

REPORT TO THE BOARD OF FISHERIES,
SOUTHEAST ALASKA DUNGENESS CRAB FISHERY



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INTRODUCTION

Dungeness crabs *Cancer magister* are members of the highly evolved brachyuran (true crab) subgroup of the order Crustacea. They are commercially significant and widely distributed in coastal waters of the eastern Pacific Ocean from Baja California to the Aleutian Islands.

Southeast Alaska (Registration Area A) is near the northern limit of the range of Dungeness crab. In Southeast Alaska, Dungeness crabs are found throughout the reporting districts between Dixon Entrance and Cape Fairweather. They congregate in areas with mud and sand substrate and depths between two and 50 fathoms, generally in the northern half of Southeast Alaska. Southeast Alaska has produced a long-term average of about 2,190,00 pounds per season.

Southeast Alaska is a superexclusive registration area for Dungeness crab; a vessel registered to fish in this area cannot register or fish in any other area in Alaska during the same calendar year. The fishery is also under limited entry. In the past five seasons, an average of 212 permit holders have registered and fished in Southeast Alaska. Most vessels are below limit seiner length (58'), although they range in size from aluminum skiffs to over 90 feet long. Almost all participants use standard, hatbox-shaped pots constructed with steel frames and webbed with stainless steel wire. The maximum legal gear limit is 300 pots.

The summer fisheries overlap a portion of the male molting period, which extends into mid-summer, and the female molting period, which extends from August to October. The major mating period is during mid to late summer. Most of the product is marketed as whole-cooked and live crab during the summer tourist markets in Washington, Oregon, and California. Alaska is the only management jurisdiction on the West Coast that allows extensive summer fisheries for Dungeness crabs. This has been justified on the basis of the overriding economics of the summer fishery.

Fishing during the molting and mating period risks local depletion and general fishery collapse. This is exacerbated by a limited management program, which is comprised of port sampling and fish ticket data. The department has conducted two pre-season pilot surveys, and on-board sampling during the early portion of the fishery in both the spring and fall openings. The risk of summer over-fishing have increased since the early 1980s when ample fishing grounds were available, seasons were longer, and fishers who encountering high percentages of soft-shelled crab, female crab, or mating pairs could move to grounds where better harvest conditions prevailed.

Many peripheral areas that once served as nursery or refuge areas that could buffer the effects of heavy harvest in adjacent areas are now heavily fished. Since the late 1980s, all available fishing grounds, even marginal ones, have been fully utilized, the exploitation rate has climbed, and the fishery is much more dependent on annual recruitment. The effect of poor recruitment of even a single year-class on the fishery would be much more pronounced now than it would have been prior to the mid-1980s.

Conflict between user groups is rising as competitive pressure and gear saturation crowds commercial gear onto grounds traditionally used by non-commercial fishers. This has resulted in commercial closures of small areas around many communities in Southeast Alaska, including Juneau, Gustavus, Tenakee Springs, Elfin Cove, Point Baker, Blank Inlet, Bostwick Inlet, Flat Bay, and Thorne Bay with continuing requests for commercial closures around more.

In keeping with a federal law that was passed in 1998, commercial Dungeness crabbing was closed in designated wilderness areas in the Glacier Bay National Park and Preserve beginning June 15, 1999. Non-wilderness portions of the bay closed to Dungeness crabbing on September 30, 1999. Permit holders will be given compensatory pay if they fished in either the Beardslee Islands or Dundas Bay wilderness areas for at least six of the years between 1987 and 1998. Processors may also apply by October 1, 1999 for compensatory pay to offset losses if they purchased crab from these areas during the same time frame.

Lastly, sea otter populations are expanding their range in Southeast Alaska. Their expansion into many areas has been accompanied by drastic declines in availability of many economically important invertebrate species, one of which is Dungeness crab.

FISHERY DEVELOPMENT AND HISTORY

The fishery dates back to the 1930s. Prior to the 1960s, harvests from much of the Gulf of Alaska coast were combined into a single total. Since 1960, harvests from Southeast Alaska have averaged about 2,190,000 pounds when annual (1960 to 1968) and seasonal (1969/70 to present) data are combined (Table 2.1).

