

Daily effort, soak time, and catch in the 1996, 1997 and 1998 Bristol Bay fishery seasons:
A summary of post-season vessel operator interviews and inseason catch reports,
Report to the Alaska Board of Fisheries

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INTRODUCTION

Following the 1996 Bristol Bay red king crab season, the Alaska Department of Fish and Game (ADF&G) petitioned the Alaska Board of Fisheries (BOF) to consider enacting regulations to allow for more effective management of the fishery at low guideline harvest levels (GHL). During that unprecedented 4-day season the harvest by 196 vessels exceeded the GHL of 5 million pounds by nearly 70 percent (Morrison et al. 1997).

Interim measures adopted by the BOF in August 1997 included provisions to lower pot limits from those previously in regulation, depending on the magnitude of the GHL and the number of vessels registered for the fishery. Regulations in effect prior to the 1997 season (5AAC 34.825 (d); ADF&G 1993) allocated “large” vessels (vessels $\geq 125'$ in length overall, LOA) an aggregate of 250 pots and “small” vessels (vessels $< 125'$ LOA) 200 pots. The new regulations (5AAC 34.825 (h); ADF&G 1998) maintained the 5:4 ratio of pots between the large and small vessel size classes, respectively. However, the new regulations also stipulated that the allocation of pots would be graduated over six tiers, with each tier based on the number of registered vessels and magnitude of the GHL. Under these new regulations the BOF also established that the closing time for a fishery season may be announced pre-season when more than 250 vessels register for the fishery. Additionally, the BOF established that the fishery would not open for GHLs less than 4-million pounds (5 AAC 34.810; ADF&G 1998a). These new regulations sunset on December 31 1999.

The revised pot limit regulations were tested during the 1997 fishery in which, with a 7-million pound GHL and under the new regulations, large vessels were permitted to fish an aggregate of 125 pots and small vessels were allowed 100 pots. The season again lasted four days during which the 256 vessels registered for the 1997 fishery harvested 8.6 million pounds (Morrison 1999a). In 1998 a GHL of 15.8 million pound effectively doubled the gear allocation, with large vessels allowed 250 pots and small vessels 200 pots. The 1998 season lasted five days, during which 275 vessels harvested 14.3 million pounds (Morrison 1999b).

This report documents and summarizes information provided by vessel operators on the daily effort and catches for the 1996, 1997, and 1998 Bristol Bay red king crab seasons and assesses the effectiveness of the new pot limit regulations. The data are derived from post-season interviews with the vessel operators and from the inseason catch and effort reports to the fishery managers from the vessel operators.

METHODS

Post-season Vessel Operator Interviews

Daily pot pulls, soak times and catches of legal crabs for individual vessels were derived from post-season vessel operator interviews. Interviews were conducted dockside by ADF&G personnel at shoreside processing plants and by contract observers onboard floater-processor vessels. For all sampled deliveries to the processors, vessel operators were queried for their daily effort records (or, when necessary, personal recollections) on each statistical area fished throughout the season. While pot soak times are usually an average value estimated to the nearest hour by the operator, interview

data overall are generally considered accurate, and when sample sizes are sufficient, representative of the catch and effort trends of the fleet. Number of pot pulls and catch of legal crabs that are reported for a day in the confidential interviews are assumed to apply to the calendar day (i.e., between 12:00 AM and 12:00 AM of the following day).

Confidential interviews were available from the operators of: 56 vessels that participated in the 1996 season (40 for vessels <125' LOA and 16 for vessels \geq 125' LOA); 77 vessels that participated in the 1997 season (42 for vessels <125' LOA and 35 for vessels \geq 125' LOA); and 156 vessels that participated in the 1998 season (96 for vessels <125' LOA and 60 for vessels \geq 125' LOA).

A more comprehensive description of vessel operator interview methods is available in the "ADF&G Shellfish Observer Field Manual" (ADF&G 1998b).

Inseason Reports

Inseason daily reports on catch of legal crabs and number of pot lifts were obtained from fishing vessels on a 24-h schedule during the 1996 season via marine telex or single side band radio. Reports were received on the morning of each fishing day during November 2 through November 5 1996. All four catcher-processor vessels (CPs) that participated in the 1996 season were required to provide daily reports via single side band radio during the November 2-5 period. Additionally, 58 catcher-only vessels <125' LOA and 34 catcher-only vessels \geq 125' LOA voluntarily provided at least one daily catch and effort report during November 2-5. During the 1996 season operators were asked to report on their daily catch and effort through the morning of the report day; we have assumed "through the morning of the report day" to mean "through to 6:00 AM." Note that, because no reports were requested or received on the morning of November 6, the inseason reports for 1996 provide no information on catch or effort for the final 12 hours of the season (between 6:00 AM and 6:00 PM on November 5).

