed processors to consistently separate unmarketable discarded crab into soft, bitter, or dead crab components. As in the past, the major discard class was bitter crab, which accounted for 110,092 pounds of the total deadloss. It was probable that the reported bitter crab loss was actually much higher, since an unknown amount of bitters were sorted and discarded on the fishing grounds. At almost \$1.95/pound, marketable product was worth at least \$5,000,000, ex-vessel. The economic loss represented by the deadloss was conservatively set at \$267,000.

The total reported catch was well over the 2,000,000 pound GHR ceiling. Catch rates and total catch were a clear indication that the fleet is currently composed of vessels and participants fully capable of attaining the harvest ceiling in less than seven days. Constraining the catch to a 2,000,000 pound ceiling will require adoption of further effort-reducing regulatory measures, since further reductions in pot limits or fishing time would most likely be counterproductive and would do little to insure the long-term viability of this resource. For example, reductions in pot limits would result in pots being picked more frequently, providing less time for sublegal males and females to leave the gear.

A total of 183 pot and ring net permits were fished during the season. The 91 pot permit crabbers landed 2,615,043 pounds of crab, of which 2,479,297 pounds were marketable. A total of 86,119 pounds, or about 3.2% of the total Tanner crab catch, were reported landed by 92 ring net permit holders. Marketable crab comprised 84,978 pounds of the total ring net catch and 1,141 pounds were deadloss, of which 452 pounds were due to bitter crab.

The short seasons for Tanner crab have encouraged some multiple-permit holders, who could fish either golden king crab or Tanner crab and who might have started on golden king crab in previous seasons, to fish Tanners for the first week of the concurrent season for golden kings and Tanners. Although golden king crab stocks appear to be recovering, the relative prices still favor fishing for Tanners before switching to golden king crab for most multiple-permit holders.

A summary of the catch by fishing area indicated that about 1,628,703 pounds (60.3%) of the total season's harvest was taken from the three major fishing areas; Icy Strait, Lynn Canal/Stephens Passage, and Frederick Sound (Table 4.3). If the contribution of historically marginal fishing grounds is discounted to more usual levels, the remaining catch closely approximates the 2.0 million pounds that management projected would be caught in a seven-day season. This season was atypical in that a large segment of the catch came from areas outside the major fishing grounds.

The increase in the percent of the catch coming from districts 106 and 108 during the last two seasons suggests a trend toward heavier effort and higher catch from some districts that have not been highly productive in the past. If the fishery continues relying on historically marginal districts, management will need to reassess its definition of fishing ground boundaries. This may have some implications for survey design in the future.

Fifteen processors, the top four of which processed over 79% of the total regional production, conducted primary on-shore processing operations this season. One catcher-seller reported a single small sale. The major portion of the catch was processed by processors based in Petersburg, with purchases also reported by plants in Hoonah, Juneau, Sitka, Wrangell, and Gustavus.

Logbooks continued to be mandatory, and summary by fishing area indicated a similar pattern to previous seasons. The only change has been a higher catch per pot at the end of the first full fishing day during more recent seasons. The catch per pot typically falls rapidly after the first day to less than half the initial catch rate by the third day of the season.

After evaluating the applicability of daily call-in of catch and effort for the prior two seasons, the department concluded that it could not rely on daily reports to conduct in-season management due to low overall compliance. The department also concluded that even with better compliance, delays between actual catch and its input into the management model would not permit its use for seasons as short as a week. As a result, the daily call-ins were dropped for the 1997/98 season.

Aerial surveys were flown over most of the fishing grounds in northern Southeast Alaska on February 16, and 17, 1998, to document effort and location of fishing vessels. Distribution of effort, in terms of observed locations of pot sets and fishing vessels, reflected the concentration of an unusual amount of effort in parts of districts 106 and 108.

Continued evaluation of sampling design and methodology for preseason assessment surveys were conducted in districts 11 and 14, which included three possible index areas. Results were encouraging and as a longer time series of data and additional areas are included in the survey, it may be possible in the near future to use a preseason survey to better manage the commercial fishery. Development of preseason methods for fishery management are becoming critically important because reliance on season length to control catch is becoming unacceptably risky to long-term conservation of the resource.

Port Sampling Data

Port sampling information summarized for the registration area indicated that, at 153.8 mm, the overall average size of crabs was above the ten-year average and the percent of recruits, representing crabs entering the fishery for the first time, was below the ten-year average (Table 4.4). Catch per unit effort was estimated at 19.14 crabs per pot, the highest since the start of the “modern” period in this fishery. The average weight of crab were also above the ten-year average (Table 4.5).

Data from Icy Strait suggest that the average size and weight were higher than recent seasons and the percent of recruit crabs declined slightly from the 80% or higher levels of the previous four seasons (Tables 4.6 and 4.7). This stock was still fished at a higher exploitation rate than stocks in other areas and may be at greater risk. The size and weight of crabs sampled from Lynn Canal (Tables 4.8 and 4.9) were high and the estimated percent of recruit crab were the lowest of the three major grounds. The high percentage of bitter crab in the catches from Lynn Canal explain the lack of general interest and effort during increasingly short seasons. As a result, it is likely that Lynn Canal has been fished at a lower exploitation rate than the other traditional fishing grounds, resulting in more large crab being left on the grounds. Size and weight data from Frederick Sound (Tables 4.10 and 4.11) were within the usual range of recent seasons, as was the percent of recruits in the catch.

1998/99 SEASON OUTLOOK

The current season opened by regulation on February 15, 1999. It, and those into the first years of the new century, represents a time of crisis for management. The department has struggled for years to manage this fishery for sustainability. From the 1981/82 season, the start of increasingly intensive fisheries for Tanners in Southeast Alaska, the greatest impediment to management has been the lack of a program to gather comprehensive biological information on stock composition, distribution, and abundance. Despite the progressively shorter seasons through the late 1980s and early 1990s, management could still use commercial catch data to estimate exploitation rates for each major geographic stock and close the entire fishery when the weakest of the major districts reached its maximum allowable rate. In-season management worked when the seasons were long enough for most vessels to make at least two, and preferably three or more, deliveries. In most cases, a minimum of a 21-day season was required to conduct in-season management with confidence that the objectives of sustainability were being attained. The last 21-day season was in 1989/90. Since then, the department has struggled, with decreasing effectiveness, to continue in-season management, finally using logbooks or reports of daily catches during the past three seasons. Neither stopgap measure has produced data that can actually be used for in-season management. The last season was seven days in length.

For the past several seasons, the department has been forced to simply project the number of days it would take the fleet to harvest 2.0 million pounds and announced a season length accordingly. This approach simply assumes that an overall catch of 2.0 million pounds is conservative enough to be sustainable. Considering the high estimated exploitation rates, the continuing dependence of the fishery on recruits, and the demonstrated interannual variability in stock abundance and composition in the major fishing areas, the risk of overfishing weak stocks is very high.

For the 1998/99 season, the department has shortened the season further, to a six day season, to insure that the catch will not exceed 2.0 million pounds. This may achieve the short-term goal of keeping the total catch under the regulatory ceiling, but it will not address the longer-term goal of assuring appropriate catch levels and sustainability of all major stocks in Southeast Alaska.

Table 4.1. Traditional commercial Tanner crab pot and ring net catch by permit, number of landings, pounds, and pounds per permit in Registration Area A, 1968/69 to present.

Season	Pot Fishery				Ring Net Fishery					Combined Gear Total
	Permits	Landings	Pounds	Pounds Per Permit	Permits	Landings	Pounds	Per Permit	Percent Total Catch	
1968/69	29	78	176,572	6,089						176,572
1969/70	31	347	660,337	21,301						660,337
1970/71	12	72	167,378	13,948						167,378
1971/72	25	274	656,661	26,266						656,661
1972/73	31	354	1,600,748	51,637						1,600,748
1973/74	52	419	1,309,673	25,186						1,309,673
1974/75	51	244	863,751	16,936						863,751
1975/76	32	369	2,149,397	67,169						2,149,397
1976/77	55	381	2,563,775	46,614						2,563,775
1977/78	44	337	2,142,409	48,691						2,142,409
1978/79	38	313	1,559,769	41,047						1,559,769
1979/80	51	354	1,773,655	34,778						1,773,655
1980/81	58	418	2,020,071	34,829						2,020,071
1981/82	72	438	3,301,909	45,860						3,301,909
1982/83	95	173	1,106,080	11,643	*	*	*	*	<0.05%	1,106,459
1983/84	100	333	1,604,864	16,049						1,604,864
1984/85	77	261	1,127,833	14,647	5	6	1,451	290	0.1%	1,129,284
1985/86	71	296	1,003,826	13,952	11	22	2,609	237	0.3%	1,006,435
1986/87	67	260	1,120,373	16,722	7	11	3,601	514	0.3%	1,123,974
1987/88	71	315	1,317,887	18,562	13	51	12,598	969	0.9%	1,330,485
1988/89	76	241	1,582,648	20,568	63	142	62,621	994	3.8%	1,645,269
1989/90	77	257	1,884,781	23,857	92	180	101,045	1,098	5.0%	1,985,826
1990/91	75	198	2,184,844	29,131	36	88	56,749	1,576	2.5%	2,241,593
1991/92	82	256	2,059,069	25,111	41	111	49,568	1,209	2.4%	2,108,637
1992/93	83	219	1,529,152	18,424	51	100	33,544	658	2.1%	1,562,696
1993/94	81	248	1,957,932	24,172	44	92	37,146	844	1.9%	1,995,078
1994/95	91	241	2,414,037	26,528	82	185	73,576	897	3.0%	2,487,613
1995/96	95	222	1,953,790	20,731	73	131	50,303	693	2.5%	2,004,391
1996/97	94	226	1,818,884	19,350	70	184	81,764	1,171	4.3%	1,900,648
1997/98 ^{u/}	93	232	2,615,043	28,119	92	213	86,119	936	3.2%	2,701,162

* Where number of permits participating is less than three, information is confidential.

^{u/} Most recent season data is considered preliminary.