The fishery in Southeast Alaska has evolved through three distinct periods since the early 1960s. From the early 1960s through the early 1980s, participation was so low that need for formal regulations and other restrictions were minimal. The 1960s were characterized by a few larger vessels in a directed fishery harvesting up to several million pounds per year. This was in response to high market demand caused by low harvests in Washington, Oregon, and California. The principal product was canned crabmeat.

During the 1970s, production in Washington and Oregon rebounded and demand for crab from Southeast Alaska declined. With little or no processor support, fishers had to either sell over the dock to the public or make complicated and risky arrangements to airfreight live crab out of state. Although the summer closure was rescinded, only a few dozen vessels in the 30' to 45' range fished primarily during the summer.

In the most recent period, since the 1981/82 season, the fishery has undergone sweeping change. Declining harvests in Pacific Coast states and changing markets increased demand for Alaskan frozen sections, whole cooked crabs, and airfreighted live crabs. More processors began purchasing crab and supporting the fishery through the entire summer season. Harvests increased, averaging 3,046,000 pounds per season, and the numbers of participants increased, climbing to a peak of 316 vessels. The fishery grew from a small group of 30' to 45' vessels to a larger fleet that included skiff-sized vessels up to 30' in length. This resulted in a defacto harvest reallocation from a primary fishery for a relatively small number of single-species participants to a secondary fishery for a larger number of new and often transitory entrants.

Most recently, interest in airfreighted live Dungeness crab is growing in the Orient. There has also been a growing demand from Canada for live Dungeness crab. In 1996, legislative changes allowed surface shipment of live crab from Southeast Alaska to Canadian markets.

Increasing numbers of participants led to a permit moratorium, imposed by the Commercial Fisheries Entry Commission (CFEC) in 1991. During the four years of the moratorium, the CFEC first conducted numerous studies and public meetings to evaluate the need for limited entry into this fishery. Subsequently, CFEC convinced the legislature to authorize use of tiered pot limits to accommodate the large number of

qualifying participants while limiting the effort to acceptable levels. In January 1996, the moratorium period ended and a tiered pot limit form of limited entry was adopted for implementation by June 15, 1997. As implemented, the maximum number of permits will eventually be set at 308 and the tiered permits system will be structured to provide a maximum of 48,750 pots to the fishery.

In the spring of 1996 and 1997, the department conducted preseason assessment surveys of the Dungeness stocks off the Stikine River flats in central Southeast Alaska. This stock is a consistently important contributor to the overall Southeast Alaska harvests. Using a random transect experimental survey design and commercially-configured pots with smaller than usual mesh, the department collected size, sex, and shell hardness data over a period of several days during late May, preceding the commercial fishery which started on June 15. After the season opened, research staff conducted on-board field observations of commercial fishing operations in the same general area. The goal of these initial projects was to develop a method for estimating the prevalence of sub-legal and legal-sized soft-shelled male crabs that would be vulnerable to handling by the commercial fleet early in the summer season. Preliminary examination of the experimental and observer data sets suggest that the two experimental methods are not comparable. Yet to be determined are whether a correlation exists between the experimental and observer data or whether the sampling design needs to be modified to better reflect the commercial harvest.

In 1999 the department conducted on-board sampling of Dungeness crab in the Stikine Flats, Thomas Bay, and Duncan Canal areas during the early portion of the summer fishery to estimate the prevalence of sub-legal and legal-sized soft-shelled male crabs that were vulnerable to handling by the commercial fleet. A subsequent on-board observer program sampled in the same areas during the beginning of the fall fishery. Preliminary data indicates that sorting of the non-legal and soft-shelled segments of the stock increases from June through the fall as the number of legal males diminishes due to harvest.

REGULATION DEVELOPMENT

All registration areas in Alaska apply generally passive management measures limiting size, sex, and to some extent, the season during which crab may be caught. In Southeast Alaska, seasons are timed to avoid some of the sensitive life history periods while maximizing economic returns.