During the 1997 and 1998 seasons vessels reporting via single side band radio provided daily catch and effort reports on a 24-h schedule beginning on the morning of November 2. This applied to both the CPs, which were required to report daily via radio, and to those catcher-only vessels that reported voluntarily via radio. It was clarified with vessel operators reporting via radio during the 1997 and 1998 seasons that the catch and effort reports should be for the 24-h period prior to 6:00 AM on the morning of the report. Vessels reporting voluntarily via marine telex during the 1997 and 1998 seasons reported on a twice-daily 12-h schedule beginning on the morning of November 2. The morning marine telex report provided catch and effort data for the 12-h period prior to 6:00 AM. The evening marine telex report provided catch and effort data for the 12-h period prior to 6:00 PM. If a vessel reporting via marine telex provided a report for 6:00 PM of one day and 6:00 AM of the next day, the total catch and effort from those two reports was also added to the reports received on a 24-h schedule via single side band radio.

The marine telex reports received on the morning of November 2 were added to the radio reports received on the morning of the same date, because both report types were providing catch and effort information for the period from 4:00 PM of November 1 to 6:00 AM of November 2. In both 1997 and 1998 vessel operators were asked to provide a final report on schedule after the fishery season closed so that catch and effort data on the final day of the fishery would be available for analysis. For both the 1997 and 1998 seasons, a 12-h report received on the

evening of the last day of the fishery reported on the same period as a 24-h report received on the morning after the fishery closure because the seasons closed between 6:00 AM and 6:00 PM. Accordingly the marine telex reports received on the evening of the last day of the fishery were added to the radio reports received on the morning after the fishery closure.

Eight CPs participated in the 1997 season and were required to provide daily reports via radio from the morning of November 2 through the morning of November 6. One hundred-five catcher-only vessels <125' LOA and 46 catcher vessels \geq 125' LOA voluntarily provided a daily report for a 24-h period at least once via radio or marine telex during November 2-6 1997. Eighty-eight catcher-only vessels (45 vessels <125' LOA and 43 vessels \geq 125' LOA) participated in 12-h reporting via marine telex.

Eleven CPs participated in the 1998 season and were required to provide daily reports via radio from the morning of November 2 through the morning of November 7. One-hundred-thirteen catcher-only vessels (80 vessels <125' LOA and 33 vessels \geq 125' LOA) voluntarily provided a daily report for a 24-h period at least once via radio or marine telex during November 2-7 1998. 75 catcher-only vessels (45 vessels <125' LOA and 30 vessels \geq 125' LOA) participated in 12-h reporting via marine telex.

Tables 1 and 2 summarize the inseason reporting activities of vessels during the 1996 through 1998 seasons. It is important to note that in no year did all the vessels that participated in the reporting program provide reports on all scheduled opportunities. For example, although 159 vessels provided at least one daily catch and effort report during the 1997 season, the highest number of vessels reporting on any one day during that season was 124 on November 3 (Table 1). In fact only 35 of the 159 participating vessels provided a daily report on every opportunity during the 1997 season (Table 1). In each year, number of reporting vessels dropped noticeably following the time of the fishery closure announcement for the season.

Daily and 12-h mean catch per vessels, mean pot lifts per vessel, and catch of legal per pot (CPUE) for vessel size classes and for the entire fleet were estimated according to a stratified sampling model with three predefined strata: catcher-only vessels <125' LOA; catcher-only vessels \geq 125' LOA; and CPs. Mean catch per vessel, mean pot lifts per vessel, CPUE were estimated by the sample means for each of these strata from the information provided by reporting vessels. Estimates for the entire fleet were computed as weighted averages of the within-strata estimates, with weighting proportional to the total number of vessels in each stratum. Since all CPs were \geq 125' LOA, estimates for vessels \geq 125' LOA were computed as weighted averages of estimates for catcher-only vessels \geq 125' LOA and for CPs. Estimates from these procedures were exactly the same as those used to estimate catch and effort during inseason management. The method used in this report for estimating daily CPUE, however, can provide slightly different estimates from that which was used during inseason management.