Table 4.2. Traditional commercial Tanner crab catch 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	0.0	0.0	10.0	8.3	13.1	60.4	35.0	32.9	*	8.6	176.6
1969/70	24.4	30.6	17.5	18.7	19.7	97.2	214.4	149.6	21.1	*	*	*	660.3
1970/71	0.9	*	6.7	7.1	21.3	41.4	56.2	*	0.0	0.0	0.0	0.0	167.4
1971/72	0.0	29.9	31.0	39.0	29.4	17.9	91.6	203.5	148.5	58.5	*	1.0	656.7
1972/73	5.4	42.0	83.8	86.7	50.7	140.8	376.6	554.6	228.7	26.6	*	*	1,600.7
1973/74	29.4	91.8	94.8	87.3	69.5	126.3	314.7	406.2	89.8	0.0	0.0	0.0	1,309.7
1974/75	*	77.2	70.6	56.6	71.6	74.4	180.6	225.8	102.6	Closed	Closed	Closed	863.8
1975/76	13.3	110.3	125.4	107.1	159.7	367.4	634.6	460.0	171.5	Closed	Closed	Closed	2,149.4
1976/77	3.9	76.2	277.0	209.2	338.3	393.8	695.3	458.0	112.1	Closed	Closed	Closed	2,563.8
1977/78	29.4	162.6	139.5	176.0	149.9	303.8	592.5	504.7	84.0	Closed	Closed	Closed	2,142.4
1978/79	6.6	47.6	76.7	91.7	200.1	189.2	465.4	422.3	60.3	Closed	Closed	Closed	1,559.8
1979/80	60.7	55.7	74.5	61.0	153.9	440.0	607.9	282.4	37.5	Closed	Closed	Closed	1,773.7
1980/81	33.7	51.9	48.5	60.1	315.9	504.1	627.3	350.5	28.1	Closed	Closed	Closed	2,020.1
1981/82	Closed	Closed	Closed	870.8	597.7	708.7	809.4	315.2	Closed	Closed	Closed	Closed	3,301.8
1982/83	Closed	Closed	Closed	1,106.5	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	1,106.5
1983/84	Closed	Closed	Closed	Closed	Closed	866.0	727.5	Closed	Closed	Closed	Closed	Closed	1,604.9
1984/85	Closed	Closed	Closed	Closed	Closed	529.4	599.9	Closed	Closed	Closed	Closed	Closed	1,129.3
1985/86	Closed	Closed	Closed	Closed	Closed	575.8	425.7	Closed	Closed	Closed	Closed	Closed	1,006.4
1986/87	Closed	Closed	Closed	Closed	635.4	488.6	Closed	Closed	Closed	Closed	Closed	Closed	1,124.0
1987/88	Closed	Closed	Closed	Closed	787.7	542.8	Closed	Closed	Closed	Closed	Closed	Closed	1,330.5
1988/89	Closed	Closed	Closed	Closed	Closed	1,087.9	552.8	Closed	Closed	Closed	Closed	Closed	1,645.3
1989/90	Closed	Closed	Closed	Closed	Closed	1,233.4	740.7	Closed	Closed	Closed	Closed	Closed	1,985.8
1990/91	Closed	Closed	Closed	Closed	Closed	1,598.8	642.8	Closed	Closed	Closed	Closed	Closed	2,241.6
1991/92	Closed	Closed	Closed	Closed	Closed	1,727.2	381.5	Closed	Closed	Closed	Closed	Closed	2,108.6
1992/93	Closed	Closed	Closed	Closed	Closed	1,261.2	301.5	Closed	Closed	Closed	Closed	Closed	1,562.7
1993/94	Closed	Closed	Closed	Closed	Closed	1,555.4	441.7	Closed	Closed	Closed	Closed	Closed	1,995.1
1994/95	Closed	Closed	Closed	Closed	Closed	2,487.1	Closed	Closed	Closed	Closed	Closed	Closed	2,487.1
1995/96	Closed	Closed	Closed	Closed	Closed	2,020.4	Closed	Closed	Closed	Closed	Closed	Closed	2,004.4
1996/97	Closed	Closed	Closed	Closed	Closed	1,900.6	Closed	Closed	Closed	Closed	Closed	Closed	1,900.6
1997/98 ^w	Closed	Closed	Closed	Closed	Closed	2,701.2	Closed	Closed	Closed	Closed	Closed	Closed	2,701.2

* Where number of permits participating is less than three, information is confidential.

^w Most recent season data is considered preliminary.

Table 4.3. Traditional commercial Tanner Crab catch 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/Lower Stephens Passage ^{c/}		Other ^{d/}		Total Harvest
	Pounds	% of S.E. Catch	Pounds	% of S.E. Catch	Pounds	% of S.E. Catch	Pounds	% of S.E. Catch	
1971/72	13,440	2.1	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	474,778	29.7	1,600,748
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	33.6	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	1,034,642	40.4	529,849	20.7	399,565	15.6	2,563,775
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	18.6	391,185	22.1	899,658	50.7	152,591	8.6	1,773,655
1980/81	321,594	15.9	682,011	33.8	641,945	31.8	374,521	18.5	2,020,071
1981/82	380,304	11.5	2,102,755	63.7	428,259	13.0	390,591	11.8	3,301,909
1982/83	96,505	8.7	816,016	73.8	108,918	9.8	85,020	7.7	1,106,459
1983/84	298,975	18.6	656,496	41.0	468,461	29.2	180,932	11.3	1,604,864
1984/85	366,496	32.5	223,404	19.8	365,395	32.4	173,989	15.4	1,129,284
1985/86	421,236	41.9	182,316	18.1	282,490	28.1	120,393	12.0	1,006,435
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	29.0	349,098	21.2	629,771	38.3	189,800	11.5	1,645,269
1989/90	386,754	19.7	621,277	31.3	709,685	35.7	268,110	13.6	1,985,826
1990/91	442,952	19.8	798,460	35.6	617,839	27.6	382,342	17.1	2,241,593
1991/92	617,235	29.3	822,562	39.0	442,200	21.0	226,640	10.8	2,108,637
1992/93	452,466	29.0	490,117	31.4	433,002	27.7	187,111	12.0	1,562,696
1993/94	253,543	12.7	517,397	26.0	881,669	44.2	342,469	17.2	1,995,078
1994/95	409,187	16.5	715,656	28.8	1,051,899	42.3	310,871	12.5	2,487,613
1995/96	314,961	15.7	725,970	36.2	704,231	35.1	258,931	12.9	2,004,391
1996/97	293,328	15.4	673,305	35.4	490,581	25.8	443,434	23.3	1,900,648
1997/98	418,743	15.5	692,620	25.6	517,340	19.2	1,072,459	39.7	2,701,162

^{a/} Includes all of District 115 and District 111-30 through 111-99.

^{b/} Includes all of District 114.

^{c/} Includes all of District 110, District 111-01 through 111-29, and District 108-40 through 108-69.

^{d/} Includes all of Southeast Alaska outside of Lynn Canal Upper/Stephens Passage, Icy Strait, and Frederick Sound/Lower Stephens Passage.

Table 4.4. Summary of traditional commercial Tanner crab size frequency and shell condition data collected during dockside sampling in Registration Area A, 1970/71 to present^{a/}.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{b/}	% Postrecruits ^{b/}
1970/71	1	99	157.0	137 - 177	68.4	31.6
1971/72	3	235	149.8	121 - 183	67.1	32.9
1972/73	3	429	156.9	128 - 183	73.4	26.6
1973/74	9	1,658	153.0	111 - 190	68.7	31.3
1974/75	6	616	157.4	127 - 190	64.2	35.8
1975/76	15	1,663	154.1	116 - 190	62.4	37.6
1976/77 ^{c/}	28	3,753	154.5	124 - 192	53.3	46.7
1977/78	36	4,786	155.3	124 - 192	25.4	74.6
1978/79	28	3,273	154.9	129 - 198	44.4	55.6
1979/80	43	4,509	154.6	128 - 193	63.0	37.0
1980/81	43	4,223	152.3	125 - 192	70.0	30.0
1981/82	59	6,556	149.7	129 - 193	67.6	32.4
1982/83	55	5,808	151.3	123 - 185	74.6	25.4
1983/84	24	2,444	152.0	135 - 187	76.2	23.8
1984/85	24	3,211	152.2	135 - 197	77.1	22.9
1985/86	50	5,453	151.0	128 - 191	75.6	24.4
1986/87	62	6,984	152.2	133 - 188	72.8	27.2
1987/88	106	10,933	150.8	134 - 186	67.7	32.3
1988/89	45	10,030	152.8	133 - 194	58.4	41.6
1989/90	122	12,806	150.8	129 - 185	63.7	36.3
1990/91	124	13,050	152.2	131 - 193	74.2	25.8
1991/92	112	11,568	155.0	129 - 190	58.3	41.7
1992/93	104	11,175	151.9	130 - 192	66.0	34.0
1993/94	125	14,731	150.1	130 - 190	77.1	22.9
1994/95	156	18,235	151.6	99 - 191	74.1	25.9
1995/96	120	15,085	153.7	132 - 189	67.0	33.0
1996/97	124	13,123	152.4	132 - 196	71.2	28.8
1997/98	148	11,329	153.8	127 - 190	67.3	32.7

^{a/} Summary tables of all dockside sampling data includes data from Tables 8, 10, and 12 plus data collected that could not be assigned to a fishing area.

^{b/} Recruits = all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width.

^{c/} Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old shell crab ≥ 140 mm carapace width.