The department is looking into implementing more active management alternatives to size, sex, and season methods than are used. In particular, guideline harvest levels would be useful for reducing the harvest rate to ensure that a significant proportion of the legal males remain unharvested and are therefore able to mate. This would be good insurance against recruitment failures, particularly if failures were to occur for more than one year in a row.

Fishing Seasons and Periods

From the early 1930s through 1955, regulations included a prohibition on the taking of females, a minimum size limit for males, and a closed season on the most important grounds for two to four months between May 1 and September 1. Available documentation from that period indicates that molting was thought to occur during the summer. The summer closure was generally acceptable to fishers because of other fishing opportunities in the salmon and halibut fisheries. The summer closure was revoked in the late 1950s.

Since the late 1960s, fishing season closures have been introduced, and then modified, to reduce fishing pressure during sensitive periods in the life history of the species. An example was the closure from March through May in 1976/77 to protect male crabs during their primary molting period. In the 1980s, management staff explored methods and means to further avoid sensitive life history periods to accommodate the increasing effort as the fleet slowly utilized more of the known habitat and range of the crabs. Management staff felt that as more of the available grounds were exploited, there would be fewer unfished stocks to act as reproductive buffers against local depletion in adjacent fishing grounds. Then, beginning in 1985, the commercial fishery was closed between August 16 and September 30 because field observations suggested that it was the major period when females molted and were mated. In response to increasingly high effort levels and high harvest rates, the season was further shortened in 1989 by reducing the winter season to October and November in most of Southeast Alaska. The split seasons have been in effect since then.

Size Restrictions

From 1924 to 1935, legal crabs were restricted to males over 6.5 inches in greatest width. From 1936 to 1962, only males over 7.0 inches in greatest width were legal. Since 1963, the legal size has been 6.5 inches in shoulder width, measured across the carapace immediately anterior to the tenth anterolateral spines. This is the current standard measuring point in all jurisdictions throughout the range of this crab and is used because the large tenth anterolateral spines are often broken or eroded in older shelled crabs.

Gear Definitions and Specifications

Since 1934, trawls have been prohibited in this fishery. Gear was further limited to pots or ring nets in 1954. A pot limit of 300 pots or ring nets was implemented in 1963. Diving gear was included as legal gear in 1966. Nearly all of the commercial harvest is currently taken with pots.

Starting in 1963, Dungeness crab buoys were required to display the registration number of the vessel fishing the gear. In 1988, the minimum size of buoy markings was set at one and one-half inches in height, in numerals at least one-fourth inch wide that contrasted with the color or texture of the buoy.

In 1977, two escape rings of 4 3/8" diameter were required in each pot, and a Dungeness pot was defined by its tunnel eye openings, which individually could not exceed 30 inches. In 1978, an escape panel secured by a maximum of 120-thread cotton twine was required. A minimum size for buoy numbers of one and one-half inch high and 1/4 inch wide numbers was implemented in 1989. In 1991, the breaking strap or biodegradable twine for the lid retainers was changed from 120 thread to 60 thread. The intent was to minimize untended ghost fishing of lost or derelict pots.

Dungeness gear development remained static for many years, with little change in configuration, materials, size, and weight to significantly affect pot efficiency. Within the last two seasons, trigger-enhancing devices that minimize escapement of crabs through entrance tunnels have been developed and are being installed on commercial gear. Future comparisons of historical harvest rates will need to account for the possible enhanced efficiency of pots with the new trigger designs.

Other Regulatory Changes

Vessel registration and hold inspection requirements started in 1974. Southeast Alaska was designated a superexclusive registration area in 1983. Hold inspections were rescinded in 1984.

1998/99 SEASON SYNOPSIS

The 1998/99 season was divided into summer (June 15 - August 15) and winter (October 1 - November 30) segments. The overall harvest was 2,325,236 pounds (Table 2.1), with an exvessel value of \$3,464,602 (\$1.49/lb). Summer season landings totaled 1,708,615 pounds, and winter season landings totaled 619,129 pounds (Table 2.2). Two hundred forty-four permit holders reported landings for either the summer or winter seasons (Table 2.1).