RESULTS

Post-season Vessel Operator Interviews

Fishing Effort

Potlifts. Summarized potlift data from interviews show distinct differences in fishing activity during each of the three seasons (Table 3). An average of 116 pots per day and 461 for the season were pulled onboard the 53 vessels sampled in 1996. With lower pot limits in effect during the 1997 season, the daily and cumulative average potlifts dropped by more than 20 percent among the 77 vessels sampled. Data from the 156 vessels sampled in 1998 indicated that average daily potlifts increased substantially from 1997, and were overall more comparable to the 1996 average. Total potlifts per vessel were highest in 1998, partially as a result of the additional day fished during that season. However, comparison of daily potlifts by fishing day indicated that vessel activity in general was highest in 1996. During that season more potlifts per vessel were made on three of the four fishing days common to all years. On two fishing days in 1997, November 3 and November 4, potlifts per vessel decreased 35 percent from the previous season. Potlifts rose on each of those days in 1998, but respectively remained 10 and 20 percent lower than the 1996 averages. Individual vessel potlifts were nearly identical on November 2 in 1997 and 1998, and slightly less than 10 percent lower than potlifts per vessel were on the same day in 1996.

Differences in daily and total potlifts between large and small vessels were also evident from the interview data. During both seasons with higher pot limits, large vessels consistently fished greater numbers of pots on a daily basis than did their small vessel counterparts (Table 4). On November 2 in 1996, for example, large vessel potlifts exceeded those of small vessels by more than 50 percent; in 1998 large vessels lifted nearly twice as many pots as small vessels on the same fishing day. The disparity in average potlifts per vessel between the two vessel size classes in 1996 and 1998 was remarkably similar; the average large vessel had 33% more potlifts than the average small vessel in 1996 and 39% more in 1998. Large vessels also lifted more pots than small vessels on average during the 1997 season, although only by 16%. In fact, 1997 was the only year during which both vessel size groups lifted an average of fewer than 400 pots by the conclusion of the fishery.

In all three years the lowest average pot pulls per vessel occurred on November 2 (Table 3). That trend also existed within vessel-size classes for all seasons but for large vessels in 1998 (Table 4).

Soak Time. Pot soak times were also somewhat variable between fishing seasons. In each of the three years pots were soaked for the shortest periods on November 2 (Table 3). On all fishing days soak periods were highest in 1998, averaging approximately 30 hours. Comparatively lower pot limits during the 1997 season resulted in an overall average pot soak of 24 hours, which was just 10 percent lower than the average soak in 1996, and less than 20 percent lower than the 1998 average.

Soak periods between large and small vessels appeared to be slightly less variable than overall soak periods between seasons, and even more comparable when pot limits were lowered. On most fishing days in 1996 and 1998 daily large vessel soak times exceeded those of small vessels, but by 2

hours or less. In 1997 small vessels soaked pots an overall average of just an hour longer than large boats.

Fishing Performance

CPUE. Trends in daily CPUE for the sampled vessels were different during each of the three seasons. In 1996 the highest daily CPUE (which was also the highest on any single day during all three years) of 24.6 crabs was recorded on November 2 (Table 3). Fishing performance declined markedly, however, after November 3 to seven crabs per pot by November 5. Conversely, during the 1997 season the lowest CPUE (11.7 crabs per pot) occurred on November 2 and the highest (18.4 crabs per pot) on the day before the season closure. Fishing performance in 1998 followed a trend of progressive decline from 19.5 crabs per pot on November 2 to 10.2 crabs per pot by the November 6 season closure. However, overall CPUEs were comparable between years and varied by less than two crabs per pot.

The daily CPUE of both large and small vessels very closely followed that of the fishery overall during each season. On any single day of the fishery between 1996 and 1998 the CPUE of one vessel size class varied from the other by no more than three crabs, and differed by less than two crabs on most days. Overall CPUE between large and small vessels varied by less than one crab in two of the three seasons.

Daily Catch. Daily catch per vessel also followed different trends among years (Table 5). Similar to the trend in CPUE, in 1996 the highest estimated daily harvests occurred on November 2 and November 3 and were markedly lower on November 5. The 1997 season showed the opposite trend with lowest average catches on the two opening days of the season and highest average catch on the last day of the season. Daily average catch per vessel in 1998 showed less variability among the first four days of the than the preceding seasons; only the last day of the 1998 season stands out by having a markedly lower average catch per vessel. Of the three seasons, highest daily catches per vessel occurred during the two opening days of the 1996 season. The lowest daily catches per vessel of the three seasons occurred on the last day of the 1996 season.