Table 4.5. 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 Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Ave. Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{b/}	Percent of Catch Sampled ^{c/}
						Average	Range		
1974/75	1					3.22	3.22-3.22		
1975/76									
1976/77	18	58	1,400	24.1	24.1-24.1	2.58	2.23-2.98	992,862	0.4
1977/78	27	270	6,268	25.2	16.0-43.1	2.68	2.27-3.11	799,406	0.6
1978/79	12	386	5,469	19.8	17.2-22.4	2.60	1.59-2.85	599,911	0.6
1979/80	3	160	1,643	10.3	10.3-10.3	2.80	2.80-2.80	636,401	0.7
1980/81	5	300	4,560	15.2	15.2-15.2	2.80	2.06-3.20	721,454	0.6
1981/82	33	6,277	132,535	26.2	5.3-71.6	2.33	2.01-2.55	1,417,128	0.5
1982/83	39	2,043	26,152	15.0	4.9-29.2	2.45	2.06-2.97	450,342	1.3
1983/84	16	620	6,050	10.5	6.9-14.0	2.50	2.30-2.72	643,194	0.4
1984/85	22	2,070	25,455	11.6	3.9-17.4	2.60	2.26-3.04	435,351	0.7
1985/86	51	7,127	75,552	12.7	1.8-30.7	2.43	1.80-3.10	414,705	1.3
1986/87	59	14,192	135,615	12.3	2.9-32.0	2.49	2.13-2.85	451,395	1.6
1987/88	95	22,745	225,850	11.7	2.4-33.0	2.38	1.96-2.71	559,027	2.0
1988/89	99	26,387	350,878	15.2	0.4-33.0	2.51	2.12-3.11	655,909	1.5
1989/90	109	31,517	366,514	11.7	1.0-34.6	2.45	2.12-2.95	820,253	1.6
1990/91	122	39,168	568,956	15.3	1.3-40.3	2.57	2.11-3.04	872,215	1.5
1991/92	105	32,421	354,003	11.7	0.3-30.0	2.67	2.11-3.07	789,752	1.5
1992/93	89	27,471	299,288	11.1	2.5-31.7	2.53	2.05-3.00	617,666	1.8
1993/94	101	48,905	772,609			2.43	1.92-2.90	821,822	2.0
1994/95	152	56,061	938,582			2.50	1.97-3.03	995,041	1.8
1995/96	120	17,874	262,601	14.7	0.5-56.8	2.64	2.06-3.22	758,603	1.9
1996/97	124	21,130	370,121	14.8	0.4-65.8	2.52	2.06-3.12	760,259	1.7
1997/98	148	28,592	547,527	19.2	0.4-91.6	2.66	2.00-3.06	1,029,162	1.8

^{a/} Summary tables of all dockside sampling data includes data from Tables 4.6, 4.8, and 4.10 plus data collected that could not be assigned to a fishing area.

^{b/} Calculated by dividing fish ticket weight data from Table 4.5 by dockside sampling average weight per crab data.

^{c/} Calculated by dividing number of crab sampled for size frequency by estimated number of crab caught.

Table 4.6. Tanner crab catch rate and average weight in Icy Strait, 1975/76 to present. Data were collected during dockside sampling and interviews.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{a/}	Percent of Catch Sampled ^{b/}
						Average	Range		
1975/76	2					1.86	1.67-2.09	271,553	0.0
1976/77	2					2.10	1.97-2.24	492,687	0.0
1977/78	2					2.82	2.78-2.86	270,387	0.31
1978/79									
1979/80									
1980/81									
1981/82	21	5,074	118,704	29.5	5.3-71.6	2.31	2.01-2.55	910,284	0.30
1982/83	34	1,556	22,758	18.4	4.9-29.2	2.46	2.06-2.76	339,384	0.98
1983/84	8					2.52	2.35-2.67	260,514	0.31
1984/85	2					2.30	2.30-2.30	97,845	0.32
1985/86	1	98	811	8.3	8.3-8.3				
1986/87	4	1,087	11,342	12.1	6.0-20.8	2.37	2.28-2.51	102,114	0.47
1987/88	10	2,712	27,371	10.9	5.0-25.0	2.24	2.11-2.44	106,783	1.05
1988/89	17	5,812	69,339	13.3	0.4-26.7	2.28		153,113	1.22
1989/90	25	8,812	113,893	13.3	4.3-34.6	2.50	2.35-2.65	248,511	1.04
1990/91	34	11,683	153,781	14.1	4.2-40.3	2.42	2.33-2.57	329,942	1.05
1991/92	26	8,901	106,340	11.8	1.0-21.5	2.73	2.56-2.94	301,305	0.98
1992/93	30	9,676	102,557	10.9	2.5-26.7	2.60	2.27-2.98	188,507	2.16
1993/94	24					2.48	2.14-2.90	208,764	1.47
1994/95	39					2.46	2.24-3.06	290,917	1.60
1995/96	29	6,379	100,386	15.7	1.7-56.8	2.65	2.32-3.22	272,311	1.24
1996/97	32	9,662	142,227	15.3	0.9-65.8	2.50	2.25-2.78	269,415	1.43
1997/98	27	9,025	142,542	15.8	0.4-56.8	2.64	2.36-3.00	262,592	0.93

^{a/} Calculated by dividing fish ticket weight data for Icy Strait from Table 4.3, by dockside sampling average weight per crab data.

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

Table 4.7. Icy Strait summary of traditional commercial Tanner crab size frequency and shell condition, 1971/72 to present. Data was collected during dockside sampling.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{a/}	% Postrecruits ^{b/}
1971/72	1	87	154.0	127 - 183	75.6	24.4
1972/73						
1973/74						
1974/75						
1975/76						
1976/77 ^{c/}	1	101	155.2	140 - 179	76.2	23.8
1977/78	4	828	157.6	126 - 190	22.3	77.7
1978/79						
1979/80	2	207	152.6	138 - 179	67.5	32.5
1980/81	23	2,863	148.8	130 - 181	67.4	32.6
1981/82	22	2,759	148.8	130 - 181	66.5	33.5
1982/83	32	3,317	151.0	123 - 178	74.7	25.3
1983/84	8	803	152.4	137 - 181	68.2	31.8
1984/85	2	309	146.6	136 - 165	55.8	44.2
1985/86	1	118	148.3	138 - 180	82.7	17.3
1986/87	4	485	148.4	136 - 176	42.8	57.2
1987/88	11	1,118	149.4	137 - 184	66.8	33.2
1988/89	18	1,875	151.8	135 - 184	64.9	35.1
1989/90	25	2,576	151.1	135 - 183	69.8	30.2
1990/91	33	3,472	150.0	132 - 180	83.9	16.1
1991/92	27	2,943	155.1	132 - 189	67.3	32.7
1992/93	36	4,079	152.4	135 - 189	71.4	28.6
1993/94	27	3,061	150.8	131 - 185	80.3	19.7
1994/95	40	4,666	150.5	135 - 190	85.6	14.4
1995/96	29	3,162	152.8	137 - 185	80.3	19.7
1996/97	32	3,859	151.6	133 - 186	80.5	19.5
1997/98	27	2,153	154.1	130 - 190	78.4	21.6

^{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" (140 mm) carapace width.

Table 4.8. Lynn Canal/Stephens Passage summary of traditional commercial Tanner crab CPUE and average weight, 1976/77 to present. Data was collected during dockside sampling and interviews.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{a/}	Percent of Catch Sampled ^{b/}
						Average	Range		
1976/77	10	58	1,400	24.14	24.14-24.14	2.62	2.45-2.98	228,652	1.10
1977/78	8	270	6,268	252	16.00-43.11	2.70	2.57-2.86	145,941	0.95
1978/79	6	386	5,469	19.8	17.18-22.42	2.68	2.56-2.80	115,211	1.05
1979/80	1	160	1,643	10.27	10.27-10.27				
1980/81									
1981/82	4	762	8,744	12.12	12.08-12.16	2.35	2.31-2.40	161,831	0.32
1982/83	8	487	3,394	10.51	5.50-13.72	2.41	2.37-2.50	39,911	3.25
1983/84	2					2.60	2.49-2.72	114,524	0.18
1984/85	6	875	8,832	10.21	3.89-14.00	2.59	2.49-2.72	141,504	0.60
1985/86	29	3,577	48,103	15.20	5.92-30.71	2.43	1.80-3.10	173,348	1.83
1986/87	37	5,000	64,115	13.97	4.95-31.96	2.53	2.13-2.79	161,032	2.78
1987/88	43	7,507	80,893	12.64	3.01-32.95	2.43	1.96-2.71	183,247	2.89
1988/89	41	7,355	94,795	14.17	4.49-37.36	2.63	2.21-3.11	178,389	2.01
1989/90	33	7,509	89,562	11.61	3.12-32.40	2.51	2.12-2.84	157,619	2.50
1990/91	14	2,555	28,802	12.19	1.95-25.26	2.60	2.45-2.81	168,434	0.63
1991/92	35	6,481	89,249	15.33	0.34-30.00	2.73	2.23-3.07	224,686	1.70
1992/93	22	6,163	68,767	11.37	4.27-19.35	2.65	2.20-3.00	170,742	1.59
1993/94	5					2.39	2.24-2.59	106,085	1.22
1994/95	30					2.53	2.19-3.00	161,734	2.59
1995/96	23	784	7,881	10.05	3.24-17.26	2.74	2.13-3.06	114,762	3.27
1996/97	26	1,820	51,099	28.08	13.17-48.31	2.68	2.34-3.12	109,335	2.16
1997/98	34	3,952	83,997	21.25	11.40-49.34	2.76	2.25-3.00	151,680	4.75

^{a/} Calculated by dividing fish ticket weight data for Lynn Canal/Stephens Passage from Table 4.3, by dockside sampling average weight per crab data.

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

Table 4.9. 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.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	Recruits% ^{a/}	Postrecruits% ^{b/}
1970/71	1	99	157.0	137 - 177	68.4	31.6
1971/72						
1972/73						
1973/74						
1974/75						
1975/76	5	655	155.5	126 - 182	47.6	52.4
1976/77 ^{d/}	15	2,521	154.7	124 - 191	45.5	54.5
1977/78	10	1,382	155.7	131 - 187	20.2	79.8
1978/79	9	1,213	154.7	129 - 191	53.4	46.6
1979/80	5	555	153.3	128 - 186	74.8	25.2
1980/81	4	155	149.9	136 - 182	36.4	63.6
1981/82	5	518	151.4	131 - 193	71.1	28.9
1982/83	12	1,296	151.2	135 - 177	79.0	21.0
1983/84	2	204	153.8	139 - 177	67.0	33.0
1984/85	8	845	153.5	136 - 183	75.5	24.5
1985/86	29	3,166	151.6	135 - 191	72.4	27.6
1986/87	40	4,473	152.9	133 - 188	72.1	27.9
1987/88	52	5,300	151.9	135 - 185	71.5	28.5
1988/89	33	3,592	154.7	133 - 194	75.2	24.8
1989/90	35	3,945	151.9	129 - 185	69.1	30.9
1990/91	10	1,053	155.2	138 - 188	69.1	30.9
1991/92	37	3,796	156.7	129 - 190	51.2	48.8
1992/93	26	2,713	155.1	135 - 192	54.7	45.3
1993/94	12	1,292	151.7	130 - 190	68.3	31.7
1994/95	30	4,194	152.9	131 - 191	64.7	35.3
1995/96	23	3,317	155.9	136 - 186	54.1	45.9
1996/97	26	2,364	155.6	134 - 196	55.0	45.0
1997/98	34	2,754	157.8	136 - 189	52.2	47.8

^{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" (140 mm) carapace width.

