ALASKA LEGISLATURE COMMITTEE FILES 1991-1992 8672
7628 SENATE RESOURCES

Limited entry was considered and rejected in 1984 partly because participation levels had been extraordinarily high during the previous few years and were expected to decline as stocks of Dungeness crabs in other non-Alaskan areas recovered and prices decreased.

III. PARTICIPATION

Number of Total Participants

From 1974-75 to 1989-90, 732 unique persons have participated in the Dungeness crab fishery in southeastern Alaska. The cumulative total participants (sum over all seasons of the number of participants fishing in each season) during the same time period was 1,783. Until 1980-81, the number of people fishing Dungeness crab was 35 or less. The number doubled from 22 to 68 in 1981-82 and doubled again in 1982-83 from 68 to 122. Participation has steadily increased since 1982-83 to a high of 255 in the 1988-89 season (Figure 2).

Most of the increase in participation has occurred in the D09B fishery. The numbers of fishermen in the D91B and D99B fisheries have remained relatively constant since 1981-82. The number of D12A (diving or hand picking) permits fished has varied from 1 in 1984-85 and 1988-89 to 6 in the 1981-82 and 1989-90 seasons.

Although the numbers are preliminary, the total number of participants in the 1989-90 season was 239. This may be the first season since 1980-81 that effort in the southeastern Dungeness crab fishery has decreased.

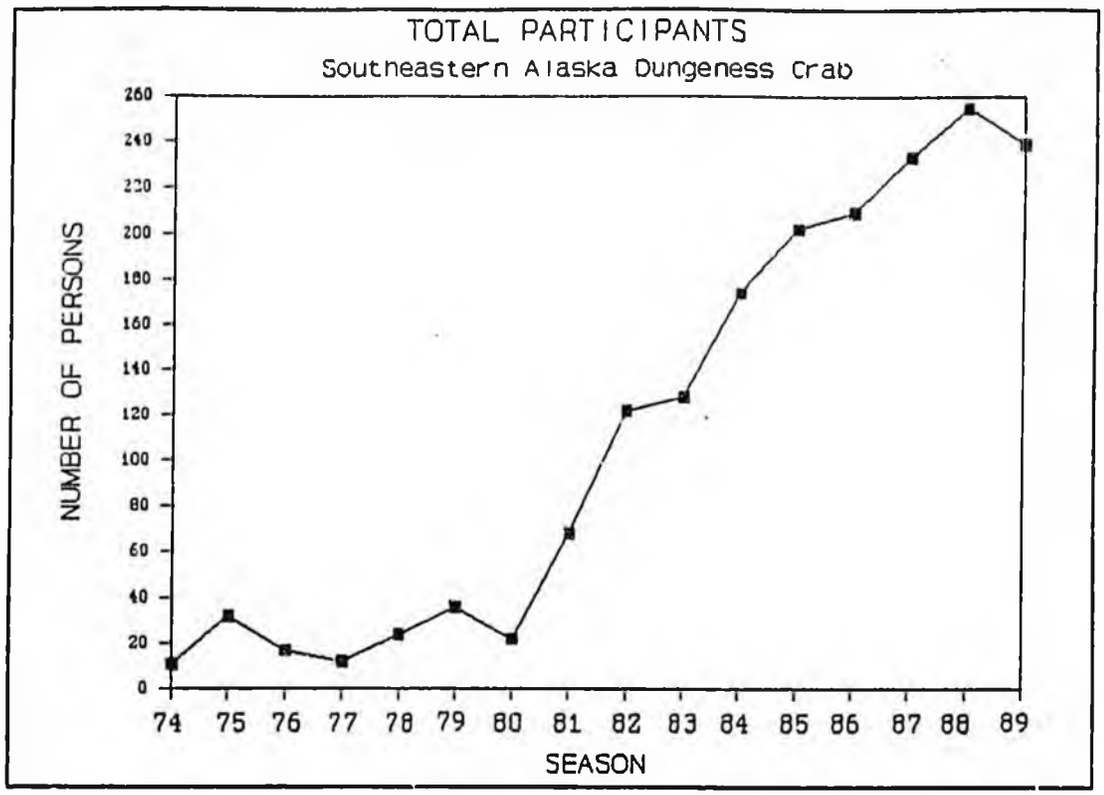

Figure 2. Total number of participants in the southeastern Alaska Dungeness crab fishery. On the x-axis, 74 represents the 1974-75 season, 75 represents the 1975-76 season, etc.

First-Year Participants

In 1981-82, fifty first-year participants entered the fishery. This was a significant increase over the numbers of first-year fishermen in previous years. Since 1982-83, an average of 82 $\pm$ 12 (standard deviation) new fishermen have entered the Dungeness crab fishery in southeastern Alaska every season, with the largest number of new participants, 94, occurring in 1985-86 (Figure 3).

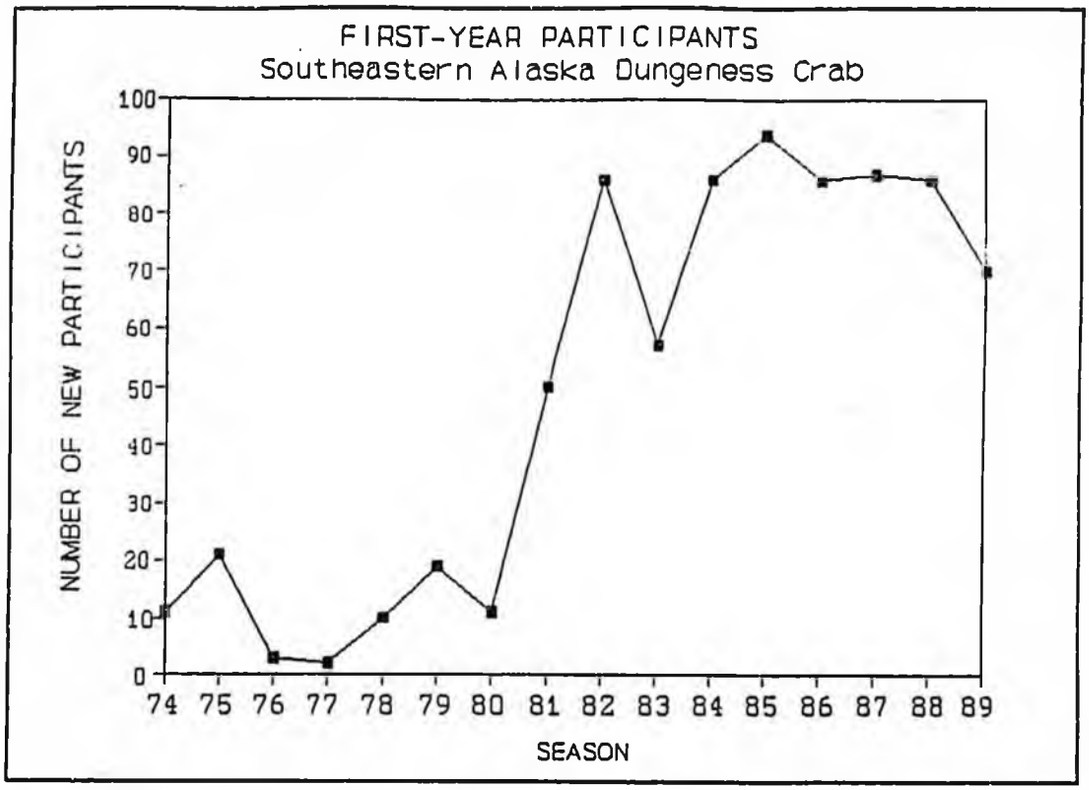

Figure 3. Number of first-year participants in the southeastern Alaska Dungeness crab fishery. On the x-axis, 74 represents the 1974-75 season, 75 represents the 1975-76 season, etc.

Residency

Before 1977-78, only 10% of the participants in the southeastern Alaskan Dungeness crab fishery were not Alaskan residents. Non-resident participation began to increase in 1978-79 and was greatest in 1982-83 at 30% (36 persons) of the total number of participants (Figure 4). Participation by non-Alaskans has since decreased from 1982-83 to the 1988-89 level of 9% (23 persons).

Participation by non-resident fishermen may be related to decreased harvest in non-Alaskan Pacific Coast (British Columbia, Washington, Oregon and California) Dungeness crab fisheries (Figure 4). The number of non-residents in the southeastern Dungeness crab fishery was highest in 1982, historically one of the lowest harvest periods in the Pacific Coast fishery. Although the Pacific Coast harvest has improved greatly in the 1988-89 and 1989-90 seasons, the percentage of non-resident participants in the southeastern Alaska fishery has not changed significantly.

Of the 28 unique non-resident participants in 1982-83, 61% were from Washington, 36% were from Oregon and 4% were non-residents with Alaskan addresses. In the 1988-89 season, 27% of the unique non-residents were residents of Washington, 8% were from California, and the remaining 55% were from Colorado, Idaho, Vermont or were non-residents with Alaskan addresses.

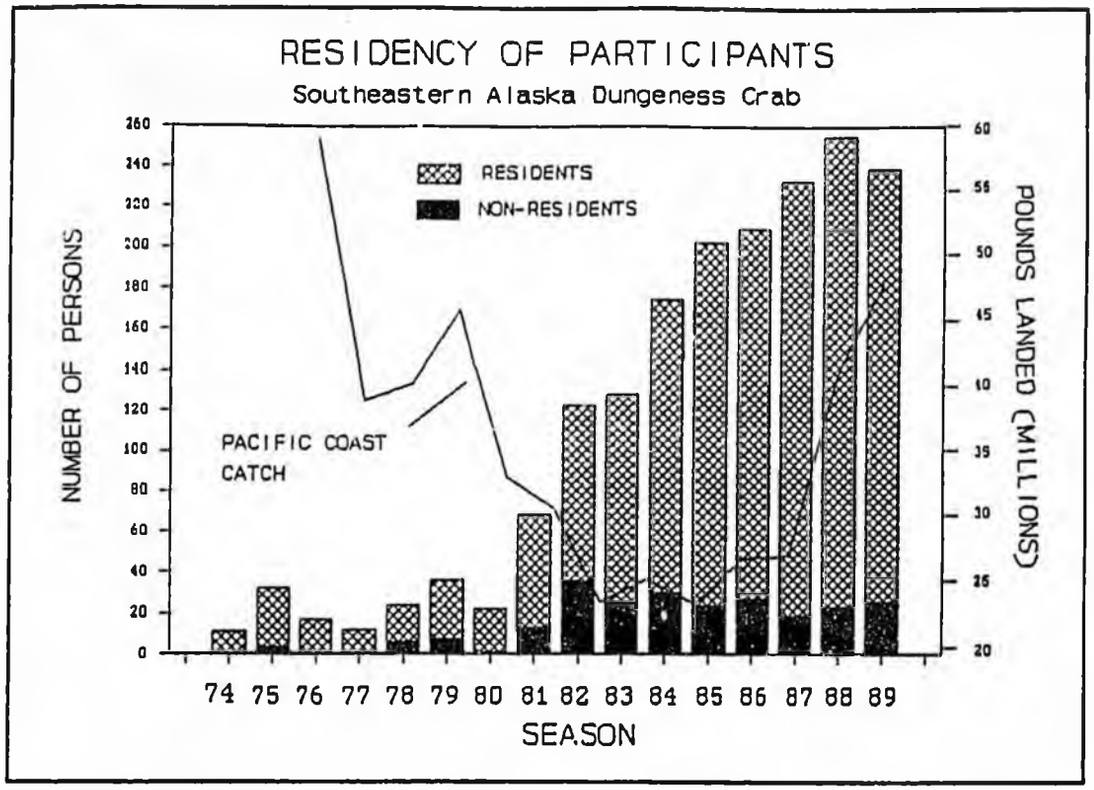

Figure 4. Relationship of the Pacific Coast (Washington, Oregon, California and British Columbia) Dungeness crab harvest to the residency of participants in the southeastern Alaska Dungeness crab fishery.

Influence of Other Fisheries on Effort in Southeastern Alaska

The price for southeastern Dungeness crab appears to have been inversely related to crab harvests in Washington, Oregon and California since the mid-1970's (Figure 5). Low catches from non-Alaskan Pacific Coast areas raised Dungeness crab prices in southeastern Alaska and led to increased effort. In the early 1980's, the decline of the Pacific Coast fisheries created an increased demand for Alaskan product.

