



MEMORANDUM

TO: Bert Lewis
Jack Erickson
Aaron Poetter

DATE: December 11, 2020

PHONE NO: 907-235-8191, Homer ADF&G Office

FROM: Elisa Russ
Jan Rumble
Wyatt Rhea-Fournier

SUBJECT: PWS Golden King Crab Test
Fishery Summary

This memo summarizes information collected from the 2020 Golden King Crab (GKC) test fishery conducted in the Prince William Sound Area (PWS; Registration Area E).

PRINCE WILLIAM SOUND AND TEST FISHERY AREA

PWS includes waters of Prince William Sound and the Gulf of Alaska bounded by the longitude of Cape Suckling (144° 00' W. long.) on the east and Cape Fairfield (148° 50.25' W. long.) on the west as defined in regulation 5 AAC 34.200. The test fishery was conducted in PWS inside waters in three discrete test fishery areas A, B, and C which were grouped by statistical areas (Figure 1).

2020 GOLDEN KING CRAB TEST FISHERY SUMMARY

ADF&G conducted a GKC test fishery in PWS during the fall of 2020. An Invitation to Bid (ITB) describing the project and terms was distributed to processors and posted online at <https://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=198857>. The original ITB was issued on July 15, 2020 with test fishery dates of September 1 through October 30, 2020. Due to concerns expressed by potential bidders about low salinity during early fall in PWS, an amendment to the ITB was issued on July 31, 2020 delaying and extending the fishery dates to September 14 through November 30, 2020. Bids were due by August 5, 2020. The winning bidder was allowed to harvest up to 15,000 lb total legal GKC with 5,000 lb apportioned to each of the three test fishery areas: A, B, and C (Figure 1). A maximum of 50 pots were allowed to be fished in a single test fishery area at a time with a maximum of 2,500 lb harvest allowed from any single statistical area.

The commercial seafood processor 60° North Seafoods in Cordova won the bid for \$1.10/lb for GKC sold. One test fishery vessel, *F/V Nip N Tuck*, was contracted by the processor and fishing began on October 22 with the final delivery on November 13. The vessel made four trips and landed 5,645 lb that was sold with 68 lb of deadloss GKC for a total harvest of 5,713 lb or 716 legal male GKC from 372 pot lifts (Table 1). In addition to the 716 legal male GKC caught and harvested in the test fishery, there were 496 sublegal male and 875 female GKC caught and

released for all areas combined (Table 1). The vessel used 45 pots and 4 of those pots were lost during the fishery.

The fishing area-specific harvest limit of 5,000 lb was achieved in only one of the three fishing areas, in Area C, which also had the majority of effort during the test fishery (Table 1). Area C had 5,326 lb or 93% of total GKC harvest and 43% of effort at 160 pot lifts. Area B had 6% of harvest at 363 lb with 35% of effort (131 pot lifts) and Area A had the least harvest at 24 lb (<1%) with 22% of effort (81 pot lifts). The average catch per unit effort (CPUE) of legal GKC for the test fishery was 1.9 crab/pot with a CPUE of 4.2 crab/pot in Area C, 0.4 crab/pot in Area B, and less than 0.1 crab/pot in Area A (Table 1).

The captain utilized information: provided by participants in the historical GKC commercial fishery, gained from the vessel's participation in the recent Tanner crab commissioner's permit fishery, and from the subsistence crab fishery to determine fishing locations. The captain relayed to the ADF&G onboard observer that pots were set in all areas in PWS where he planned to fish. The areas of highest GKC harvest during the final years of the historical commercial fishery were fished by the test fishery vessel.

The high harvest of 667 legal GKC (5,326 lb) from Area C occurred in Knight Island Passage with five statistical areas fished (Table 1). The highest harvests from Area C were in statistical areas 476006 in northern Knight Island Passage (28%) and 486005 south of Chenega Island (27%).

Fishing in Area B occurred in two statistical areas and was concentrated on steep edges in historical locations of GKC commercial harvest. In statistical area 476032, fishing was focused north of the boundary between Areas B and C (60° 30' N lat), primarily on the west side near Crafton Island and to a lesser degree on the east side adjacent to the top of Knight, Ingot, and Eleanor Islands. In statistical area 476033, fishing was mainly in waters east of Perry Island and those bordering Lone Island. Area B harvest was low with 46 crab (363 lb) from 131 pot lifts.