Table 4.10. Frederick Sound summary of traditional commercial Tanner crab CPUE and average weight, 1974/75 to present. Data was collected during dockside sampling and interviews,.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{a/}	Percent of Catch Sampled ^{b/}
						Average	Range		
1974/75	1					3.22	3.22-3.22		
1975/76									
1976/77	4					2.60	2.40-2.79		
1977/78	14					2.74	2.51-3.11		
1978/79	5					2.50	1.59-2.85		
1979/80	1					2.80	2.80-2.80		
1980/81									
1981/82	5					2.42	2.20-2.54	176,967	1.2
1982/83	4					2.66	2.35-2.97	40,947	2.0
1983/84	4					2.42	2.30-2.56	193,579	0.4
1984/85	7					2.72	2.26-3.04	134,336	0.8
1985/86	15	2,879	21,651	6.6	1.78-10.03	2.46	2.10-2.72	115,115	1.3
1986/87	10	3,423	36,051	11.7	2.87-22.22	2.48	2.13-2.85	128,035	0.9
1987/88	22	7,478	67,096	10.3	2.40-26.00	2.39	2.17-2.58	190,676	1.2
1988/89	30	8,957	150,506	18.8	4.48-42.74	2.44	2.25-2.75	242,605	1.4
1989/90	42	13,577	149,824	10.9	1.03-30.00	2.45	2.16-2.95	268,599	1.7
1990/91	35	13,188	209,884	16.1	5.71-38.64	2.63	2.12-2.99	230,171	1.8
1991/92	26	10,387	93,663	8.7	2.00-20.00	2.68	2.34-2.98	158,191	1.6
1992/93	19	6,449	75,307	12.0	3.33-31.72	2.45	2.05-2.82	176,736	1.4
1993/94	44					2.44	1.92-2.86	363,335	1.7
1994/95	45					2.54	1.97-3.02	414,133	1.4
1995/96	40	6,404	109,007	13.2	0.53-31.70	2.65	2.06-2.85	265,764	2.1
1996/97	35	6,704	79,087	11.3	6.41-34.71	2.55	2.14-2.92	192,117	1.8
1997/98	27	3,760	87,759	23.3	0.50-52.18	2.54	2.16-3.06	203,979	1.4

4.29

^{a/} Calculated by dividing fish ticket weight data for Frederick Sound from Table 4.5, by dockside sampling average weight per crab data.

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

Table 4.11. Frederick Sound summary of traditional commercial Tanner crab size frequency and shell condition, 1970/71 to present. Data was collected during dockside sampling.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{a/}	% Postrecruits ^{b/}
1970/71						
1971/72	2	148	147.4	121 - 180	60.0	40.0
1972/73	3	429	156.9	128 - 183	73.4	26.6
1973/74	9	1,658	153.0	111 - 190	68.7	31.3
1974/75	4	412	158.8	127 - 190	58.7	41.3
1975/76	3	304	154.3	135 - 183	75.3	24.7
1976/77 ^{c/}	8	820	155.3	129 - 192	67.7	32.3
1977/78	16	1,862	156.2	124 - 192	33.3	66.7
1978/79	17	1,851	155.5	131 - 198	42.3	57.7
1979/80	36	3,747	154.9	134 - 193	61.0	39.0
1980/81	30	3,081	153.0	125 - 192	68.9	31.1
1981/82	20	2,046	150.9	130 - 188	63.8	36.2
1982/83	8	785	153.4	135 - 185	70.2	29.8
1983/84	8	839	152.4	135 - 187	80.6	19.4
1984/85	8	1,068	155.2	135 - 197	67.7	32.3
1985/86	14	1,524	151.5	131 - 188	80.0	20.0
1986/87	10	1,150	151.8	136 - 187	81.3	18.7
1987/88	23	2,338	150.3	135 - 186	65.6	34.4
1988/89	33	3,434	151.9	133 - 182	44.3	55.7
1989/90	45	4,586	150.9	132 - 185	60.0	40.0
1990/91	40	4,086	153.6	131 - 193	70.4	29.6
1991/92	26	2,593	154.6	134 - 189	60.1	39.9
1992/93	24	2,413	149.4	133 - 185	73.1	26.9
1993/94	48	6,297	150.0	130 - 186	80.2	19.8
1994/95	47	5,593	152.8	115 - 188	73.4	26.6
1995/96	40	5,549	154.1	135 - 188	66.9	33.1
1996/97	35	3,394	153.4	132 - 195	67.3	32.7
1997/98	27	2,152	152.3	127 - 186	73.3	26.7

^{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" (140 mm) carapace width.

Section 5

Yakutat Red and Blue King Crab Fisheries

REPORT TO THE BOARD OF FISHERIES, 1999
YAKUTAT RED AND BLUE KING CRAB FISHERIES



By
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and
Catherine A. Botelho

Regional Information Report¹ No. 1J99-07

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

February 1999

¹ The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data, this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

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INTRODUCTION

This chapter describes the commercial red and blue king crab fisheries in the Yakutat area (Registration Area D). Red king crab *Paralithodes camtschatica* and blue king crab *P. platypus* are harvested in small numbers during a season from November 15 through January 24. Catches are limited by low abundance of both species in the Yakutat area.

Registration Area D is a non-exclusive registration area and the king crab fishery is not under limitation. Depending on circumstances in other crab fisheries in the state, the fishery attracts skiffs as well as an occasional Bering Sea-class crabber. Most of the participating vessels are usually small vessels locally based in Yakutat. Fishing effort is limited by severe winter weather in Yakutat Bay and its associated fjords.

The current red and blue king crab management approach is to avoid fishing during sensitive life history stages, to harvest only male crab, and to require separate minimum legal carapace widths for each species (7 inches for red king crab and 6.5 inches for blue king crab).

FISHERY DEVELOPMENT AND HISTORY

Harvests and effort in this fishery have been relatively low and intermittent. Since 1969, there have been reported harvests during 13 seasons, with a maximum of four participating vessels, and resulting harvests have averaged only 4,474 pounds. The highest seasonal harvests on record total less than 15,000 pounds. Both red and blue king crab have been landed, but the most consistent harvests are from the Russell Fjord blue king crab population.

REGULATION DEVELOPMENT

Fishing Seasons

Starting in 1962, a legal season throughout the entire calendar year was established by regulation. This season was established as January 1 through December 31. In 1969 the season was shortened to August 15 to March 15. In 1970 the season length was tied into a maximum harvest of 1.5 million pounds combined from Registration Areas A and D. In 1971 the season was from September 1 through January

31 or until 400,000 pounds of red king crab were taken in areas A and D combined. The season remained the same but the harvest ceiling was raised to 600,000 pounds in 1974. The season was shortened in 1981 to October 1 to January 31 and in 1983 to November 15 to January 24. In 1982 the season was changed to October 10 to January 24 and once more in 1985 to November 15 to January 24, which is the existing fishing season.

Sex and Size Limits

From its inception, this fishery has been restricted to harvesting only male crab in order to protect the reproductively important female crab. The minimum legal size was 6 1/2 inches in carapace width from 1960 to 1971, and 7 inches beginning in 1972. The limit was lowered back to 6 1/2 inches in 1979 for blue king crab in response to information from other locations in the state which indicated that growth and size at maturity were smaller for this species than for red or brown king crabs.

Quotas and Guideline Harvest Ranges

In 1970 a quota of 1.5 million pounds was provided for king crab, all species (red, blue, and brown) combined, for Southeast Alaska and Yakutat. The first red and blue king crab quota was set in 1971 at 400,000 pounds per season for Southeast Alaska and Yakutat, combined. This was increased to 600,000 pounds in 1974, then incorporated into a Guideline Harvest Range (GHR) of 300,000 to 600,000 pounds in 1979. In 1982, the GHR of 40,000 pounds was established specifically for Yakutat. Catches have never approached this catch ceiling.

Fishing Gear

Starting in 1962, only pots could be used in the Yakutat king crab fishery. In 1969, pot storage requirements were developed. Buoys were required to display the license number of the vessel operating the gear. In 1971 a limit of 40 pots per vessel was established for Yakutat waters. The maximum number of pots per vessel that could be set in Yakutat Bay was increased to 60 in 1974, and to 100 in 1976. Rigid tunnels were required with a minimum size of five inches in one dimension and a total perimeter greater than 30 inches. In 1978 an escape panel, sewn with no greater than 120 cotton or linen thread, was required to minimize ghost fishing of lost gear. Buoy stickers for pots fished in Yakutat Bay were implemented in 1979 and pot storage was permitted in waters less than 25 fathoms, with doors open and bait removed.

In-water gear storage was not allowed from May 1 to August 31 in 1981 and 1982. Side-loading pots were prohibited in Yakutat waters beginning in January 1, 1983. Pot storage requirements were changed so that all gear needed to be removed from the water within seven days of the closure of the 1983/84

season. Starting in 1985, pot gear could not be used for 14 days prior to the season opening date by crabbers intending to fish for red and blue king crabs. Pots could be stored all year in waters of Russell Fjord. In 1988 escape panels needed to be fastened with no greater than 30 count thread.

RECENT SEASON SYNOPSES

Yakutat Red and Blue King Crab Fishery

The Yakutat red and blue king crab season was open from November 15 through January 24 during each of the past three seasons. The GHL was not achieved and it was not necessary to use emergency order authority to close the fishery during the past three fishing seasons. The long-term average catch since the 1977/78 season is 5,094 pounds. There were some seasons when no catches were reported (Table 5.1). The harvest since the 1994/95 season has ranged from 4,208 to 4,467 pounds, seasonally, which compares favorably to the long term average. Three permit holders participated during each of the last three seasons. Stock assessment surveys are not conducted in the Yakutat area.

1998/99 SEASON OUTLOOK

Yakutat Red and Blue King Crab Fishery

Fishing opportunities are provided by regulation. Past fishing efforts and harvests have been limited, and resulted in harvests far below the GHL. It is anticipated that the same situation will exist next season.

Table 5.1. Red and blue king crab catch, number of landings and number of permits by season in Registration Area D, 1977/78 to present. Landings prior to 1977 are omitted because they were small and combined with the much larger Southeast Alaska total.