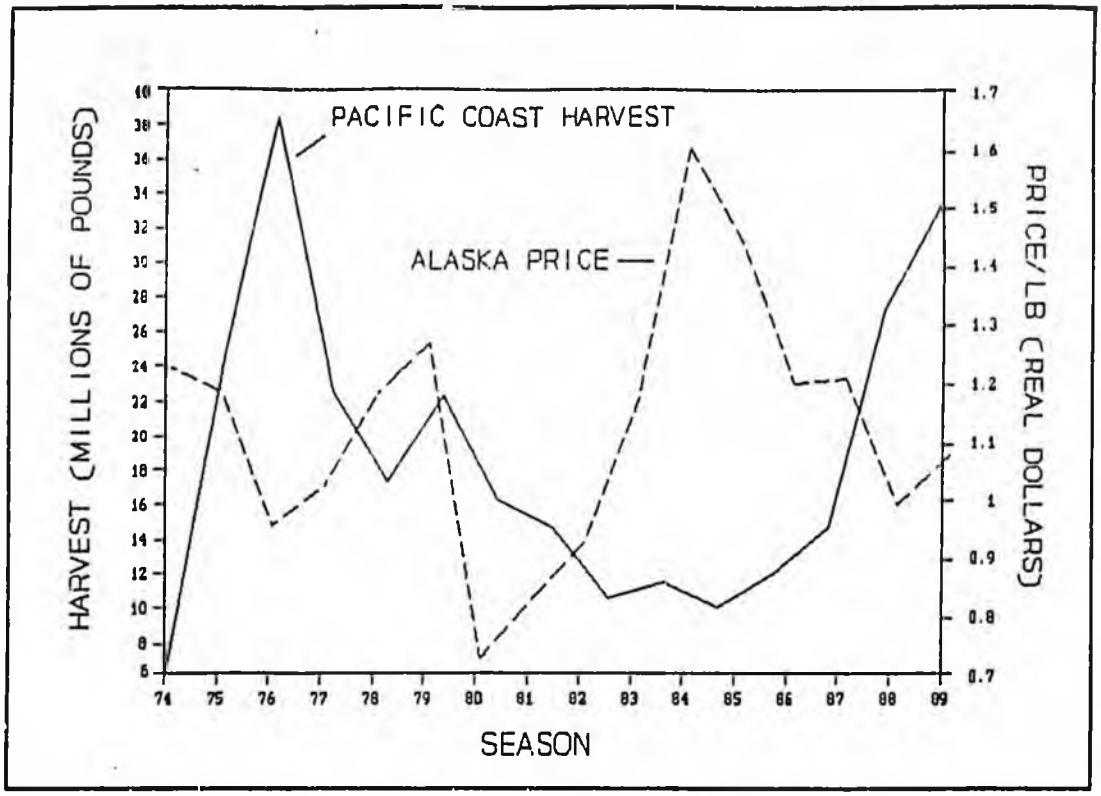

Figure 5. Combined harvests of Pacific Coast Dungeness crab fisheries (British Columbia, Washington, Oregon and California) and the price of Dungeness crab (in real dollars based on the Consumer Price Index value in December, 1989) in southeastern Alaska. On the x-axis, 74 represents the 1974-75 season, 75 represents the 1975-76 season, etc.

In recent years, the number of participants has continued to increase despite increased production in British Columbia, Washington, Oregon and California, and apparent declines in the real ex-vessel price per pound of Dungeness crab in southeastern Alaska. The average CFEC ex-vessel price for Dungeness crab in southeastern Alaska in 1988 was estimated at $0.95 per pound. The number of processors buying Dungeness crab in southeastern Alaska increased from 6 in 1979 and 1980 to 11 in 1981 and 13 in 1982 (Processor Annual Reports). About

12 to 14 processors have reported Dungeness crab purchases on their Processor Annual Reports every year from 1984 to 1988.

Cycles of Dungeness Crab Populations

The Dungeness crab populations in northern California, Oregon and Washington have exhibited cyclic variations in abundance which were somewhat independent of variations in fishing effort. The period of the cycle has been regular at about ten years for northern California, Oregon and Washington (Figure 6), but the amplitude has been variable. Crab populations in central California crashed in the late 1950's and have not recovered.

Dungeness crabs in British Columbia and Alaska do not appear to be cyclic in abundance (Botsford, 1986[2]). However, significant changes in effort in the southeastern Alaska fishery affect biological interpretation of population abundance and may mask cycles of abundance.

Proposed causal mechanisms for the cycles have been predator-prey interactions, density-dependent recruitment, cyclic environmental variables or

[2]Botsford, L. W. 1986. Population dynamics of the Dungeness Crab (Cancer magister). In: Jamieson, G. S. and N. Bourne (eds.) Canadian Special Publication of Fisheries and Aquatic Sciences 92: 140-153.

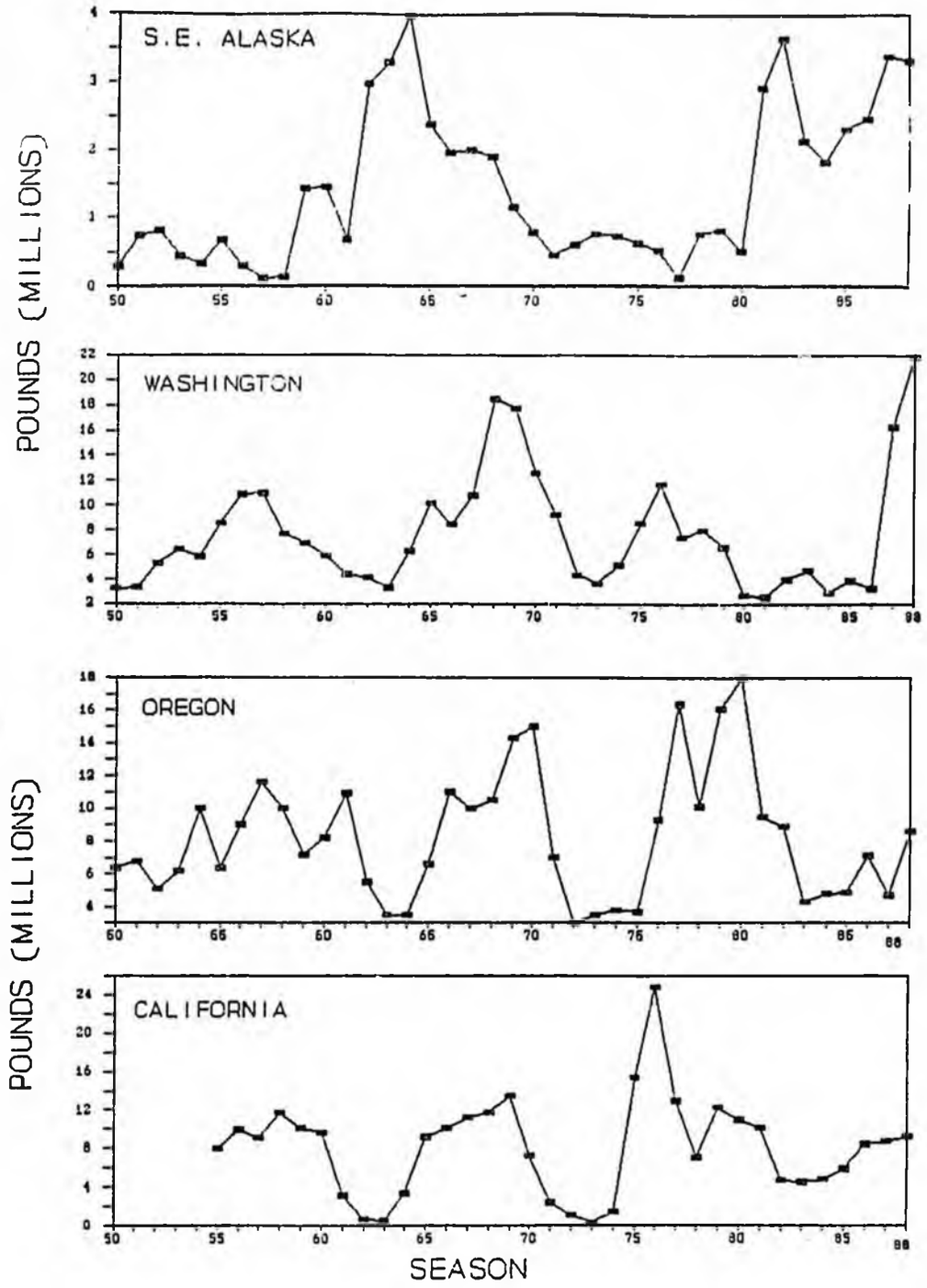

Figure 6. Harvest of Dungeness crabs in northern California, Oregon, Washington and southeastern Alaska.

combinations of the three (for review, see Botsford, 1986). Changes in effort may be partially responsible for cycles of harvest levels.

Recruitment in the Dungeness crab fisheries is inconsistent. Years with large population abundances may be a result of good recruitment years which support high harvest levels for a few years. Years with low abundances of Dungeness crabs may result from poor recruitment. Removal of a large year class by the fishery may pave the way for another year of good recruitment if recruitment is indeed density-dependent.

The southeastern Alaska Dungeness crab fishery is less inclined toward extremes in good and bad recruitment years (Ken Imamura, ADF&G). Most of the fishery occurs in inside waters, and is insulated from dramatic environmental changes that could affect recruitment. The Yakutat fishery with its open coastline experiences environmental and recruitment variations similar to the Washington, Oregon and California coasts. Patterns of recruitment in the southeastern fishery parallel those of Yakutat, but are less extreme.

The number of total participants, both resident and non-residents, in the Dungeness crab fishery may also be related to the declining harvests of other crab species in southeastern Alaska. At the time the total participants in the Dungeness crab fishery began to increase, the Tanner crab harvest in

southeastern Alaska was declining, as was the red and blue king crab harvest. Some king and Tanner crab fishermen may have switched over to Dungeness crabs in the wake of declining populations of other crabs in southeastern Alaska (Figure 7), and/or the limitation of the southeastern Alaska king and Tanner crab fisheries in 1984.

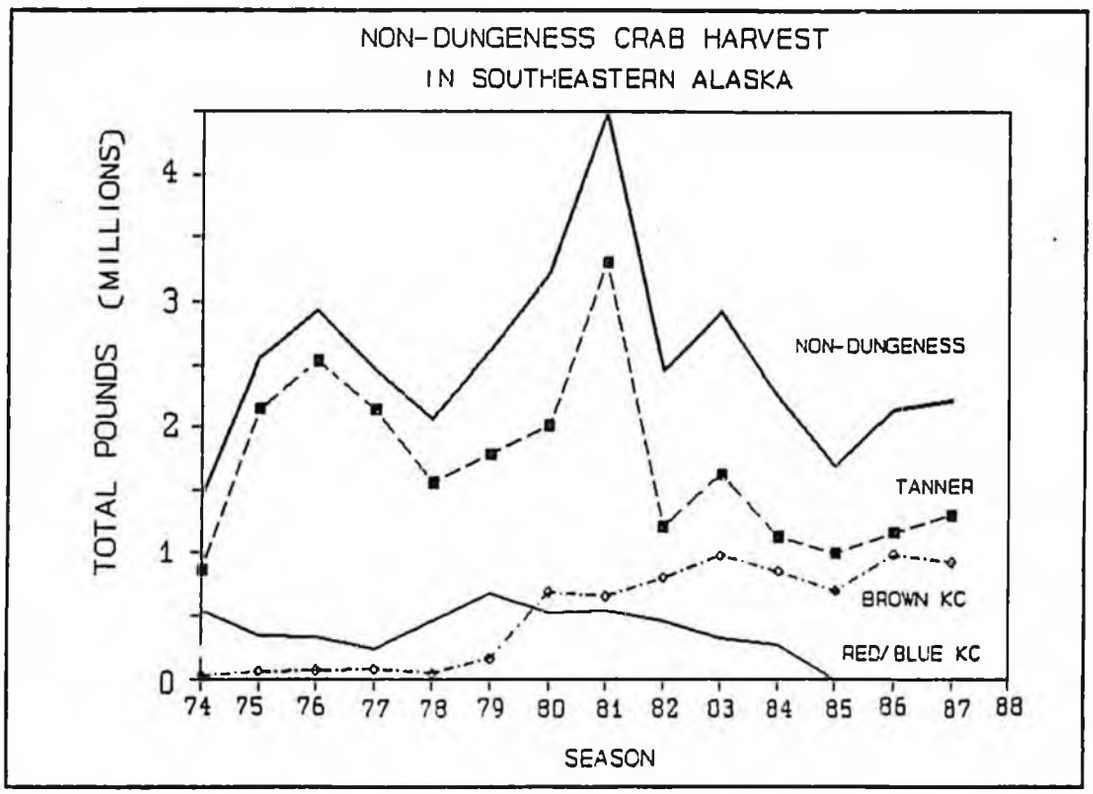

Figure 7. Commercial catch of Tanner crab, red and blue king crab, brown king crab and combined Tanner and king crab (non-Dungeness) in southeastern Alaska. On the x-axis, 74 represents the 1974-75 season, 75 represents the 1975-76 season, etc.

The increased effort in recent years in the Dungeness crab fishery may be due in part to limited entry of the Tanner and king crab fisheries in southeastern Alaska. Because Tanner and king crab pot permits have not been for sale, the only crab fishery open to new fishermen in southeastern Alaska is the Dungeness crab fishery. Some fishermen may be attempting to establish a participation history in anticipation of eventual limitation of the Dungeness fishery.

Limited entry, decreased populations of king and Tanner crabs, improved marketing and high prices of crab have contributed to consistently high effort in the southeastern Alaska Dungeness crab fishery.

Multiple Years of Participation

The number of unique persons (in the combined D09B, D91B and D99B fisheries) with specific year combinations of participation in the Dungeness fishery since the 1974-75 season are presented in Table 1. During the 16 seasons from 1974-75 to 1989-90, a total of 732 unique persons fished Dungeness crab in southeastern Alaska.

Only 1% of the participants have fished ten years or more. Thirteen percent have fished five to ten years, and 86% have fished for less than five years.

Fifty-two percent, or 384 persons, fished only one year; the largest number (66 persons or 17%) of those entered the fishery for the first time in 1989-90.

