## 2017 Southern District Trawl Survey Summary

Joshua Mumm

September 19, 2017

The 2017 Southern District large-mesh bottom trawl survey was conducted between August 29th and September 6th. A total of 39 successful 0.5 nmi tows were completed, including 38 core stations and 1 ancillary station (station 139). 1,481 male and 1,350 female Tanner crab were captured.

The recruit class size definitions for male Tanner crab in Cook Inlet were revised in 2017, coinciding with a reduction in the legal size limit from 140 mm (5.5 in) to 114 mm (4.5 in) (Table 1). The new 2017 size class definitions are anticipated to be the focus from this point on, however for historical comparison the entire time series of survey data (1990 to 2017) were analyzed using both sets of recruit classes herein.

Using the new legal size (114 mm), 137 legal males were captured in the 2017 survey. Mean legal male CPUE was 10.12 crab/nmi (CV = 3.22) and ranged from 0 to 186. The estimated abundance of legal males using the new legal size was 124,965 crabs (95% CI = 132,244). When the new size limits were retroactively applied to the historical survey data, the 2017 legal abundance estimate was the 2nd lowest on record, surpassing only 2012 (Table 2; Figure 2).

Using the old legal size (140 mm), 8 legal males were captured in the 2017 survey. When analyzed using the old size categories, the 2017 survey produced the lowest legal male abundance estimate on record, 7,078 crab (+/-8,329) (Table 3; Figure 3).

Legal Male Dungeness crab CPUE in the 2017 survey was greater than in 2009 to 2013, but less than all but 2 years prior to 2009 (Table 4).

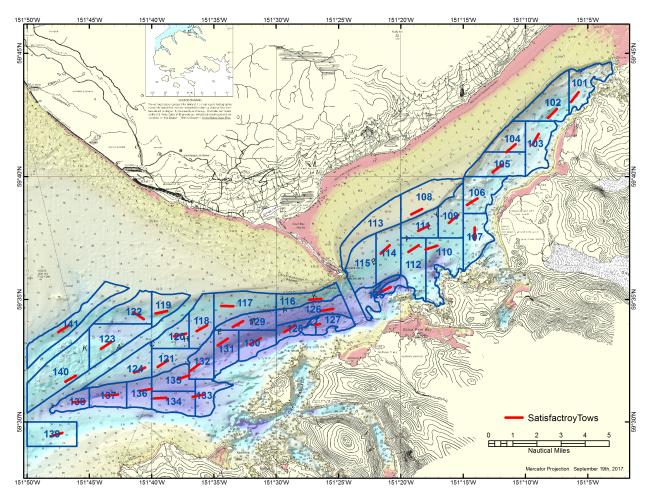


Figure 1: 2017 Southern District large-mesh trawl survey grid and tow paths.

Table 1: Male Tanner crab carapace width (mm) by recruit category for the Southern Distric trawl surveys.

( ) 0		0 0
Recruit category	pre-2017	2017
Prerecruit-4	< 70	< 66
Prerecruit-3	70-91	66-79
Prerecruit-2	92-114	80-95
Prerecruit-1	115 - 139	96 - 113
Recruit	140 - 165	114 - 134
Postrecruit	> 165	> 134

Table 2: Male Tanner crab abundance estimates using the 2017 size class definitions from trawl surveys in the Southern District, 1990-2017. No survey was conducted in 2010 or 2014-2016. Confidence intervals are at 95 percent.