The average total catch per vessel as estimated from the interview data tends to be higher than that estimated from fish ticket summaries (Table 5). The two data sources indicate that the average vessel's total catch for the 4-d long 1996 season was 82% to 92% of that for the 5-d long 1998 season, a reduction that is comparable to the relative difference in season length. On the other hand, the two data sources indicate that average catch per vessel in the 4-d 1996 season was 26% to 33% greater than that for the 4-d long 1997 season. That difference is not comparable to the doubling in pot limits for the 1996 season over the 1997 season. Daily average catches tended to be lower in 1997 than in the other two seasons. In fact, on three of the four fishing days common to all seasons, the 1997 estimated daily harvest was notably lower than catches per vessel during either 1996 or 1998.

Inseason Reports

Only minor discrepancies exist between the daily catch and effort statistics as estimated from post-season interviews and from inseason reports. Accordingly only differences in estimates that explain, contradict, or strongly corroborate the trends seen in the post-season interviews are reviewed.

Differences between the two data sources in estimates for the last day or two of a season are not detailed here, because such difference may be attributed to the reduction in inseason reports following a closure announcement (Tables 1 and 2).

Fishing Effort

Potlifts. Inseason reports reveal that virtually no pot pulls were performed in any of the three seasons prior to 6:00 AM on November 2 (Table 6). Estimates of pot pulls on a 12-h schedule show that vessels were pulling pots at consistent rates between 6:00 AM and 6:00 PM on November 2 in 1997, but were not pulling pots at consistent rates until between 6:00 PM of November 2 and 6:00 AM of November 3 in 1998 (Table 7).

Some discrepancies exist between the post-season interviews and the inseason reports in comparisons of daily effort between vessel size classes. The inseason reports tend to show greater disparity in daily pot pulls between small vessels and large vessels (Table 8) than do the post-season interviews (Table 4). Also, unlike the interview data, the inseason reports indicate that in 1998 large vessels followed the trend of pulling fewer pots on November 2 than during subsequent days of the season.

Fishing Performance

CPUE. No noteworthy differences exist in the trends of CPUE as estimated by post-season interviews and inseason reports. One notable feature for the CPUE estimates based on inseason reports is that the high CPUE that occurred on November 2 of the 1996 fishery is evident even for the few pot pulls executed prior to 6:00 AM of that day (Tables 6 and 8). In the following two seasons, CPUE estimates were at their lowest for that period.

Daily Catch. Trends in daily average catch as estimated from inseason reports (Table 9) are in agreement with estimates derived from post-season interviews (Table 5). The inseason reports reveal that during the three fisheries virtually all of the harvest obtained by the average vessel on November 2 was captured after 6:00 AM.

DISCUSSION

Data from the operator interviews conducted following each of the three seasons clearly indicates that the reduction of pot limits in 1997 had considerable impact on fishing effort. Both daily and cumulative potlifts and average soak times per vessel decreased when pot limits were lowered. That reduction was not, however, sufficient to avoid a harvest over the 7-million pound GHLL in a 4-d season (Morrison 1999a). The reduction in fishing effort and catch per vessel in 1997 was not proportional to the change in pot limits. Even though in comparison to the other two years the 1997 pot limits were halved, the greatest reduction in daily potlifts during this season was no more than one-third less than total potlifts for the same day in 1996 or 1998. Cumulative pot pulls per vessel in 1997 were only one-fifth lower than the total during the same season length in 1996. Likewise, average catch per vessel was only reduced by 20-25% in the 1997 season relative to the 1996 season. The overall immeasurable decrease in fishing performance under the lower pot limits was certainly in part attributable to the fact that potlifts remained higher than expected in 1997. Although

total registered pots in 1997 were only 70% of that from the previous year, the total catch in 1997 actually exceeded that of 1996 during the same time period.

Although large vessels had more pot lifts than small vessels during each of the three seasons examined, the data indicates that large vessels have a greater competitive advantage over small vessels at high pot limits than at low pot limits. During 1996 and 1998 the increase in large vessel potlifts over those of small vessels was positively disproportionate to the gear allocation ratio between the two groups. In 1997 the disparity in potlifts was negatively disproportionate to this ratio.