Table 1
Southeastern Dungeness Crab Fisheries
Participation History
Number of Years Fished and Year Combinations

SEASONS FISHED	TOTAL PEOPLE	SEASON COMBINATIONS	SEASONS 89-90	88-89	87-88	86-87	85-86	84-85	83-84	82-83	81-82	80-81	79-80	78-79	77-78	76-77	75-76	74-75
16	1	89-88-87-86-85-84-83-82-81-80-79-78-77-76-75-74	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	2	89-88-87-86-85-84-83-81-79-78-77-76-75-74	2	2	2	2	2	2	2	0	2	0	2	2	2	2	2	2
12	2	89-88-87-86-85-84-83-82-81-80-79-78-	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0
10	5	89-88-87-86-85-84-83-82-81-80-	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0
		89-88-87-86-85-84-83-82-81-79-	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0
		85-84-83-80-79-78-77-76-75-74	0	0	0	0	1	1	1	0	0	1	1	1	1	1	1	1
9	10	89-88-87-86-85-84-83-82-81-	6	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0
		89-88-87-86-85-84-83-81-79-	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0
		89-88-87-85-84-83-77-76-75-	1	1	1	0	1	1	1	0	0	0	0	0	1	1	1	0
		89-88-84-83-79-77-76-75-74	1	1	0	0	0	1	1	0	0	0	1	0	1	1	1	1
		88-87-86-84-83-82-81-78-77-	0	1	1	1	0	1	1	1	1	0	0	1	1	0	0	0
8	16	89-88-87-86-85-84-83-82-	10	10	10	10	10	10	10	10	0	0	0	0	0	0	0	0
		89-88-87-86-85-84-83-79-	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0
		89-88-87-86-85-83-82-81-	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0
		89-88-85-84-83-82-81-80-	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0
		88-87-86-85-84-83-82-81-	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
		88-87-86-85-84-83-81-79-	0	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0
		84-83-82-81-79-78-76-75-	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	0
7	17	89-88-87-86-85-84-83-	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0
		89-88-87-86-85-84-81-	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0
		89-88-87-86-85-83-82-	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0
		89-88-87-86-85-78-75-	1	1	1	1	1	0	0	0	0	0	0	1	0	0	1	0
		89-88-87-85-84-83-82-	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0
		88-87-86-85-84-83-82-	0	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0
		88-87-86-85-84-83-75-	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0
		88-86-84-82-81-75-74	0	1	0	1	0	1	0	1	1	0	0	0	0	0	1	1
		87-86-82-77-76-75-74	0	0	1	1	0	0	0	1	0	0	0	0	1	1	1	1
6	23	89-88-87-86-85-84-	9	9	9	9	9	9	0	0	0	0	0	0	0	0	0	0
		89-88-87-86-85-82-	4	4	4	4	4	0	0	4	0	0	0	0	0	0	0	0
		89-88-87-86-85-75-	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0
		89-88-87-86-83-82-	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0
		89-88-87-85-84-83-	2	2	2	0	2	2	2	0	0	0	0	0	0	0	0	0
		89-87-86-85-84-83-	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0
		88-87-86-85-84-83-	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
		88-87-85-84-83-82-	0	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0
		88-87-85-84-79-78-	0	1	1	0	1	1	0	0	0	0	1	1	0	0	0	0
		85-84-83-82-81-79-	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0
		80-79-78-77-76-75-	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0
5	29	89-88-87-86-85-	13	13	13	13	13	0	0	0	0	0	0	0	0	0	0	0
		89-88-87-85-84-	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0
		89-88-87-82-81-	2	2	2	0	0	0	0	2	2	0	0	0	0	0	0	0

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Number of Years Fished and Year Combinations

SEASONS FISHED	TOTAL PEOPLE	SEASON COMBINATIONS	SEASONS 89-90	88-89	87-88	86-87	85-86	84-85	83-84	82-83	81-82	80-81	79-80	78-79	77-78	76-77	75-76	74-75
		89-88-86-85-84-	2	2	0	2	2	2	0	0	0	0	0	0	0	0	0	0
		89-88-86-85-83-	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0
		89-88-86-83-82-	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
		89-87-86-85-81-	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0
		88-87-86-85-84-	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
		87-86-85-84-83-	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0	0
		87-85-83-82-81-	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0
		86-85-84-83-82-	0	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0
		85-84-83-82-81-	0	0	0	0	2	2	2	2	2	0	0	0	0	0	0	0
4	58	89-88-87-86-	21	21	21	21	0	0	0	0	0	0	0	0	0	0	0	0
		89-88-87-85-	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0
		89-88-87-82-	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
		89-88-86-85-	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0
		89-87-86-85-	2	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
		89-87-86-82-	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
		88-87-86-85-	0	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0
		88-87-86-84-	0	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0
		88-87-86-83-	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0
		88-87-85-84-	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0
		88-87-81-77-	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0
		88-86-85-84-	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0
		88-85-84-82-	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0
		88-84-82-81-	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0
		87-86-85-84-	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
		87-86-85-83-	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0
		87-86-84-83-	0	0	2	2	0	2	2	0	0	0	0	0	0	0	0	0
		87-85-84-82-	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0
		87-84-82-81-	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0
		86-85-84-83-	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0
		86-85-83-82-	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0
		86-84-83-82-	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0
		85-84-83-82-	0	0	0	0	3	3	3	3	0	0	0	0	0	0	0	0
		85-84-83-79-	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0
		85-81-80-79-	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0
		85-79-78-75-	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0
		82-81-79-78-	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0
		78-77-76-75-	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0
3	59	89-88-87-	25	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0
		89-88-82-	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
		89-87-86-	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
		88-87-86-	0	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0

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		88-86-85-	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0
		88-80-75-	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0
		87-86-85-	0	0	5	5	5	0	0	0	0	0	0	0	0	0	0	0
		87-86-82-	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
		87-86-79-	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0
		87-85-84-	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
		86-85-84-	0	0	0	4	4	4	0	0	0	0	0	0	0	0	0	0
		86-84-83-	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
		86-83-82-	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0
		85-84-83-	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
		85-84-82-	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0
		85-83-82-	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0
		85-83-79-	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0
		84-83-82-	0	0	0	0	0	3	3	3	0	0	0	0	0	0	0	0
		84-83-81-	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0
		84-83-80-	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
		84-82-81-	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
		82-76-75-	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
2	126	89-88-	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		89-87-	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
		89-86-	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		88-87-	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0
		88-86-	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		88-85-	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
		87-86-	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0
		87-85-	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
		87-84-	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
		87-83-	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
		86-85-	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0
		86-84-	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0
		86-83-	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
		86-81-	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
		85-84-	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
		85-83-	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
		85-82-	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
		85-76-	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
		84-83-	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0
		84-81-	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
		83-82-	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0
		82-81-	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0
		81-79-	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0

Table 1
Southeastern Dungeness Crab Fisheries
Participation History
Number of Years Fished and Year Combinations

SEASONS FISHED	TOTAL PEOPLE	SEASON COMBINATIONS	SEASONS 89-90	88-89	87-88	86-87	85-86	84-85	83-84	82-83	81-82	80-81	79-80	78-79	77-78	76-77	75-76	74-75
		79-78-	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0
		78-75-	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0
		76-75-	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
		75-74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
1	384	89-	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		88-	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		87-	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0
		86-	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0
		85-	0	0	0	0	42	0	0	0	0	0	0	0	0	0	0	0
		84-	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0
		83-	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0
		82-	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0
		81-	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0
		80-	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0
		79-	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0
		78-	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
		76-	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
		75-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
		SEASON TOTALS	241	257	237	210	202	175	128	125	68	19	32	22	11	15	31	10

TOTAL UNIQUE PEOPLE= 732

Note: The years in the Season Combinations column represent the first year of a season. For example, 88 represents the 1988-89 season; 87 represents the 1987-88 season, etc.

Table 2

Southeastern Dungeness Crab Fisheries
Participation History: Number of Participants
By Fishery,
Who Have Fished During the Given Time Period

FISHERY: D09B (Pots, <50 ft.)

Year/Season Combination	Total Unique Individuals
Jan. 1, 1989 to 89-90	222
Jan. 1, 1989 to 88-89	312
Jan. 1, 1989 to 87-88	373
Jan. 1, 1989 to 86-87	428
Jan. 1, 1989 to 85-86	487
Jan. 1, 1989 to 84-85	544
Jan. 1, 1989 to 83-84	574
Jan. 1, 1989 to 82-83	609
Jan. 1, 1989 to 81-82	626
Jan. 1, 1989 to 80-81	632
Jan. 1, 1989 to 79-80	639
Jan. 1, 1989 to 78-79	644
Jan. 1, 1989 to 76-77	647
Jan. 1, 1989 to 75-76	657

Table 2

Southeastern Dungeness Crab Fisheries
Participation History: Number of Participants
By Fishery,
Who Have Fished During the Given Time Period

FISHERY: D91B (Pots, >50 ft.)

Year/Season Combination	Total Unique Individuals
Jan. 1, 1989 to 89-90	13
Jan. 1, 1989 to 88-89	16
Jan. 1, 1989 to 87-88	21
Jan. 1, 1989 to 86-87	32
Jan. 1, 1989 to 85-86	36
Jan. 1, 1989 to 84-85	42
Jan. 1, 1989 to 83-84	46
Jan. 1, 1989 to 82-83	56
Jan. 1, 1989 to 81-82	63
Jan. 1, 1989 to 80-81	67
Jan. 1, 1989 to 79-80	69
Jan. 1, 1989 to 78-79	70
Jan. 1, 1989 to 76-77	71

Table 2

Southeastern Dungeness Crab Fisheries
Participation History: Number of Participants
By Fishery,
Who Have Fished During the Given Time Period

FISHERY: D99B (Ring nets)

Year/Season Combination	Total Unique Individuals
Jan. 1, 1989 to 89-90	7
Jan. 1, 1989 to 88-89	13
Jan. 1, 1989 to 87-88	18
Jan. 1, 1989 to 86-87	30
Jan. 1, 1989 to 85-86	42
Jan. 1, 1989 to 83-84	43
Jan. 1, 1989 to 82-83	49
Jan. 1, 1989 to 80-81	50
Jan. 1, 1989 to 79-80	51

Table 2

Southeastern Dungeness Crab Fisheries
Participation History: Number of Participants
Who Have Fished During the Given Time Period

ALL FISHERIES COMBINED

Year/Season Combination	Total Unique Individuals
Jan. 1, 1989 to 89-90	239
Jan. 1, 1989 to 88-89	333
Jan. 1, 1989 to 87-88	399
Jan. 1, 1989 to 86-87	464
Jan. 1, 1989 to 85-86	532
Jan. 1, 1989 to 84-85	594
Jan. 1, 1989 to 83-84	627
Jan. 1, 1989 to 82-83	672
Jan. 1, 1989 to 81-82	695
Jan. 1, 1989 to 80-81	703
Jan. 1, 1989 to 79-80	713
Jan. 1, 1989 to 78-79	719
Jan. 1, 1989 to 76-77	722
Jan. 1, 1989 to 75-76	732

Dungeness crabs in the D12A (diving) fishery, 3,740 pounds, occurred in 1989-90.

The distribution of catch in all seasons was skewed with a large percentage of participants harvesting a small percentage of the catch (Table 3). For example, in the 1988-89 season, 75% of the fishermen caught 19,730 pounds or less while 10% (25 people) caught 37,760 pounds or more.

Some fishermen believe that the increase in catch after 1981 was due not to a higher abundance of crabs, but to increased effort in the southeastern Dungeness crab fishery (Tim Koeneman, ADF&G). The number of people with landings tripled in 1981-82 and the total catch increased five-fold.

The high harvest levels in 1987-88 and 1988-89 in southeastern Alaska paralleled historically large harvests in the other Pacific Coast fisheries in those years (Figure 8). Management biologists in Alaska, Washington and Oregon attribute the recent good harvests to a strong 1984 year class that recruited into the fishery in 1987 and 1988. A decline in the 1989 Pacific Coast catch reflects the removal of the 1984 crabs by the fishery, and as a result, managers anticipate declining harvests in the future (Steve Barry, Washington Department of Fisheries).

CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

Table 2

Southeastern Dungeness Crab Fisheries
Participation History: Number of Participants
Who Have Fished During the Given Time Period

ALL FISHERIES COMBINED

Year/Season Combination	Total Unique Individuals
Jan. 1, 1989 to 89-90	239
Jan. 1, 1989 to 88-89	333
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Jan. 1, 1989 to 81-82	695
Jan. 1, 1989 to 80-81	703
Jan. 1, 1989 to 79-80	713
Jan. 1, 1989 to 78-79	719
Jan. 1, 1989 to 76-77	722
Jan. 1, 1989 to 75-76	732

IV. CATCH IN THE SOUTHEASTERN DUNGENESS CRAB FISHERY

Total Catch

Average, median and total[4] pounds of Dungeness crab caught in southeastern Alaska, and the 75th and 90th percentiles for catch are presented for all fisheries combined (D09B, D91B and D99B), by unique number of persons by season in Table 3. (See Table 9 for comparison of catch by vessels.)

The total catch has varied from 127,201 pounds in 1977-78 to 3,574,175 pounds in 1982-83 (Table 3). Prior to the 1981-82 season, the annual total catch was less than one million pounds. The total seasonal catch in 1988-89, 3,309,795 pounds, was the third largest catch for the southeastern fishery since the 1974-75 season.