1990         14         434,468         336,711           1991         15         252,510         131,374           1992         15         209,831         71,948           1993         16         558,464         59,025           1994         16         260,137         127,473           1995         16         176,841         32,054           1996         16         176,841         32,054           1997         16         134,484         87,749           1998         16         134,484         87,749           1999         16         134,484         87,749           1999         16         134,484         87,749           1999         16         134,484         87,749           1999         16         1508,596         470,833           2002         14         1,673,386         908,731           2003         16         884,933         861,700           2004         16         635,416         355,266           2005         15         986,832         174,394           2006         17         970,276         133,238           2008         16						
15 252,510 15 209,831 16 558,464 16 260,137 16 300,509 16 176,841 16 176,841 16 320,868 16 713,951 16 446,734 16 446,734 16 635,416 15 986,832 17 970,276 16 326,276 16 326,276 16 326,276 17 970,276 18 84,933 19 884,933 10 884,933 11 986,832 12 986,832 13 986,832 14 1,528,442 15 986,832 17 970,276 18 986,832 17 970,276 18 126,783 19 127,582	556,501	493,498	893,456	674,240	2,714,634	1,145,882
15 209,831 16 558,464 16 260,137 16 300,509 16 176,841 16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 326,276 17 970,276 18 818,177 37 4,005,798 37 1,527,582	273,576	685,422	1,379,426	453,670	2,722,308	879,693
16 558,464 16 260,137 16 300,509 16 176,841 16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582	134,688	381,086	1,978,010	1,054,687	2,775,565	1,097,301
16 260,137 16 300,509 16 176,841 16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 18 884,933 16 635,416 17 970,276 16 326,276 16 528,442 17 970,276 18 818,177 37 4,005,798 37 1,527,582	73,378	107,855	848,810	363,005	1,647,532	430,628
16 300,509 16 176,841 16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 884,933 16 986,832 17 970,276 16 326,276 16 528,442 17 970,276 18 818,177 37 4,005,798 37 1,527,582	161,944	101,303	356,246	156,693	1,007,104	451,486
16 176,841 16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 17 818,177 37 4,005,798 37 1,527,582 37 1,527,582	301,598	484,296	811,734	807,143	2,096,344	1,299,465
16 134,484 16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	49,592	454,902	742,974	595,718	1,456,364	1,174,485
16 320,868 16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	107,042	244,548	478,055	211,981	1,051,879	323,965
16 713,951 16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	9,216	20,131	403,196	347,716	771,087	373,615
16 446,734 16 1,508,596 14 1,673,386 16 884,933 16 635,416 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	830,294	518,904	312,049	239,298	3,074,360	2,743,906
16 1,508,596 14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	345,433	316,831	480,494	261,368	1,820,868	754,144
14 1,673,386 16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 778,423	344,754	255,343	504,698	318,804	3,084,224	1,995,590
16 884,933 16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 1,527,582	838,260	369,526	311,822	244,971	4,101,726	2,098,934
16 635,416 15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 778,423	806,086	553,965	358,230	201,368	3,464,914	1,726,501
15 986,832 17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582	1,041,375	723,209	868,018	460,041	3,623,284	1,875,763
17 970,276 16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 778,423	87,049	155,515	405,890	452,079	1,809,679	1,083,062
16 326,276 16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 778,423	113,845	191,802	456,127	583,967	1,865,289	1,828,893
16 528,442 15 818,177 37 4,005,798 37 1,527,582 37 778,423	100,798	116,841	561,046	909,757	1,143,914	1,252,423
15 818,177 37 4,005,798 37 1,527,582 37 778,423	187,970	125,792	351,461	425,347	1,281,516	787,437
37 4,005,798 37 1,527,582 37 778,493	547,114	636,899	752,945	548,314	3,195,079	2,338,396
37 1,527,582	78,819	32,032	139,263	121,689	4,447,159	1,983,355
27 778 793	2 721,862	123,414	80,920	55,218	4,829,149	1,796,356
074,011	716,835	1,098,146	192,637	105,523	3,179,046	975,058
2017 38 180,159 369,070	274,479	187,270	124,965	132,255	1,135,943	806,870

Table 3: Male Tanner crab abundance estimates using the pre-2017 size class definitions from trawl surveys in the Southern District, 1990-2017. No