Districts 6, 8, 9, 10, and 14, with reported landings of 1,412,372 pounds, accounted for 60% of the total harvest (Table 2.2). Seventy-three percent of the harvest was taken during the summer season (Table 2.2). The winter harvest was much lower than the previous winter (Table 2.2).

Testing for paralytic shellfish poison (PSP) continued, with small samples representative of harvests from major fishing grounds sent to the Alaska Department of Environmental Conservation (ADEC) laboratories in Palmer. PSP levels were low and no restrictions were placed on the transport and sale of whole crabs.

1999/00 SEASON OUTLOOK

Preliminary harvest figures indicate that 2,693,547 pounds were harvested from June 15 through August 15, indicating a slight increase in recruitment entering the fishery this season. Number of permits fishing dropped significantly from the two most recent seasons to 195 permit holders. Distribution of the harvest indicated that production in central districts contributed most significantly to the total. Average price per pound was \$ 1.62 per pound.

Winter fisheries contend with icing of productive areas at the heads of bays, shorter days, more inclement weather, and poorer market conditions. Through November 30, 1999, 99 fishers had harvested an additional 360,805 pounds. A small additional harvest may occur from Districts 1, 2, and a portion of District 13 before the winter portion of the 99/00 season ends on February 28, 2000.

Use of the newly authorized option for surface transport of live crab to foreign ports will bear some scrutiny as crabbers exploit this marketing option and take advantage of favorable prices being offered by Canadian buyers. It is likely the first foreign landings will be at British Columbia ports such as Prince Rupert. The Alaska Department of Environmental Conservation continued testing crabs for PSP before, and immediately following the summer 1999 fishery.

Table 2.1 Registration Area A (Southeast Alaska) Dungeness crab harvest, number of permits fished, number of landings, and average harvest per landing, 1961 to present.

Year/ Season	Harvest in Pounds	Number of Permits	Pounds per Permit	Number of Landings	Pounds per Landing
1960	1,449,405	-			
1961	671,455	-			
1962	2,985,939	-			
1963	3,296,362	-			
1964	3,996,100	-			
1965	2,392,395	-			
1966	1,968,117	-			
1967	2,033,156	-			
1968	1,900,690	-			
1969/70	1,149,111	24	47,880	392	2,931
1970/71	776,617	21	36,982	380	2,043
1971/72	452,681	23	20,576	315	1,437
1972/73	597,587	31	19,277	315	1,897
1973/74	748,519	41	18,257	483	1,549
1974/75	713,995	55	12,982	453	1,576
1975/76	611,621	36	16,989	344	1,177
1976/77	515,378	25	20,615	174	2,961
1977/78	127,345	12	10,612	87	1,463
1978/79	754,759	25	30,190	208	3,628
1979/80	801,753	37	21,669	313	2,561
1980/81	521,247	26	20,048	227	2,296
1981/82	2,932,427	75	39,099	749	3,915
1982/83	3,668,062	129	28,435	1,303	2,815
1983/84	2,150,692	131	16,417	1,530	1,405
1984/85	1,843,502	180	10,242	1,583	1,164
1985/86	2,314,618	216	10,716	2,073	1,116
1986/87	2,453,055	224	10,974	2,330	1,052
1987/88	3,391,699	241	14,070	2,746	1,235
1988/89	3,321,734	264	12,535	2,683	1,238
1989/90	1,918,880	245	7,831	2,096	915
1990/91	2,662,840	243	10,787	2,342	1,136
1991/92	4,705,314	316	14,890	3,379	1,392
1992/93	3,089,398	247	12,508	2,492	1,239
1993/94	2,536,701	198	12,812	1,956	1,296
1994/95	1,921,689	182	10,559	1,786	1,075
1995/96	4,404,519	201	21,913	2,737	1,609
1996/97	5,005,840	203	24,659	2,896	1,728
1997/98	4,062,423	232	17,510	4,042	1.005
1998/99 ^a	2,325,236	244	9,530	3,127	743

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

Table 2.2a. Registration Area A (Southeast Alaska) 1997/98 season; Dungeness crab harvest by month and district.