About 90% of the total Dungeness catch since 1981-82 was harvested in the small boat fishery (D09B), and 10% or less from the large boat fishery (D91B). The ring net fishery (D99B) did not exist before the 1979-80 season and has averaged less than 1% of the total catch. The largest seasonal harvest of

[4]The database used to calculate catch statistics consisted of 99% of all pounds harvested.

Dungeness crabs in the D12A (diving) fishery, 3,740 pounds, occurred in 1989-90.

The distribution of catch in all seasons was skewed with a large percentage of participants harvesting a small percentage of the catch (Table 3). For example, in the 1988-89 season, 75% of the fishermen caught 19,730 pounds or less while 10% (25 people) caught 37,760 pounds or more.

Some fishermen believe that the increase in catch after 1981 was due not to a higher abundance of crabs, but to increased effort in the southeastern Dungeness crab fishery (Tim Koeneman, ADF&G). The number of people with landings tripled in 1981-82 and the total catch increased five-fold.

The high harvest levels in 1987-88 and 1988-89 in southeastern Alaska paralleled historically large harvests in the other Pacific Coast fisheries in those years (Figure 8). Management biologists in Alaska, Washington and Oregon attribute the recent good harvests to a strong 1984 year class that recruited into the fishery in 1987 and 1988. A decline in the 1989 Pacific Coast catch reflects the removal of the 1984 crabs by the fishery, and as a result, managers anticipate declining harvests in the future (Steve Barry, Washington Department of Fisheries).

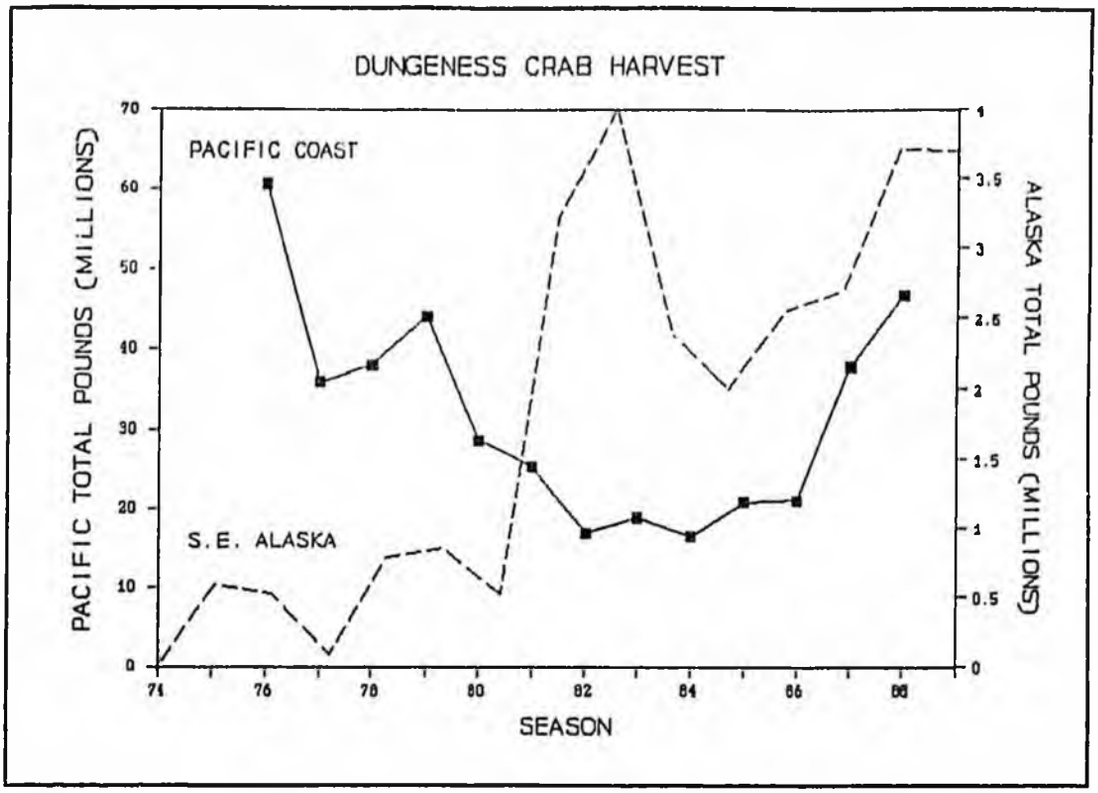


Figure 8. Total harvest of Dungeness crab from the Pacific Coast fisheries (British Columbia, Washington, Oregon and California) compared to the harvest from southeastern Alaska. On the x-axis, 74 represents the 1974-75 season, 75 represents the 1975-76 season, etc. Note that the scales for Alaska and Pacific Coast catch are different.

Average Catch

The average catch per person for the D09B fishery varied from 10,600 pounds per person in 1977-78 to 45,033 pounds per person in the 1981-82 season. In 1988-89, the average catch per person was 12,671 pounds.

Similarly, the average catch per person for all fisheries combined varied from 10,391 pounds per person in 1984-85 to 42,442 pounds per person in the 1981-82 season (Table 3). The average catch in 1988-89 was 12,980 pounds per person, approximately the mean average catch since the 1933-84 season.

Table 3
Southeast Commercial Dungeness Crab Fisheries
Harvest Distributional Statistics By Season

SEASON	UNIQUE PEOPLE	AVERAGE POUNDS	MEDIAN POUNDS	TOTAL POUNDS	75TH PERCENTILE	90TH PERCENTILE
74-75	11	3,347	867	36,817	4,574	13,348
75-76	32	17,750	9,742	567,986	21,719	57,218
76-77	17	29,983	19,720	509,718	59,999	85,027
77-78	12	10,600	4,826	127,201	14,025	38,926
78-79	24	30,898	18,243	741,549	37,375	117,058
79-80	35	22,905	4,472	801,676	35,322	74,585
80-81	22	23,071	2,655	507,551	28,891	103,885
81-82	68	42,442	7,168	2,886,039	55,712	136,132
82-83	122	29,297	11,790	3,574,175	38,975	83,181
83-84	128	16,756	8,723	2,144,762	26,633	47,040
84-85	174	10,391	3,175	1,808,062	14,639	29,980
85-86	202	11,377	3,306	2,298,134	12,317	37,830
86-87	209	11,585	3,367	2,421,258	15,110	35,989
87-88	233	14,246	4,080	3,319,408	18,411	45,556
88-89	255	12,980	3,894	3,309,795	19,730	37,760
89-90	239	7,940	2,429	1,897,777	9,724	22,309

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

Summer vs. Winter Fisheries

The Dungeness crab fishery in southeastern Alaska has been predominately a summer fishery (June, July and August). About 62% of the total seasonal harvest was landed in the months of June, July and August (Table 4).

Legal-sized crabs are more abundant in the summer months after the new recruits molt into the fishery, and weather conditions are more favorable for the small boat fishery in the summer. Dungeness crabs are less active in the winter months and spend more time burrowed into the substrate. Because of their lower activity levels, crabs enter pots less readily in the winter than in the summer.

The largest monthly harvest has been in July, with an average of 37% of the total seasonal catch from 1984-85 to 1988-89. July has also been the month with the most people fishing and the largest average catch per person in the last few seasons.

The winter harvest (October through February) was greatest in 1987-88 at 924,802 pounds. Recent winter harvests have been much lower at 565,866 pounds in 1988-89 and 314,332 pounds in 1989-90 (without January or February catch included, 1990 ADF&G Shellfish Report to the Board of Fisheries).

Table 4

Southeast Commercial Dungeness Crab Fishery
Number of Fishermen and Catch by Month and Season
All Dungeness Crab Fisheries Combined

	SEASON													
	74-75		75-76		76-77		77-78		78-79		79-80		80-81	
	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH
	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM
MONTH														
JUN			15	101,889	9	105,864	.	.	6	123,469	10	165,728	5	62,684
JUL			23	134,639	11	206,112	.	.	12	203,898	16	184,630	11	157,122
AUG			15	109,187	11	89,889	4	29,570	14	152,623	16	137,043	11	119,007
SEP			13	69,486	8	46,068	5	31,376	12	104,609	17	137,417	10	69,865
OCT			18	48,924	7	30,554	7	15,897	11	70,330	18	75,079	7	36,342
NOV			12	25,424	7	9,373	6	24,956	10	43,301	12	52,067	10	29,949
DEC			7	11,677	7	11,670	.	.	5	17,926	9	30,098	9	15,064
JAN	6	6,298	5	5,344	.	.	.	.	.	.	.	.	4	7,434
FEB	5	13,717	.	.	.	.	4	7,971	.	.	.	.	.	.
MAR	8	16,802	.	.					.	.			.	.
APR			9	18,101										
MAY			12	35,906										
ALL	11	36,817	32	567,986	17	509,718	12	127,201	24	741,549	35	801,676	22	507,551

(CONTINUED)

Note: Where column is blank, data was not available.
The 1974-75 season consists only of 1975 data.
The 1989-90 season consists only of 1989 data.

Note: The number of unique people is given by season along with the total seasonal harvest in 'ALL'.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Table 4

Southeast Commercial Dungeness Crab Fishery
Number of Fishermen and Catch by Month and Season
All Dungeness Crab Fisheries Combined

	SEASON													
	81-82		82-83		83-84		84-85		85-86		86-87		87-88	
	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH	PEOPLE	CATCH
MONTH	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM
JUN	19	450,460	67	883,972	79	737,396			97	330,090	98	267,150	108	567,866
JUL	33	886,041	77	1,046,229	75	451,013	96	670,284	124	861,069	122	795,339	136	1,175,349
AUG	33	553,393	68	735,259	66	334,480	93	487,335	100	445,269	111	447,525	119	644,540
SEP	31	422,004	52	450,122	63	267,533	83	271,486	.	.				
OCT	33	288,194	45	218,577	58	146,541	77	149,460	90	376,379	118	447,829	126	466,776
NOV	24	164,235	35	142,609	52	84,438	75	135,542	85	172,581	93	273,207	112	276,047
DEC	23	67,699	37	62,588	29	45,745	46	58,631	62	62,794	72	101,386	62	81,230
JAN	10	24,467	10	12,866	19	28,533	17	21,266	28	29,840	35	39,834	.	.
FEB	12	25,632	.	.	18	14,239	25	11,758	27	15,014	45	36,929	68	54,438
MAR	4	3,914	.	.	.	.	.	.	.	.	11	12,059	.	.
APR							.	.						
MAY					.	.	.	.						
ALL	68	2,886,039	122	3,574,175	128	2,144,762	174	1,808,062	202	2,298,134	209	2,421,258	233	3,319,408

(CONTINUED)

Note: Where column is blank, data was not available.
The 1974-75 season consists only of 1975 data.
The 1989-90 season consists only of 1989 data.

Note: The number of unique people is given by season along with the total seasonal harvest in 'ALL'.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Table 4

Southeast Commercial Dungeness Crab Fishery
Number of Fishermen and Catch by Month and Season
All Dungeness Crab Fisheries Combined

	SEASON			
	88-89		89-90	
	PEOPLE	CATCH	PEOPLE	CATCH
MONTH	SUM	SUM	SUM	SUM
JUN	134	774,169	149	494,873
JUL	153	1,387,390	161	816,401
AUG	128	581,410	134	272,171
SEP				
OCT	126	302,288	88	202,176
NOV	100	185,307	73	96,977
DEC	54	43,936	12	15,179
JAN	.	.		
FEB	34	18,677		
MAR	.	.		
APR				
MAY				
ALL	255	3,309,795	239	1,897,777

Note: Where column is blank, data was not available.
The 1974-75 season consists only of 1975 data.
The 1989-90 season consists only of 1989 data.

Note: The number of unique people is given by season along with the total seasonal harvest in 'ALL'.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

V. EARNINGS IN THE SOUTHEASTERN ALASKA DUNGENESS CRAB FISHERY

Total Earnings

Average, median and total gross earnings[5] of fishermen in the southeastern Alaska Dungeness crab fishery and the 75th and 90th percentiles for earnings are presented for all fisheries combined (D09B, D91B and D99B), by unique number of persons by season in Table 5. (See Table 10 for comparison of earnings by vessels.)

The total earnings in the southeastern Alaska Dungeness crab fishery were highest in 1987-88 at $3,672,409 and lowest in 1977-78 at $64,305 (Table 5). The gross earnings from the 1988-89 fishery was $3,154,951.

The total earnings by fishery (Table 5) roughly parallel the catch data (Table 3).

[5]All earnings values in this report are CFEC estimates of gross earnings. Gross earnings refers to the amount received from the sale of crabs. No costs have been subtracted.

Average Earnings

The average gross earnings per person was $12,372 in 1988-89. The average gross earnings per person has declined from a peak of $26,489 in the 1981-82 season, and has varied between $12,183 and $15,761 since 1984-85 (Table 5).

Diversification of Fishing Income

Three years were chosen for examining diversification of fishing activity by the Dungeness crab fleet in southeastern Alaska. The years chosen were 1980, 1985 and 1988. Those years were chosen to look at the fishery before the large increase in effort began in the early 1980's and in the most recent year with complete gross earnings data (1988). A third year about mid-way between 1980 and 1989 was also chosen (1985).

