COMMONWEALTH of VIRGINIA

Marine Resources Commission
2600 Washington Avenue
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Newport News, Virginia 23607

Douglas W. Domenech
Secretary of Natural Resources

Jack G. Travelstead
Commissioner

January 2, 2013

Peyton Robertson
NOAA Chesapeake Bay Office
410 Severn Ave, Suite 207
Annapolis, MD 21403

Dear Peyton,

During the October 22, 2013 Virginia Marine Resources Commission public hearing, my staff presented a framework plan that could be used to reopen the crab dredge fishery season, with limitations pertaining to where, when, and how this fishery would operate. This management framework is based on specific abundance criteria that, if all are met, would signal to the Commission that a very limited winter dredge fishery season would not pose a risk to the blue crab resource and could be considered. This consideration would occur annually, as required by § 28.2-207 of the Code of Virginia.

At that October 2013 public hearing, the Commission endorsed the concept of a trigger-based option for management of a limited winter crab dredge fishery season, but agreed that a scientific peer review of these management triggers be conducted by the Chesapeake Bay Stock Assessment Committee (CBSAC). The Commission also requested that the (CBSAC) peer review include examination of an alternative management trigger option offered by the Chesapeake Bay Foundation.

For these reasons, I am requesting that the CBSAC review these trigger options for their merits as risk-averse approaches to allowing a winter crab dredge fishery season. Both approaches are attached to this letter.

I appreciate your consideration of this request.

Sincerely,

Jack G. Travelstead

Background on a Limited Virginia Crab Dredge Fishery Season

Dr. Rom Lipcius (VIMS), VIMS staff and VMRC staff conducted a crab dredge discard mortality study, from December 2012 to March 2013. The VIMS and VMRC staffs presented the Commission with the preferred winter dredge fishery season areas as 'mud' bottom. This means that sites in mud (areas of < 40% sand composition) resulted in a 5% total (on board and on bottom) discard mortality losses. Noteworthy is that this is the only gear-based fishery with a comprehensive scientific study of discard losses. Other areas would be off limits to crab dredging, including the 1942 sanctuary area.

VMRC staff proposed a fair, but limited entry crab dredge fishery season (in October 2013), with a maximum of 49 participants and a total allowable dredge fishery harvest of 1.5 million pounds. Industry repeatedly has said that there would not be even 49 boats that could participate, and 35 is more likely. The 1.5 million pounds is near the 2007/08 harvest (the last season on record) when 65 vessels participated. The Commission did not approve a reopening of the crab dredge fishery season because the abundance was low in 2012-13, especially the juvenile component of the stock which was the second lowest in 24 Bay-wide Winter Dredge Surveys.

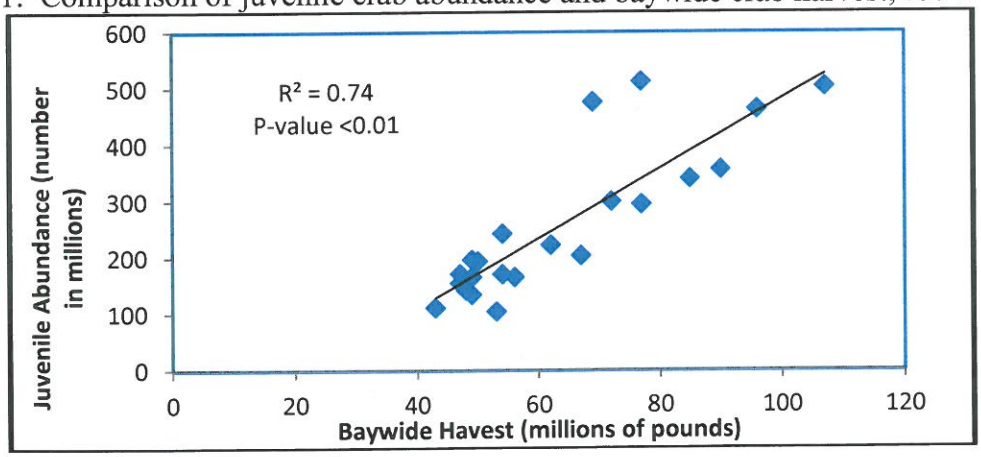
The Commission did endorse the use of a management trigger, based on abundance, to determine future openings of this fishery but requested the CBSAC provide its recommendation on its staff trigger approach, as well as the one provided by the Chesapeake Bay Foundation.