Season ^a	Total Catch ^b	Number of Landings ^c	Number of Permits ^d
1977/78	*	*	*
1978/79	*	*	*
1979/80	13,915	17	4
1980/81	*	*	*
1981/82	*	*	*
1982/83	4,118	14	4
1983/84	1,248	4	4
1984/85	0		
1985/86	*	*	*
1986/87	0		
1987/88	0		
1988/89	0		
1989/90	0		
1990/91	*	*	*
1991/92	*	*	*
1992/93	*	*	*
1993/94	*	*	*
1994/95	*	*	*
1995/96	*	*	*
1996/97	*	*	*
1997/98 ^e	*	*	*

^a Data prior to 1977/78 is combined with Southeast Alaska totals and omitted because it was an insignificant part of the total.

^b Catch data is for red and blue king crab, combined. In some years, the blue catch was a large part of the total.

^c Total landings are the number of unique fish tickets reporting king crab landings in any combination in a season.

^d Total permits are the number of unique CFEC permits that made landings in a season.

^e Most recent year's data should be considered preliminary.

* Where number of permits is less than three, the information is considered confidential.

Section 6

Yakutat Tanner Crab Fisheries

REPORT TO THE BOARD OF FISHERIES, 1999

YAKUTAT TANNER CRAB FISHERIES



By

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and
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Regional Information Report¹ No. 1J99-07

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INTRODUCTION

The Tanner crab *Chionoecetes bairdi* is a brachyuran (true) crab that inhabits temperate and subarctic waters of the eastern Pacific Ocean from northern California to the Bering Sea. *Chionoecetes bairdi* and the closely-related snow crab *C. opilio* support significant Alaskan fisheries, but only *C. bairdi* is known to be present in Registration Area D (Yakutat) of Region 1.

The Yakutat fishery occurs in both the relatively protected major bays in the area, Icy Bay and Yakutat Bay, as well as 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, and District 189 includes waters under state management jurisdiction between three and 200 miles.

Yakutat is an open registration area for Tanner crab, which means that a vessel fishing there may also fish in other open 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.

In recent years, this fishery has 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 have 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 fish in any given season.

Currently, light-weight cone or pyramid-shaped pots are more commonly used than the heavier, seven-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 an extended winter season (January 1 - May 1). Also, a guideline harvest ceiling of 1,000,000 pounds, 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 for this species. In recent years, the season has opened by regulation on January 15 and has usually closed by regulation on May 1.

Port sampling of Tanner crab from Yakutat is limited by the widespread, low-level nature of the fishery and limited staffing and funding. Available information demonstrates that Yakutat crab 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 crab in Yakutat than other areas. Seasonal effort and total catch in the last decade have been a fraction of that during the 1970s. Despite many indications of poor recruitment and low abundance, continued fishing has been permitted so harvest data is available to generally assess stock condition. A low level of fishing activity will be tolerable as long as it does not significantly exceed that of recent seasons. If stocks decline further or more vessels enter this fishery, more restrictive management will become necessary.

FISHERY DEVELOPMENT AND HISTORY

It was not until the early 1970s that significant Tanner crab fisheries developed in the Yakutat area (Table 6.1). As the overall market for Tanner crab slowly grew, landings from the Yakutat area also rose, averaging about 1,500,000 pounds per season between the 1972/73 and 1979/80 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 6.2), although the season 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 area was heavily fished (Table 6.3). Many vessels also participated in shellfish fisheries in other areas of Alaska.

The stocks could not sustain the levels of harvest of the late 1970s and crashed between the 1979/80 and 1980/81 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. Many of the larger vessels left the fishery. Those remaining were forced by regulation to switch to top-loading conical or pyramidal pots. By 1984 and 1985, 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 6.3).

In 1986, two larger crabbers entered the fishery. The larger vessels experienced uniformly poor catches despite extensive exploratory fishing. In 1987, 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 disappointing landings discouraged the remaining three from entering the fishery. In 1988, only one large vessel and several of the smaller vessels fishing around Yakutat Bay reported any landings. In 1989, one large vessel and several of the smaller vessels based in Yakutat reported landings from the Yakutat area. Much of the detailed data from this fishery is considered confidential because of the few vessels that fish in this area.

During the 1988/89 season, only a few local vessels, limited to the waters of Yakutat Bay, participated in the fishery. From the 1989/90 season to the present, the consistent fishing pattern has been 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.

The Tanner crab stocks in the Yakutat area have not recovered since the crash in the early 1980s. They continue to show signs of severe depletion and exhibit no indication of imminent recovery.

REGULATION DEVELOPMENT

Fishing seasons and Periods

Fishing seasons in Yakutat started in the 1973/74 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 1979/80 and 1980/81 seasons were shorter, closing by emergency order on April 20 in the 1979/80 season and by regulation on May 1, 1981, respectively. Stocks began crashing in the 1980/81 season, and subsequent changes to the season resulted into reduced fishing time. In 1981/82 and 1982/83, 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 1983/84 season and ending on May 1, 1984. Increasing catch resulted in adoption of a 1984/85 season that extended from January 15 to May 1, 1985. Although catches reached their historical lows in 1984/85 and 1985/86, and have fluctuated widely from 38,615 pounds in 1991/92 to 155,528 pounds in 1988/89, season dates have remained unchanged since 1984/85.

Size restrictions

Size restrictions permitting harvest of only male crabs over 5.5 inches in carapace width were first implemented in the 1976/77 season and have remained the same since then.

Quotas and GHRs

A 3,000,000 pound Guideline Harvest Ceiling (GHC) was instituted in 1976/77 in response to the rapidly escalating fishery. It was amended to a Guideline Harvest Range (GHR) in 1978/79, of between 500,000 and 3,000,000 pounds. This range remained unchanged through the 1983/84 season. The range was revised for the 1984/85 season to 200,000 to 1,000,000 pounds. This was further revised for the 1986/87 season to ceiling of 1,000,000 pounds and has remained unchanged since. The last revision essentially reduced the lower end of the GHR to zero pounds and provided for closures if stock conditions did not support any harvest.

Gear Restrictions

There were no gear restrictions during the 1973/74 season. Between the 1974/75 and 1976/77 seasons, pots, ring nets, and shrimp trawls were legal. In 1976/77, 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 1977/78, 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 five 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 1980/81, 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 1982/83 season to reduce halibut by-catch. Consequently, some vessels which had been using side-loading king crab pots with Tanner boards were discouraged from entering the fishery. Two, four, and three-quarter-inch diameter escape rings were required for each pot during the 1984/85 season. Starting in 1985/86, gear storage was restricted to a period of seven days after the season closure. Escape rings were repealed for the 1988/89 fishery. Ring nets were prohibited starting with the 1991/92 fishery, as a consequence of Board action restricting their use in the state to Southeast Alaska.

Other Restrictions

Starting in 1979/80, formal hold inspections and certifications were repealed. Starting in 1985/86, pre-season 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.

1995/96 SEASON SYNOPSIS

During the 1995/96 season, a total of seven vessels harvested 27,828 pounds of Tanner crab in the Yakutat area. As in the past, the major portion of the catch was reported from waters between the Yakutat forelands and Icy Bay.

Port sampling for Tanner crab from the Yakutat area was not conducted for the 1995/96 season. The landings were sporadic or at times when department personnel were unable to sample them.

1996/97 SEASON SYNOPSIS

During the 1996/97 season, seven vessels harvested 16,302 pounds of Tanner crab in the Yakutat area. The major portion of the catch was reported from waters between the Yakutat Forelands and Icy Bay.

Port sampling for Tanner crab from the Yakutat area was not conducted for the 1996/97 season. The landings were sporadic or at times when department personnel were unable to sample them.

1997/98 SEASON SYNOPSIS

During the 1997/98 season, four vessels harvested, 9,050 pounds of Tanner crab in the Yakutat area. As in the past, the major portion of the catch was reported from waters between the Yakutat Forelands and Icy Bay. The combined catch of a few of the larger vessels accounted for most of the harvest.

Port sampling for Tanner crab from the Yakutat area was not conducted for the 1997/98 season. The landings were sporadic or at times when department personnel were unable to sample them.

1998/99 SEASON OUTLOOK

In the total absence of any stock assessment data and a lack of a port sampling program for the 1998/99 season, no projections are available for the ongoing season and no port sampling data is likely to be collected. There is little expectation of a significant improvement in the abundance of Tanner crab in Registration Area D.

Table 6.1. 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.

Season	Catch in Pounds	Number of Permits	Pounds Per Permit	Number of Landings	Pounds Per Landing
1972/73	222,441	7	31,777	22	10,110
1973/74	1,872,357	11	170,214	110	17,021
1974/75	1,972,752	13	151,750	60	32,879
1975/76	1,762,589	5	352,518	35	50,359
1976/77	966,650	7	138,093	15	64,443
1977/78	1,003,116	8	125,390	103	9,738
1978/79	1,691,941	15	112,796	107	15,812
1979/80	2,435,123	23	105,875	114	21,360
1980/81	642,608	14	45,901	84	7,650
1981/82	71,302	7	10,186	32	2,228
1982/83	151,621	10	15,162	55	2,756
1983/84	11,142	4	2,786	13	857
1984/85	3,665	5	733	15	244
1985/86	2,379	5	476	9	264
1986/87	48,877	*	*	*	*
1987/88	*	*	*	*	*
1988/89	155,528	5	31,106	23	6,762
1989/90	76,816	5	15,363	27	2,845
1990/91	41,709	6	6,952	42	993
1991/92	38,615	4	9,654	29	1,331
1992/93	116,718	5	23,344	37	3,154
1993/94	364,365	11	33,124	75	4,858
1994/95	107,010	14	7,644	76	1,408
1995/96	27,828	7	3,975	40	695
1996/97	16,302	7	2,329	33	494
1997/98 ^u	9,050	4	2,263	24	377

^u Most recent season data is considered preliminary.

* Where numbers of vessels participating is three or less, information is confidential.

