Scallop Survey Group Call

Wednesday, August 18, 2021

Follow-ups and upcoming meetings.

Attendance: Jonathon Peros (Council Staff), Kevin Stokesbury & Kyle Cassidy (SMAST), Dave Rudders & Sally Roman (VIMS), Tasha O'Hara, Lusia Garcia, Liese Siemann (Coonamessett Farm Foundation), Dvora Hart & Jui-Han Chang (NEFSC), Amber Lisi (ME DMR), Cameron Hodgdon and Claire Ober (UMaine).

Upcoming Meetings and Key Milestones:

1. August 18, 2021 – Survey short reports distributed
2. August 27, 2021 - Survey Short Reports due by close of business
3. August 31, 2021 – Survey Presentations due by close of business
4. Wednesday, September 1, 2021 - First PDT Data Meeting – 10am start
5. Thursday, September 2, 2021 - Second PDT Data Meeting – 1pm start
6. Wednesday, September 8, 2021 - Third PDT Data Meeting – 9am start
7. September 21 & 22, 2021 – PDT/AP and Committee Meetings (webinars)
8. Council Meeting - September 28 - 30, 2021
9. SSC Meeting - Wednesday, October 13

Follow-ups from August 18, 2021 Call

1. Circulate survey short report templates (Jonathon). NOTE: There will be one for GB/MA and another for the GOM.
2. Follow-up with ME DMR/UMaine, SMAST, and NEFSC re: post-stratifying the survey data from southern Stellwagen (non-NGOM) to be able to compare the two estimates. The groups will discuss the biomass estimates from these areas. The decision to post-stratify would suggest this group thinks that the data should be considered as part of the 2022 projections. (Jonathon)
3. Council staff adjusted to the survey short report to allow for a comparison of GSC data broken out between 3 areas (North, Middle, South), and the original GSC area. (Complete – see short report template).
4. NEFSC (dredge) and SMAST (Drop camera) provide estimates for the GSC in three parts and for the original area. (SMAST complete)
5. General interest re: survey strata and SAMS areas.
    a. Discussion about multiple non-contiguous pieces of the MAB nearshore and NYB inshore. SAMS areas in the Mid-Atlantic are being evaluated as part of the survey re-stratification process being led by the NEFSC (Paul Rago contractor on this project).
    b. There are no survey strata in the NGOM, trying to move in that direction so that we have defined survey areas/SAMS areas for generating estimates for management in the future. Primary focus of survey restratification is GB and the MA, but may be able to include GOM in this work by Paul Rago. SSWG is the best place to discuss this topic in the immediate future.

   c. No action needed.
6. Ideas for FW34 Specifications process to discuss with PDT:
   a. NLS-West Closure. VIMS, SMAST and NEFSC all saw small scallops there. Discuss if a closure is warranted. Council staff bring up at PDT.
   b. The highest density seed area found in CFF's 2021 survey was in the northeastern portion of the NLS-South. Average densities in high abundance seed areas in northeastern NLS-South were ~15/m2, with ~30/m2 in small 15 min long section. There were a few images with 30-100 seed per image. Tasha share general area of where seed was observed with other survey groups and Council staff. CFF discuss in short report. CFF planned to share photos with other groups.
   c. Consider a possible closure in the 'gully' in the MAB to improve YPR and enhance odds of source-sink dynamics between this area and the Elephant Trunk. Survey groups invited to consider an area as a place to begin this discussion.
   d. Positive reports from surveys for the southeast parts of Georges Bank. If survey groups feel that re-stratification of a SAMS area is appropriate, they were asked to suggest the area and provide rationale.
7. SH/MW for Stellwagen Bank: ME DMR/UMaine working on a SH/MW relationship from their 2021 data. Preparing a GLM model with no covariates and a GLM model with depth and latitude as covariates. Once the model is complete they will send to NEFSC, Council staff, and SMAST.
   a. SMAST agreed to use the updated model as a sensitivity for their Stellwagen Bank biomass estimates.

Scallop Survey Group – Data Prep Information

Tuesday, August 3, 2021 – Version 2 – Updates in red made on 8/13/2021
8/18/21 - Call Notes Shown in Blue

Recipients: Jonathon Peros & Sam Asci (Council Staff), Kevin Stokesbury & Kyle Cassidy (SMAST), Dr. Dave Rudders & Sally Roman (VIMS), Dr. Liese Siemann and Tasha O'Hara (Coonamessett Farm Foundation), Dr. Dvora Hart & Dr. Jui-Han Chang (NEFSC), Amber Lisi (ME DMR), Ryan Silva (GARFO – SFD – RSA)

Files can be accessed at this link.