In 1980, the southeastern Alaska Dungeness crab fishermen earned large percentages of their annual fishing income from the king crab (K09A, K91O), Tanner crab (T09B and T91B) and Dungeness crab (D09B, D91B) fisheries. They also earned significant income from the halibut (B61B) and southeastern herring purse seine fisheries (G01A) in late spring and early summer, and the southeastern salmon purse seine (S01A) and drift gill net fisheries (S03A) in the late summer. These fisheries accounted for 90% of the annual fishing income of

the Dungeness crab fishermen. Income from the Dungeness crab fishery alone comprised 32% of the annual fishing income.

In 1985, the Dungeness crab fishermen were more diversified in their fishing activities. There were more fishermen participating in the salmon hand troll (S05B) and power troll (S15B) fisheries in southeastern Alaska, and in the shrimp (P09B), sablefish (C61A) and miscellaneous fin fish (M61B) fisheries. Five people fished the Bristol Bay salmon drift gill net fishery (S03T) and four people fished the Prince William Sound salmon purse seine fishery (S01E) in addition to the southeastern Alaska Dungeness crab fishery. These fisheries accounted for 90% of the annual fishing income, with 31% of that coming from Dungeness crab alone.

Diversification of fishing activity had increased again by 1988. The fisheries mentioned in the previous paragraph contributed only 78% of the annual fishing income in 1988. The income produced by the Dungeness crab fishery increased to 38% of the annual fishing income, however.

The percentage of the total gross earnings from a fishery did not always parallel the number of Dungeness crab fishermen participating in that fishery. For example, in 1988 36% of the Dungeness crab fishermen participated in the halibut fishery, but the gross earnings from halibut were less than 1% of the

annual fishing income. Sizable percentages of the fishermen fished the southeastern hand troll and pot shrimp fisheries, but 1% or less of the total gross earnings for all fisheries combined for the year was generated by each of those fisheries. Conversely, only 4% of the Dungeness crab fishermen fished the southeastern salmon purse seine fishery, but they generated about 10% of the annual gross earnings.

The two fisheries generating the highest percentages of the total monthly income for the Dungeness crab fishermen, by month for 1980, 1985 and 1988 were as follows:

MONTH	1980	1985	1988
January	T91B, T09B	T91K, D091A	K69A, T91E
February	T91B, T09B	K69A, K49A	K69A, K49A
March	T91B, T09B	G34A, K69A/G01A	G34A, T91D
April	T91B, G01A	B61B, G01A	G01A, K29A
May	T91B, B61B	B61B, D091A	D091A, G34A
June	D091A, B61B	D091A, S03T	D091A, S03T
July	D091A, SO3A	D091A, D03A	D091A, S03A
August	S01A, D091A	S01A, D091A	S01A, S01E/S03A
September	D091A, K09A	S03A, S04D	S04D, S03A
October	K91Q, K09A	D091A, C61A	D091A, K91E/K91T/P09B
November	K91O, K09A/D091A	D091A, K91E	D091A, K91E
December	K91O, K09A	D091A, K91E	D091A, P09B

Note: D091A represents the combined D09B and D91B fisheries.
K91E, K91O, K91Q are king crab pot fisheries (vessels >50 ft.) in Prince William Sound, Dutch Harbor and the Bering Sea, respectively.
K29A is the red/blue/brown king crab fishery in Southeast
K49A is the red/blue king crab and Tanner crab fishery in Southeast
K69A is the red/blue/brown king crab and Tanner crab fishery in Southeast
S04D is the salmon set gill net fishery in Yakutat
T91D, T91E, T91K are Tanner crab pot fisheries (vessels >50 ft.) in Yakutat, Prince William Sound and Kodiak, respectively.
The remaining fisheries were previously defined in the text above.

Table 5

Southeast Commercial Dungeness Crab Fisheries
Harvest Distributional Statistics By Season

SEASON	UNIQUE PEOPLE	AVERAGE EARNINGS	MEDIAN EARNINGS	TOTAL EARNINGS	75TH PERCENTILE	90TH PERCENTILE
74-75	11	$1,694	$434	$18,632	$2,333	$6,696
75-76	32	$9,270	$5,066	$296,656	$11,705	$29,321
76-77	17	$13,276	$9,709	$225,691	$24,754	$35,711
77-78	12	$5,359	$2,945	$64,305	$8,305	$17,517
78-79	24	$19,659	$11,606	$471,822	$23,828	$74,917
79-80	35	$17,691	$4,427	$619,195	$20,656	$66,421
80-81	22	$11,638	$1,432	$256,034	$14,446	$52,369
81-82	68	$26,489	$4,664	$1,801,236	$33,465	$81,664
82-83	122	$21,116	$9,194	$2,576,114	$26,581	$59,933
83-84	128	$15,785	$8,166	$2,020,501	$24,875	$44,462
84-85	174	$13,881	$4,422	$2,415,220	$19,302	$38,670
85-86	202	$14,181	$4,222	$2,864,508	$15,866	$46,589
86-87	209	$12,183	$3,557	$2,546,151	$16,288	$38,328
87-88	233	$15,761	$4,582	$3,672,409	$20,539	$50,886
88-89	255	$12,372	$3,723	$3,154,951	$18,783	$35,984
89-90	239	$8,582	$2,489	$2,051,214	$10,333	$23,902

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

VI. EFFORT

Number of Weeks Fished per Season

The number of weeks fished (weeks with landings) per season is given in Table 6a, by season, as an index of fishing activity. The number of people and the percentages of the total seasonal participants that fished within given "number of weeks fished" categories are presented.

Two patterns of fishing in the southeastern Dungeness crab fishery were evident. In most years, high percentages of participants had either 1 or 2 weeks with landings per season or 11 to 20 weeks with landings per season. About 55% of the fishermen had five weeks with landings or less in 1988-89, and about 22% had ten weeks or more. The percentages, by weeks fished categories, for all seasons combined were similar to those of the 1988-89 season.

Average Weekly Catch

The average weekly harvest of Dungeness crab was 1,000 pounds or less per week for 53% of the fishermen from 1974-75 to 1989-90 (Table 6b). Thirty-nine percent averaged between 1,001 and 5,000 pounds per week and only 8%

averaged more than 5,000 pounds per week. The average weekly harvests in recent years were consistent with the historical trends for the fishery.

Table 6a
Southeast Commercial Dungeness Crab Fisheries
Number of Weeks Fished per Season

	SEASON																							
	74-75		75-76		76-77		77-78		78-79		79-80		80-81		81-82		82-83		83-84		84-85		85-8	
	PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOP LE	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	
WEEKS FISHED																								
1	4	36	6	19	.	.	4	33	.	.	6	17	5	23	12	18	22	18	27	21	35	20	4	
2	.	.	4	13	0	0	.	.	.	.	.	.	.	.	8	12	15	12	10	7.8	19	11	2	
3	.	.	.	.	.	.	0	0	5	21	5	14	.	.	5	7.4	13	11	10	7.8	11	6.3	1	
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	8.8	6	4.9	2	1.6	19	11	1	
5	0	0	.	.	.	.	0	0	0	0	6	17	.	.	.	.	7	5.7	8	6.3	11	6.3	1	
6	0	0	0	0	.	.	.	.	.	.	0	0	.	.	4	5.9	.	.	6	4.7	8	4.6	1	
7	0	0	.	.	.	.	0	0	4	17	.	.	.	.	5	7.4	6	4.9	5	3.9	13	7.5	1	
8	0	0	.	.	.	.	0	0	0	0	0	0	.	.	.	.	.	.	7	5.5	.	.		
9	0	0	.	.	0	0	0	0	.	.	.	.	.	.	.	.	6	4.9	7	5.5	9	5.2	1	
10	0	0	0	0	0	0	0	0	.	.	.	.	0	0	4	5.9	6	4.9	7	5.5	9	5.2		
11 - 15	0	0	.	.	4	24	4	33	.	.	5	14	.	.	12	18	23	19	22	17	17	9.8	2	
16 - 20	0	0	4	13	.	.	0	0	.	.	.	.	.	.	.	.	7	5.7	8	6.3	14	8.0	1	
21 - 30	0	0	.	.	.	.	0	0	.	.	0	0	.	.	.	.	7	5.7	9	7.0	.	.	4	
31 - 40	0	0	.	.	0	0	0	0	0	0	0	0	0	0	.	.	0	0	0	0	0	0	0	
ALL	11	100	32	100	17	100	12	100	24	100	35	100	22	100	68	100	122	100	128	100	174	100	20	

(CONTINUED)

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Table 6a
Southeast Commercial Dungeness Crab Fisheries
Number of Weeks Fished per Season

	SEASON										
	85-86 PE-OP-LE	86-87		87-88		88-89		89-90		ALL	
	PEOPLE	PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE	
	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
WEEKS FISHED											
1	21	34	16	35	15	52	20	54	23	343	19
2	11	15	7.2	21	9.0	25	9.8	28	12	178	10
3	9.4	14	6.7	25	11	22	8.6	24	10	165	9.3
4	6.9	17	8.1	14	6.0	22	8.6	13	5.4	123	6.9
5	5.4	18	8.6	17	7.3	18	7.1	21	8.8	124	7.0
6	7.9	15	7.2	14	6.0	11	4.3	18	7.5	100	5.6
7	5.0	12	5.7	.	.	19	7.5	24	10	116	6.5
8	3.0	10	4.8	15	6.4	18	7.1	16	6.7	87	4.9
9	6.4	13	6.2	16	6.9	13	5.1	8	3.3	94	5.3
10	4.0	.	.	15	6.4	15	5.9	10	4.2	87	4.9
11 - 15	12	30	14	28	12	26	10	19	7.9	220	12
16 - 20	5.4	20	9.6	18	7.7	9	3.5	4	1.7	103	5.8
21 - 30	2.0	.	.	.	.	5	2.0	0	0	.	.
31 - 40	0	0	0	0	0	0	0	0	0	.	.
ALL	100	209	100	233	100	255	100	239	100	1783	100

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Table 6b
Southeast Commercial Dungeness Crab Fisheries
Average Weekly Catch in Pounds

	SEASON																					
	74-75		75-76		76-77		77-78		78-79		79-80		80-81		81-82		82-83		83-84		84-85	
	PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
AVG LBS/WEEK																						
0 - 1,000	7	64	.	.	5	29	6	50	8	33	12	34	14	64	28	41	42	34	55	43	98	56
1,001 - 5,000	4	36	18	56	8	47	6	50	12	50	17	49	.	.	22	32	54	44	59	46	69	40
5,001 - 10,000	0	0	.	.	.	.	0	0	.	.	4	11	.	.	8	12	19	16	.	.	7	4.0
10,001 - 20,000	0	0	0	0	.	.	0	0	.	.	.	.	.	.	5	7.4	4	3.3	0	0	0	0
20,001 - 30,000	0	0	0	0	0	0	0	0	0	0	.	.	0	0	.	.	.	.	.	.	0	0
30,001 - 40,000	0	0	0	0	0	0	0	0	.	.	0	0	0	0	.	.	.	.	0	0	0	0
40,001 - 50,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	0	0	0	0	0
ALL	11	100	32	100	17	100	12	100	24	100	35	100	22	100	68	100	122	100	128	100	174	100

(CONTINUED)

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Table 6b
Southeast Commercial Dungeness Crab Fisheries
Average Weekly Catch in Pounds

	SEASON											
	85-86		86-87		87-88		88-89		89-90		ALL	
	PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE		PEOPLE	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
AVG LBS/WEEK												
0 - 1,000	118	58	123	59	130	56	137	54	148	62	944	53
1,001 - 5,000	72	36	71	34	88	38	100	39	82	34	687	39
5,001 - 10,000	.	.	.	.	.	.	14	5.5	.	.	111	6.2
10,001 - 20,000	.	.	.	.	.	.	4	1.6	.	.	26	1.5
20,001 - 30,000	0	0	.	.	0	0	0	0	.	.	9	0.5
30,001 - 40,000	0	0	0	0	0	0	0	0	0	0	.	.
40,001 - 50,000	0	0	0	0	0	0	0	0	0	0	.	.
ALL	202	100	209	100	233	100	255	100	239	100	1783	100

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of persons is less than 4, the cell will contain a '.'

Number of Pots Fished

The number of pots fished per vessel was obtained from the ADF&G vessel registration file for 1987 through 1989. At the time a vessel is registered, the owner is asked how many pots he plans to fish[6]. Ken Imamura of ADF&G explained that some fishermen report the actual number of pots on board, while others give the maximum allowable number of 300 pots whether they plan to fish that many or not.

Although the number of pots varied between vessels within the same size category, the average number of pots generally increased with vessel length. Vessels 1 to 29 feet averaged 158 $\pm$ 107 pots while vessels 30 to 39 feet averaged 190 $\pm$ 106 pots (Figure 9). Vessels 40 to 49 feet averaged 224 $\pm$ 109 pots; vessels 50 to 59 feet averaged 250 $\pm$ 87 pots. For most vessels 60 feet and larger the maximum limit of 300 pots was recorded at the time of vessel registration.

The vessels in the D09B Dungeness crab fishery have been fishing only 50 to 60% of the maximum pot limit for the last three years. The amount of gear

[6]Although the question posed to the fishermen may vary depending upon who asks at the time of registration, Ken Imamura of ADF&G asks how many pots a fisherman can realistically expect to fish during the season. This number can be interpreted as the maximum number of pots fished.

could theoretically double within the current pot limits. Many vessels cannot practically fish 300 pots, however. The maximum number of pots a vessel of 40 to 45 feet can transport at one time is between 50 and 75 (Ken Imamura, ADF&G). Vessels 20 to 25 feet in length could probably transport a maximum of 20 pots. Transportation of large numbers of pots would be difficult for the smallest vessels, but once the pots were in the water they could be fished from small boats. Small vessels may hire a larger vessel to transport their pots to and from the fishing grounds only if the hired vessel is registered with ADF&G as a tender. The tender can only transport the pots and cannot set the gear.