The decrease in pot soak periods amounted to less than might have been expected under the lower pot limits, and clearly had no net impact on overall fishing performance. Additionally, the fact that average pot soaks were only slightly lower in 1996 and 1998 than in 1997 indicates that during 1996 and 1998, a number of vessel operators chose to lift productive pots more frequently. It is also likely that at least a few operators did not fish their entire available pot complement because of the short duration of the seasons.

Soak times within the ranges recorded over the three seasons appeared to have little discernible effect on catch rates. For example, even though in 1997 and 1998 the average overall soak periods differed by more than 18 percent, CPUE remained relatively unchanged. Conversely, both within and between seasons comparable daily soak times produced catch rates varying by as much as 13 crabs per pot. Notably, the CPUE of large and small vessels remained very comparable during each season. The fact that overall CPUE between the vessel size classes differed by less than one crab in two years suggests that fishery performance for each was primarily affected by difference in daily and overall fishing effort.

Fishery CPUE unquestionably had the single greatest effect on the harvests in each year and under both pot limit scenarios. Even though overall catch rates between seasons were comparable, the high variability in daily CPUE confounded management of the fishery in 1996 and 1997. The 1996 harvest would likely have equaled more than double the fishery GHY had the unprecedented catch rates of the first two days been sustained throughout the season. Any improvement in manageability due to lower pot limits in 1997 was more than offset by the progressive and unexpected increase in daily CPUE throughout the season. Likewise, the slight under-harvest that occurred during the 1998 season can be attributed to the unanticipated drop in CPUE on the last two days of the fishery following the closure announcement.

Data from inseason reports corroborate the catch and effort trends seen in the post-season interview data. The inseason reports also serve to give a more detailed view of the first 38-42 hours of the fishery season. Those reports help to better determine the lag time between the fishery opening and the beginning of pot pulling and how that lag time may be influenced by pot limits. Regardless of the pot limits in effect, few pots were pulled prior to 6:00 AM on November 2 during 1997 and 1998. Under lower pot limits of 1997 vessels were pulling pots at near-capacity by 6:00 PM of November 2. Under the higher pot limits of 1998, however, vessels were not pulling pots at capacity until 6:00 AM of November 3. Although the difference in lag time is only on the order of 12 hours, under the shortened fisheries experienced in recent years, 12 hours of full-capacity effort can have a substantial effect on the total harvest for a season.

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Table 1. Number of vessels providing reports on a 24-h schedule for daily catch and effort through 6:00A.M. of the report day by fishing season, vessel size class and date during the 1996-1998 Bristol Bay red king crab fishery seasons.

Date	1996		1997		1998	
	<125'	≥125' ^a	<125'	≥125' ^b	<125'	≥125' ^c
11/2	46	24	78	41	54	35
11/3	53	37	84	40	62	35
11/4	33	21	84	38	68	34
11/5	23	13	43	27	24	33
11/6	-	-	34	23	17	18
11/7	-	-	-	-	9	13
At least once	58	38	105	54	80	44
All opportunities	17	9	19	16	5	16

^a Includes 4 catcher-processor vessels that were required to report daily.

^b Includes 8 catcher-processor vessels that were required to report daily.

^c Includes 7 catcher-processor vessels that were required to report daily.

Table 2. Number of vessels providing catch and effort reports on a 12-h schedule via marine telex by fishing season, vessel size class, date, and report time during the 1997 and 1998 Bristol Bay red king crab fishery seasons.

Date	Time	1997		1998	
		<125'	≥125'	<125'	≥125'
11/2	06:00	36	27	31	21
11/2	18:00	31	33	27	20
11/3	06:00	33	32	24	18
11/3	18:00	29	26	26	15
11/4	06:00	27	29	22	14
11/4	18:00	31	33	22	14
11/5	06:00	23	18	10	9
11/6	18:00	16	13	6	8
11/6	06:00	-	-	5	6
11/7	18:00	-	-	4	5
At least once		45	43	45	30
All opportunities		10	5	3	3

Table 3. Estimated daily mean pot pulls, mean soak hours, and CPUE, from post-season vessel operator interviews conducted following the 1996, 1997 and 1998 Bristol Bay red king crab fishery seasons.