Table 6.2. Commercial Tanner crab catch in thousands of 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	0.0	*	*	0.0	0.0	0.0	0.0	*	122.9	*	0.0	17.9	222.4
1973/74	0.0	0.0	0.0	0.0	*	*	313.8	990.2	558.0	Closed	Closed	Closed	1,872.4
1974/75	0.0	0.0	0.0	0.0	*	*	592.1	839.4	481.9	Closed	Closed	Closed	1,972.8
1975/76	0.0	0.0	0.0	*	*	*	661.8	456.7	*	Closed	Closed	Closed	1,762.6
1976/77	0.0	0.0	0.0	0.0	*	*	486.1	*	0.0	Closed	Closed	Closed	966.7
1977/78	0.0	*	14.5	31.6	161.7	206.0	254.2	279.0	53.1	Closed	Closed	Closed	1,003.1
1978/79	*	*	0.0	*	63.7	185.1	412.8	766.3	238.1	Closed	Closed	Closed	1,691.9
1979/80	0.0	10.2	16.4	27.9	56.9	524.1	1,220.9	578.7	Closed	Closed	Closed	Closed	2,435.1
1980/81	0.0	0.0	0.0	*	6.2	181.9	392.7	60.8	0.0	Closed	Closed	Closed	642.6
1981/82	Closed	Closed	Closed	Closed	0.0	0.0	16.4	47.1	7.8	Closed	Closed	Closed	71.3
1982/83	Closed	Closed	Closed	Closed	Closed	50.2	73.9	27.5	0.0	Closed	Closed	Closed	151.6
1983/84	Closed	Closed	Closed	Closed	Closed	*	5.8	3.6	0.0	Closed	Closed	Closed	11.1
1984/85	Closed	Closed	Closed	Closed	0.0	0.0	0.0	3.7	0.0	Closed	Closed	Closed	3.7
1985/86	Closed	Closed	Closed	Closed	*	*	1.1	*	0.0	Closed	Closed	Closed	2.4
1986/87	Closed	Closed	Closed	Closed	0.0	*	48.2	*	*	Closed	Closed	Closed	*
1987/88	Closed	Closed	Closed	Closed	0.0	*	*	*	*	Closed	Closed	Closed	*
1988/89	Closed	Closed	Closed	Closed	*	*	70.3	36.8	47.1	Closed	Closed	Closed	155.5
1989/90	Closed	Closed	Closed	Closed	*	29.2	37.5	7.4	0.0	Closed	Closed	Closed	76.8
1990/91	Closed	Closed	Closed	Closed	*	8.7	14.1	15.9	0.0	Closed	Closed	Closed	41.7
1991/92	Closed	Closed	Closed	Closed	0.0	18.9	13.4	5.8	0.0	Closed	Closed	Closed	38.6
1992/93	Closed	Closed	Closed	Closed	0.0	*	66.2	31.6	15.7	Closed	Closed	Closed	116.7
1993/94	Closed	Closed	Closed	Closed	7.6	207.3	109.4	31.0	9.1	Closed	Closed	Closed	364.4
1994/95	Closed	Closed	Closed	Closed	54.0	35.7	7.3	2.6	0.0	Closed	Closed	Closed	107.0
1995/96	Closed	Closed	Closed	Closed	13.0	6.7	4.3	3.9	0.0	Closed	Closed	Closed	27.8
1996/97	Closed	Closed	Closed	Closed	*	4.7	1.9	4.4	*	Closed	Closed	Closed	16.3
1997/98*	Closed	Closed	Closed	Closed	*	4.5	2.2	*	*	Closed	Closed	Closed	9.0

* Most recent season data is considered preliminary.

* Where numbers of permits participating is three or less, information is confidential.

Table 6.3. Commercial Tanner crab, catch in thousands of pounds by district and season in Registration Area D, 1972/73 season to present.

Season	District				Total
	181	183	189	191	
1972/73	120.2	102.2	0.0	0.0	222.4
1973/74	963.3	292.6	616.0	0.0	1,872.4
1974/75	1,330.0	*	*	428.0	1,972.8
1975/76	1,448.5	*	*	*	1,762.6
1976/77	513.9	452.7	0.0	0.0	966.7
1977/78	0.0	1,003.1	0.0	0.0	1,003.1
1978/79	718.0	404.6	0.0	544.0	1,692.0
1979/80	1,330.1	154.0	112.8	838.2	2,435.1
1980/81	164.0	151.0	65.4	262.3	642.6
1981/82	0.0	51.2	0.0	*	71.3
1982/83	8.4	83.8	*	*	151.6
1983/84	0.0	11.1	0.0	0.0	11.1
1984/85	0.0	3.7	0.0	0.0	3.7
1985/86	0.0	2.4	0.0	0.0	2.4
1986/87	*	*	0.0	0.0	*
1987/88	0.0	*	0.0	*	*
1988/89	*	7.9	*	*	155.6
1989/90	27.9	*	0.0	*	76.8
1990/91	16.2	25.6	0.0	0.0	41.7
1991/92	*	*	0.0	0.0	38.6
1992/93	*	*	0.0	0.0	116.7
1993/94	320.6	28.6	15.2	0.0	364.4
1994/95	77.4	29.6	0.0	0.0	107.0
1995/96	10.2	17.6	0.0	0.0	27.8
1996/97	*	*	0.0	0.0	16.3
1997/98 ^u	0.0	9.0	0.0	0.0	9.0

^u Most recent season data is considered preliminary.

* Where numbers of permits participating is three or less, information is confidential.

Table 6.4. Tanner crab size frequency and shell condition in Yakutat Area D, 1974/75 to present. Data collected during dockside sampling.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			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					
1977/78	9	2,256	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					
1985/86	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					
1991/92	4	565	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					
1995/96	0					
1996/97	0					
1997/98	0					

^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" (140 mm) carapace width.

Table 6.5. 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	Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lb)		Estimated No. of Crab Caught ^{a/}	Percent of Catch Sampled ^{b/}
						Average	Range		
1975/76	11					1.86	1.67-2.09	947,628	0.1
1976/77 ^{c/}	2					2.10	1.97-2.24	460,310	
1977/78	4					2.22	2.01-2.51	451,854	0.5
1978/79	7	3,810	160,164	34.1	20.1-48.6	2.32	2.25-2.38	729,285	0.2
1979/80	21	8,802	322,624	40.9	7.7-79.0	2.25	2.13-2.38	1,082,277	0.2
1980/81	12	3,688	51,765	17.8	10.2-27.1	2.29	2.05-2.67	280,615	0.9
1981/82	0								
1982/83	16					2.08	1.91-2.21	72,895	2.6
1983/84	0								
1984/85	1					2.41	2.41-2.41	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	2.09	2.09-2.09		
1988/89	5	705	12,429	9.8	1.4-38.1	2.10	2.09-2.11	74,061	0.8
1989/90	4	142	1,621	11.3	7.9-16.3	2.19	2.12-2.30	35,076	2.2
1990/91	0								
1991/92	5	597	8,335	7.6	1.2-16.6	2.31	2.23	16,168	3.5
1992/93	0								
1993/94	0								
1994/95	0								
1995/96	0								
1996/97	0								
1997/98	0								

^{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" (140 mm) carapace width.

Section 7

Section 11-A Personal Use King Crab Fisheries

REPORT TO THE BOARD OF FISHERIES, 1999
SECTION 11-A PERSONAL USE KING CRAB FISHERIES



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Regional Information Report¹ No. 1J99-07

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INTRODUCTION

This report concerns the Southeast Alaska personal use king crab fishery, with emphasis on the fishery that occurs in Section 11-A (Juneau Area). It also provides background information on general regulation development, management tools available, recent management actions, and catch and effort statistics since 1996.

The personal use king crab fishery developed from the subsistence fishery. Current management occurs through a mixture of commercial and personal use regulations. The Section 11-A fishery is conducted according to a management and allocation plan adopted by the Board of Fisheries during the 1995/96 meeting cycle. Commercial fish ticket data are available to determine commercial harvests. Personal Use Permits, creel census data, and phone survey results provide estimates of the non-commercial use of the king crab resource. Personal Use Permits have only been required in the Juneau area.

In Section 11-A, present management provides for a split in the available harvest among approximately 1,500 personal use households and an average of 16 commercial permit holders. Recent harvests have ranged between 8,200 and 9,100 crab. Continued controversy between personal and commercial uses centers on the harvest allocation and fishing area.

BACKGROUND

Initially, non-commercial king crab fishing by Alaska residents occurred under subsistence regulations. Regulation changes affecting this fishery occurred in various portions of the commercial, subsistence, and personal use regulations. Thus, following the changes is not straightforward. However, the significant issues relate to decisions concerning the urban and rural preference in subsistence regulations, development of the personal use regulations, closed waters in the commercial regulations, and development of the management and allocation plan in the commercial regulations.

Prior to 1988, the urban versus rural split occurred in the subsistence regulations. In Southeast Alaska the cities of Juneau, Sitka, and Ketchikan were classified as urban areas. All other locations were classified as rural areas. The Alaska Board of Fisheries subsequently provided for a "personal use" fishery in the urban areas to replace the lost subsistence opportunities. Personal use fishing under 5 AAC 77.001 (f), "means the taking, attempting to take or possession of finfish, shellfish or aquatic plants by an individual for consumption as food or use as bait by that individual or his immediate family." Daily bag and possession limits generally have been six crab per person per day. Gear definitions in personal use regulations generally mirror those in subsistence regulations.

The Alaska Board of Fisheries has not recognized customary and traditional subsistence use of king crab resources in Southeast Alaska. Currently all non-commercial utilization occurs under personal use regulations. Given the limited king crab resource available, there has been no allocation for sport users.

Some allocation of the king crab resource had previously occurred through the closed waters portion of the commercial fishing regulations, currently 5 AAC 34.150. In 1978 Gastineau Channel was closed to commercial fishing. Auke Bay and Fritz Cove were added to the commercial closed waters regulations in 1980.

The commercial fishery was closed from the 1985/86 through 1992/93 seasons due to low stock abundance. Commercial regulations were altered to reflect a more conservative approach to management of the commercial fishery. Restrictive conservation measures were discussed, but not implemented in the subsistence or personal use fisheries. This inaction resulted in a "de facto" allocation of king crab resources to the personal use fishery for a period of approximately eight years. As red king crab stocks in the region rebuilt and the closure of the commercial fishery continued, an expansion of the personal use fishery occurred.

When survey data indicated that stocks were once again strong enough to support commercial fishing, the allocation controversy intensified. In 1993 additional portions of Section 11-A were closed to commercial fishing by emergency order by direction of Commissioner Rosier. In 1995, the portions of Section 11-A initially closed by emergency order were added into the commercial fishing regulations. However, the controversy over stock strength and allocation of Juneau area king crab stocks persisted, even as stock increased to high levels.

