

**OREGON COMMERCIAL DUNGENESS CRAB
SUMMER FISHERY MANAGEMENT**

**A Report prepared for the
Oregon Fish and Wildlife Commission**

Salem, Oregon

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**OREGON DEPARTMENT OF FISH AND WILDLIFE
STAFF REPORT**

COMMERCIAL DUNGENESS CRAB - SUMMER FISHERY

**PREPARED FOR OREGON FISH AND WILDLIFE COMMISSION
MAY 12, 1999 SALEM, OREGON**

I. REPORT OVERVIEW

This report reviews the status of Oregon's ocean commercial summer Dungeness crab fishery, discusses current issues and proposes a range of management options for Commission action. An earlier staff report prepared for the October, 1998 Commission meeting on Dungeness crab contains extensive documentation of the fishery characteristics. This report will highlight trends pertinent to the summer fishery issue.

In addition, several status reports on other are attached:

- A review of crab pot biodegradable escape mechanisms and regulations.
- Ocean recreational crab fishery issues.
- Commercial crab pot limit discussion and status of legislation.

II. INTRODUCTION

History of Fishery Regulations

The Dungeness crab fishery along the west coast is managed as a "recruitment" fishery. This means that no quota is set, but rather all animals of a certain size and sex are available for harvest. The fishery is primarily managed by "3S" regulations: Size, Sex and Season. Size and sex regulations insure high levels of annual reproduction, by protecting all females from harvest as well as most adult males below the commercial minimum size of 6.25 inches. Season regulations are designed to insure that the harvest occurs well after molting, to allow a period of protection for newly-molted softshell crabs of legal size (the "recruits") while they harden-up and reach an acceptable meat content. The traditional approach of west coast crab managers has been to close the season during the period when the majority of adult male crabs are softshelled, in order to optimize the annual yield from the crab resource. However, both Oregon and Washington state seasons are currently extend into a period when molting activity and softshell abundance is typically high (July and August).

The setting of season regulations has been an active issue since the early days of the crab fishery. As early as 1911 there were regulations which recognized the months of July, August and September as

the time when crabs were in poorest condition. In 1948, season closure and opening criteria were established on the basis of at-sea sampling. When more than 10 percent softshells were present, the season was closed. Since then, fixed season dates have been established, modified and extended. In 1984, following several years of high-volume fishing on low quality crabs at the end of the season, the Commission set the season closure date to the current August 14. Late-season ("summer") landings and effort declined for several years but soon began to increase. In 1992, the Commission enacted a summer harvest quota, requiring the Director to close the season if landings after May 31 exceed ten percent of the previous December through May total landings. The seasonal ten percent quota has been approached but not exceeded since the rule was established.

Effort and Harvest

The annual landings have fluctuated in an approximately cyclical manner over the last fifty years, with peaks in the 15 to 18 million pound range and valleys in the 3 to 5 million pound range (Figure 1). This pattern is to be expected in a fishery which relies on a single year class. The long term season average is slightly more than 9 million pounds. Since 1984, no less than 67 percent of the annual catch has been harvested during December and January; in each of the last two seasons more than 82 percent has been harvested during the first two months. Current season landings are approximately 8.3 million pounds to-date.

The number of participating vessels has averaged 331 during the three complete seasons since limited entry was enacted, although 459 permits are issued. The number of pots fished by Oregon vessels has averaged about 118,000 during each of the past four December openings (1995-1998). By comparison, the 13 year average from 1977 to 1989 was 81,600 pots statewide.

III. DUNGENESS CRAB SUMMER FISHERY

Description, History and Markets

Figure 2 displays the recent summer landings history for the period June 1 through season's end (currently August 14). Recent peaks of nearly one million pounds were reached in the first half of the 1990's, with significantly lower levels during the past two seasons. Annual landings this decade have averaged approximately 650,000 pounds in the June through August fishery. The number of vessels fishing during the summer fluctuates, averaging 135, or about 37 percent of the active fleet average (362 vessels) over the past eight years (Figure 3). A declining number of participating vessels from June to August is the typical pattern with an average of 89 vessels remaining in August during the past eight years (Table 1).

Crab fishing and marketing operations during the winter-spring period are characterized by a consistent ex-vessel price structure and uniform quality. During the summer period the market product is more diverse, and crab quality and price can vary widely. Historically, exploitation rates were lower and some hardshells were still being caught through July. In the last two decades, in most years, there are few old hardshells available and the new recruits are not of sufficient quality to support significant catches for the hardshell markets. In occasional years, however, the crab molt and harden-up relatively

early so that by mid-July there is an opportunity to market substantial quantities. The quality is still not up to winter standards but finds market acceptance at a time when domestic supplies of fresh crab are limited.

While the remaining hardshell crabs caught in summer command a very high price, lesser-quality crabs which have recently molted are harvested and sold at lower prices. For example, price per pound in August of 1998 ranged from \$1.06 to more than \$3.00. Obviously, the minimum acceptable quality varies between buyers. Recently, a developing market demand for live softshell crabs has defined the lowest price range recently, whereas "recovery fishing" for the crab meat market previously brought the lowest summertime prices in the past. Monthly average prices in recent seasons are presented in Table 2.

Current Summer Fishery Trends

As opportunities in other fisheries diminish, the summer crab fishery has become a maintenance-level or target fishery for more vessels looking for additional income. It has long been a part of the annual income cycle for a core group of vessels which search for available hardshell crab in the summer months, typically in shallow waters (usually less than 15 fathoms). Declines in salmon opportunities and price, tuna prices, and open access groundfish opportunities generate more reliance on crab income. Besides the variation between vessels' reliance on summer crab income, the crab fleet exhibits varying degrees of reliance on summer crab income by port (figure 4). This reliance is best illustrated when the summer poundage is compared to each port's season total (figure 5). For example, Newport had a very robust summer fishery earlier in the decade that contributed a relatively small amount to the port's annual total. In contrast, Florence has recently had robust summer landings which contribute greatly to that port's annual total. The ten percent limit on summer crabbing is determined primarily by the winter production in the larger ports. This creates a relatively large summer quota for other ports to access. Ports such as Garibaldi, Pacific City, Depoe Bay, Florence, and Winchester Bay have poor ocean access in winter due to hazardous bar conditions.

While some vessels maintain a relatively high quality "hardshell" crab standard through the end of the season, others have obtained markets for softshell crabs which sell for low prices. Approximately half of the crab delivered in the past two seasons have been softshelled, marketed at sharply lower prices than the prevailing price for hardshells.

The timing of the crab molt cycle is not synchronous along the Oregon coast, usually occurring earlier off Southern Oregon and later off Northern Oregon. Both the timing of molting and the rate of quality improvement (meat content) vary between years and areas. From a variety of sources, including fishermen's reports, it appears that the period of peak molting activity is usually from mid-May through mid-August south of Cascade Head, and from July through September north of Cascade Head. During and immediately after these peak periods, most of the stock of crabs slated for the next season's harvest are of legal size but softshelled. Each newly-molted recruit requires a minimum of eight to twelve weeks to approach the level of meat content (23 percent) chosen as minimally acceptable in the winter fishery. Well before the season ends in most areas off Oregon, this level of meat content would be unattainable in sea-run samples of legal male crabs.

Regardless of the quality of crabs marketed during this time period, there is a significant level of handling and sorting of the new class of recruits which are soft-shelled and of low meat content. A recent study of crab handling mortality in Alaska (Kruse et al, 1994) adds to a consensus among crab biologists: that capturing, handling and releasing softshells results in fewer harvestable crabs from each year-class of recruits. Softshell crab losses from handling mortality and pot confinement (cannibalism) are variable, yet all studies conducted to-date have found softshell mortality to be significantly higher than for hardshells (Tegelberg, 1972; Waldron, 1958; Barry, 1984). Table 3 summarizes the methods and results of these studies. A 15 percent mortality rate for once-discarded softshell crabs was deemed "representative" in the background information included in the 1978 draft crab management plan coordinated by the Pacific Marine Fisheries Commission (PMFC, 1978).

Under high fishing effort scenarios in the summer, lost yield will be substantial in terms of numbers of crabs, dollars and meat yield. Softshell crab sorting rates at-sea have been reported to be very high during periods and areas of peak softshell abundance, with as many as nine out of every ten caught being returned to the water. When staff sampled at-sea in 1992 (eleven trips, central coast), the average sort rate from mid May to early August was 2 males discarded out of every three caught (67 % discard rate). In 1983, at-sea sampling in August determined that the discard rate was 95% of the legal size male crab caught; in 1984 average at-sea discard rate in August was 88% on the North coast and 60% on the central coast (Demory 1991).