Fishing Day	Pot Pulls per Vessel			Soak Hours			CPUE		
	1996 ^a	1997 ^b	1998 ^c	1996	1997	1998	1996	1997	1998
2-Nov.	91	82	83	24	22	25	24.6	11.7	19.5
3-Nov.	137	88	109	27	25	30	21.3	14.5	19.1
4-Nov.	138	91	120	28	24	30	12.5	18.4	16.7
5-Nov.	95	103	117	26	23	29	7.0	16.6	12.7
6-Nov. ^d	-	-	103	-	-	29	-	-	10.2
Season Avg.	116	92	107	26	24	29	16.9	15.4	15.7
Season Total	461	364	532						

^aPot limit 200/250; GHJ 5 million lb.; 53 vessels sampled.

^bPot limit 100/125; GHJ 7 million lb.; 77 vessels sampled.

^cPot limit 200/250; GHJ 15.8 million lb.; 156 vessels sampled.

^dFishing season closed on 5-Nov. in 1996 and 1997.

Table 4. Daily mean pot pulls, mean soak hours and CPUE of vessels < 125' and those \geq 125 feet, estimated from post-season vessel operator interviews conducted following the 1996, 1997 and 1998 Bristol Bay red king crab fishery seasons.

Day Fished	1996 ^a		1997 ^b		1998 ^c	
	<125'	\geq 125'	<125'	\geq 125'	<125'	\geq 125'
Pot Pulls Per Vessel						
2 Nov.	73	112	75	89	68	132
3 Nov.	122	155	81	98	99	131
4 Nov.	120	155	88	96	108	132
5 Nov.	81	105	99	115	103	132
6 Nov. ^d	-	-	-	-	91	124
Totals	396	527	343	398	469	651
Soak Hours						
2 Nov.	23	25	23	22	25	26
3 Nov.	27	27	25	25	29	32
4 Nov.	26	28	25	24	29	33
5 Nov.	24	27	24	22	28	31
6 Nov.	-	-	-	-	29	30
Totals	25	27	24	23	28	30
Catch Per Unit Effort						
2 Nov.	25.5	24.0	12.1	11.4	18.3	19.5
3 Nov.	22.0	20.7	14.4	14.7	18.5	20.1
4 Nov.	11.2	14.0	18.0	18.7	15.8	18.0
5 Nov.	6.2	8.2	15.1	18.2	12.4	13.2
6 Nov.	-	-	-	-	9.3	11.2
Totals	16.2	16.7	14.9	15.8	14.9	16.4

^aPot limit 200/250; GHL 5 million lb.; 53 vessels sampled.

^bPot limit 100/125; GHL 7 million lb.; 77 vessels sampled.

^cPot limit 200/250; GHL 15.8 million lb.; 156 vessels sampled.

^dFishing season closed on 5-Nov. in 1996 and 1997.

Table 5. Daily mean harvest per vessel estimated from the results of vessel operator interviews conducted following the 1996, 1997 and 1998 Bristol Bay red king crab fishery seasons.

Fishing Day	Mean Catch per Vessel per Day ^a		
	1996 ^b	1997 ^c	1998 ^d
2-Nov.	15,000	6,500	10,900
3-Nov.	19,600	8,600	13,900
4-Nov.	11,600	11,200	13,500
5-Nov.	4,500	11,800	10,000
6-Nov. ^e	-	-	7,000
Season Totals	50,700 ^f	38,100 ^g	55,300 ^h

^a In pounds.

^b Pot limit 200/250; GHL 5 million lb.; 53 vessels sampled; 196 vessels fished.

^c Pot limit 100/125; GHL 7 million lb.; 77 vessels sampled; 256 vessels fished.

^d Pot limit 200/250; GHL 15.8 million lb.; 156 vessels sampled; 275 vessels fished.

^e Fishing season closed on 5-Nov. in 1996 and 1997.

^f Value computed from fish tickets is 42,887 pounds (Morrison 1999b, Table 1).

^g Value computed from fish tickets is 34,205 pounds (Morrison 1999b, Table 1).

^h Value computed from fish tickets is 55,300 pounds (Morrison 1999b, Table 1).

Table 6. Daily mean pot pulls per vessel and CPUE estimated from inseason reports collected during the 1996, 1997 and 1998 Bristol Bay red king crab fishery seasons.