The Alaska Board of Fisheries initiated a management and allocation plan for red king crab in Section 11-A, beginning with the 1996/97 season. Commercial Fishing Regulation 5 AAC 34.111 allocated 45% of the available harvest to the commercial fishery with a season from November 1 until closed by emergency order, 46% to the summer personal use fishery from July 1 to September 30, and 9% to the winter personal use fishery from October 1 to March 31. One of the reasons the Board separated personal use allocation into summer and winter seasons was to provide crab for dive fishers who traditionally harvest during the winter when crab migrate into shallow waters.

HARVEST TRENDS

Fish ticket data indicate that the average commercial harvest for seven seasons beginning in 1978/79 was more than 6,300 crab, seasonally (Table 7.1). This number of crab represented approximately 42,000 pounds seasonally and was about 9% of the total Southeast Alaska commercial harvest. An average of 11 vessels participated in the commercial fishery in Section 11-A during these seven seasons. The estimated subsistence or personal use harvest during this same seven-season period gradually increased from less than 5% to over 17% of the total Section 11-A harvest. (Table 7.1).

From the 1985/86 season through the 1992/93 season the commercial fishery was closed. While the commercial fishery was closed the subsistence and personal use harvest increased from about 500 crab to almost 7,000 crab (Table 7.1).

The king crab abundance in the region increased during the commercial closure and stocks were able to support a commercial fishery beginning with the 1993/94 season. With the reopening of the commercial fishery under a more conservative management plan, a portion of Section 11-A was closed to recognize the increase that had occurred in the personal use fishery. Commercial fishing time was also severely restricted. Due to these restrictions, many commercial vessels opted to fish in other locations.

Since the reopening of the commercial fishery, the commercial fleet has harvested an average of 3,460 crab seasonally (Table 7.1) which is 32% of the available harvest in Section 11-A. This harvest represents about 24,000 pounds per season. An average of 16 commercial fishers participated. During the same five-season period, the personal use fishery harvested an average of 6,806 crab, seasonally, which represented about 68% of the available harvest in Section 11-A (Table 7.1). As the personal use fishery permitting process evolved, the department was able to bring management of the personal use fishery more in line with the Management and Allocation Plan. In 1995/96 the personal use fishery harvested 89.1% of the available Section 11-A stock, compared to 58.1% during the 1997/98 season.

PERMITTING AND DAILY BAG LIMITS

Permit procedures have been revised each season in an effort to more precisely achieve allocation objectives (Table 7.2). In the 1996/97 season, separate summer and winter individual permits were issued for the personal use king crab fishery. A daily bag and possession limit of three-crab per person was implemented with no seasonal limit. In the 1997/98 season, household permits replaced individual permits to simplify the permitting process and to get more accurate data from the fishery. The daily bag and possession limit was decreased to two-crab per person in order to keep the fishery open for the entire season. A combined summer/winter limit of 20 crab per household permit, or 10 crab per household when the household was a single person, was put in effect for the 1998/99 fishery. The purpose of the seasonal bag limit was to ensure that anyone wanting to fish in the winter season could do so without fear that the season would close early. In effect, permit holders choose when to catch their limit during the July to March season.

For all three seasons of regulation, about 1,500 permits have been issued, with an additional 643 permits issued for the winter 1996/97 season (Table 7.3). The return rate for 1996/97 summer permits was 83%. This rate decreased to 63 % in 1997/98.

GUIDELINE HARVEST LEVEL, CATCH, AND GEAR

The Guideline Harvest Level (GHL) has been set each year based on survey estimates of crab abundance and the allocation percentages (Table 7.4). For the combined personal use and commercial fishery, the allocation was about 8,400 crab for the 1996/97 and 1997/98 seasons. In the 1998/99 seasons the allocation increased by 70% (14,518 crab), because survey results indicated an increased number of mature, legal male king crab in Section 11-A.

For the summer personal use fishery the catch for each season has been larger than the allocated amount (Table 7.5). According to returned permits for the 1996/97 summer fishery, the catch exceeded the allocation by 1,318 crabs and for the winter fishery by 232 crabs. These data are based on returned permits and underestimate the true catch if any unreturned permits were successful. In the 1997/98 summer fishery, the reported catch only exceeded the allocation by 57 crabs but there were 855 crabs that

had no associated catch dates reported. Of these, 830 crab came from permits that had been issued in the summer season. Management tools are limited because the survey is completed just prior to the opening of the personal use fishery, but the GHL is determined after the fishery begins.

Most of the crab were caught with pots in all years (Table 7.3), especially in the summer seasons, when nearly all (99 %) of the crab were caught in pots and less than 1% were caught diving or with rings. In the 1996/97 winter fishery, 78% of the crab were caught with pots, 20% by divers, and 2 % by crab rings. In the next winter season, 96% were caught by pots, 3% by divers, and 1% by rings. Fewer crab were caught by divers in the 1997/98 winter season because the fishery closed in December, whereas the majority of diving for king crab occurs from January 1 to the end of March.

ESTIMATION OF CATCH AND MANAGEMENT ACTIONS

Permits are required to be returned at the end of the season with catch and effort information completed. These data are not available to assist with in-season management. In order to obtain in-season catch estimates and determine if the catch is approaching the allocation, the department has used two methods of estimation; dockside creel surveys (conducted by the Sportfish Division) for the summer fishery and random phone surveys for the winter component. Both types of surveys provide results in-season that have been used to close the fishery by emergency order.

In 1996/97 these dockside creel survey data were analyzed and indicated the allocation had been reached; hence, the summer fishery was closed August 30, 1996 (Table 7.2). The Division of Commercial Fisheries conducted a random phone survey for the 1996/97 winter personal use fishery. The phone survey data indicated that the allocation had been surpassed and the fishery was closed three weeks early on March 7, 1997 (allocation 765, estimated catch 1,051).

The 1996/97 commercial fishery in the open portions of Section 11-A lasted for 11 days, three days less than for most waters of Southeast Alaska. Twelve commercial permit holders participated and landed 3,116 individual crab, or approximately 24,000 pounds.

For the 1997/98 season, the creel survey indicated the summer personal use catch to be over the allocation and the fishery was closed on August 16, 1997 (Tables 7.2 and 7.4). A phone survey in early December 1997 was used to estimate the catch, which exceeded the allocation for the winter fishery. That fishery was closed on December 29, 1997. This history of early closures prompted the department to adopt a seasonal bag limit, so as to meet the Board's intention of having the summer and winter season last as long as possible according to 5 AAC 34.111 (c) (6).

Red king crab survey results in 1998 indicated that sufficient crab were not available to reach, or exceed, the minimum commercial fishery GHL of 300,000 pounds. The Southeast Alaska commercial fishery was closed by emergency order for the entire 1998/99 season.

Table 7.1. Catch of red and blue king crab in the personal use and commercial fisheries in Section 11-A. Catch data are in numbers of crab.

Season	Personal Use Catch	Commercial Catch	Number of Commercial Permits	Personal Use Catch as Percent of 11-A Total	Total Catch in 11-A	Total Catch in Southeast
1978/79	300	6,964	9	4.1	7,264	69,147
1979/80	300	7,436	9	3.9	7,736	100,973
1980/81	300	11,406	10	2.6	11,706	81,105
1981/82	300	9,233	12	3.1	9,533	80,545
1982/83	500	2,477	11	16.8	2,977	67,273
1983/84	500	2,310	9	17.8	2,810	47,986
1984/85	500	4,402	16	10.2	4,902	41,152
1985/86	500	0		100.0	500	1,363
1986/87	500	0		100.0	500	1,257
1987/88	500	0		100.0	500	1,304
1988/89	665	0		100.0	665	2,383
1989/90	2,228	0		100.0	2,228	5,591
1990/91	2,361	0		100.0	2,361	3,147
1991/92	2,972	0		100.0	2,972	3,825
1992/93	6,835	0		100.0	6,835	8,590
1993/94	10,799	4,205	19	72.0	15,004	42,058
1994/95	7,139	6,208	31	53.5	13,347	47,224
1995/96	5,672	694	7	89.1	6,366	60,217
1996/97	6,104	3,081	11	66.5	9,185	67,552
1997/98	4,314	3,116	12	58.1	7,430	47,055

Table 7.2. Openings/closings and fishery regulations by season for the red king crab personal use fishery from 1996-1999.

Personal Use Fishery					
	Type of permit	Daily Limit	Seasonal Limit	Closure date	Closure reason
1996/97 summer	individual	3 crabs per person	none	8/30/96	creel survey indicates catch is over allocation
1996/97 winter	individual	3 crabs per person	none	3/7/97	phone survey indicates catch is over allocation
1997/98 summer	household	2 crabs per person	none	8/16/97	creel survey indicates catch is over allocation
1997/98 winter	household	2 crabs per person	none	12/29/97	phone survey indicates catch is over allocation
1998/99 summer	household	2 crabs per person	20 crab per permit combined for summer/winter	9/30/98	did not close early
1998/99 winter	household	2 crabs per person			open

Table 7.3. Number of permits issued/returned, total catch of returned permits, percent of catch by gear in the red king crab personal use fishery by season and summer/winter.

Year/season	Permits issued	Permits returned	Catch	Percent by Gear		
				Pot	Dive	Rings
96/97 summer	1,476	1,218	5,218	99	<1	<1
96/97 winter	643	380	997	78	20	2
subtotal			6,215			
97/98 summer	1,452*	911*	3,857	99	<1	<1
97/98 winter			631	96	3	1
Unknown season			855	99	0	<1
subtotal			5,343			
98/99 summer/winter	1,532**					

*permits not separated by winter and summer

**1998/99 data are preliminary

Table 7.4. Red king crab summer/winter personal use and commercial allocation and catch for 3 seasons from 1996-1999. Commercial catch data is from the fish ticket database

Year	1996/97		1997/98		1998/99	
	Allocation	Catch	Allocation	Catch	Allocation	Catch
Commercial	3,825	2,842	3,750	2,830	6,533	0
Personal Use summer	3,900	5,218	3,800	3,857	6,678	n/a
Personal Use winter	765	997	750	631	1,307	n/a
Personal Use Unknown				855		
Total Allowable Catch	8,490	9,057	8,300	8,173	14,518	

Table 7.5. Red king crab personal use catch estimates. Data are from creel and phone surveys and from returned permits.

	96/97	97/98
Summer		
Permit Reported	5,218	3,857*
Creel Survey Estimates	4,826	4,713
Allocation	3,900	3,800
Winter		
Permit Reported	997	631*
Phone Survey Estimates	1,051	1,003
Allocation	765	750

*855 crab with no catch date associated not included in this number.