Fishing in Area A occurred in Port Nellie Juan (statistical areas 486003 and 486031) and the area south of Esther Island (statistical area 486033). The poor fishing for legal GKC in Area A near Esther Island was unexpected, as this area is considered a good GKC spot for residents of Whittier to fish their subsistence crab pots, and ADF&G subsistence permit records indicate this statistical area (486033) had the highest catch since the subsistence fishery reopened in 2008 (100 total legal GKC for all years combined). Area A harvest was negligible at only 3 crab (24 lb) from 81 pots.

An ADF&G observer was onboard for all trips to collect biological information, which included shell condition and carapace length for sampled male and female GKC, with additional measurements collected on male GKC of chela height and carapace width, both with and without spines; clutch condition was collected on female GKC. The majority of male GKC were in new shell condition. Legal male GKC had an average weight of 8.0 lb. Female GKC appeared healthy with most gravid females carrying full clutches of eggs; there were some large female GKC with a few exceeding the male legal size of 7" in carapace width. Future work on data from this test fishery will include examining pot location and catch composition information using GIS, and analysis of biological data.

The captain and processor were concerned about low salinity of PWS surface waters during the test fishery and its potential negative effects on GKC health. Crab held in lower saline waters for an extended period exhibited swollen abdomens. The captain monitored salinity in the fish hold using a hydrometer. Low salinity was mitigated by traveling and anchoring in more saline waters

to fill the fish hold. The captain also turned the influent pump off periodically when fishing in low saline waters. As a result, there was little mortality (deadloss).

Total revenue collected by ADF&G for the test fishery was \$6,210 (5,645 sold lb GKC at \$1.10/lb). Total costs incurred by ADF&G totaled \$16,814 (\$15,992 for observer salary and \$822 for travel).

RECOMMENDATIONS FOR GOLDEN KING CRAB

The test fishery indicated that, although there are some concentrated aggregations of GKC in Knight Island Passage, the overall distribution of GKC in PWS is patchy with very low abundance in Areas A and B. The area apportionment of 5,000 lb was only achieved in Area C, with very few crab caught in Areas A and B, despite substantial effort by the test fishery vessel.

Results of the test fishery do not indicate there is a harvestable surplus of GKC in PWS to sustain a commercial fishery. ADF&G recommends that the commercial fishery for GKC remains closed.

HISTORICAL COMMERCIAL KING CRAB FISHERY SUMMARY

The first commercial harvest of king crab in PWS was landed in 1957 and the fishery quickly developed; the second highest harvest of 246,965 lb was landed in 1960 (Table 2). In 1972, the highest harvest of 296,200 lb of primarily blue king crab were landed. Species separation of the king crab species in harvest reporting began in the 1979/80 season. Between 1979 and 1984 both blue and red king crab harvest declined and commercial fisheries for both these species were closed by emergency order (EO) from the 1984/85 season through the 1990/91 season, and also from 1992/93 through 1994/95 before being closed by regulation in 1996. These closures coincided with the development of the GKC fishery from 1982 to 1989.

Harvest levels of GKC were negligible during the first three seasons of species separation and then peaked during the 1982/83 season at 147,016 lb before declining to relatively low levels from the 1983/84 season through the 1988/89 season. During the fishery, the average weight of GKC decreased from 9.7 lb in the 1982/83 season to 6.6 lb in the 1988/89 season. Due to conservation concerns, the fishery was closed for the 1989/90 season by EO. Because of low harvest levels and the decrease in average size of harvested crab, the Alaska Board of Fisheries (BOF) established a guideline harvest range (GHR) of 40,000 to 60,000 lb. For the following years, the lower end of the GHR was not achieved, leading to a closure of the commercial fishery for 1992/93 and 1993/94 seasons. For years when pot effort data were available (beginning in 1984/85 season), catch per unit effort (CPUE) for GKC also declined to the lowest level of 0.6 crab/pot during the 1991/92 season. Although the fishery did reopen for a month during the 1994/95 season, participation and harvest were low, and the fishery was closed by EO each season until the BOF closed it by regulation in 1996.

SUBSISTENCE KING CRAB FISHERY SUMMARY

In March 2008, BOF made a positive customary and traditional use finding for king crab in PWS and subsequently opened a GKC subsistence fishery. Harvest in this fishery is monitored with a required permit and administered in conjunction with the subsistence Tanner crab fishery (Figure 2). Harvest and participation have remained low since the fishery opened in 2008. The number of trips with GKC harvest has ranged from 0 in 2012/13 to a high of 42 trips in the 2018/19 season (Table 3). The 2018/19 season produced the highest harvest of GKC since the subsistence fishery was implemented in 2008. During the 2018/19 season, there were 181 legal male GKC caught with 47 crab retained, 230 sublegal male crab released, and 605 female crab released on 42 trips. During

the 2019/20 season, there were 38 legal male crab retained and 17 released with 97 females released; GKC were caught on 16 trips.