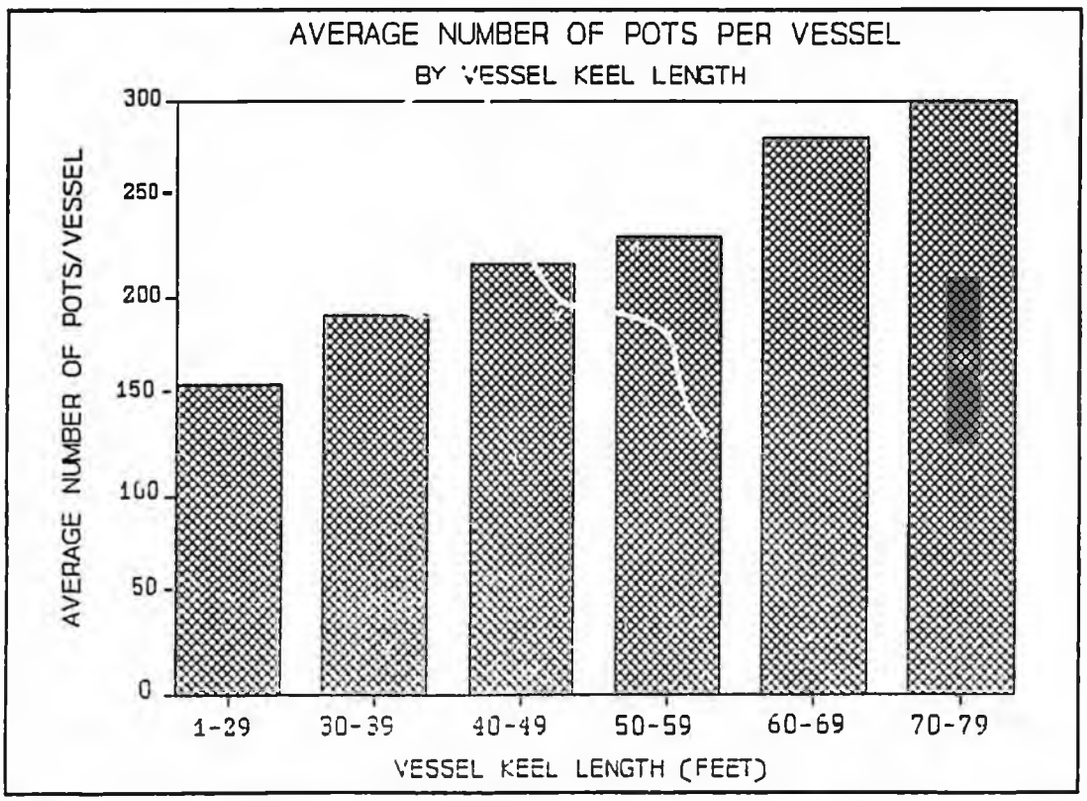


Figure 9. Average number of Dungeness crab pots reported by fishermen at the time of vessel registration in the years 1987 through 1989.

Experience

Dungeness crab fishermen with multiple seasons of experience had significantly ($P \leq 0.01$) more weeks with landings per season (in seasons that they fished) than less experienced fishermen. Using only the number of seasons fished as an index of experience, the average weekly catch for experienced fishermen did not differ from less experienced fishermen. But because experienced fishermen had more weeks with landings per season, their average seasonal catch was significantly ($P \leq 0.01$) greater than that of less experienced fishermen.

The average weeks with landings per season was calculated by summing the number of weeks with landings over all seasons that an individual had reported harvests of Dungeness crabs, and dividing the total number of weeks by the total number of seasons that person fished. Average weekly catch was calculated in a similar manner. The total pounds harvested by an individual over all seasons in which he had recorded harvests was divided by the total number of weeks fished by that individual.

Average weekly catch may be dependent on factors other than just the number of seasons a person fished, however. The time the fishing activity took

place within a season and also the area in which fishing occurred are only two factors which could significantly affect weekly catch.

VII. THE DUNGENESS CRAB FISHING FLEET

A wide range of vessel sizes and conditions exists among the southeastern Alaska Dungeness crab fleet. The protected waters of the inshore fishery allow considerable variability in the seaworthiness of the vessels (1990 ADF&G Shellfish Report to the Board of Fisheries).

Vessels range in size from small skiffs powered by outboard motors to a few large Bering sea-class crabbers. From 1974-75 to 1983-84 the predominant vessel size (30 to 50% of all vessels) was 30 to 39 feet in length (Table 7). Large vessels, 60 to 79 feet, entered the fishery in 1981-82 and remained until 1985-86. Since the 1986-87 season, less than 1% of the fleet has exceeded 60 feet.

Almost all of the new vessels that have entered the Dungeness crab fishery in recent years have been small (1 to 29 feet in length). In the 1988-89 season, the predominant vessel size class was 29 feet or less (45% of the fleet), and over 75% of the fleet was smaller than 40 feet.

Table 7
Southeast Commercial Dungeness Crab Fisheries
Number of Vessels By Vessel Length, By Season
All Gear Types Combined

	VESSEL LENGTH (feet)															
	1-29		30-39		40-49		50-59		60-69		70-79		80+		ALL	
	VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
SEASON																
74-75	2	18.2	4	36.4	3	27.3	2	18.2	0	0	0	0	0	0	11	100
75-76	2	6.9	13	44.8	9	31.0	5	17.2	0	0	0	0	0	0	29	100
76-77	1	5.9	8	47.1	3	17.6	5	29.4	0	0	0	0	0	0	17	100
77-78	0	0	6	50.0	4	33.3	2	16.7	0	0	0	0	0	0	12	100
78-79	2	9.1	9	40.9	8	36.4	2	9.1	1	4.5	0	0	0	0	22	100
79-80	4	11.4	15	42.9	12	34.3	4	11.4	0	0	0	0	0	0	35	100
80-81	6	28.6	10	47.6	3	14.3	2	9.5	0	0	0	0	0	0	21	100
81-82	17	25.0	23	33.8	13	19.1	8	11.8	4	5.9	3	4.4	0	0	68	100
82-83	24	22.0	33	30.3	36	33.0	12	11.0	2	1.8	0	0	2	1.8	109	100
83-84	30	24.2	43	34.7	38	30.6	8	6.5	2	1.6	2	1.6	1	0.8	124	100
84-85	55	34.0	60	37.0	34	21.0	9	5.6	2	1.2	2	1.2	0	0	162	100
85-86	75	40.1	68	36.4	34	18.2	8	4.3	1	0.5	1	0.5	0	0	187	100
86-87	84	41.8	71	35.3	36	17.9	10	5.0	0	0	0	0	0	0	201	100
87-88	84	38.2	80	36.4	45	20.5	9	4.1	0	0	2	0.9	0	0	220	100
88-89	109	44.7	80	32.8	46	18.9	7	2.9	0	0	1	0.4	1	0.4	244	100
89-90	100	45.0	77	34.7	36	16.2	7	3.2	0	0	2	0.9	0	0	222	100
ALL	595	35.3	600	35.6	360	21.4	100	5.9	12	0.7	13	0.8	4	0.2	1684	100

Multiple Operators per Vessel

The number of vessels with Dungeness crab harvests recorded on fish tickets by more than one person within a season is presented, by season, in Table 8. The number of vessels with two operators doubled from 1983-84 to 1984-85 and almost doubled again in 1985-86, but has remained relatively constant at about 18 vessels in recent seasons. Three or fewer vessels had three operators within a season from 1985-86 to 1988-89.

Table 8. Number of vessels with multiple operators within a season in the southeastern Dungeness crab fishery.

Season	Vessels with 2 Operators	Vessels with 3 Operators
1974-75	0	0
1975-76	1	0
1976-77	0	0
1978-79	0	0
1979-80	0	0
1980-81	0	0
1981-82	0	0
1982-83	6	2
1983-84	5	0
1984-85	10	0
1985-86	18	2
1986-87	18	3
1987-88	19	2
1988-89	17	2
1989-90	14	0

Catch and Earnings by Vessels

The average, median and total pounds of Dungeness crab caught in southeastern Alaska, and the 75th and 90th percentiles for catch are presented for all fisheries combined (D09B, D91B and D99B), by unique number of vessels by season in Table 9.

The average, median and total earnings in the Dungeness crab fishery in southeastern Alaska, and the 75th and 90th percentiles for catch are presented for all fisheries combined (D09B, D91B and D99B), by unique number of vessels by season in Table 10.

These tables are included for comparison of catch and earnings by people in Tables 3 and 5.

The catch and earnings by number of vessels is similar to catch and earnings by number of people (Tables 3 and 5) in all seasons. In seasons where the number of vessels was less than the number of people, more than one person fished from the same vessel. The difference between number of vessels and number of people was greatest in the seasons 1987-88 to 1989-90.

In some seasons the number of vessels was greater than the number of people indicating some individuals fished from more than one vessel in a season.

Table 9
Southeast Commercial Dungeness Crab Fisheries
Harvest Distributional Statistics By Season

SEASON	UNIQUE VESSELS	AVERAGE POUNDS	MEDIAN POUNDS	TOTAL POUNDS	75TH PERCENTILE	90TH PERCENTILE
74-75	11	3,347	867	36,817	4,574	13,348
75-76	30	18,933	10,173	567,986	24,004	59,655
76-77	17	29,983	19,720	509,718	59,999	85,027
77-78	12	10,600	4,826	127,201	14,025	38,926
78-79	22	33,707	19,773	741,549	40,752	119,999
79-80	36	22,269	5,105	801,676	32,736	76,014
80-81	21	24,169	3,071	507,551	32,283	104,203
81-82	68	42,442	8,101	2,886,039	55,712	121,221
82-83	109	32,791	17,603	3,574,175	46,631	99,507
83-84	124	17,296	8,668	2,144,762	26,633	50,418
84-85	163	11,092	3,934	1,808,062	15,921	30,299
85-86	192	11,969	3,774	2,298,134	15,243	38,802
86-87	201	12,046	3,117	2,421,258	14,686	36,150
87-88	221	15,020	4,125	3,319,408	20,000	46,640
88-89	245	13,509	4,129	3,309,795	19,944	41,815
89-90	222	8,549	2,828	1,897,777	10,824	24,614

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

Table 10

Southeast Commercial Dungeness Crab Fisheries
Harvest Distributional Statistics By Season

SEASON	UNIQUE VESSELS	AVERAGE EARNINGS	MEDIAN EARNINGS	TOTAL EARNINGS	75TH PERCENTILE	90TH PERCENTILE
74-75	11	$1,694	$434	$18,632	$2,333	$6,696
75-76	30	$9,889	$5,504	$296,656	$12,695	$30,465
76-77	17	$13,276	$9,709	$225,691	$24,754	$35,711
77-78	12	$5,359	$2,945	$64,305	$8,305	$17,517
78-79	22	$21,446	$12,335	$471,822	$26,081	$76,799
79-80	36	$17,200	$4,098	$619,195	$18,376	$65,852
80-81	21	$12,192	$1,536	$256,034	$16,141	$52,430
81-82	68	$26,489	$5,303	$1,801,236	$33,465	$73,264
82-83	109	$23,634	$13,164	$2,576,114	$34,663	$70,692
83-84	124	$16,294	$8,096	$2,020,501	$24,875	$47,515
84-85	163	$14,817	$5,425	$2,415,220	$20,641	$40,392
85-86	192	$14,919	$4,509	$2,864,508	$19,077	$49,071
86-87	201	$12,667	$3,295	$2,546,151	$15,743	$38,530
87-88	221	$16,617	$4,588	$3,672,409	$22,050	$51,788
88-89	245	$12,877	$3,931	$3,154,951	$18,986	$39,855
89-90	222	$9,240	$2,904	$2,051,214	$11,076	$26,476

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

Dungeness Crab Harvest by Vessel Length

Forty-one percent of the total harvest of Dungeness crabs from 1975 to 1989 was caught from vessels 30 to 39 feet in length (Figure 10). Less than 2% of the historical harvest was caught from vessels greater than 60 feet in length. Over half of the total harvest was from vessels 30 to 49 feet in length.