The ten percent catch ceiling on summer landings was added in 1992 as a way to limit the scale of the summer fishery. Recognizing variability in molt-timing along the Oregon coast, the harvest limit was set relatively high based on past fishery performance. The ten percent limit was intended to prevent large-scale impacts to the future resource while allowing summer deliveries to continue for small-scale, high unit value markets. Staff, as well as many in the industry, feel that further steps should be considered to further reduce handling effort (number of pot-lifts) and to discourage the development of low unit value softshell crab prices to fishermen. The allocative downside of restrictions to protect crabs in summer is that the dual benefits of increased crab survival and biological yield (meat content/total weight) will be accrued by a somewhat different and much larger segment of the crab fleet: those who fish the next winter opening when crabs are in prime condition.

IV. NEED FOR ACTION

Issue Summary

Extensive discussions with industry and staff deliberations indicate that the long-standing problem of softshell crab protection remains unresolved. The problem with leaving the fishery open in the summer (status quo) is two-fold:

- 1) There is consensus that the sale of softshell crabs is a detriment to the fishery's economics and a threat to the stability of the entire fishery.
- 2) At high levels of fishing effort, the sorting of softshells at sea (bycatch) with its associated mortality will depress the next season's yield. This sorting occurs regardless of the market form (shell hardness) that a vessel sells.

Protection of softshell crabs requires something more than market-driven forces and the ten percent harvest limit. The direct effects of sorting (softshell bycatch) are the pounds lost due to handling-related mortality. The economic effects are indirect: at some level of overall effort and softshell sales, the future value of the pounds of crabs killed or lost (unfilled crab) will override the value of the crabs sold in summer.

A complicating factor in softshell crab protection is the unknown amount of crab mortality incurred by the nearshore trawl fishery. Again, the question is one of how much impact occurs. While the industry has lived with deeper-water trawling for many decades, the nearshore zone (inside of approximately 15 fathoms) has been the province of the summer crab fishery in many areas, apparently pre-empting trawling to some degree. Any added summer crab fishery effort restrictions created by rule will intensify the call for scrutiny of the nearshore trawl fishery impacts on softshell crabs.

Response to Commission Directions

At the October 1998 Commission meeting, staff was directed to proceed with industry discussions and development of management options for the summer crab fishery. Based on considerations outlined above and earlier public comment, staff developed the following goal and objectives to guide these industry discussions:

Goal: Improve the conservation and utilization of the crab resource, through better protection of soft-shelled crabs and protection of hard-shell crab markets.

Objectives:

- Stabilize or reduce effort in the summer fishery (i.e. number of pot-lifts).
- Discourage the higher volume, lower price fishery for soft-shelled crabs.
- Document the nearshore trawl fisheries: targeted catch and value, effort, crab encounter rates, etc..

V. INDUSTRY MEETINGS AND SURVEYS

The issue of fishing for crab in the summer has been a contentious issue for the entire decade, discussed at virtually every public meeting held by staff. In addition, the Oregon Dungeness Crab Commission has included the issue on their agenda for several years. Earlier summaries of this issue, including public input and contributed letters have been part of past staff reports to the Commission, particularly those of October 1998 and October 1992.

Past Survey Results

Several industry surveys have been conducted in past years. In 1991, PSMFC Tri-State Crab Committee polled crabbers from all three states on this issue, and received 103 Oregon responses as follows:

- Q1- Earlier closure date for the fishery coastwide? 47% in favor; 37% opposed; 14% no response.
- Q2- Depth limits during latter part of season? 47% No; 33% Yes; 20% no response.
- Q3- Restrictive trip limits last two months (= 500 lbs)? 47% No; 25% Yes; 22% no response or neutral.

In 1998, the Oregon Dungeness Crab Commission received 178 responses (a 43% return rate) on this issue as follows:

- Q1: Do you think changes should be made to the summer fishery? 59% Yes; 41% No.
- Q2: If yes, what changes? 42% shorten season; 36% prohibit softshell landings; 22% Other.
- Q3: Do you usually crab during the "summer period"? 49% Yes; 49% No.
- Q4: Do you intend to crab this summer? 53% Yes; 41% No.

Most common miscellaneous comments: 14 recommended pot limits; 9 recommended trawler restrictions.

Current Survey Results

In early March of 1999 ODFW staff sent each Oregon crab permit holder a questionnaire. See Attachment B for a tabulation of responses, additional comments, and profile of responders. Summarized below are the replies from 198 respondents through April 12 (44% return).

- Q1: Do you believe there is a need to reduce fishing pressure on soft-shelled crabs?
 - Yes: 136 (69%)
 - No: 55 (28%)
 - Not Sure: 7 (3.5%)

Q2: If yes to Q1, which of the following do you prefer?

- | | |
|-----------------------------|----|
| A) Shorten the season: | 87 |
| B) Allow rings only: | 11 |
| C) Restrictive trip limits: | 31 |
| D) Other (write-ins): | 16 |

If yes to Q2A: Season dates favored for early closure: June 1 - 56%; June 16 - 21%; July 1 - 15%; other (later) dates - 7%.

If yes to Q2C: Trip limit options favored: other - 68%; 200 lbs. twice per week-32%.

Thirty-one respondents addressed the trip limit concept, including a few who answered "no" to question 1. The results cannot be extrapolated directly to the entire fleet since the question was not answered by (or asked of) all respondents. Twenty five crabbers responded with a multiple trip per week suggestion. The average pounds per trip suggested by this group was 468 pounds, with an average frequency of 2.6 trips per week. In addition, 6 crabbers suggested cumulative weekly trip limits (no limit on number of trips), with an average of 917 pounds per week. The most common dates suggested for trip limits to begin was either June 1 or June 15 (each suggested nine times).

Summary of March, 1999 public meetings

Four public meetings were held. Attendance was good at three of four meetings, totalling more than 85 people representing a cross-section of crabbers, buyers and smaller processors. General comments heard at every meeting reflected the following points of view:

- End the softshell crab harvests; the low prices and quality are seen as a detriment to the industry as a whole. Increased participation in this market will occur, if current fishery continues.
- Small vessels and in-state buyers need summer crab fishery income to survive. Producing quality crabs in summer is hard work, but alternative fishery opportunities and prices are low. Even if the catch is not great, the high value of hard-shell crabs in summer is important in the annual cycle of income for crabbers and local marketers.
- Many factors affect summer prices (soft crab, Alaskan and Canadian crab, etc.).
- The summer fishery is very diverse, more direct sales and small markets.
- A trip limit of 200 pounds/trip is too low to be economically viable for most vessels.
- Create a softshell regulation/testing program dockside. Prohibit buyers from buying soft crab; develop soft crab definition.
- Limit trawling to avoid impacts, in the major crab grounds.
- In some years, during the last 3-6 weeks of the season, the catch and quality increases greatly.
- Need more investigation of crab life history and gear/handling impacts.

The notes from each of the public meetings are presented in Appendix B.

Discussion of Public Input

Recent meetings with the crabbing industry statewide reflect a diverse summer fishery profile. There is an integrated mix of vessel operations, from dories at Pacific City to large multi-fishery vessels. Markets span the range from local consumers to out-of-state buyers. Product type varies from whole-cook to frozen sections to crab meat to live sales. Each market segment has an associated range of acceptable quality depending on the buyer's needs.

At the public meetings, staff presented a list of 13 options generated through industry discussion during the past several years. As explained in the survey questionnaire, the options which staff felt both met the goal and objectives and could be implemented with current management and enforcement resources were: status quo; shorter season; ring gear only after a certain date; and restrictive trip limits.

- Other than a few individuals, it is clear that the crab fleet is not ready to entertain a seasonal switch to a new gear type (rings), so the seasonal rings-only option is dropped from the discussion. Likewise, staff is not evaluating summer pot limits, as proposed by some, until after a more comprehensive discussion takes place on this issue (see Appendix E).
- The option of prohibiting softshell sales by rule was discussed at-length, yet it does not address the objective of reducing handling of softshells. This option is advocated by crabbers who feel the handling impacts are insignificant and the implementation and enforcement costs should be borne by the Department or industry. Many in the industry, as well as the shellfish staff, believe it is impractical to regulate quality. The Washington state experience illustrates the shortcomings of this type of subjective regulation. Last year, Washington officials tried a seasonal fishing area regulation (maximum of 4 miles from shore) in combination with their longstanding softshell regulation, but an emergency closure was still implemented to stop the wholesale harvest of softshell crabs.
- The option of at-sea testing to determine closure date(s) is would be too costly with current shellfish staffing and budget levels. Depth or area (3 mile limit, etc) restrictions are unproven and could easily fail to adequately address the goal of softshell protection, while adding a significant at-sea enforcement cost. Seasonal pot limits could be effective in serving the objective of reducing effort and softshell handling, but the implementation and enforcement costs are currently deemed prohibitive. In addition, pot limits alone would not directly address the second objective of discouraging targeted softshell crab harvesting, unless the limits were extremely low.
- Finally, there is a strong coastwide concern over the impacts of trawl fisheries, particularly during the times and areas when softshelled crabs are abundant. As a general rule, Dungeness crabs are most abundant from about 50 fathoms to the shore. After the spring mating season, a significant portion of the adult male stock molts and is soft-shelled anytime from June through September in most years. A large majority of the crab fleet has been consistently asking that the issue of trawl impacts be addressed when discussing the conservation of the Dungeness crab resource. Trawlers' contribution to lost crab production relative to the crab fishery's bycatch is undetermined. However, it would take a large crab encounter rate per trawl tow to approach the total number of crabs sorted out as bycatch in crab pots, considering the relative magnitudes of the two fisheries at present.