Table 1.–Golden king crab (GKC) catch from the 2020 test fishery: harvest of legal male GKC (lb and number), pot lifts, catch per unit effort of legal crab (average crab/pot), catch of sublegal and female GKC (numbers of crab), and average depth in fathoms, by test fishery and statistical areas.

Statistical Area	Harvest lb	Legal GKC harvested	Pot lifts	CPUE legal male GKC/pot	# of sublegal male GKC	# of female GKC	# of total GKC	Avg Depth (ftm)
Test Fishery Area A								
486003	0	0	4	0	0	0	0	177
486031	24	3	39	<0.1	3	2	8	207
486033	0	0	38	0	72	135	207	199
Area A Totals/Avg	24	3	81	<0.1	75	137	215	201
Test Fishery Area B								
476032	293	37	76	0.5	30	115	182	214
476033	70	9	55	0.2	2	20	31	202
Area B Totals/Avg	363	46	131	0.4	32	135	213	209
Test Fishery Area C								
476004	378	48	12	4	27	21	96	214
476005	976	122	19	6.4	61	56	239	231
476006	1,455	182	60	3	129	226	537	198
486001	1,003	125	35	3.3	62	135	322	214
486005	1,514	190	34	5.6	110	165	465	235
Area C Totals/Avg	5,326	667	160	4.2	389	603	1,659	214
Combined All Test Fishery Areas								
	Harvest (lb)	# of GKC harvested	Pot lifts	CPUE legal male GKC/pot	# sublegal male GKC	# female GKC	# of total GKC	Avg depth
Combined All Pots	5,713	716	372	1.9	496	875	2,087	210

Table 2.—Prince William Sound Area (Registration Area E) commercial king crab harvests, 1960–2019, including golden king crab catch per unit effort (CPUE; crab/pot) and average weight when available.

Season ^{a,b,c}	Vessels	Landings	King Crab Harvest (lb)				Golden King	
			Red	Blue	Golden	Total	CPUE ^d	Avg Wt (lb)
1960						246,965		
1961						236,081		
1962						31,478		
1963						43,569		
1964						14,028		
1965						5,500		
1966						11,000		
1967						41,800		
1968						200,000		
1969						48,100		
1970						94,300		
1971						144,200		
1972						296,200		
1973						207,916		
1974						85,379		
1975						53,423		
1976/77						17,087		
1977/78						86,595		
1978/79						114,000		
1979/80	18	109	52,026	13,662	0	65,688		
1980/81	14	65	32,433	7,282	20	39,735		
1981/82	11	43	25,358	5,634	0	30,992		
1982/83	31	187	30,809	10,433	147,016	188,258		9.7
1983/84	18	69	16,467	5,324	50,535	73,226		8.8
1984/85	4	14	235	closed	40,232	40,467	0.9	6.0 ^d
1985/86	4	11	closed	closed	51,800	51,800	1.4	5.8
1986/87	4	11	closed	closed	65,674	65,837	3.4	6.1
1987/88	4	15	closed	closed	68,270	68,270	2.4	6.6
1988/89	5	14	closed	closed	48,442	48,442	2.6	6.6
1989/90	0	0	closed	closed	closed	0		
1990/91	^e	^e	closed	closed	^e	^e	0.8	6.4 ^d
1991/92	^e	^e	^e	^e	^e	^e	0.6	6.5 ^d
1992/93	0	0	closed	closed	closed	0		
1993/94	0	0	closed	closed	closed	0		
1994/95	^e	^e	closed	closed	^e	^e	1.4	7.9 ^d
1996–						closed by regulation		

^a 1995/1996 to 1999 seasons closed by emergency order.

^b Seasons closed by regulation effective August 1999.

^c Catch not reported by species prior to 1979/1980 season.

^d Derived from available fish ticket data.

^e Data are confidential.

Table 3.—Annual effort, harvest, and catch for trips targeting golden king crab (GKC) in the Prince William Sound Area subsistence fishery, 2008/09–2019/20 seasons.