For the 24 hour period preceding 06:00 AM on	Mean Pot Pulls Per Vessel			CPUE		
	1996	1997	1998	1996	1997	1998
11/2 ^{a,b}	2	2	3	16.1	8.5	1.9
11/3	91	81	93	20.9	11.5	18.3
11/4	122	87	111	20.1	13.0	18.9
11/5	150	101	130	9.6	16.8	16.9
11/6 ^{c,d}	-	98	152	-	18.5	12.6
11/7 ^e	-	-	108	-	-	8.1
Season Totals	365 ^f	369	592	16.5	15.0	14.9

^a For 1996, the preceding 18 hours from 12:00 PM on 11/1.

^b For 1997 and 1998, the preceding 14 hours from 4:00 PM on 11/1.

^c For 1996, no reports were received for the 12-h period between 6:00 AM and 6:00 PM on 11/5.

^d For 1997, catch and effort are only for the 12-h period from 06:00 AM to 6:00 PM on 11/5.

^e For 1998, catch and effort are only for the 10-h period from 06:00 AM to 4:00 PM on 11/6.

^f Estimate of 365 pot pulls per vessel for 1996 is a minimum because no reports were received for the period between 06:00 AM and 6:00 PM on 11/5.

Table 7. Estimated pot pulls per vessel by 12-h period during the 1997 and 1998 Bristol Bay red king crab fishery seasons.

For the 12-h period preceding		Season	
Date	Time	1997	1998
11/2	6:00 AM	1	0
11/2	6:00 PM	46	37
11/3	6:00 AM	40	64
11/3	6:00 PM	49	62
11/4	6:00 AM	44	56
11/4	6:00 PM	52	69
11/5	6:00 AM	56	64
11/6	6:00 PM	91	65
11/6	6:00 AM	-	84
11/7	6:00 PM	-	92

Table 8. Daily mean pot pulls and CPUE of vessels <125' and those ≥125' estimated from inseason reports collected during the 1996, 1997, and 1998 Bristol Bay red king crab fishery seasons.

For the 24-h period preceding 06:00 AM on	1996		1997		1998	
	<125	≥125	<125	≥125	<125	≥125
Mean Pot Pulls Per Vessel						
11/2 ^{a,b}	2	3	1	5	2	8
11/3	76	123	75	95	82	119
11/4	113	141	79	103	99	139
11/5	144	161	92	123	117	158
11/6 ^{c,d}	-	-	89	118	135	188
11/7 ^e	-	-	-	-	97	132
Catch Per Unit Effort						
11/2 ^{a,b}	16.8	15.7	8.5	8.9	4.7	0.4
11/3	24.0	18.3	12.0	11.0	19.1	17.1
11/4	19.6	21.8	12.4	14.6	17.8	19.2
11/5	7.8	14.5	14.8	19.3	17.4	14.8
11/6 ^{c,d}	-	-	19.2	16.2	12.3	14.6
11/7 ^e	-	-	-	-	9.9	7.5

^a For 1996, the preceding 18 hours from 12:00 PM on 11/1.

^b For 1997 and 1998, the preceding 14 hours from 4:00 PM on 11/1.

^c For 1996, no reports were received for the 12-h period between 6:00 AM and 6:00 PM on 11/5.

^d For 1997, catch and effort are only for the 12-h period from 6:00 AM to 6:00 PM on 11/5.

^e For 1998, catch and effort are only for the 10-h period from 6:00 AM to 4:00 PM on 11/6.

Table 9. Daily mean catch per vessel estimated from inseason reports collected during the 1996, 1997 and 1998 Bristol Bay red king crab fishery seasons.

For the 24 hour period preceding 6:00 AM on:	Mean Catch Per Vessel ^a		
	1996	1997	1998
11/2 ^{b, c}	285	148	50
11/3	13,355	6,485	11,746
11/4	17,369	7,752	14,052
11/5	10,381	11,521	14,698
11/6 ^{d, e}	-	11,819	13,800
11/7 ^f	-	-	6,716

^a In pounds.

^b For 1996, the preceding 18 hours from 12:00 PM on 11/1.

^c For 1997 and 1998, the preceding 14 hours from 4:00 PM on 11/1.

^d For 1996 no reports were received for the 12-h period between 6:00 AM and 6:00 PM on 11/5.

^e For 1997, catch is only for the 12-h period from 6:00 AM to 6:00 PM on 11/5.

^f For 1998, catch is only for the 10-h period from 6:00 AM to 4:00 PM on 11/6.

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