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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: October 2, 2008

TO: Council and Patricia Kurkul, Regional Administrator

FROM: Scallop Plan Development Team (PDT)

SUBJECT: **Updated exploitable biomass estimates for Elephant Trunk Area (ETA) and Delmarva access areas**

A rulemaking procedure was adopted under Framework 19 that gives the Regional Administrator the authority to reduce the number of trips that can be taken in the Elephant Trunk Area and/or Delmarva Area if the exploitable biomasses estimated for those areas are considerably lower than originally projected based. A series of biomass triggers were identified in the framework that correspond to lower trip allocations if updated biomass levels using 2008 survey data are lower than anticipated (Table 1). An additional trigger was established for ETA; if the updated estimate of overall fishing mortality is above 0.29 in 2008 then one less trip will be allocated in ETA to prevent overfishing, as well as fewer general category and set-asides.

Any adjustment of the 2009 trips shall be based on all available scientific surveys of scallops. This year three surveys were available and combined into final estimates of biomass for each area. The three surveys include the SMAST video survey, VIMS commercial dredge survey and the federal dredge survey conducted by NEFSC. The PDT met on September 29, 2008 to review the final estimates from each survey as well as the combined estimates. The relevant portion of the PDT meeting summary has been attached for more detailed information about these surveys and estimates (Attachment 1).

Table 1 – Summary of exploitable biomass triggers from FW19 that would reduce the number of 2009 trips

	Elephant Trunk		Delmarva	
FW19 allocation for 2009	3		1	
Biomass thresholds for trips reductions				
	>30,000	No Adjustment	>10,000	No Adjustment
	20,000-29,000	2	<10,000	0
	10,000-19,000	1		
	<10,000	0		

The differences between the estimates from all three surveys are statistically insignificant. In addition, the results from all three surveys were combined using an inverse variance weighted mean to determine if any of the biomass triggers were met. **Overall, the final estimate of exploitable biomass for ETA is 32,102 mt. (2,102 mt above the threshold of 30,000 mt). The final estimate**

for Delmarva is 11,130 mt. (907 mt above the 10,000 mt threshold) (Table 2). Therefore, based on the best available science updated through 2008 using results from three different surveys, the access area allocations for ETA and Delmarva should remain the same in 2009 – no action is required to reduce effort in those areas. In addition, there is no evidence that overfishing is occurring overall for the resource in 2008 to date.

Table 2 – Summary of updated biomass estimates for 2009 (in mt.)

	Elephant Trunk			**Delmarva**		
	Biomass	ExpBio	Std. error	Biomass	ExpBio	Std. error
FW19 projected	46327	42246		15901	13146	
Threshold		**30000**			**10000**	
NEFSC	48539	36621	4947	10758	7166	3329
NEFSC – extend	50941	39565	5114	12008	7696	2632
SMAST	33545	23571	5468	17873	10779	1722
VIMS	N/A	N/A	N/A		11966	1167
IVW mean	**42824**	**32102**	**3735**		**11130**	**907**
Diff from threshold		*+2102*			*+1130*	

Scallop PDT Meeting

September 29, 2008
Gloucester, MA

PDT members in attendance: Erin Kupcha, Dvora Hart, Pete Christopher, Lynn Lankshear, Kevin Kelly, Sarah Pautzke, Deirdre Boelke, Cate O'Keefe, Demet Haksever, Bill DuPaul, and Rula Deisher.

About 10 audience members were present.

Meeting agenda included: updated biomass estimates for Delmarva and Elephant Trunk access areas (presentations by SMAST, VIMS and NEFSC) and discussion of ACL structure and alternatives for Amendment 15.

Updated biomass estimates for Delmarva and Elephant Trunk

Framework 19 included a provision that gives the Regional Administrator the authority to reduce the number of Elephant Trunk and/or Delmarva access area trips if the biomass is considerably less than projected. NMFS shall reduce the number of trips using the specifications described in Table 1 below provided that an updated biomass estimate is available with sufficient time. In addition, the number of Elephant Trunk trips can be reduced if overfishing of the resource is expected to occur. The adjustment of the 2009 trips shall be based on all available scientific surveys of scallops. This year three surveys were considered and combined into one final estimate of biomass (SMAST, VIMS and the federal dredge survey conducted by NEFSC).