Season	Number of permits issued	Number of legal crab retained	Number of legal crab released	Total crab	Number of sublegal released	Number of females released	Number of Trips ^a
2008/09	115	5	8	13	9	12	13
2009/10	93	3	7	10	21	22	9
2010/11	73	12	0	12	5	8	12
2011/12	79	10	8	18	23	39	9
2012/13	151	0	0	0	0	0	0
2013/14	173	27	2	29	6	97	20
2014/15	211	35	22	57	15	179	24
2015/16	206	16	7	23	9	39	16
2016/17	183	5	0	5	4	7	15
2017/18	179	6	4	10	12	27	6
2018/19	192	47	134	181	230	605	42
2019/20	252	38	17	55	92	97	16

Note: permits are combined for Tanner and GKC which have different habitats (GKC, very deep) with most trips targeting Tanner crab.

^a Number of trips with GKC harvest.

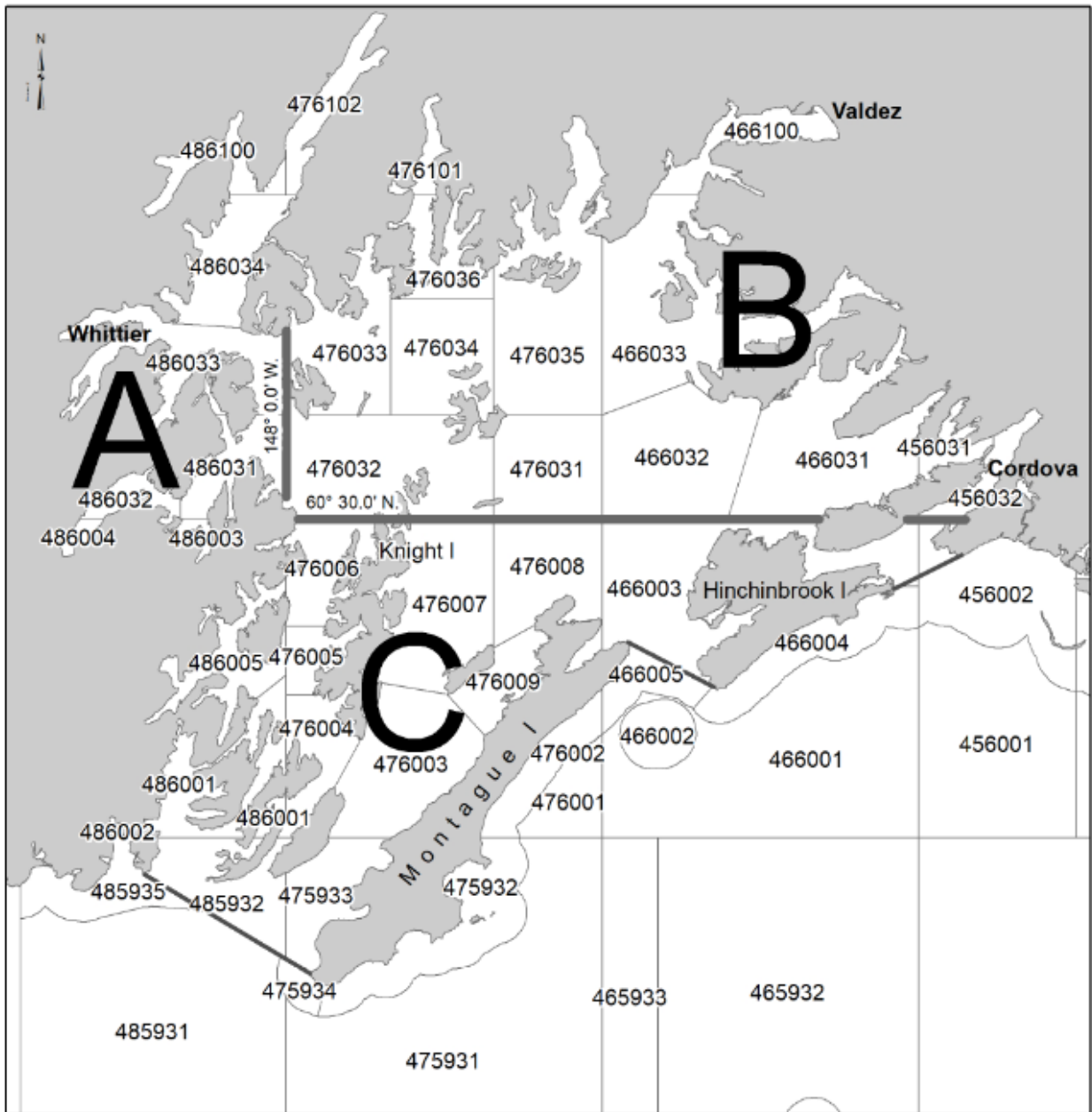


Figure 1.—Prince William Sound Area golden king crab test fishery areas A, B, and C with statistical areas.