VI. STAFF ANALYSIS OF ISSUE AND OPTIONS - RECOMMENDATIONS

Option 1: No Action.

Option 1 Analysis: Inaction at this time will not address the current issues: targeted softshell crab harvests or stabilizing fishery effort and softshell crab bycatch levels. Sixty-nine percent of the responders to the recent survey of crab permit holders feel there is a problem to be solved. Inaction will allow the marketing of softshell crab fisheries to continue and possibly grow. In addition, high-effort hardshell crab fishing with its associated handling mortality may increase to higher levels as crab abundance cycles back to higher levels.

Option 2: Earlier Season Closure Date.

Adopt rule changes implementing a June 15 closure date for the commercial ocean Dungeness crab season.

Option 2 Analysis: This option clearly addresses the management issues created by leaving the season open for a total of eight and a half months and extending into a time when crabs are molting and of suboptimal meat quality. There is, however, substantial sentiment that earlier closure and pot removal will expose softshelled crabs to unrestrained trawl impacts. Crabbers currently feel that the existence of the pots in the traditional summer crab grounds creates a partial barrier, protecting certain areas of crab abundance from trawling impacts. The magnitude of these impacts are currently unknown.

The Oregon Dungeness Crab Commission has gone on record favoring an earlier closure of the fishery, as did 44 percent of the survey respondents (see Appendix B). Of the survey respondents favoring changes in summer fishery management, this was the preferred option (64 percent). The most common date chosen for early closure was June 1 (49 votes), followed by June 16 and July 1 with 18 and 13 votes, respectively. The data in Table 4 show the summer pounds harvested after these three dates in the past seven crab seasons, giving some idea of the range of harvest that would be unavailable to summer markets under various early closure dates. While the revenue from these pounds would be lost to the summer fishery, the crabs would not go unharvested but would be conserved for the following winter. The biological yield would be augmented by weight gain (improved meat content) and lower crab fishery bycatch and cannibalism impacts (reduced mortality). The June 15 date is chosen as a compromise, to allow the harvest effort to wind down in mid-June while still avoiding the period of peak softshell abundance.

The crab conservation benefits of this option need to be weighed against the impacts on summertime "hardshell" crabbers and the markets they serve. From the data tables presented in Appendix A, it is obvious that many vessels would need to seek alternative sources of income during the summer months, although only a fraction of the total vessel crews rely on summer crab income alone. Virtually all seafood retailers claim that Dungeness crab simply must be available in their display cases, or many other lost dollars in sales will result. Industry comments indicate that quantities of better quality crabs are available from British Columbia or Alaskan sources in the summer. However, many local marketers

would need to make significant adjustments to access these crabs, likely at higher wholesale prices. Obviously, the limited fish sellers marketing crabs directly off their boats would be eliminated from the retail mix in Oregon.

Option 3 (preferred): Adopt rules to limit late-season possession and landing limits.

Adopt rules to implement a late-season commercial crab trip delivery limit, such that: Beginning with the second Monday in June through August 14, no permitted crab vessel may take, land or possess more than 400 pounds, with a maximum of three landings per week. A week is defined as Monday 12:01 P.M. to midnight the following Sunday.

Option 3 Analysis: There is no option which will satisfy all segments of the crab industry. Yet a large majority of the industry desires further restrictions in the summer fishery. As a compromise to virtually all parties concerned, staff recommends adopting a trip limit option that will discourage both the softshell fishery and high levels of fishing effort. The mid-June date is chosen to allow vessels to continue to fish unrestricted for remaining old hardshells through mid-June. Based on input from the crab fleet, the risk of high catch rates of softshells remains low in most years until this time. As pointed out at several public meetings, the incentive to resume fishing aggressively increases for most vessels only during the last 4 to 6 weeks of the current season in most years. This option would preserve a modest scale of fishery landings but should discourage high fishing effort levels (numbers of pot-lifts). The trip frequency should encourage regular attending of the gear, discourage large numbers of pots per vessel, and reduce effects of crab confinement (cannibalism, starvation, etc.).

Figure 6 illustrate the monthly summer crab fleet landings pattern for the past three seasons (1996-1998). Based on these past landings patterns, most vessels could be accommodated by a 400 pound trip limit and a delivery frequency of three times per week or less. The vessels landing the largest deliveries would have been sharply curtailed, causing them to either run fewer pots per trip or land less softshell crabs, depending on which market they service. Based on numbers of deliveries per month, several vessels would have curtailed numbers of deliveries, particularly in the half month of August. Analysis of a higher-abundance period, 1992-1995, shows somewhat higher impacts to summer crabbers (Figure 7). The above option should stabilize the summer hardshell fishery effort to levels similar to the 1997 and 1998 seasons, but should discourage the targeted softshell fishery which depends on higher delivery volumes to compensate for the relatively low prices paid. Many of the summer crab vessels would be unaffected by this trip limit. For example, an average of 57 vessels in the "summer fleet" have annually landed less than 1,000 pounds after May 31 since 1985 (range 39 to 75 vessels, Table 1).