The biomass thresholds for Elephant Trunk and Delmarva are described in the table below. Each survey had a different estimate of biomass and standard error for each access area based on the number of stations and how robust the estimate was. **The results from all three surveys were combined and the final estimates for both areas came in above the thresholds, so no action is warranted at this time (Table 2). In addition, the differences between the surveys are statistically insignificant.**

Table 1 – Summary of exploitable biomass triggers (in mt.) from FW19 that would reduce the number of 2009 trips

	Elephant Trunk		Delmarva	
FW19 allocation for 2009	3		1	
Biomass thresholds for trips reductions				
	>30,000	No Adjustment	>10,000	No Adjustment
	20,000-29,000	2	<10,000	0
	10,000-19,000	1		
	<10,000	0		

SMAST

Ms. Cate O'Keefe with SMAST presented the updated biomass estimates for Delmarva, Elephant Trunk and Closed Area II based on 2008 data from the SMAST video survey. She explained that the survey program was very successful this year and completed all stations on 4 trips to GB and 2 trips in the Mid-Atlantic. SMAST has added a digital still camera with higher resolution to help identify smaller scallops. In addition, the SMAST survey has stations outside the NEFSC survey strata. From those stations it was noted that an estimated 12 million pounds of scallop biomass are in the areas outside access areas, closed areas and survey strata on GB and the MA (see Figure 1). There was a question from the audience about specifically where the majority of the 12 million pounds were distributed; SMAST reported after the meeting that the majority (about 9 million pounds) was to the west of the Hudson Canyon and Elephant Trunk areas. The PDT discussed the stations to the south in the previous Virginia Beach access area. Several speakers agreed that small scallops do show up in that area from time to time, but they do not seem to survive. Ms. O'Keefe also summarized the results for CA2 access area since that area will open in 2009. The highest densities are in the eastern part of that access area, and they estimate about 20 million pounds of total biomass, so there should be enough to support one trip in 2009. There is high density but the meat weights are lower in some areas.

SMAST presented several different values for exploitable biomass estimates based on various equations that have been used over the years. Different equations are used to adjust estimates for parameters like: different shell height: meat weight ratios at different depths, dredge efficiency and selectivity, and size of scallops that are considered exploitable (i.e. >80mm). The recent stock assessment approved use of new parameters based on research results. Ultimately, it was decided that the regional SH:MW equation should be used with no depth adjustment. Since the SAMS model used to generate the original biomass estimates in FW19 projects a biomass by area (not station); and it would not be appropriate to average depth over an entire area, the depth adjustment should not be used. It was explained that in order to use the depth adjusted equation, the depth would have to be factored in by station, not averaged for the entire access area. It was requested that the area specific non-depth adjusted SH:MW ratios be provided to the PDT for all 15 areas used in the SAMS model for future biomass estimate updates.

The final estimates from SMAST are 23,571 mt. for Elephant Trunk and 10,779 mt. for Delmarva (Table 2). The value for ET is below the threshold suggesting that based on this survey alone, the number of trips should be reduced from three to two in 2009. The trigger of 10,000 was not met for Delmarva, but Ms. O'Keefe commented that their estimate is only slightly above the trigger; therefore considering a reduction may be justified. The PDT discussed that before the estimates were discussed in terms of the triggers the results from all three surveys should be reviewed first since they will likely be combined.

VIMS

Dr. William DuPaul reviewed the updated biomass estimates for Delmarva and Closed Area II, the two areas that group was funded to survey (both areas open in 2009 in addition to ETA). VIMS conducts a dredge survey with both a commercial dredge and a survey dredge. They also collected data on YT bycatch so will be providing a ratio of scallop catch to YT catch along with the location of YT catch. The PDT is interested in using this information in FW21 and supports

getting this info out to the industry directly for the 2009 opening. If areas with high YT bycatch rates within the access areas are known, perhaps those areas could be avoided voluntarily by the fleet. The scallops are concentrated in deeper waters in CA2 VIMS plans to do more research on scallop health and condition as well. Dr. DuPaul added that the condition of large scallops in CA2 is very good and a June 15 opening should work well in terms of meat yields.

Overall, the VIMS survey found that most scallops are in deeper waters in both areas (Delmarva and CA2). Both areas have sufficient biomass to support one trip in 2009 based on updated estimates from VIMS alone. They estimate a total exploitable biomass of 10,240 mt. for the survey dredge and 11,966 mt. for the commercial dredge (Table 2). The PDT discussed that the results from the survey dredge could be used, but then a selectivity curve would have to be applied, so it may be more appropriate to use the results from the commercial dredge, rather than averaging the two. The PDT then discussed that these values are relatively close to the 10,000 trigger; should there be concern. However, Dr. DuPaul responded that these estimates use a high dredge efficiency value of 60%, so the result is a conservative estimate of biomass. The true biomass is probably higher so he is not concerned that the biomass is just above the threshold. Also, there is recruitment in Delmarva so it would be beneficial to get the larger scallops out of that area before the small scallops are susceptible to fishing gear (Figure 2). However, the PDT did discuss that it may be problematic in 2010 to allocate even 1 trip in Delmarva because biomass levels will decline as a result of the 2009 opening. The small scallops found in the area during the 2008 survey may not make up the difference as they grow into 2010 when they would be recruited to the gear. It was noted that the potential increase in yield from this closure was likely inhibited by fishing activity that took place in this area before it closed in 2007.