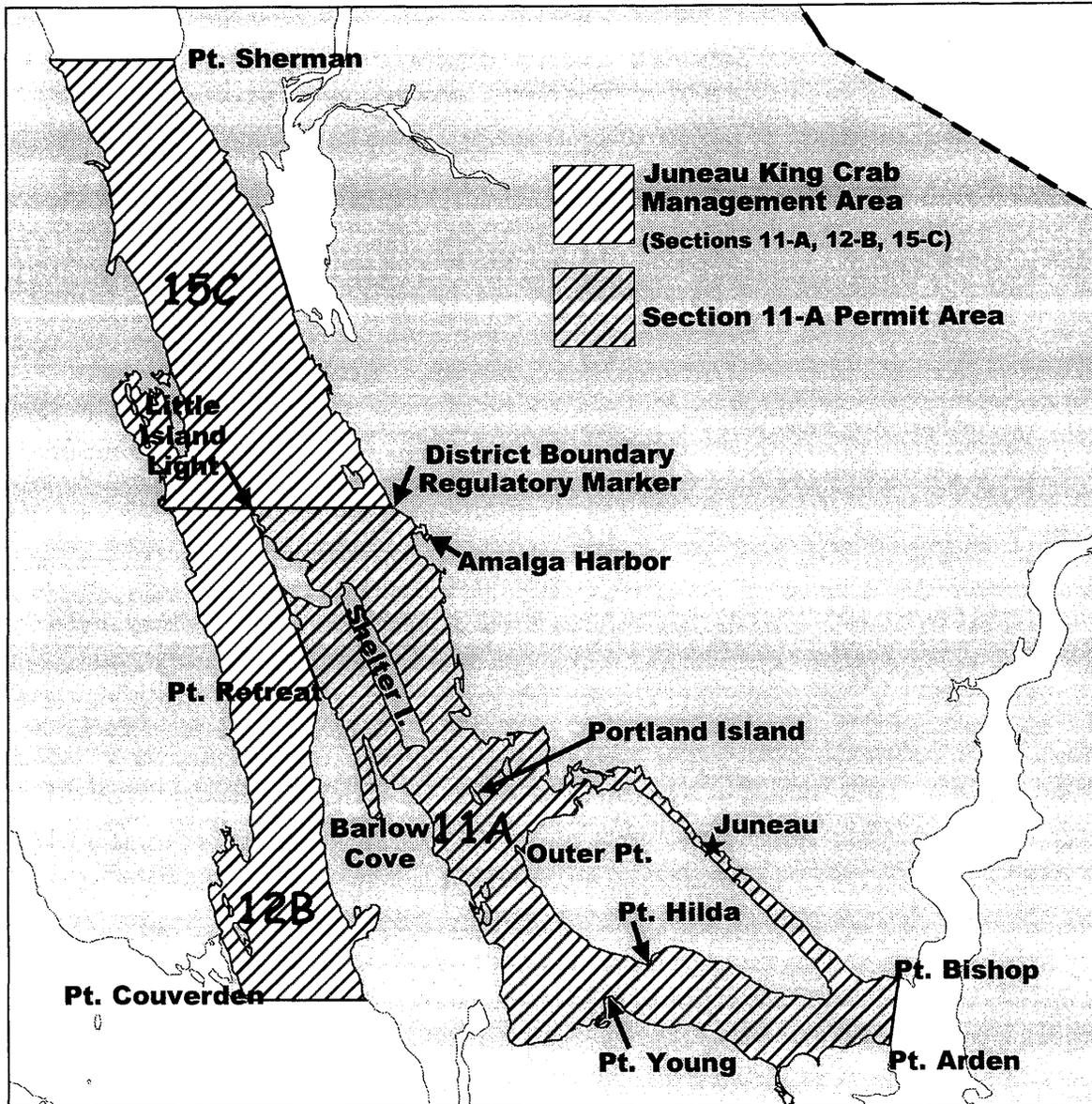


Figure 7.1 Map showing the Juneau king crab management area including the Section 11-A permit area.

ERRATA

RIR No. 1J99-07, King and Tanner Crab Fisheries, 1999, Report to the Board of Fisheries, Region I, Southeast and Yakutat. Section 11-A Personal Use King Crab Fisheries (section 7 in the report).

- Numerical changes made to tables 7.1 and 7.4 are shaded in gray.
- The hatching on figure 7.1 has been changed to better view the boundaries of the Section 11-A permit area (back of this page).

Table 7.1. Catch of red and blue king crab in the personal use and commercial fisheries in Section 11-A. Catch data are in numbers of crab.

Season	Personal Use Catch	Commercial Catch	Number of Commercial Permits	Personal Use Catch as Percent of 11-A Total	Total Catch in 11-A	Total Catch in Southeast
1978/79	300	6,964	9	4.1	7,264	69,147
1979/80	300	7,436	9	3.9	7,736	100,973
1980/81	300	11,406	10	2.6	11,706	81,105
1981/82	300	9,233	12	3.1	9,533	80,545
1982/83	500	2,477	11	16.8	2,977	67,273
1983/84	500	2,310	9	17.8	2,810	47,986
1984/85	500	4,402	16	10.2	4,902	41,152
1985/86	500	0		100.0	500	1,363
1986/87	500	0		100.0	500	1,257
1987/88	500	0		100.0	500	1,304
1988/89	665	0		100.0	665	2,383
1989/90	2,228	0		100.0	2,228	5,591
1990/91	2,361	0		100.0	2,361	3,147
1991/92	2,972	0		100.0	2,972	3,825
1992/93	6,835	0		100.0	6,835	8,590
1993/94	10,799	4,205	19	72.0	15,004	42,058
1994/95	7,139	6,208	31	53.5	13,347	47,224
1995/96	5,672	694	7	89.1	6,366	60,217
1996/97	6,215	3,081	11	66.9	9,296	67,663
1997/98	5,343	3,116	12	63.2	8,459	48,084

Table 7.4. Red king crab summer/winter personal use and commercial allocation and catch for 3 seasons from 1996-1999. Commercial catch data is from the fish ticket database

Year	1996/97		1997/98		1998/99	
	Allocation	Catch	Allocation	Catch	Allocation	Catch
Commercial	3,825	3,081	3,750	3,116	6,533	0
Personal Use summer	3,900	5,218	3,800	3,857	6,678	n/a
Personal Use winter	765	997	750	631	1,307	n/a
Personal Use Unknown				855		
Total Allowable Catch	8,490	9,296	8,300	8,459	14,518	

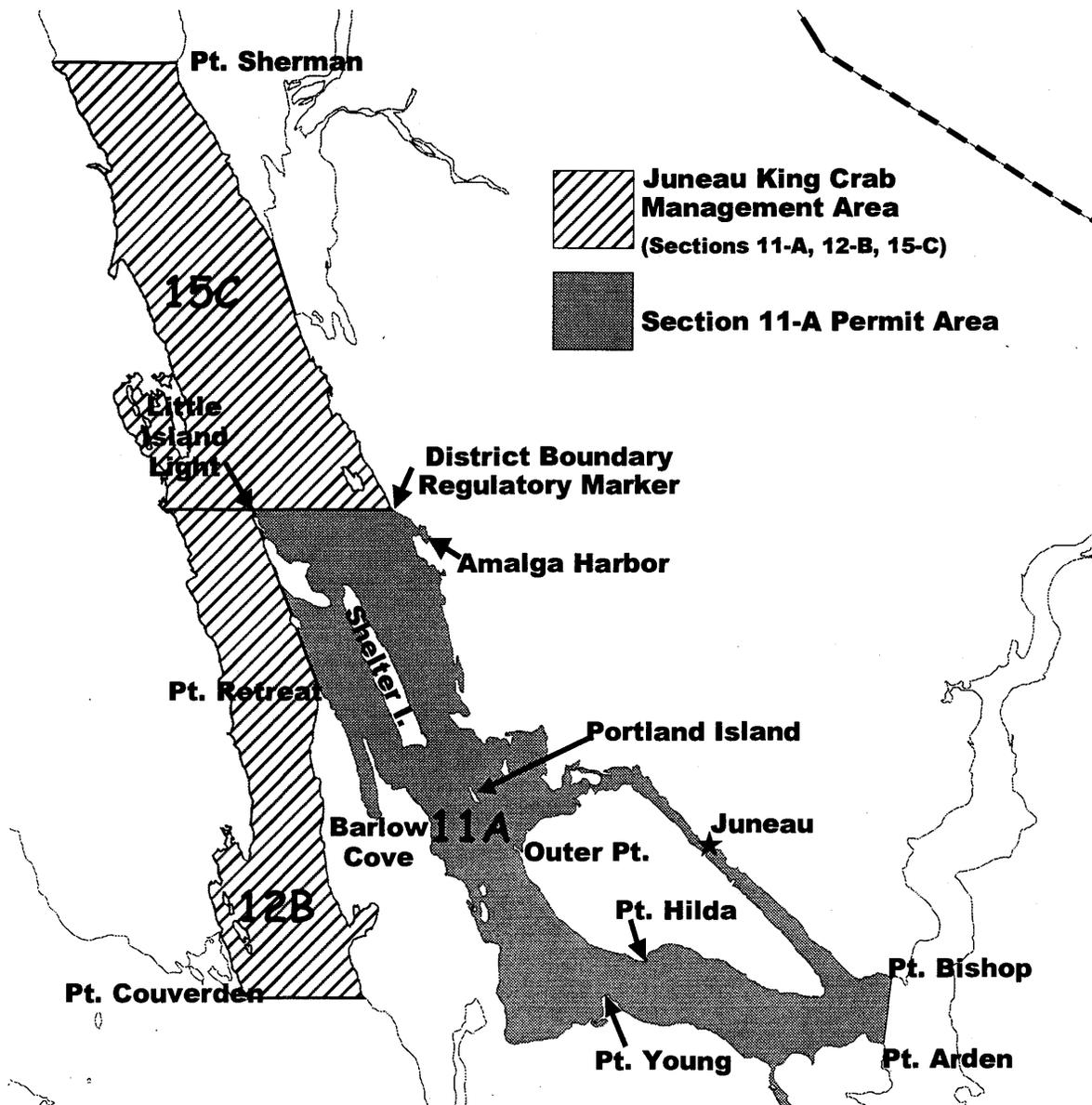


Figure 7.1 Map showing the Juneau king crab management area including the Section 11-A permit area.