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APPENDIX A: DUNGENESS CRAB FISHERY TABLES AND FIGURES

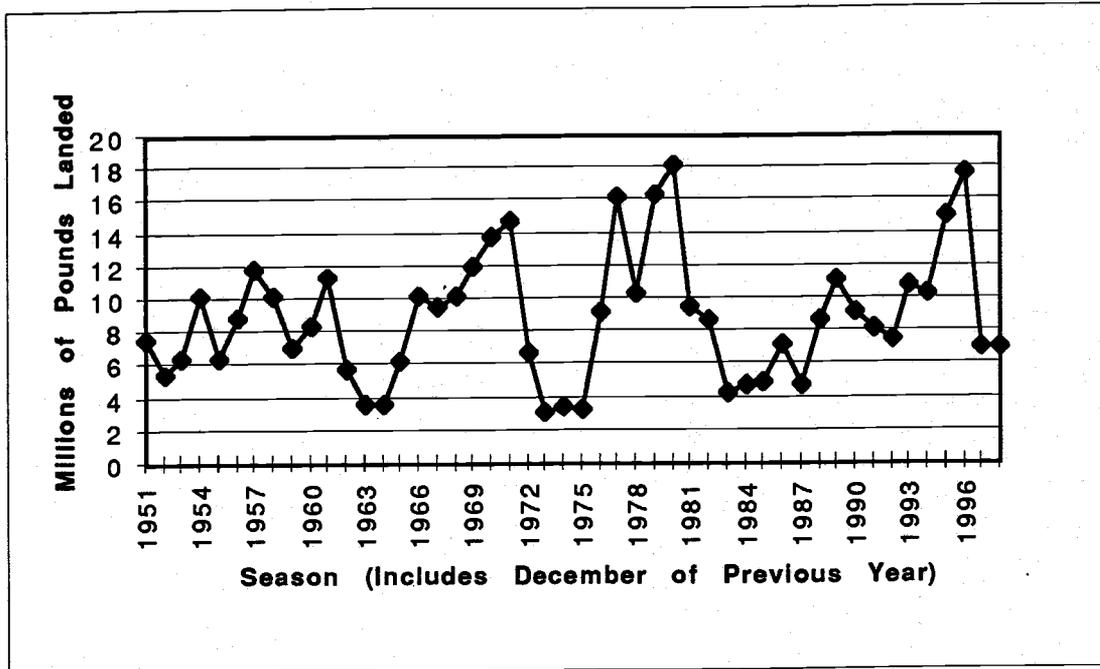


Figure 1. Total season landings of Dungeness crab in Oregon

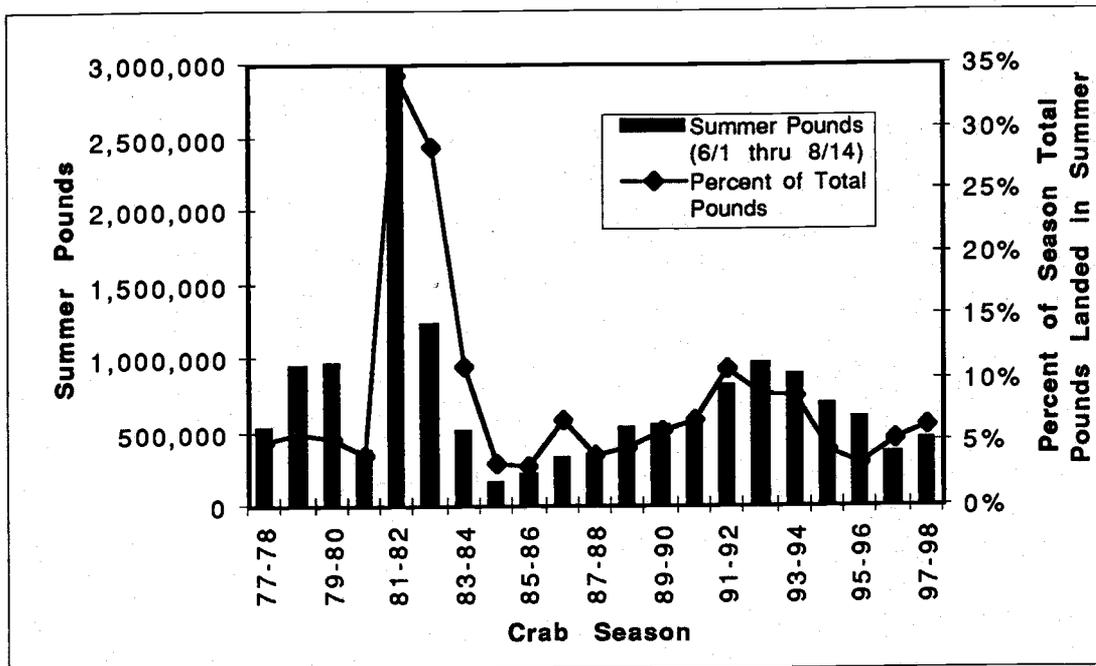


Figure 2. Summer (6/1 thru 8/14) Dungeness crab landings in Oregon

Table 1. Summer (6/1 thru 8/14) landings of Dungeness crab in Oregon

Season	Season Total Number of Vessels	Number of Summer Vessels (6/1 - 8/14)	Percent of Fleet in Summer Fishery	Number of Vessels Landing in June	Number of Vessels Landing in July	Number of Vessels Landing in August	Average Number of Summer Deliveries per Vessel
84-85	318	113	36%	102	74	50	7
85-86	339	81	24%	71	52	30	8
86-87	330	85	26%	70	60	52	9
87-88	330	92	28%	72	47	45	7
88-89	345	90	26%	69	58	45	9
89-90	454	135	30%	102	87	78	10
90-91	367	135	37%	108	102	94	11
91-92	374	138	37%	103	114	93	11
92-93	354	122	34%	84	103	91	13
93-94	386	142	37%	127	107	96	12
94-95	424	173	41%	127	131	101	10
95-96	346	147	42%	120	116	100	10
96-97	331	113	34%	88	80	71	9
97-98	314	112	36%	84	74	66	14
Season	Pounds Landed in Summer Fishery (6/1 - 8/14)	Number of Summer Deliveries	June Landings in Pounds	July Landings in Pounds	August Landings in Pounds	Number of Summer Vessels Landing >20K lbs	Number of Summer Vessels Landing <1K lbs
84-85	162,293	736	66,930	49,072	46,291	0	75
85-86	224,076	646	108,697	72,523	42,856	0	43
86-87	319,025	786	89,247	147,485	82,293	2	43
87-88	351,707	643	143,986	137,713	70,008	4	53
88-89	528,175	832	187,504	239,226	101,445	5	39
89-90	542,162	1,389	177,542	221,934	142,686	6	71
90-91	555,781	1,435	184,387	234,626	136,768	5	58
91-92	809,322	1,540	206,182	346,772	256,368	11	58
92-93	960,839	1,559	224,876	379,469	356,494	16	42
93-94	885,060	1,685	202,537	372,064	310,459	11	60
94-95	681,977	1,652	185,773	283,825	212,379	8	73
95-96	604,756	1,505	258,553	210,026	136,177	4	47
96-97	364,571	1,044	68,422	154,641	141,508	4	64
97-98	449,661	1,538	48,744	220,574	184,502	6	70

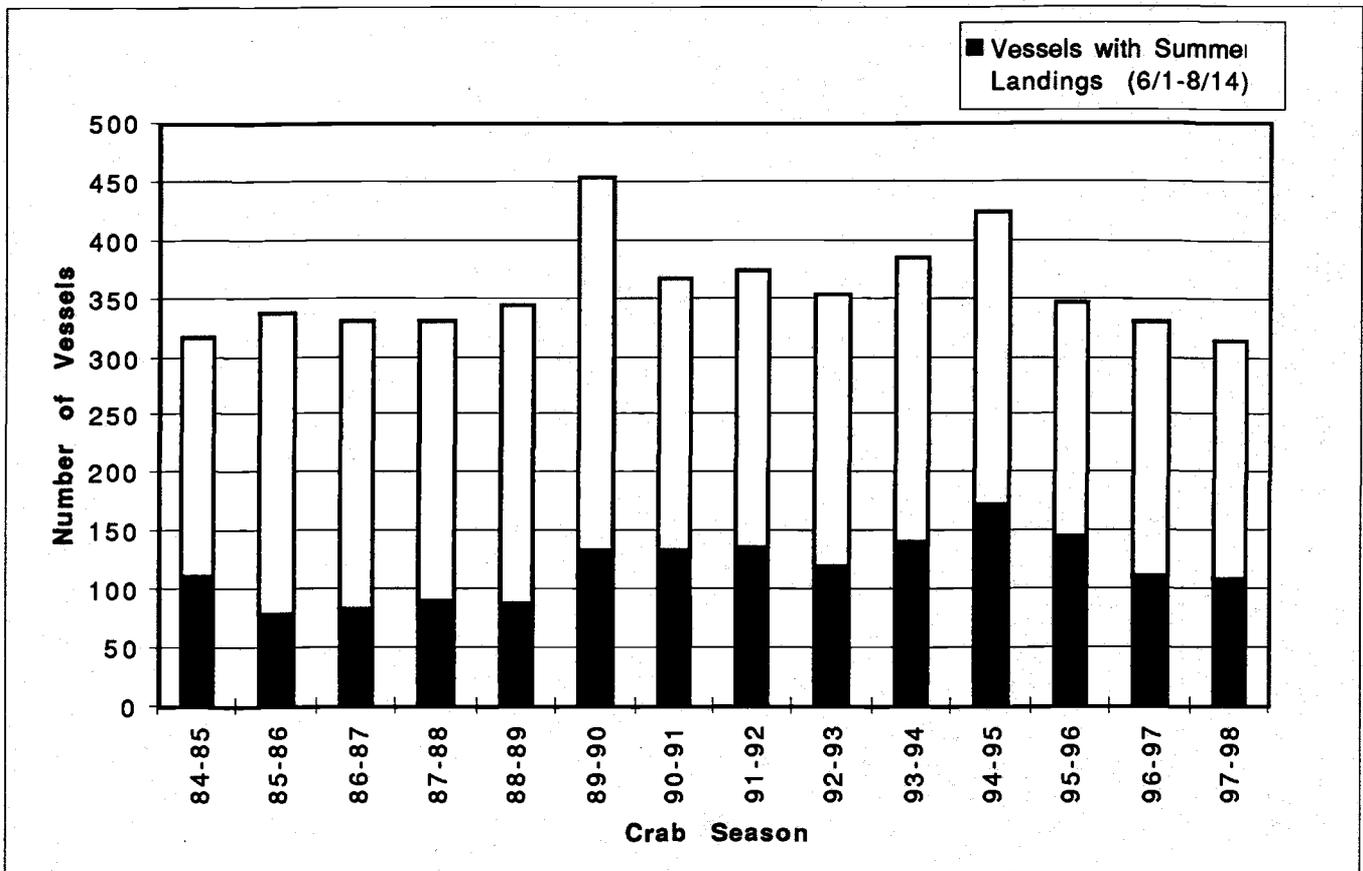


Figure 3. Numbers of vessels landing Dungeness crab in Oregon

Table 2. Average ex-vessel prices for Dungeness crab

Month	1992	1993	1994	1995	1996	1997	1998
December*	\$1.23	\$1.00	\$1.14	\$1.40	\$1.26	\$1.63	\$1.65
January	\$1.20	\$1.01	\$1.15	\$1.65	\$1.16	\$2.12	\$2.17
February	\$1.24	\$1.05	\$1.28	\$1.99	\$1.31	\$2.56	\$2.53
March	\$1.33	\$1.15	\$1.45	\$2.00	\$1.44	\$3.04	\$2.30
April	\$1.56	\$1.32	\$1.54	\$2.01	\$1.60	\$3.21	\$2.26
May	\$1.55	\$1.37	\$1.57	\$2.00	\$1.66	\$3.13	\$2.35
June	\$1.44	\$1.31	\$1.52	\$1.97	\$1.75	\$2.96	\$2.33
July	\$1.34	\$1.31	\$1.45	\$1.79	\$1.74	\$2.36	\$1.50
August	\$1.25	\$1.22	\$1.46	\$1.61	\$1.71	\$2.00	\$1.47
Season Average	\$1.25	\$1.05	\$1.21	\$1.65	\$1.27	\$1.89	\$1.76