survey	was con	iducted in 2010 or 2	2014-2016. Confiden	survey was conducted in 2010 or 2014-2016. Confidence intervals are at 95 percent.	percent.				
Year	Tows	Pre-4 (<70mm)	Pre-3 (70-91mm)	Pre-2 (92-114mm)	Pre-1 (115-139mm)	Legal (>140mm)	Legal CI	Total	Total CI
1990	14	496,674	722,894	613,950	492,692	388,422	403,617	2,714,634	1,145,882
1991	15	293,894	277,640	802,800	848,159	499,815	226,608	2,722,308	879,693
1992	15	237,159	125,034	455,057	902,459	1,055,855	734,287	2,775,565	1,097,301
1993	16	578,321	89,958	135,248	325,507	518,498	254,074	1,647,532	430,628
1994	16	312,332	210,142	132,840	158,590	193,199	106,304	1,007,104	451,486
1995	16	356,090	389,839	565,725	506,325	278,365	296,245	2,096,344	1,299,465
1996	16	186,397	44,644	522,916	601,084	101,322	69,836	1,456,364	1,174,485
1997	16	171,929	123,219	287,722	325,897	143,111	80,729	1,051,879	323,965
1998	16	325,474	19,208	24,005	195,049	205,808	190,004	771,087	373,615
1999	16	911,483	1,160,291	697,642	200,663	104,282	91,894	3,074,360	2,743,906
2000	16	513,366	453,588	390,984	380,557	82,374	72,974	1,820,868	754,144
2001	16	1,619,958	655,741	319,106	392,469	96,951	61,266	3,084,224	1,995,590
2002	14	2,027,607	1,275,475	499,598	211,036	88,010	69,895	4,101,726	2,098,934
2003	16	1,228,442	1,188,614	710,246	288,894	48,717	52,980	3,464,914	1,726,501
2004	16	671,544	1,119,199	1,037,689	683,921	110,930	75,834	3,623,284	1,875,763
2005	15	1,043,700	185,975	186,987	347,339	45,676	41,786	1,809,679	1,083,062
2006	17	1,029,633	154,678	230,111	226,338	224,530	286,932	1,865,289	1,828,893
2007	16	339,466	92,716	176,167	373,061	162,504	238,989	1,143,914	1,252,423
2008	16	552,269	224,880	159,200	239,726	105,440	130,955	1,281,516	787,437
2009	15	1,000,556	643,343	852,512	554,785	143,882	141,993	3,195,079	2,338,396
2011	37	4,109,517	159,347	40,208	94,797	42,660	40,810	4,447,159	1,983,355
2012	37	2,031,199	2,532,088	188,265	57,085	20,512	20,105	4,829,149	1,796,356
2013	37	925,729	680,678	1,390,554	141,245	38,077	34,026	3,179,046	975,058
2017	38	234,313	553,408	230,471	110,673	7,078	8,329	1,135,943	806,870

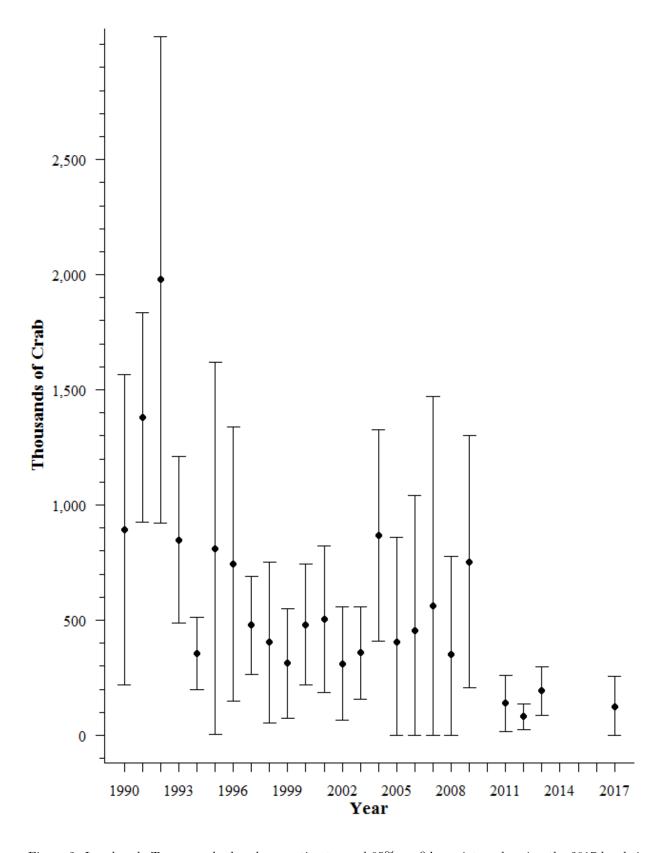


Figure 2: Legal male Tanner crab abundance estimates and 95% confidence intervals using the 2017 legal size (114 mm) from trawl surveys in the Southern District, 1990-2017.