Virginia Crab Dredge Fishery Season Management Trigger: VMRC Method

Background:

The juvenile abundance of blue crab, as estimated from the December-March Bay-wide Winter Dredge Survey, is the major determinant of the success of the harvest that immediately follows the Survey results. Figure 1 indicates there is a very strong, significant relationship between bay-wide harvest and juvenile crab abundance, as 74% of the variability in either juvenile abundance or harvest is accounted for by this relationship.

Figure 1: Comparison of juvenile crab abundance and baywide crab harvest, 1990 - 2011.

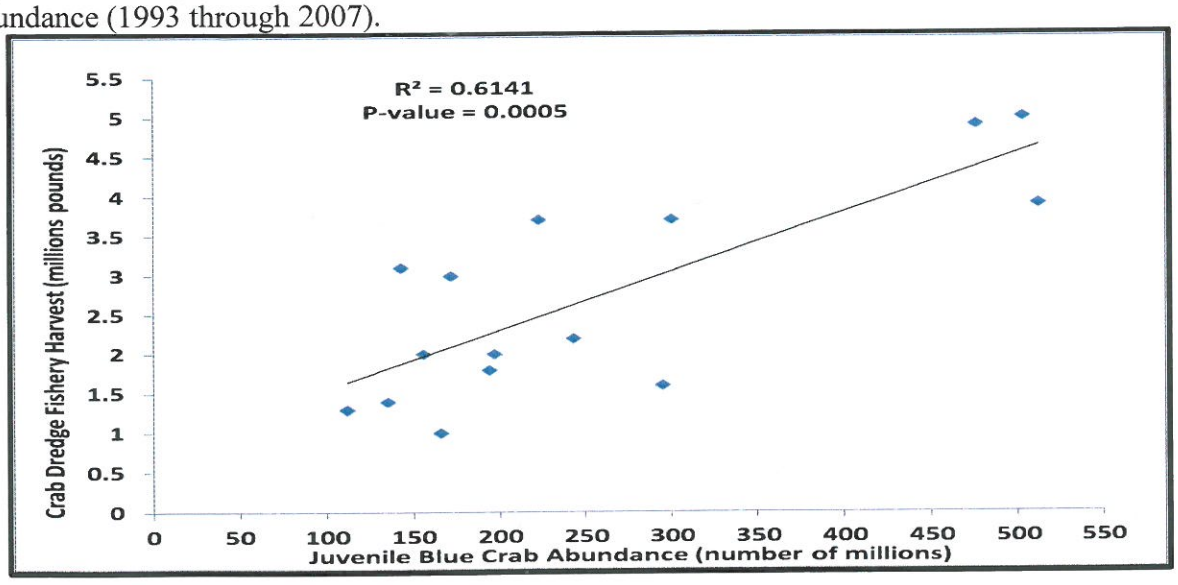


Please note that 2012 data are excluded because the high 2011 – 2012 abundance of juvenile crabs did not recruit strongly to the Virginia crab pot fisheries, by late summer or fall 2012, as compared to other years with high juvenile abundance, as shown below:

Five Highest Juvenile Abundance Survey Year (Year Survey Ended)	Number of Juvenile Crabs in Millions (both sexes)	Chesapeake Bay Harvest August through November
1990	463	25,026,779
1993	503	27,587,369
1996	476	15,948,307
1997	512	15,956,868
2012	581	9,243,655

Dr. Lipcius of VIMS indicates 'that mature female crabs that have overwintered in the lower bay are composed predominantly (over 90%) of females that have either never spawned or that spawned for the first time in the summer/fall'. These females are mostly 1+ ($\geq$ 60 millimeters in carapace width), and the juveniles collected by any current Bay-wide Winter Dredge Survey would be the dominant fraction of that overwintering assemblage of blue crabs and any subsequent harvest of crabs by dredge gear (Figure 2). For this reason, any 'trigger' for a limited opening of the Virginia winter crab dredge fishery should be based on juvenile abundance, as of the previous December-March Bay-wide Winter Dredge Survey.