* December of previous year

Table 3. Summary of Dungeness Crab Handling Mortality Studies

Study Author (date)	Method	Results by Shell Condition, (see definition below)
Cleaver (1949)	Tagging, disc tags	31.0% return of Grade III's* 92.5% return of Grade II's*
Waldron (1958)	Tagging, disc tags	51% return of Grade II's*
Tegelberg (1970)	Holding pots, 4 days 25 crabs per pot	4% mortality of Grades I and II's 16% mortality of Grade III's †
Barry (1984)	Holding pots, 2-3 days	15% mortality of Grade III's 5% mortality of Grade I's
	Holding pots, 6 days	22% mortality of Grade III's †
Kruse (1994)	Tagging, spaghetti tags	57% return of soft-shell as compared to hard-shell returns

Shell Condition Definitions (Tegelberg, 1972):

Grade I. shell hard, little or no flexibility in carapace or legs.

Grade II. shell and legs moderately flexible, intermediate between I and III

Grade III. recently molted soft shells, carapace and legs flexible, easily cracked by finger pressure

* As compared to Grade I returns

† Note: injuries and harsh or multiple handlings increased mortality substantially.

Table 4. Late season Oregon Dungeness crab landings

Season	Pounds Harvested on or After:			Total Season Pounds
	June 1	June 16	July 1	
1992	815,764	727,928	609,582	7,560,909
1993	956,540	858,203	731,664	10,849,772
1994	887,132	813,236	684,595	10,242,135
1995	681,977	594,612	496,204	15,051,787
1996	604,840	488,129	346,287	17,680,981
1997	360,055	327,275	291,633	7,050,880
1998	452,277	432,890	403,533	7,084,510

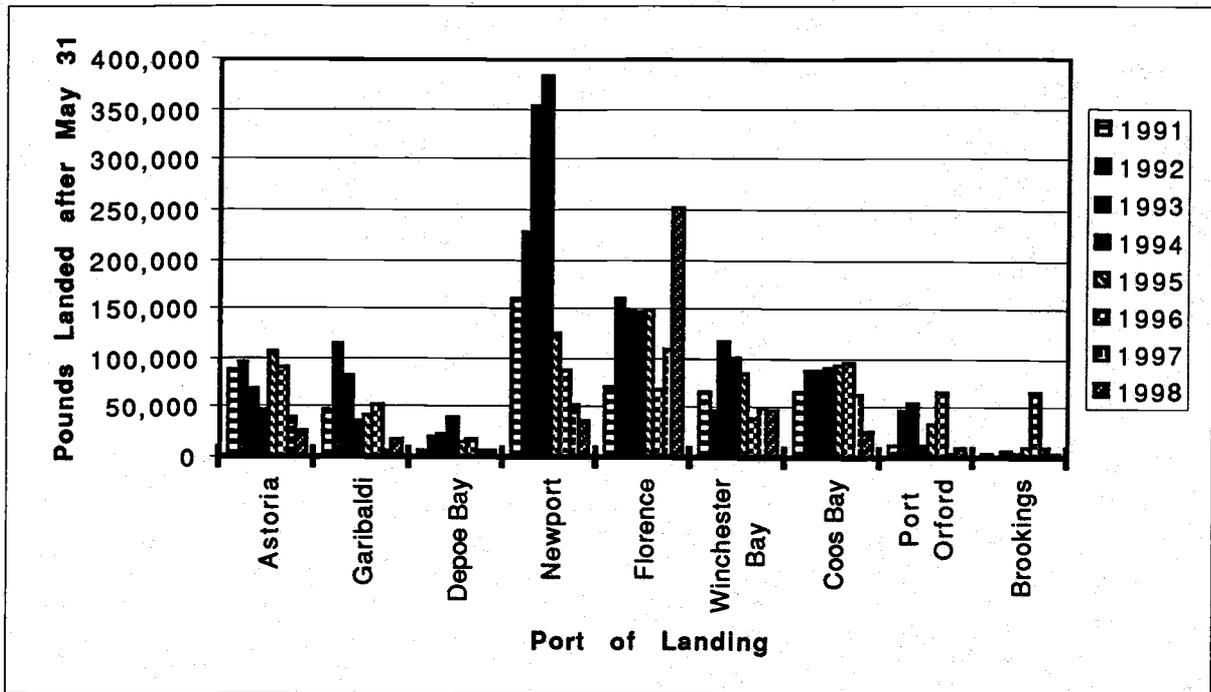


Figure 4. Pounds of Dungeness crab landed after May 31st, by port

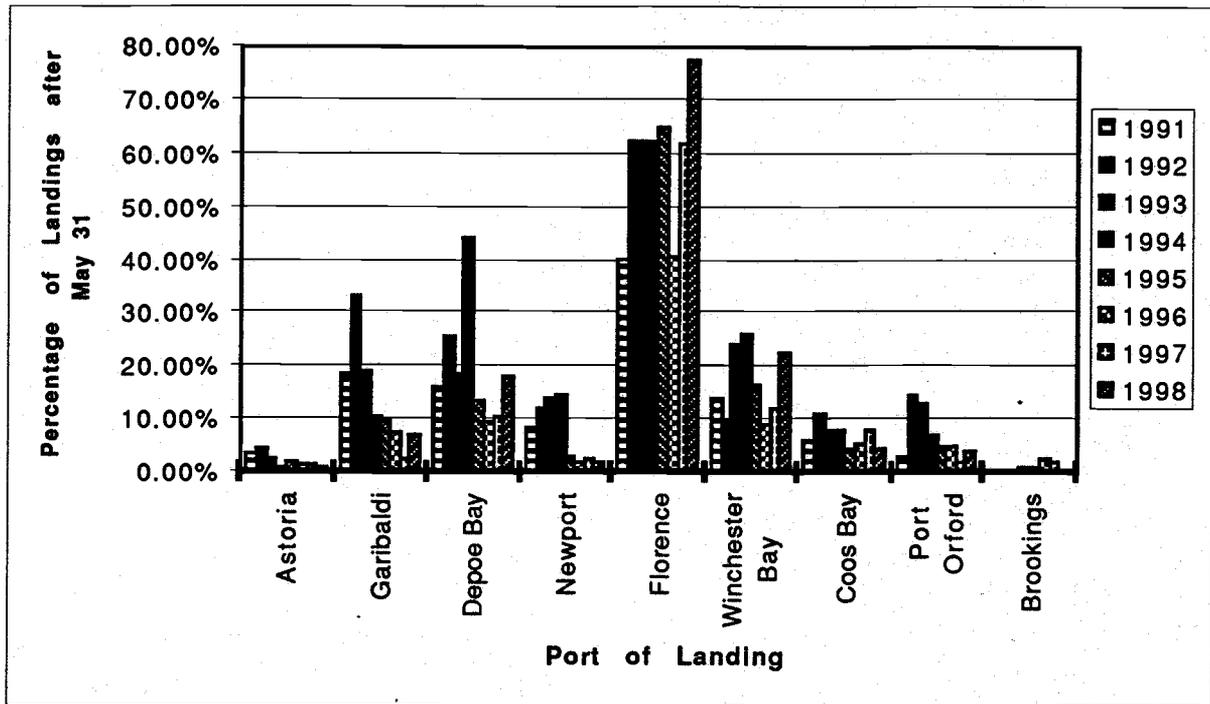


Figure 5. Percentage of season total Dungeness crab landings landed after May 31st, by port