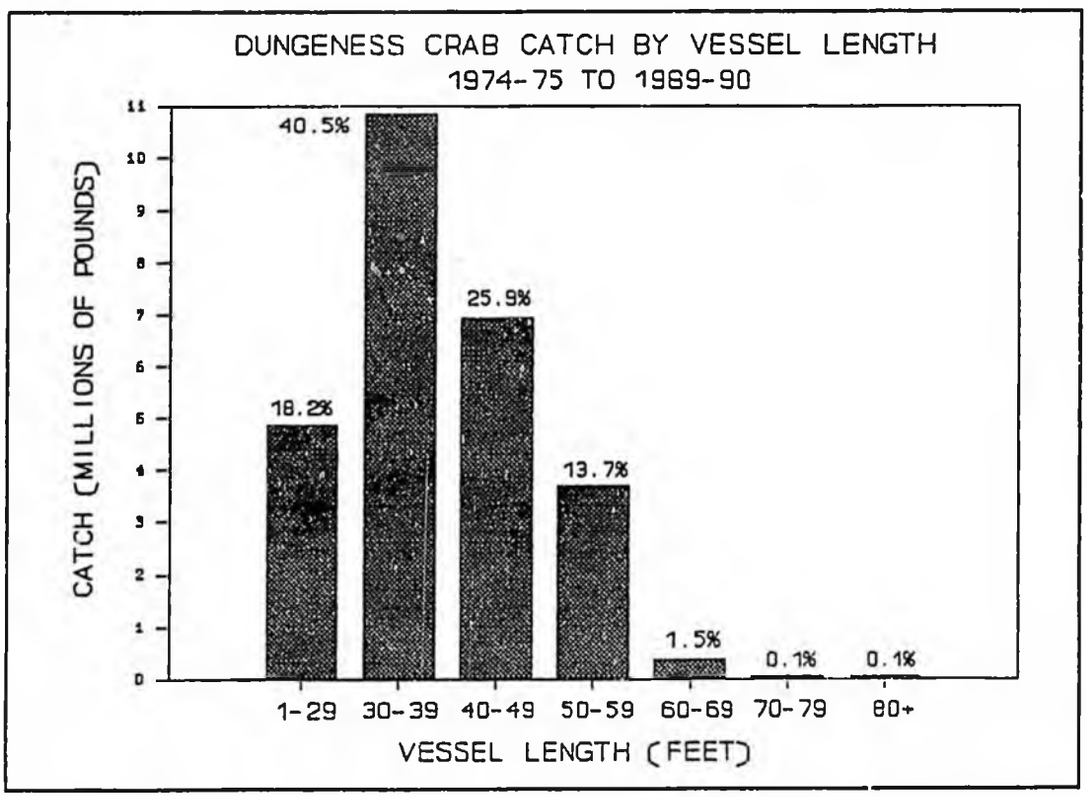


Figure 10. Percent of total Dungeness crab harvest (in pounds) in southeastern Alaska, from 1974-75 to 1989-90, that was caught from vessels in each vessel length category.

Average Seasonal Catch by Vessel Length

The average seasonal harvest from 1974-75 to 1989-90 by vessels in seven vessel length categories is presented in Table 11.

The percentage of vessels with average seasonal harvests of 5,000 pounds or less decreased with increasing vessel length up to 70 to 79 feet. The percentage of vessels with average seasonal catches of 5,000 pounds or less was 76% for vessels 1 to 29 feet in length, 56% for 30 to 39 feet, 49% for 40 to 49 feet, 27% for the 50 to 59 feet vessel class.

The average seasonal harvest for vessels greater than 70 feet in length closely resembled that of the smallest vessels (1 to 29 feet).

In contrast, the percentage of vessels with average seasonal harvests greater than 20,000 pounds increased with increasing vessel length. The percentages of vessels with average seasonal catches of 20,000 pounds or greater was 8% for vessels 1 to 29 feet in length, 17% for 30 to 39 feet, 25% for 40 to 49 feet, 42 % for the 50 to 59 feet vessel class.

Table 11
Commercial Southeast Dungeness Crab Fisheries
Average Seasonal Catch in Pounds, by Vessel Length
1974-75 to 1989-90 Seasons

	VESSEL LENGTH														ALL	
	1-29		30-39		40-49		50-59		60-69		70-79		80+			
	VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
AVG LBS/SEASON																
0 - 1,000	142	45	69	29	35	26	4	11	0	0	.	.	.	.	255	34
1,001 - 5,000	98	31	63	27	32	23	6	16	.	.	.	.	.	.	205	28
5,001 - 10,000	30	9.6	31	13	20	15	7	18	0	0	0	0	0	0	88	12
10,001 - 20,000	17	5.4	31	13	15	11	5	13	.	.	.	.	0	0	71	9.6
20,001 - 30,000	9	2.9	16	6.8	14	10	6	16	0	0	0	0	0	0	45	6.1
30,001 - 40,000	12	3.8	13	5.6	9	6.6	.	.	.	.	0	0	.	.	38	5.1
40,001 - 50,000	.	.	.	.	6	4.4	.	.	.	.	.	.	0	0	14	1.9
50,001 - 75,000	.	.	.	.	.	.	.	.	.	.	0	0	0	0	14	1.9
75,001 -100,000	0	0	5	2.1	.	.	.	.	.	.	0	0	0	0	.	.
100,001 - 150,000	0	0	.	.	0	0	.	.	0	0	0	0	0	0	.	.
ALL	313	100	234	100	137	100	38	100	8	100	8	100	4	100	742	100

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of vessels is less than 4, the cell will contain a '.'

Average Weeks Fished per Season by Vessel Length

The average number of weeks fished (weeks with landings) per season from vessels in seven vessel length categories is presented in Table 12 for the combined seasons 1974-75 to 1989-90.

The large vessels, 70 feet in length or larger, had the smallest average number of weeks with landings per season, with 91% fishing an average of 3 weeks or less per season. Approximately 30 to 40% of the vessels less than 60 feet in length had an average of 2 weeks with landings or less per season. Twelve to 19% of those vessels had an average of 11 to 20 weeks per season, which was consistent with the group of people that made landings in 11 to 20 weeks per season in Table 6a.

Table 12
Commercial Southeast Dungeness Crab Fishery
Number of Weeks Fished per Season, by Vessel Length
1974-75 to 1989-90 Seasons

	VESSEL LENGTH (in feet)															
	1-29		30-39		40-49		50-59		60-69		70-79		80+		ALL	
	VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS		VESSELS	
	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT	CNT	PCT
AVG WEEKS/SEASON																
1	77	25	40	17	30	22	5	13	.	.	5	63	.	.	162	22
2	44	14	22	9.4	21	15	4	11	.	.	.	.	.	.	97	13
3	31	9.9	30	13	22	16	6	16	0	0	.	.	.	.	90	12
4	26	8.3	29	12	7	5.1	.	.	0	0	0	0	.	.	65	8.8
5	25	8.0	19	8.1	9	6.6	.	.	.	.	.	.	0	0	58	7.8
6	18	5.8	15	6.4	8	5.8	4	11	0	0	0	0	0	0	45	6.1
7	17	5.4	15	6.4	6	4.4	4	11	0	0	0	0	0	0	42	5.7
8	15	4.8	13	5.6	6	4.4	.	.	0	0	.	.	0	0	35	4.7
9	10	3.2	13	5.6	.	.	.	.	.	.	0	0	0	0	33	4.4
10	.	.	12	5.1	8	5.8	.	.	0	0	0	0	.	.	32	4.3
11 - 15	28	8.9	22	9.4	12	8.8	.	.	.	.	0	0	0	0	64	8.6
16 - 20	11	3.5	.	.	.	.	.	.	0	0	0	0	0	0	.	.
21 - 30	.	.	.	.	0	0	0	0	0	0	0	0	0	0	.	.
ALL	313	100	234	100	137	100	38	100	8	100	8	100	4	100	742	100

Note: The 1974-75 season consists only of data from 1975.
The 1989-90 season consists only of data from 1989, and should be considered preliminary.

For confidentiality, if the number of vessels is less than 4, the cell will contain a '.'

Relationship of Fishing Activity, Catch and Earnings to Vessel Attributes

Vessel attributes were examined to determine if they influenced fishing activity, catch and earnings in the southeastern Alaska Dungeness crab fishery from 1974-75 to 1989-90. The vessel attributes examined were vessel length, gross tonnage, net tonnage, holding tank capacity, live tank capacity, depth, fuel capacity and horsepower. The activity, catch and earnings variables examined were mean and total catch per season, mean and total earnings per season and mean and total number of weeks fished (weeks with landings) per season.

Statistically significant positive relationships ($P \leq 0.01$) existed between vessel length and mean and total catch per season and mean and total earnings per season.[7] As vessel length increased, catch and earnings increased.

Statistically significant negative relationships ($P \leq 0.01$) existed between mean number of weeks with landings per season and vessel size (vessel length, gross and net tonnage). As vessel size increased, the mean number of weeks with landings per season decreased. Fuel capacity, which is also related to vessel size, was negatively correlated with mean number of weeks with landings per season.

[7]These relationships were determined by calculating Pearson product-moment coefficients between each pair of variables, and using correlation analysis to measure the closeness of the linear relationship between the two variables.

No relationships existed with horsepower, holding or live tank capacity or depth.

The larger vessels made larger harvests of Dungeness crab and therefore had greater earnings in the fishery than the smaller vessels. The larger vessels harvested more and earned more even though they had fewer weeks with landings per season than the smaller vessels.

The large vessels may have spent more time fishing than the smaller vessels, however. There were significant direct relationships between the number of days between landings and vessel length, holding and live tank capacity and fuel capacity. The larger vessel size, holding and live tank capacity and greater fuel capacity enable large vessels to stay out on the fishing grounds longer than smaller vessels.

VIII. DATA SUMMARY

Participation in the southeastern Alaska Dungeness crab fishery has continued to increase since the fishery was last considered for limited entry in 1984. The largest number of fishermen in the fishery since 1974-75 was 255 in the 1988-89 season. Final counts for the 1989-90 season were not available at the time of this writing.

About 93% of the Dungeness crab fishermen had permits for the D09B (pots, vessel $\leq$ 50 feet). Most of the increase in participation has been in the D09B fishery. The number of D91B (pots, vessel > 50 feet) permits has remained relatively constant. In 1988-89, only 4 people were fishing ring nets (D99B) and only 2 people had both a D09B and a D99B permit.

Large numbers of first-year participants, predominantly Alaskan residents, continue to enter the fishery each year. Limitation of king and Tanner crab fisheries and closure of the red and blue king crab seasons may have resulted in concentration of effort, especially new effort, in the Dungeness crab fishery. Poor harvests in the Pacific Coast fisheries in the mid-1980's may have prompted further development of the southeastern Alaska fishery for Dungeness crabs.

As a result, the southeastern Alaska Dungeness crab fishery has become very intense. Effort has been concentrated in a few productive areas, with most fishing occurring primarily during the summer months of June, July and August. Abundant crabs, high prices, good weather and lower harvests in non-Alaskan Pacific Coast fisheries in the summer months contribute to high levels of fishing effort in the summer in southeastern Alaska. Season openings for southeastern Alaska drift gill net and purse seine fisheries in late June and July may constrain fishermen who fish both Dungeness crabs and salmon to the first few weeks of the crab fishery.

An additional problem for management, aside from concentrated effort, is the overlap of part of the Dungeness crab season with the sensitive molting and mating periods of the crab. An intense fishery such as this can inflict substantial handling mortality on newly molted crabs.

Seasonal harvests in the 1987-88 and 1988-89 seasons, 3.3 million pounds, approached the largest historical harvest of 3.9 million pounds in 1964. The recent high effort levels have resulted in almost record-level harvests.

Dungeness crabs in southeastern Alaska are fished predominantly from vessels less than 40 feet in length. Large numbers of small boats have entered the fishery in the last few seasons. In 1988-89, 45% of the fleet was less than 30

feet in length. Only 7 of the 244 vessels in 1988-89 were between 50 and 59 feet, and only 2 were larger than 70 feet.

Not only were the vessels less than 40 feet in length the most numerous, but they have harvested 59% of the total catch since 1974-75, with the 30 to 39 foot vessels harvesting the highest percentage of any vessel length category.

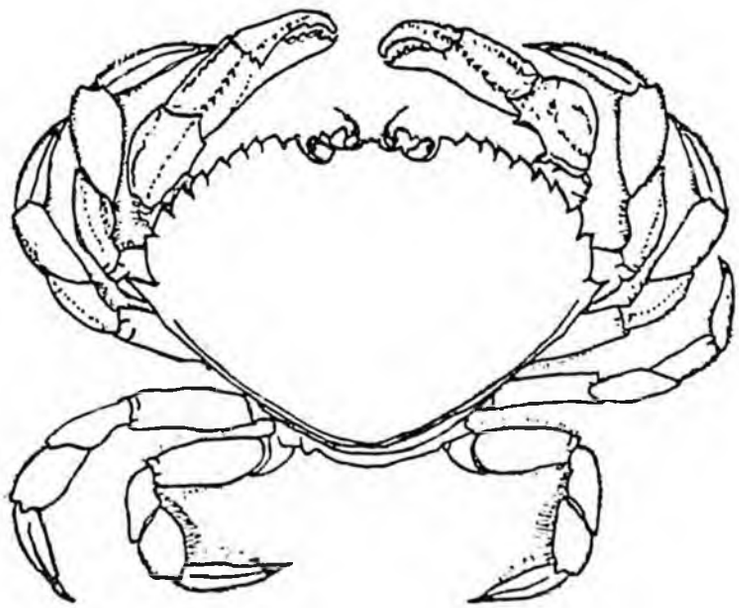
As vessel length increased, the average seasonal catch increased. The average number of weeks with landings per season decreased with increasing vessel length. The potential for effort to increase if the southeastern Alaska Dungeness crab fishery is limited exists through upgrading vessel size and, therefore, increasing the seasonal harvest. Larger vessels harvested more crabs with less time fishing than small vessels, even with a gear limit of 300 pots.

The vessels in the D09B Dungeness crab fishery have been fishing only 50 to 60% of the maximum pot limit for the last three years. The amount of gear could potentially double within the current pot limits even if the number of fishing operations was limited.