Figure 2: Comparison of Virginia crab dredge fishery season harvest and juvenile blue crab abundance (1993 through 2007).



Bases for a Management Trigger for The Virginia Crab Dredge Fishery Season::

Table 1 provides the input data for the management trigger design. Three criteria must be met for the trigger to enact a discussion by the Commission on any opening of the winter crab dredge fishery. To establish any crab dredge fishery season, the total abundance, juvenile abundance, and female spawning-age abundance values must be one standard error above the mean of the eligible Winter Dredge Survey samplings. The mean is derived from abundance estimates in those years (of 24, currently) that the percentage of female exploitation fraction was no greater than 29% or approximately midway between the target and threshold exploitation rate (34%).. Once a limited crab dredge fishery season is established, any years when the total abundance, juvenile abundance, and female spawning-age abundance values are less than one standard error above the mean, management measures should be enacted to reduce effort and harvest in the crab dredge fishery. When the total abundance, juvenile abundance, and female spawning-age abundance values are between the upper and lower standard error values, then no management change is recommended.

Virginia Crab Dredge Fishery Season Management Trigger: CBF Alternative Method

The Chesapeake Bay Foundation (CBF) offered an alternative decision-making process for opening the winter crab dredge fishery season. CBF recommended closure of the winter crab dredge fishery season until the adult female (spawning age) blue crab population has reached the target abundance of 215 million crabs for two of the three previous years. The VMRC staff thinks this target of abundance should not solely be the arbiter of an opening of a crab dredge season. Juvenile production in any year is tied more closely to crab dredge harvest (see Figure 2). Given that this target has only been met once, in 25 sampling events, by the Bay-wide Winter Dredge Survey, it is a standard that may prevent any opening of even the limited dredge fishery.

For comparison, based on past data, there is about a 41% probability that the VMRC staff trigger approach can lead to a limited winter dredge fishery season, if future conditions (abundance and exploitation rate) are similar to those during the 10 years highlighted in Table 1. It is reasonable to allow for some exceedance of the target exploitation rate (25.5%), in some years, but, of the 10 years that meet the the VMRC trigger approach, 8 of 10 are associated with exploitation rates under target.

Table 1: Estimated abundance (total, juvenile, and spawning-age females) of blue crabs from the Chesapeake Bay-wide winter dredge survey, annual commercial harvest, and removal rate of female crabs for use in determining a winter crab dredge fishery season management trigger.

Survey Year (Year Survey Ended)	Total Number of Crabs in Millions (All Ages and Both Sexes)	Number of Juvenile Crabs in Millions (both sexes)	Number of spawning age Female crabs in Millions	Bay-wide Commercial Harvest (Millions of Pounds)	Percentage of Female Crabs Harvested (female exploitation fraction)
1990	791	463	117	96	44
1991	828	356	227	90	34
1992	367	105	167	53	60
1993	852	503	177	107	35
1994	487	295	102	77	**28**
1995	487	300	80	72	32
1996	661	476	108	69	**20**
1997	680	512	93	77	**22**
1998	353	166	106	56	40
1999	308	223	53	62	37
2000	281	135	93	49	43
2001	254	156	61	47	42
2002	315	194	55	50	34
2003	334	172	84	47	33
2004	270	143	82	48	42
2005	400	243	110	54	**24**
2006	313	197	85	49	**29**
2007	251	112	89	43	35
2008	293	166	91	49	**24**
2009	396	171	162	54	**23**
2010	663	340	246	85	**18**
2011	452	204	191	67	**24**
2012	765	581	95	56	**10**
2013	300	111	147		

	Total Number of Crabs in Millions (All Ages and Both Sexes)	Number of Juvenile Crabs in Millions (both sexes)	Number of spawning age Female crabs in Millions	
Mean + One S.E.*	**564**	**367**	**145**	**Liberalize crab management when all three indices are above mean plus one standard error**
Mean*	**511**	**319**	**128**	**No recommended crab management changes if between upper and lower boundaries of the mean**
Mean - One S.E.*	**458**	**270**	**111**	**Crab management reductions if all three indices are below the mean minus one standard error**

*** Based on years with a female exploitation fraction of 29% or less (years are highlighted in table)**