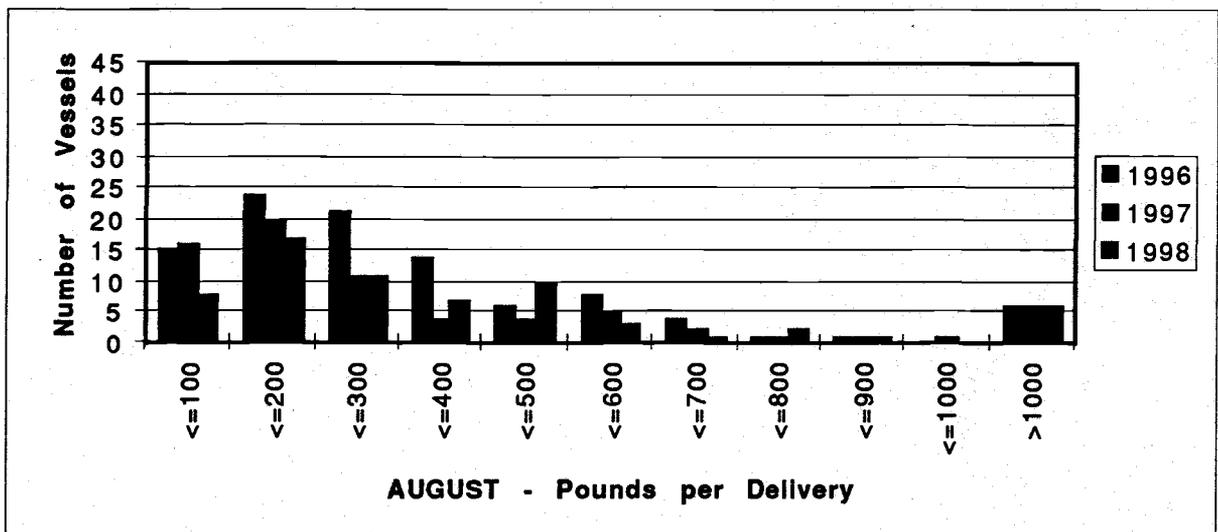
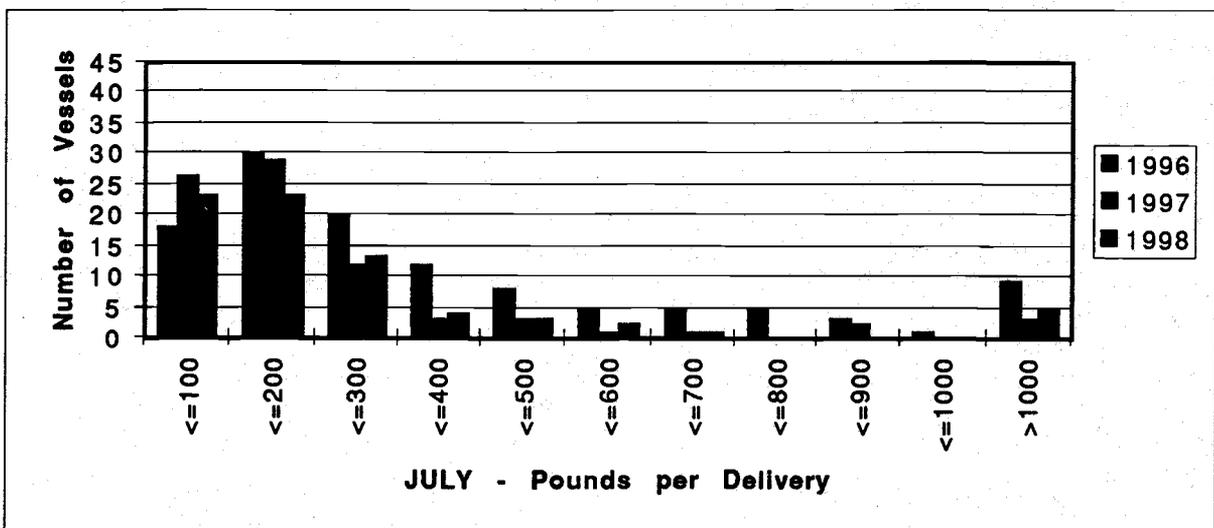
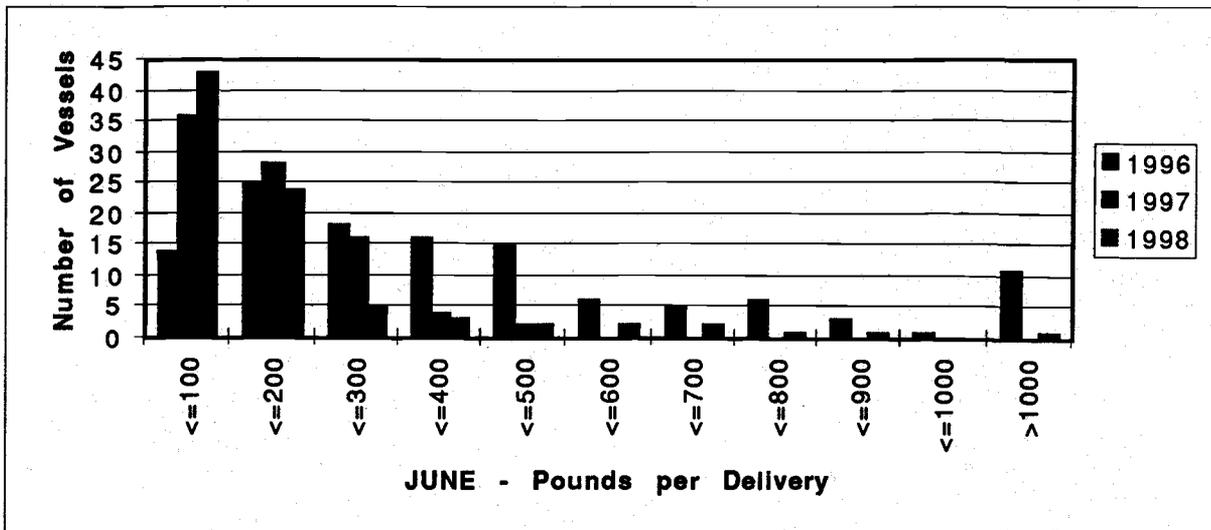