NEFSC

Dr. Hart presented an overview of the 2008 federal dredge survey. It was conducted on a new vessel, R/V Sharp. Based on limited calibration data (44 stations in CA1) there is no statistical evidence that the vessels fish differently. Overall, modest increase in survey biomass in 2008 compared to 2007. Large amount of scallops in CAII, especially HAPC area. Most biomass in Mid-Atlantic in ETA and DMV. Good signs of recruitment in GB (northern edge of HAPC), as well as good recruitment in MA (mostly in Delmarva and some in ETA). There was substantial recruitment in the channel as well; something the Council should keep in mind for FW21 as a potential rotational area on GB. About one hundred paired stations with Habcam were completed this year. Preliminary biomass results using Habcam were looked at for ETA and Delmarva, but will not be included in this process until how that data source can be integrated is peer reviewed.

The NEFSC has expanded their survey to include more stations to the west in both the ETA and Delmarva area. Therefore, two estimates are provided with NEFSC data, one with stations from the original survey strata and one estimate with the additional survey stations. Dr. Hart has calculated what the NEFSC estimate would be combined with HabCam data, but those results will not be used in this estimate. The PDT discussed that the extended area would be the most appropriate estimate to use for this action. The 2008 exploitable biomass estimate for the extended area is 39,565 mt. for ETA and 7,696 mt. for Delmarva (Table 2).

COMBINED

The traditional way to combine results from different surveys is not to simply average them; instead, they are combined and weighted by the standard error or variance associated with each estimate. This approach is called the inverse variance weighted mean, or IVW mean. This calculation gives greater weight to more precise estimates (which have smaller variances) than those with less precision. Among all weighted means of the estimates, it is the one which has the smallest variance and hence greatest precision. For this reason, it is the accepted method for combining multiple independent estimates. For example, the VIMS survey had about 100 stations in Delmarva so the variance of that estimate is low because the sampling size was high; therefore, that estimate dominates the overall estimate when combined with the results from NEFSC and SMAST surveys. Table 2 summarizes the individual and combined results for the various surveys.

Overall, the final estimate of exploitable biomass for ETA is 32,102 mt. (2,102 mt above the threshold of 30,000 mt). The final estimate for Delmarva is 11,130 mt. (907 mt above the 10,000 mt threshold) (Table 2). Therefore, based on the best available science updated through 2008 using three different surveys the access area allocations for ETA and Delmarva should remain the same in 2009 – no action is required to reduce effort.

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Figure 1 – Overlap of SMAST stations (dots) and NEFSC survey strata outside of access areas (Source:SMAST)

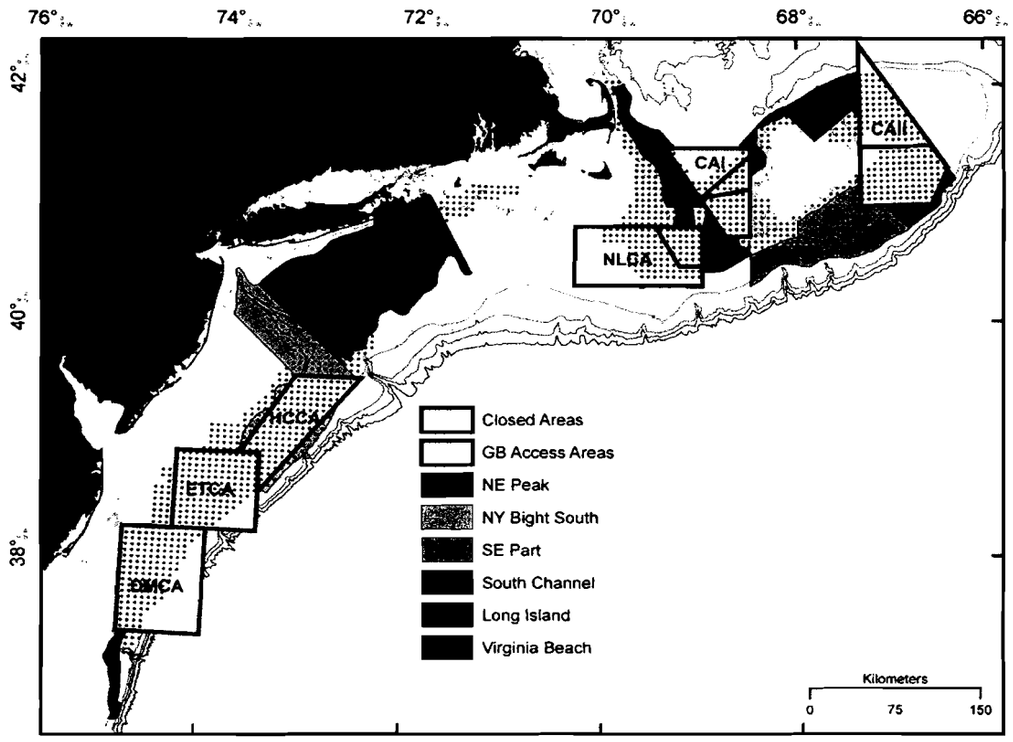

Figure 2 – Proportion of total catch by shell height for Delmarva in 2008 for both the commercial dredge and survey dredge survey conducted by VIMS (Source: VIMS)