There appear to be at least two groups of people fishing Dungeness crabs in southeastern Alaska. One group consists of a large contingent of new participants with small vessels. These people make landings in only a few weeks

per season and harvest an average of 5,000 pounds or less of crab in a season. The second group of fishermen has been fishing 4 to 7 seasons, makes landings 11 to 20 weeks per season and harvests substantially more crabs. The second group tends to fish from vessels less than 40 feet in length. The fishermen with more seasons of experience in the Dungeness crab fishery had significantly more weeks with landings per season and had significantly larger seasonal harvests than fishermen with less seasons of experience.

If the new fishermen remain in the fishery for several more seasons, their impact on the fishery should theoretically increase. Through the process of increasing fishing efficiency through experience, the potential exists for further increase in effort following limitation of the fishery.



Appendix A.

To - State of Alaska, Limited Entry Commission

Subject:
Limited Entry For Dungeness Crab fisheries

Reason: Large influx of new boats into the dungeness crab fisheries

NAME	Address
John C. Kaer	Box 716 Petersburg, Alaska
Richard M Kaer	Box 318 Wrangell Alaska
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Harold Bailey	Box 887 Wrangell, AK.
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[illegible]	Box 641 Wrangell AK
[illegible]	Box [illegible] [illegible] AK.
[illegible]	P.O. Box 932 WRG AK.
Mrs. Jean E. White	P.O. Box 932 Wrangell AK.
Steven H Thomassen Sr	Po Box 742 Wrangell AK
Steve Thomassen Jr	PO BOX 742 Wrangell AK
Charles Harris Sr. [illegible]	P. Box 555 Petersburg AK
Jerry Dahl	Box 128 (Billie B) " "
JERRY DAHL JR.	PETERSBURG
[illegible]	Box 265
Richard Eide	Box 15 PETERSBURG
[illegible]	Box [illegible] PETERSBURG

State of Alaska Limited Entry Commission

Subject:
Limited Entry for Dungeness Crab Fisheries

Reason: Large influx of new boats into the dungeness crab fisheries

Name	Address
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Trygve Thorsen	Box 515 Petersburg AK. 99833
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[illegible] Madsen	Box 918 Petersburg, AK.
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Todd [illegible]	Box 935 Petersburg, AK 99833
Carl H. Andersen	Box 1612 Petersburg AK
Gregory D. [illegible]	Box 1521 Petersburg AK.
[illegible]	Box 917 Petersburg AK
John Eide	Box 101 PETERSBURG
Dan Kowalski	Box 477 Petersburg, AK. 99833
W.W.A. Greinier	Box 1141 " " " "

RECEIVED
MAY 17 1984

DUNGENESS PETITION RECEIVED
May 17, 1984

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Dungeness Petition Received (cont.)
May 17, 1984

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Appendix B.

April 1, 1985

Southeast Dungeness Fishermen

Gentlemen:

Thank you for your petition regarding the Southeast Dungeness crab fishery. Your concern about the long term health of the Southeast Dungeness crab fishery is shared by the Commission. Nevertheless, we feel that limitation under existing conditions would be a mistake. In our view, the benefits of freezing Dungeness participation at current extraordinary levels would be few while costs could be substantial. We do not plan to limit the fishery but have asked our staff to continue to monitor ongoing developments.

To limit the number of participants in a fishery, the state must have adequate jurisdictional authority and the Commission must be convinced that such action will promote the conservation and sustained yield management of the resource and the economic health and stability of the fishery. In many of the state's shellfish fisheries, inadequate constraints on the fishing power of individual units make entry limitation an impractical exercise. If the limited number of participants can easily increase their fishing power, any benefits created by entry limitation may be quickly diminished. Thus the Commission will not limit a fishery unless we are convinced that the program in concert with other regulations will clearly serve the statutory purposes stated above.

Limited entry is a relatively expensive management measure and the Commission's budget is quite tight. These factors make it doubly important that we utilize this important management tool prudently. The Commission has not been able to conclude that limiting the Southeast Dungeness fishery would serve the purposes of the statute.

To date, management biologists have little solid research data concerning the biology and the extent of the Southeast Dungeness resource. There is no certainty as to the effort and harvest levels

which can be readily maintained over time. While fishery managers have expressed concerns about possible handling mortalities on female and sublegals due to the recent effort increases, the Board of Fisheries has followed a size, sex, and season management strategy and has seen no need to directly contain effort to prevent biological overfishing.

Harvest levels in the 1.9 to 4.0 million pound range occurred continuously over an eight year period during the sixties. From the 80-81 through 82-83 season, as participation levels increased the total harvest rose. Average catch and earning levels during the 82-83 season with 114 participants were roughly equivalent to average catch and earning levels during the 78-79 season with 24 participants.

Traditionally, ex-vessel prices and hence effort levels in Alaska's Dungeness fisheries have been inversely related to stock conditions down South. Current price and effort levels in Southeast are at least partially due to the present status of stocks in Washington, Oregon, and California. High prices for king and Tanner may also be having a positive impact on Southeast Dungeness prices.

Biologists in Washington, Oregon, and California indicate that their Dungeness stocks follow a long-term cycle. These scientists are optimistic that a significant upturn will occur within the next three seasons. When this occurs effort on Southeast stocks should decline as out-of-state fishermen and other transient fishermen exit the fishery.

The recent sharp decline in the Southeast Dungeness harvest to 1.9 million pounds during the 83-84 season and to approximately 1.4 million pounds during the past season are a cause for concern. This may be an indication that the stocks have entered a downcycle or that overfishing may have occurred and recent effort levels cannot be sustained over time. Should this downturn continue participation will naturally decline. Indeed, Alaska Department of Fish and Game data indicate that participation leveled off during the 84-85 season. To the extent that participation should naturally decline in the near future, freezing participation at these current high levels would be a mistake.

The Commission also feels that a lack of adequate control over other inputs which affect an operation's overall fishing power would make attempts to limit the number of Dungeness participants a futile endeavor.

Currently, gill net size vessels are the dominant vessel size in the fleet. The 300 pot limit does not appear to be a binding constraint for many of these participants. If the Commission limited the fishery, average vessel size and pots fished could easily increase thereby diminishing any benefits which limitation might provide.

At this point, we have no plans to limit the State's Dungeness fisheries. Limiting participation at these historically unprecedented levels would convey no relief or benefits, particularly if transient effort is expected to decline in the near future. Moreover, as noted above, we have doubts about the workability of a simple salmon type limited entry program for these fisheries. Thus, even if effort returns to more sustainable levels, we would have major reservations about using this management tool in the Dungeness fisheries.

You may be aware that the State Board of Fisheries at its recent March meeting in Anchorage, established a committee to review all Dungeness proposals (which committee included the advisory committee representatives). The report of the committee to the Board declined to recommend limited entry of Dungeness at this time, because limitation would not serve to reduce the current number of participants in the fishery.

We will continue to monitor developments in the Southeast fishery, and we'll pay particular attention to any new scientific information on the Dungeness stocks, as well as any significant changes in the management measures adopted by the Board of Fisheries. If it later becomes apparent that a salmon-type limited entry system could play a useful role, we would reconsider our position.

If you have questions about this matter or limited entry in general, please feel free to contact the Commission. Your group may be contacted by our research staff in the future. Any help you can provide the staff will be greatly appreciated.

By Direction of the
COMMERCIAL FISHERIES ENTRY COMMISSION

Bruce Twomley, Chairman
Richard Listowski, Commissioner
Philip Smith, Commissioner

By:_____

BT/dw
bcc: Lennie Boston
Special Staff Assistant
Office of the Governor

Appendix C.

WILLIAM P. FLOR
BOX 262
PETERSBURG, ALASKA
99833

FEBRUARY 20, 1989

BRUCE TWOMLEY
COMMERCIAL FISHERIES ENTRY COMMISSION
BOX KB
JUNEAU, ALASKA 99811

DEAR MR. TWOMLEY:

ON FEBRUARY 4-6, 1989 THE BOARD OF FISH MET IN PETERSBURG TO ADDRESS SOUTHEAST DUNGENESS CRAB FISHERY PROPOSALS AND ISSUES. DURING THE MEETING BOTH THE BOARD AND FISHERMEN RECOGNIZED THAT THE DUNGENESS CRAB FISHERY IS SERIOUSLY JEOPARDIZED BY THE RECENT DRAMATIC INCREASE IN EFFORT.

ENCLOSED IS A PETITION OF CONCERNED FISHERMEN WHO WERE IN

ATTENDANCE AT THE MEETINGS AND STRONGLY URGE THE LIMITED ENTRY COMMISSION TO IMPOSE A MORATORIUM ON NEW PERMITS AND TO INSTITUTE A STUDY OF THE LIMITED RESOURCES OF THE SOUTHEAST DUNGENESS CRAB FISHERY.

THANK YOU FOR YOUR TIME.

SINCERELY,

William P. Flor

WILLIAM P. FLOR

RECEIVED

FEB 23 1989

COMMERCIAL FISHERIES ENTRY COMMISSION

WE THE UNDERSIGNED AGREE THAT THE CURRENT STATE OF THE DUNGENESS CRAB FISHERY IS SERIOUSLY JEOPARDIZED BY THE DRAMATIC INCREASE IN NEW PERMITS BEING ISSUED AND RECOGNIZE THE NECESSITY TO LIMIT THE NUMBER OF FISHERMEN TO THE LIMITED HABITAT OF DUNGENESS CRAB.

WE STRONGLY URGE THE LIMITED ENTRY COMMISSION TO IMPOSE A MORATORIUM ON NEW PERMITS BEING ISSUED AND INSTITUTE A STUDY OF THE LIMITED RESOURCES OF THE DUNGENESS FISHERY.

PRINTED NAME	ADDRESS	SIGNATURE
DAVID M BEEBE	BOX 148 PETERSBURG, AK 99833	David M. Beebe
WILLIAM FLOR	Box 262 PETERSBURG AK 99833	William Flor
DANIEL HICKMAN	" 108 " " "	[illegible]
DAN FOLEY	BOX 57 GUSTAVUS 99826	Dan Foley
KURT WOHLHUETER	Box 1312 PSG. 99833	Kurt Wohlhueter
Otis Marsh	Box 666 Petersburg	Otis Marsh
RON SCHARNS	Box 432 PETERSBURG	Ronald Scharns
Chris L. Keegans	Box 811 Petersburg	Chris L. Keegans
Mike Nilsen	Box 1084 Petersburg	[illegible]
Ole Nilsen	Box 1287 Petersburg	O. R. N.
James Whitethorn	Box 94 PETERSBURG	[illegible]
[illegible]	Box 770	Petersburg AK	[illegible]
Steve Bergman	Box 365	Petersburg AK	Steve Bergman
Kraig Norheim	Box 878 Petersburg AK	Kraig Norheim
[illegible] FARRELL	Box 1440 Petersburg AK	[illegible] Farrell
Otto Florschutz	Bx 547 Wrangell AK	Otto Florschutz III
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Joe Short	Box 1224 Petersburg AK	MARINER
Mike Bangs	Box 1733 Petersburg AK	Mike Bangs
CHARLES. H. HARRIS	Box 555 Petersburg AK	Charles Harris
Ken Madsen	BOX 918 PSG AK	Ken Madsen
John Kiesz	Box 916 Psg AK	John [illegible]
Paul KORCHAK	Box 1256 PSG AK	Paul Korchak
Gordon Scott Olsen	Box 433 Psg AK	Gordon Scott Olsen
Carl K Anderson	Box 1622 Psg AK	Carl [illegible]

Appendix D.

COMMERCIAL FISHERIES ENTRY COMMISSION

P.O. BOX KB
JUNEAU, ALASKA 99811-0302
PHONE: (907) 465-4081

March 24, 1989

RE: PETITION TO IMPOSE A MORATORIUM ON NEW PERMITS ISSUED IN THE SOUTHEASTERN ALASKA DUNGENESS CRAB FISHERY AND INSTITUTE A STUDY OF THE LIMITED RESOURCES OF THE FISHERY

Dear Crab Fishermen:

We received your subject petition on February 23, 1988. Thank you.

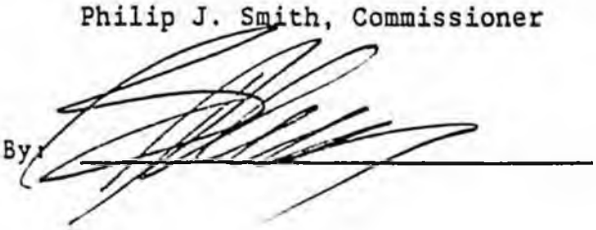
Regarding your request that the Commission impose a moratorium on the issuance of new permits in this fishery, please be advised the Commission does not have the statutory authority to do this. Your petition, therefore, is denied.

To accomplish your request would require new legislation. If it is your desire to pursue this, we would suggest you contact your legislators. We, of course, would assist you in any way we could.

Regarding your request that the Commission institute a study of the limited resources of this fishery, please be informed that prior to receiving your petition, our research section had already begun work to update our database regarding the crab fisheries. We cannot tell you how long this will take - our resources are limited as well - but our instructions to our research people are to continue with this project.

If you have any questions, please do not hesitate to contact this office again.

By Direction of the
COMMERCIAL FISHERIES ENTRY COMMISSION
Bruce Twomley, Chairman
Richard F. Listowski, Commissioner
Philip J. Smith, Commissioner

By: 

:SMS

Distribution: All signers of petition

11-K28LH