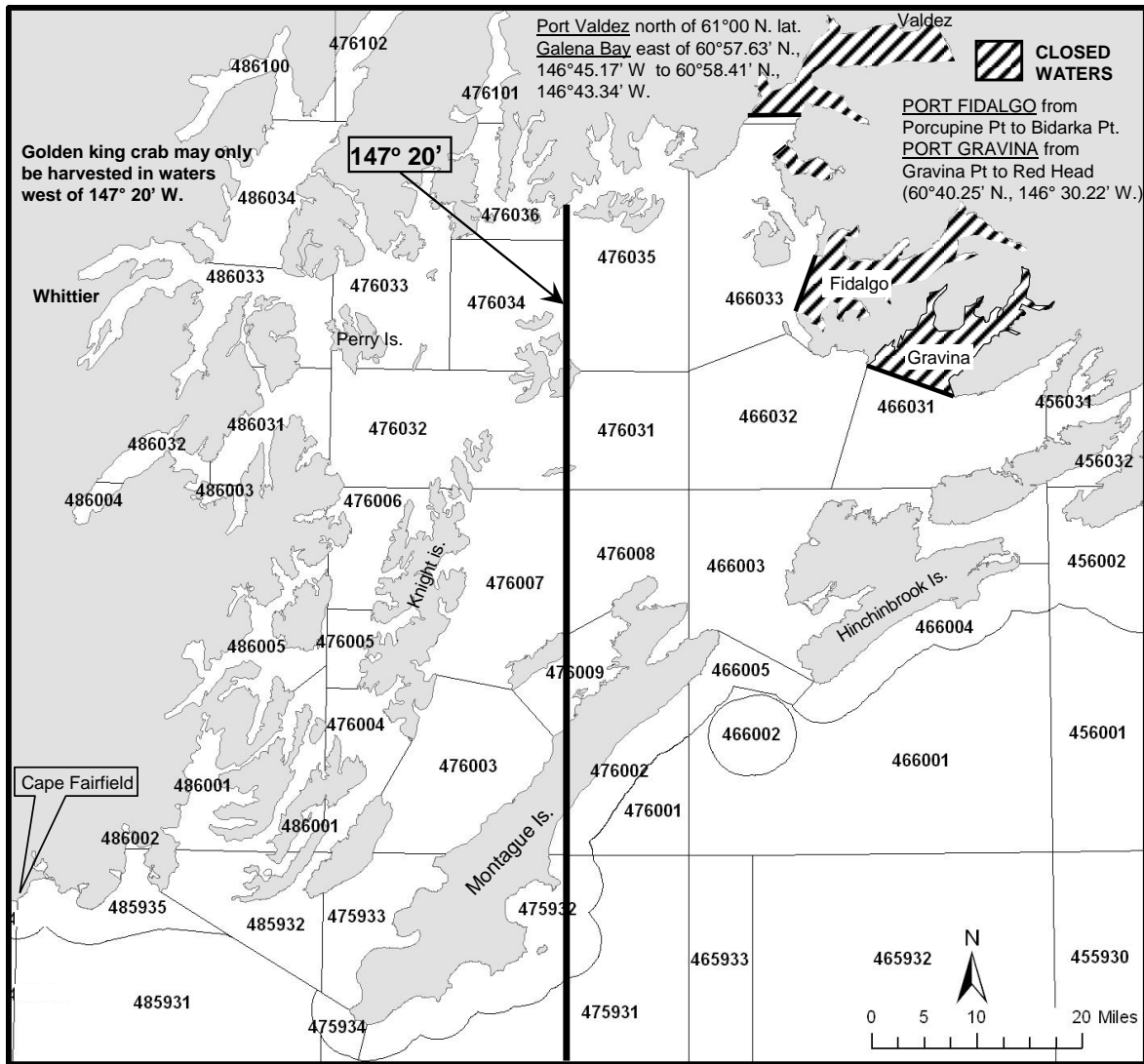


Figure 2.—Prince William Sound Area Tanner and golden king crab subsistence fishery statistical areas, closed waters, and boundaries; golden king crab may only be retained in waters west of 147° 20' W. long.