Figure 6. Pounds per delivery 1996-1998

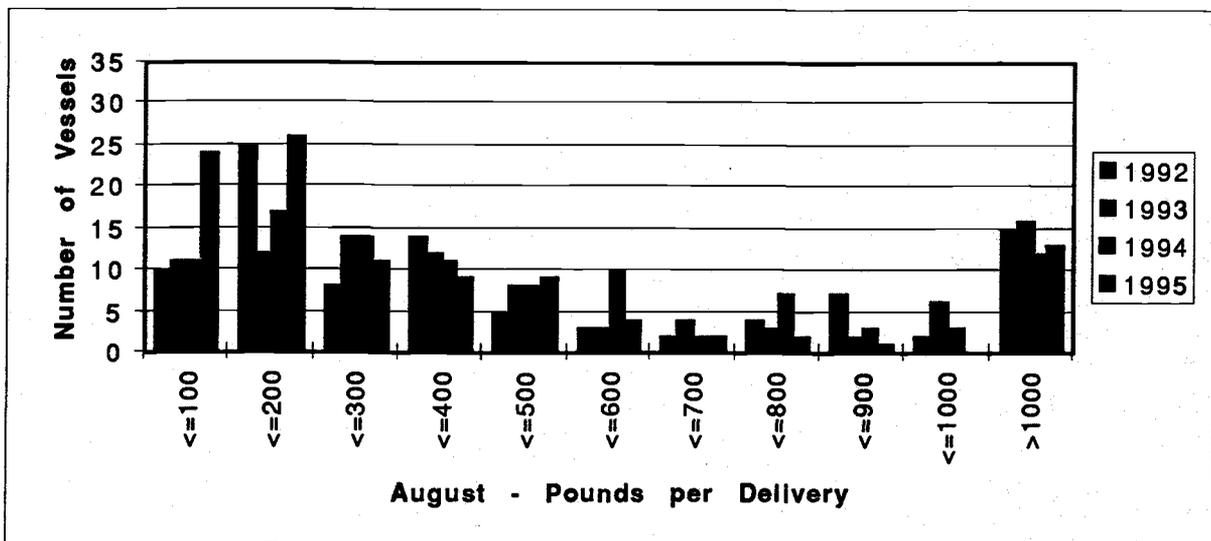
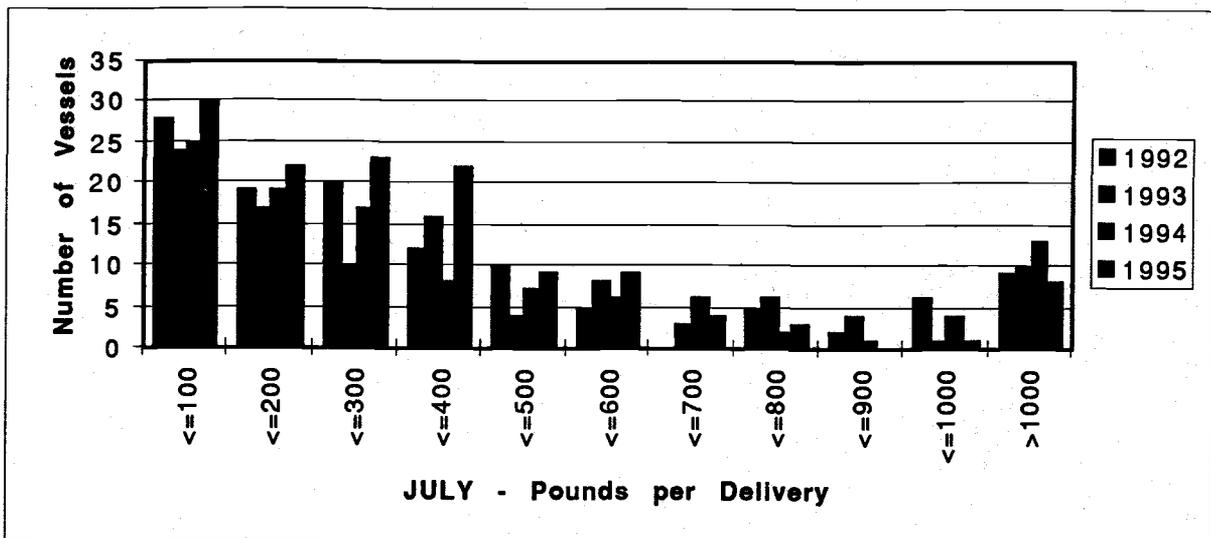
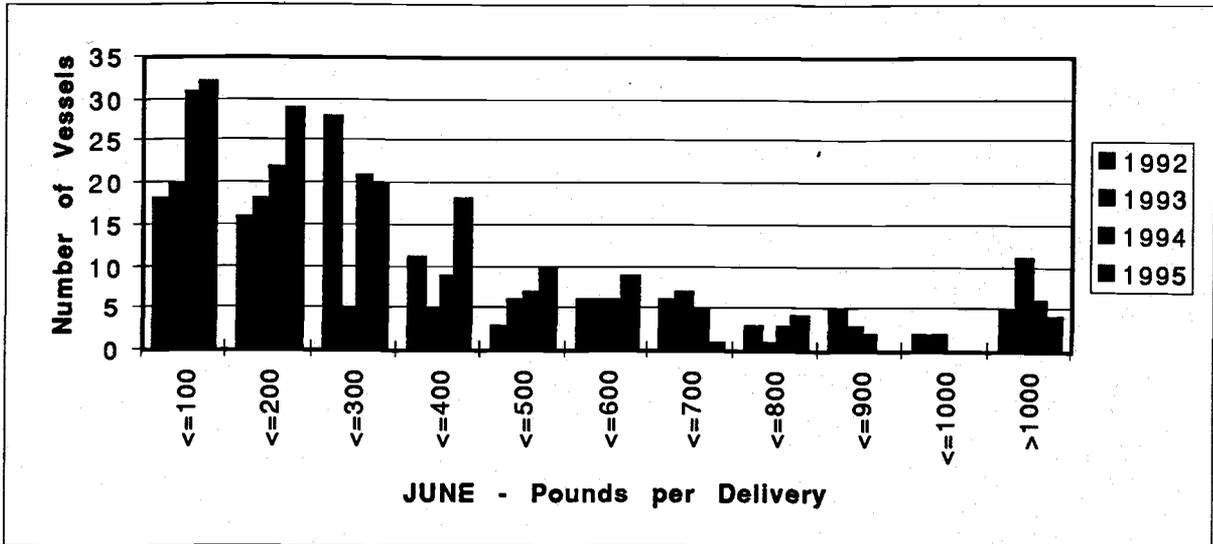


Figure 7. Pounds per delivery 1992-1995

ODFW Crab Permit Holder's Questionnaire Results

A questionnaire requesting the opinions of all crab permit holders was sent out on 3/2/99. One completed questionnaire was accepted for each permitted vessel. 198 of the approximately 450 questionnaires sent out have been returned.

Question 1: Do you believe there is a need to reduce fishing pressure on soft-shelled crabs?

Yes:	136	(68.7%)
No:	55	(27.8%)
Not Sure	7	(3.5%)

Question 2A: Do you favor a shortened season? (87 positive responses)

If you favor a shortened season, which of the following closure dates do you favor.

Date	Votes
June 1	49
June 16	18
July 1	13
July 16	4
August 1	2
No date	1

Question 2B: Do you favor allowing rings only? (11 positive responses)

If you favor allowing rings only, which of the following beginning dates do you favor.

Date	Votes
June 1	5
June 16	1
July 1	4
No date	1

Question 2C: Do you favor restrictive trip limits? (31 positive responses)

If you favor restrictive trip limits, which of the following options do you favor.

Option	Votes
200 pounds per trip, twice per week, after May 31	6
200 pounds per trip, twice per week, after June 15	4
Other	21

Question 2D:

If you favor another proposal please specify.

Option	Votes
Various other proposals	16

Selected Questionnaire Comments	Votes
Trawler restrictions	16
Pot Limits (some year round, some for summer only)	14
Crab testing (either at-sea or at-dockside) and closing when meat recovery drops below a standard	18
Rules prohibiting the sale of softshell crabs	15

Profile of Questionnaire Responders, by Vessel Characteristics

Category	Question 1: response by number			
	Yes	No	Not Sure	Total
Vessel \geq 50 feet	49	8	1	58
Vessel < 50 feet	86	47	7	140
\geq 20% of lbs landed in summer of 1998	10	15	0	25
\geq 10% of lbs landed in summer of 1998	15	20	2	37
\geq 1% of lbs landed in summer of 1998	29	23	4	56
Nonsummer landings only	77	12	2	91
No landings in 1998 season	29	20	2	51
Landings in 1998 season	106	35	6	147

APPENDIX B: CRAB FLEET QUESTIONNAIRE & PUBLIC MEETINGS NOTES - Page 3

Category	Question 1: response by percentage			
	Yes	No	Not Sure	Total
Vessel >=50 feet	84%	14%	2%	100%
Vessel < 50 feet	61%	34%	5%	100%
>=1% of lbs landed in summer of 1998	52%	41%	7%	100%
Nonsummer landings only	85%	13%	2%	100%
No landings in 1998 season (N= 51)	57%	39%	4%	100%
Landings in 1998 season (N= 147)	72%	24%	4%	100%

Notes from March, 1999 public meetings

Astoria-March 10 @ 1 p.m. (Attendance=2)

- Very small turnout - one crabber and one processor attended
- Trip limit of 200 pounds/trip (as per survey) is too low for economic viability
- Suggested 5 days/week @ 500 pounds/trip
- 200-300 pots is optimum number to turn-over every 1-2 days in summer
- Summer soft crab live markets in San Francisco and L.A. These are new market strategies
- Deal with specific port's high catches of soft crab directly; not coastwide limits
- Try pot limits
- Limit trawling in the major crab grounds
- Softshells show up later off northern Oregon and southern Washington (early August)

Tillamook-March 10 @ 7 p.m. (Attendance=20)

- Good turnout of crabbers (4 ports) and small processors/retailers
- Most attending were summer hardshell market crabbers, dependent on summer crab income
- Staff needs to investigate biology and harvest impacts on resource
- Prohibit buyers from buying soft crab; develop soft crab definition
- Asked staff to highlight diversity of opinion and local fishery differences
- Consensus that 600-800 pounds/trip, twice/week would work for them
- Limit trawling in the major crab grounds

APPENDIX B: CRAB FLEET QUESTIONNAIRE & PUBLIC MEETINGS NOTES -Page 4

Newport-March 18 @ 7 p.m. (Attendance=40-50)

- Excellent turnout, all segments of fleet represented, including Florence and Depoe Bay
- Create a softshell regulation/testing program dockside to stop soft crab fishery
- Crab Commission could fund dockside testing for soft crab
- Florence fishers willing to pay for monitoring to meet a quality regulation
- Fear of summer trip limits spreading into the rest of fishery season
- What is considered "inshore" fishery (related to trawl impacts discussion)
- Many factors affect summer prices (soft crab, AK and CAN crab, etc.)
- Need more investigation of crab life history and gear/handling impacts
- Don't like old research findings; need more current information
- Newport summer landings can exceed 1000 pounds per trip
- Last 3 to 4 weeks of season, in some years, catches and quality increase greatly
- Don't restrict summer hard shell crabbing

North Bend-March 19 @ 1 p.m.(Attendance=17)

- Good turnout - good representation of most segments of fleet, several processors
- Concentrate on softshell problem areas of summer fishery- hire soft shell monitors
- Crab Commission should get more involved in quality monitoring
- Handling mortality needs to be addressed
- Concerns about at-sea summer sorting, impact, mortality - adequacy of data
- Used to be more old hardshell crabs in early summer due to lower wintertime effort
- Some buyers are being approached to supply live, soft crabs for "ethnic markets"
- Some fishers may be gearing up for more soft crab production in 1999
- Can a meat content standard be set and monitored?
- Suggestion to adjust the summer 10% quota based on long term average production
- Many saw a trip limit of 500 pounds twice/week after June 15 as reasonable
- Others thought 500 pounds per trip was high, could encourage lots of gear per boat
- Last 3 to 6 weeks of season, in some years, the catch and quality increases greatly

APPENDIX C: CRAB POT BIODEGRADABLE ESCAPE MECHANISMS

Overview

This issue is presented for discussion and Commission guidance to staff.