Dist.	1997								1998		Total
	May	June	July	Aug	Sept.	Oct	Nov	Dec	Jan	Feb	
101	Closed	Closed	Closed	Closed	Closed	81,411	49,362	31,734	30,092	11,784	204,383
102	Closed	Closed	Closed	Closed	Closed	11,363	10,906	26,908	33,851	25,519	108,547
103	Closed	3,808	17,742	13,582	Closed	*	*	Closed	Closed	Closed	42,450
104	Closed	0	*	0	Closed	0	0	Closed	Closed	Closed	*
105	Closed	38,953	109,170	29,661	Closed	27,041	8,926	Closed	Closed	Closed	213,751
106	Closed	133,069	85,342	18,969	Closed	49,030	31,424	Closed	Closed	Closed	317,834
107	Closed	97,946	111,733	19,729	Closed	31,592	17,389	Closed	Closed	Closed	278,389
108	Closed	355,378	339,380	56,203	Closed	42,459	16,218	Closed	Closed	Closed	809,708
109	Closed	120,625	250,997	74,362	Closed	32,771	22,843	Closed	Closed	Closed	501,598
110	Closed	83,559	154,184	50,868	Closed	34,546	8,892	Closed	Closed	Closed	332,049
111	Closed	47,587	96,203	33,410	Closed	43,131	13,330	Closed	Closed	Closed	233,661
112	Closed	42,767	78,078	32,986	Closed	20,343	6,358	Closed	Closed	Closed	180,532
113	Closed	64,917	95,112	29,802	Closed	83,039	12,873	0	*	*	286,009
114	Closed	78,358	168,245	68,997	Closed	48,985	21,195	Closed	Closed	Closed	385,780
115	Closed	61,529	59,581	26,142	Closed	13,176	4,873	Closed	Closed	Closed	165,301
116	Closed	0	0	0	Closed	0	0	Closed	Closed	Closed	0
Total		1,128,496	1,568,198	454,711	Closed	524,626	219,601	65,279	64,055	37,457	4,062,423

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

Table 2.2b. Registration Area A (Southeast Alaska) 1998/99^a season; Dungeness crab harvest by month and district.

Dist.	1998								1999		Total
	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	
101	Closed	Closed	Closed	Closed	Closed	55,514	37,370	15,306	9,166	*	118,623
102	Closed	Closed	Closed	Closed	Closed	57,753	6,296	8,434	6,037	*	81,310
103	Closed	6,253	9,725	4,617	Closed	0	*	Closed	Closed	Closed	22,551
104	Closed	0	0	0	Closed	0	0	Closed	Closed	Closed	0
105	Closed	34,979	49,602	15,805	Closed	5,255	9,800	Closed	Closed	Closed	115,441
106	Closed	172,569	120,224	36,776	Closed	84,689	24,885	Closed	Closed	Closed	439,143
107	Closed	113,624	58,567	14,661	Closed	16,016	19,472	Closed	Closed	Closed	222,340
108	Closed	170,904	87,588	15,650	Closed	52,692	30,342	Closed	Closed	Closed	357,176
109	Closed	82,733	77,597	21,920	Closed	35,658	22,452	Closed	Closed	Closed	240,360
110	Closed	54,343	45,384	11,563	Closed	8,863	4,132	Closed	Closed	Closed	124,285
111	Closed	46,108	41,030	8,770	Closed	10,427	*	Closed	Closed	Closed	107,593
112	Closed	37,516	51,523	11,375	Closed	15,397	5,957	Closed	Closed	Closed	121,768
113	Closed	49,518	37,151	10,708	Closed	12,370	10,685	1,474	1,067	*	123,445
114	Closed	39,790	58,720	20,884	Closed	25,345	8,614	Closed	Closed	Closed	153,353
115	Closed	44,242	35,877	10,319	Closed	3,356	4,054	Closed	Closed	Closed	97,848
116	Closed	0	0	0	Closed	0	0	Closed	Closed	Closed	0
Total		852,579	672,988	183,048	Closed	383,335	178,943	33,544	16,270	4,529	2,325,236

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

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