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TECHNICAL MEMORANDUM

DATE: August 28, 2007
TO: Gary Painter, BSFRF
FROM: Scott Goodman / Steve Hughes
SUBJECT: *Preliminary BSFRF Opilio Results from 2007 NMFS Survey Data*

Gary:

Data from the 2007 NMFS survey for *opilio* has been provided to BSFRF by the NMFS as per the BSFRF/NMFS Joint Project Memorandum of Agreement. We have made our own BSFRF estimates of *opilio* abundance using those data and preliminary summaries are provided here. The official survey estimates of abundance will be made by NMFS and provided to ADF&G for use in the ADF&G stock assessment process. Those official estimates may differ from those that BSFRF have made and provided here.

In a nutshell, this year's survey results support last year's survey results with respect to "unmodeled" *opilio* abundance, again showing large male *opilio* crab numbers greater than 140 million animals. Details are provided in the table below.

This preliminary summary table reports 2007 abundances (numbers of crab) for *opilio* by size/sex category (consistent with the NMFS Report to Industry) and compares those to 2006 results. The overall *opilio* change from last year is relatively small (+ 2.4%). Large males showed a modest increase (+ 4.8%) but more significantly, both medium males and large females showed increases of around + 20%. Preliminary statistics run on the 2007 abundances also suggest a significant improvement in precision of abundance estimates of the large male *opilio*.

2007 Standard Area Survey Strata	Num of Stations in Strata	Num of Tows in Strata	Sq. Naut. Miles in Strata	<-----Males----->				<-----Females----->			Total Opilio
				Large (≥ 102 mm)	Medium (78-101 mm)	Small (< 78 mm)	Total	Large (≥ 50 mm)	Small (< 50 mm)	Total	
------(MILLIONS OF CRAB)----->											
East Multi	1	2	401	0.000	0.033	0.033	0.066	0.000	0.000	0.000	0.066
East Single	227	227	91,027	92.371	238.988	718.702	1,050.061	761.759	251.402	1,013.161	2,063.222
Pribs Multi	25	45	10,025	27.070	19.512	18.753	65.335	66.636	0.018	66.654	131.989
StMatt Multi	17	27	7,218	16.143	55.518	130.972	202.633	144.596	37.022	181.618	384.251
West Single	68	68	27,268	15.255	30.090	289.777	335.122	271.374	145.604	416.979	752.101
2007 Totals	338	369	135,939	150.839	344.142	1,158.236	1,653.217	1,244.365	434.046	1,678.411	3,331.628
2006 Totals	---	---	---	143.900	288.400	1,106.900	1,539.200	1,045.500	669.800	1,715.300	3,254.500
07-06 Change			+/- # crab	+6.939	+55.742	+51.336	+114.017	+198.865	-235.754	-36.889	+77.128
			+/- % diff	+4.8%	+19.3%	+4.6%	+7.4%	+19.0%	-35.2%	-2.2%	+2.4%

While the current ADFG harvest strategy is somewhat complicated, a relative idea of interpreted results can be derived using survey results. Importantly, the transparency of the "process" from survey results (NMFS) to modeled results (ADFG) to announced TAC's (ADFG) still remains unclear in some elements, and therefore the results provided here should be considered as a "general idea" of interpreted results.

A direct application of the harvest strategy to survey abundance numbers from 2006 suggested a potential *opilio* 2006/07 TAC significantly higher than actual (> 60 million lbs versus ≈ 37 million lbs). Management decisions to reduce abundance inputs into the harvest strategy, while not fully explained, were highlighted in the 2006 NMFS Report to Industry and in the Stock Assessment of Eastern Bering Sea Snow Crab (Appendix A, 2006 Crab SAFE). The 100% increase in 2006 large males was "marked by extremely poor precision" (+/- 76%), and was qualified with a "high degree of uncertainty." Stock assessment modeled numbers were significantly lower for large male *opilio*. Further confusing a direct application of the harvest strategy, were anomalous shell condition rates for surveyed large male *opilio* (which is incorporated as an important factor in the harvest strategy). 2006 survey results reported a very low new hard shell percentage for large males (13%) where typically annual survey results show new hard shell rates greater than 50%. Consequently, ADFG harvest strategy results announced in the 2006/07 TAC news release were at the lower than anticipated level of approximately 37 million lbs.

Our analysis of preliminary 2007 numbers show three main positive signs for an expected increase in TAC;

- 1) Increases in all 3 size sex categories considered in the harvest strategy – large males (+5%), medium males (+19%) and large females (+19%).
- 2) Significantly improved precision around the abundance estimate for large males compared with 2006 results (+/- 76% versus +/- approx. 40%).

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- 3) Typical observed rates of new hard shell large male *opilio* during the survey (approx. 60%).

Barring management decisions or other unknowns that could again reduce abundances from the survey as direct inputs into the current harvest strategy, our (BSFRF) analysis indicates that the *opilio* TAC for 2007/08 would likely exceed 60 million lbs.