Current escape mechanism rules were liberalized in 1994 by the Commission to include "other twine as approved by the Department". In addition to 120 thread size untreated cotton twine, the use of cotton/polyester twine (50% or less polyester content blended within individual threads) may be used as part of the pot's lid hook assembly or as part of a modification of the wire mesh so that when a single strand of twine breaks, the lid is unlatched or an opening is created of at least 5 inches in diameter.

Background

The original rule, which allowed only twine materials of cotton or other natural fibers, was adopted at the conclusion of a federal crab management planning process. The intent was for all three states to adopt crab pot escape mechanisms to prevent "ghost fishing" of lost or abandoned pots. Staff fears that the current regulation, allowing twine materials blended with polyester, may not be providing an effective pot escape mechanism. It is unclear whether these twine materials will deteriorate and allow the pot lid or mesh to open up to allow trapped crabs to escape in a reasonable period of time. This concern is based on both industry input and staff-designed tests run by volunteer commercial crabbers. None of the polyester blends broke during volunteer trials lasting up to 5 months. There are no established criteria for desired deterioration rates, although a minimum of 3 months and maximum of 6 months is suggested in the 1979 draft federal management plan for the OR/WA/CA Dungeness crab fishery.

If the Commission instructs staff to pursue this issue, we will, with industry input, develop a modest-cost in-water experiment over the next 1-2 years evaluating the deterioration rates by twine type and size and bring results back to the commission for discussion. There is some Alaskan research (Kimker, et al) on which to build upon, although none of the Alaskan trials included twine as large as 120 thread count.

APPENDIX D: STATUS REPORT -OCEAN DUNGENESS CRAB SPORT FISHERIES

Overview

Currently, ocean (and bay) sport crabbing regulations allow the use of three crab rings, pots, or baited lines per person. There are no gear specifications. Pots can be left overnight and can be pulled with mechanical assistance. A daily bag limit of 12 male crab/person, 24 in possession, with a minimum size of 5.75 inches. It is unlawful to catch all or part of another person's limit. No license is required. Ocean sport crabbing is closed concurrent with ocean commercial season closure, August 15-November 30.

This is an expanding fishery, particularly the sport charter component.

Background

There is concern by commercial industry and staff that some ocean sport charter vessel crews are directly harvesting crab and simply providing crab for the client; that the client is not actually doing the fishing.

Similarly, some charters may be storing crabs in "holding pots" and then later providing clients crab as part of a fishing or whale watching trip. Such actions may violate current regulations for sport crabbing.

The question arises, who is the fisher if crab are held in pots by the vessel/crew and handed out to a charter client at a later time or date?

The commercial industry also has concerns about the differential size limit, 6.25 inches for commercial and 5.75 inches for sport.

The OSP has additional concerns about the use of holding pots.

All of the above issues also apply to sport crabbing in bays.

If the Commission instructs staff to pursue this issue, they will evaluate the characteristics of the fishery and provide a status report at a future date. The appropriate time to consider management options will be during the stateside angling regulations proposal process, to be conducted during 2000.

APPENDIX E: STATUS REPORT - COMMERCIAL CRAB POT LIMITS

Overview

Many ocean fisheries rely on limiting participation and gear restrictions as key elements of a management plan in stabilizing a fishery over time. Oregon's ocean commercial Dungeness crab fishery has operated under a restricted permit entry system since the 1995-96 season. Of approximately 450 permits issued or pending, approximately 330 vessels have actively fished during the past three seasons. To date, pots have not been limited in the fishery. Discussion over pot limitation has occurred over the past 1-2 years within the fishing industry, Oregon Dungeness Commodity Commission (ODCC), ODFW staff and OFW Commission, and, most recently, the Oregon legislature (1999 session). This issue cannot be resolved by Oregon unilaterally, but must be part of a coastwide review and cooperative framework with Oregon, Washington, and California.

Background

It is estimated that during the most recent four fishing seasons (1995-96 through 1998-99) about 118,000 pots (as declared by fishers during preseason hold inspection) have been actively fished at the start of the season. For an earlier period of 1977 through 1989 (13 fishing seasons), an average of 83,000 pots were estimated to have been fished.

Gear use has increased in recent years for a variety of reasons. Dungeness crab participants fear the future adoption of individual vessel pot limits and/or a total fishery-wide pot moratorium and have increased gear use to show increased gear participation. Some Dungeness crab permit holders, who may have been inactive in the fishery, are seeking alternative revenue as other Oregon and West Coast fishery opportunities are reduced or lost to them. Others are taking advantage of existing winter and summer hardshell markets or the emerging summer large volume soft live crab fishery.

Recent Events

Feb. 10, 1999: Dept. of Justice opinion confirmed OFW Commission authority to impose crab limits.

Feb. 19, 1999: HB's 2645 and 2746, two crab pot limitation bills introduced by members of fishing industry and Rep. Terry Thompson, Newport (D-House District 4). Assigned to House Agriculture and Forestry subcommittee.

March 8, 1999: Dungeness Crab pot limit workshop sponsored by Rep. Thompson in Salem to discuss HB's 2645 and 2646. Meeting facilitated by Rep. Thompson, Bob Jacobson, Commissioner Feldner, and Neal Coenen (ODFW). Over 50 fishermen attended. No consensus on issue. No time to gather industry-wide support necessary for a pot limit bill in 1999 session. Decided to amend and simplify HB 2646 to reflect DOJ opinion stating OFW Commission authority, set fishery participation date (December 1, 1998, and determine if such a pot limit program is necessary.

April 7, 1999: HB 2646 amended to reflect March 8 workshop language. House Ag and Forestry holds public hearing and workshop on amended bill. Recommends a do pass w/amendments.

April 9, 1999: Second reading of House Bill 2646 A-engrossed).

A copy of April 7, 1999 bill is attached for review.

70th OREGON LEGISLATIVE ASSEMBLY--1999 Regular Session

NOTE: Matter within { + braces and plus signs + } in an amended section is new. Matter within { - braces and minus signs - } is existing law to be omitted. New sections are within { + braces and plus signs + } .
LC 2522

A-Engrossed
House Bill 2646
Ordered by the House April 7
Including House Amendments dated April 7

Sponsored by Representative THOMPSON

SUMMARY

The following summary is not prepared by the sponsors of the measure and is not a part of the body thereof subject to consideration by the Legislative Assembly. It is an editor's brief statement of the essential features of the measure.

{ + Authorizes State Fish and Wildlife Commission to restrict participation in Dungeness crab fishery. Directs commission to determine whether crab pot limit program is necessary. + }

{ - Limits number of crab pots person may use in Oregon ocean Dungeness crab fishery. Reduces limit by 10 percent for season beginning December 1, 2000, with two exceptions. - }

A BILL FOR AN ACT

Relating to ocean Dungeness crab fishery.

Whereas the Legislative Assembly finds that the Oregon ocean Dungeness crab fishery is overcapitalized, which has led to economic destabilization of the ocean Dungeness crab industry and the coastal communities relying on the crab harvest and to excessive harvesting pressure on Oregon's ocean Dungeness crab resources; now, therefore,

Be It Enacted by the People of the State of Oregon:

SECTION 1. { + (1) The State Fish and Wildlife Commission may restrict participation in the Oregon ocean Dungeness crab fishery as the commission considers appropriate.

(2) The commission shall review the condition of the Oregon ocean Dungeness crab fishery and determine whether a crab pot limit program is necessary for the efficient and effective management of the fishery.

(3) If the commission requires previous participation in the Oregon ocean Dungeness crab fishery as part of a restriction under subsection (1) or (2) of this section, the commission shall consider participation in the Oregon ocean Dungeness crab fishery only before December 1, 1998. Such prior participation includes but is not limited to the number of crab pots fished in a particular season. + }