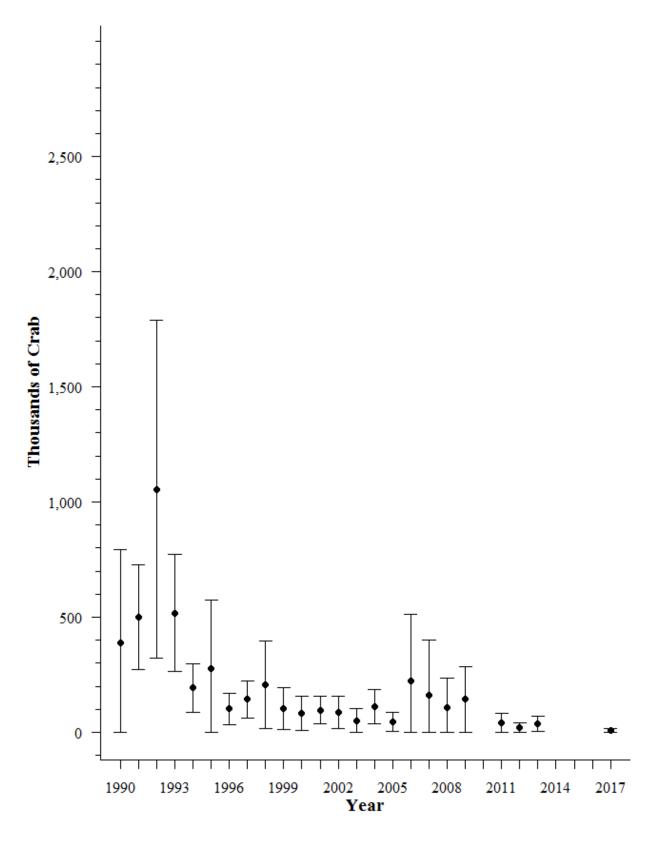


Figure 3: Legal male Tanner crab abundance estimates and 95% confidence intervals using the pre-2017 legal size (140 mm) from trawl surveys in the Southern District, 1990-2017.

Ta	ble 4: Di		rab CPUE (	crab/nmi)	) in the Sout	hern Dist	ric trawl surv	vey, 1990 t	o 2017.
Year	Tows	Sublegal	SD	Legal	SD	Total	SD	Total	SD
		Male		Male		Male		Female	
		CPUE		CPUE		CPUE		CPUE	
1990	14	21.93	36.14	0.35	0.83	22.28	36.74	40.25	74.57
1991	15	12.00	17.05	2.83	4.86	14.83	21.66	23.63	39.31
1992	15	9.62	15.07	4.35	6.99	13.97	21.73	35.13	54.41
1993	16	4.21	8.89	4.85	8.12	9.06	16.59	26.69	87.50
1994	16	0.73	1.40	1.51	3.21	2.24	4.42	6.05	15.68
1995	16	9.06	23.48	0.54	1.03	9.60	23.65	6.05	8.58
1996	16	7.51	15.74	3.48	6.05	10.99	21.55	22.88	40.23
1997	16	1.54	3.29	0.55	1.31	2.10	3.70	5.30	11.16
1998	16	0.32	0.62	0.19	0.40	0.51	0.82	0.76	1.51
1999	16	0.38	0.88	0.62	2.01	1.00	2.73	1.48	2.97
2000	16	0.31	0.60	0.12	0.34	0.44	0.73	1.12	2.27
2001	16	33.17	84.55	0.31	0.60	33.48	84.95	41.34	134.83
2002	14	5.43	13.33	0.91	2.12	6.34	14.49	24.70	66.42
2003	16	11.54	20.29	0.56	1.08	12.10	21.15	17.28	38.52
2004	16	3.45	6.52	0.88	2.28	4.32	8.69	5.38	13.34
2005	15	2.45	3.50	0.86	1.48	3.31	4.37	2.69	7.80
2006	17	53.05	169.52	3.08	6.69	56.12	175.78	25.93	46.34
2007	16	7.97	11.82	1.07	1.86	9.04	12.75	27.22	57.72
2008	16	8.28	9.66	0.89	2.09	9.17	11.41	15.70	18.82
2009	15	0.73	1.79	0.00	0.00	0.73	1.79	0.20	0.56
2011	37	0.05	0.31	0.04	0.27	0.10	0.41	0.10	0.42
2012	37	0.25	0.90	0.00	0.00	0.25	0.90	0.06	0.35
2013	37	0.33	1.25	0.00	0.00	0.33	1.25	0.17	0.76
2017	38	10.58	26.63	0.21	1.02	10.79	26.92	18.64	49.13