Requests/homework for Survey Groups:

1. Provide survey data to NEFSC and Council staff by August 16, 2021.
    a. Complete. Thank you!
    b. NEFSC has the data.
2. Participate in a survey partner call on August 18, 2021. TODAY.
3. Survey short reports are due by COB Friday, August 27, 2021.
    a. Discuss SAMS areas and SH/MW before finalizing tables of areas in the short report.
4. Prepare a roughly 20-minute presentation for the PDT summarizing survey results and send to Council staff ahead of the PDT survey data meeting.

Meeting Outlook

10. Participate in a survey partner call on August 18, 2021.
11. First PDT Data Meeting - Wednesday, September 1 (webinar morning - 10am start)
    a. Presentations due COB on August 31, 2021.
12. Second PDT Data Meeting - Thursday, September 2 (webinar)
13. Third PDT Data Meeting - Wednesday, September 8 (webinar – morning))
14. Everyone should have a meeting invite to the three PDT calls in early September.
15. Scallop AP and Committee Meetings – September 21 & 22, 2020 (webinar)
16. Council Meeting - September 28th - 30th
17. SSC Meeting - Wednesday, October 13

Key Points:

1. **Data Delivery:**
    a. The deadline for ALL data (Georges Bank, Mid-Atlantic, and Gulf of Maine) is August 16, 2021. Data from the NGOM will be used in calculations of the OFL, ABC, and ACL, in addition to the NGOM TAL, so it is imperative that all information is available as we begin the specifications process.
    b. The minimum shell-height cutoff for abundance and biomass estimates will continue to be 40mm.
2. **2021 Survey Short Reports:** The survey short report is due to Council staff by COB Friday, August 27, 2021.
    a. The template will be updated with the 2021 SAMS areas and will shared with all survey partners. We should have this over to you next week.

b. For survey abundance and biomass estimates, a minimum shell-height cutoff at 40 mm will be used to provide consistency in what is being presented. The smallest scallops that are modeled in the SAMS model are 40mm.

3. **Presentations for the September 1, PDT meeting:** should be ~20 minutes, with 5-10 minutes for questions. Send presentations to Council staff before the meeting (due COB August 31, 2021), we will click through your slides for you. The meeting is expected to start at 10am.
    a. Survey presentations to start the discussions. Order of presentations:
        1. VIMS (Sally)
        2. SMAST (Kyle)
        3. CFF (Tasha) – Note: CFF will be presenting separate biomass calculations from HabCam data. These estimates will be used to help interpret biomass estimates.
        4. ME DMR/UMaine – (Amber/Cameron)
        5. NEFSC (Dvora) – Present data from Center survey, and combined survey estimates. The combined survey estimates (dredge, drop camera, HabCam) will use the HabCam biomass calculations from the NEFSC.
4. ~~New~~ **SAMS areas and NGOM Stellwagen Area:**
    a. The GSC will be split into three areas this year because of a discrepancy in survey coverage. New SAMS areas and a map of the HabCam coverage can be found at this link. There is full coverage of the area for the dredge and drop camera, but HabCam missed the "middle" part of the area, so we now have "North", "Middle" and "South". The PDT will develop combined estimates for each part of the GSC.
        i. Council staff have requested that SMAST and the NEFSC prepare estimates of abundance and biomass for the entire GSC SAMS area. The PDT and survey partners should compare the results of area wide estimates with the results of three smaller areas, and consider the trade-offs associated with splitting the area into 3 parts.
        ii. This is an area where we should think about how to present the data in the short reports. Having 4 different GSC areas will be confusing. Staff can try to work on this.
            1. Side by side comparison in the document.
    b. DMR and SMAST have agreed to provide an estimate from the same area of Stellwagen Bank in the NGOM. Their survey domains did not match, and the Council needs an estimate from the same area to be able to compare and average the two. This is explained in more detail below, and the shp file is available using the link above.
        i. No comments – can compare these two estimates.
        ii. Amber shared the survey grid, which was updated from the original survey grid.
        iii. Any thoughts about the biomass south of 42'20 (the southern Stellwagen Bank area)
            1. Follow-up correspondence with DMR/UMaine, SMAST, NEFSC about the area that is not a SAMS area but was surveyed. (JMP)
    c. Looking to have a discussion about the rationale/genesis of the SAMS areas in the MAB. Is there a reason why the three parts of NYB and the two parts of MAB-Nearshore aren't either their own SAMS areas or merged with the neighboring SAMS areas?

i. The inshore NYB was not always surveyed by the dredge. After some fishing activity.
ii. Standard index does not include this area. For that reason, separated the inshore area
iii. MAB nearshore is two pieces. Two separate areas that are not contiguous and are all labeled the same way.
iv. Is there another way that we can do this?
1. Expecting some changes to this with the restratification.

d. Anything in the data we have that would suggest a change to the SAMS areas? Examples would be a large set of 1-2yo scallops. Source/sink closure in NYB/HCS area?
i. New closure: NLS-West. Surveys did see small scallops there. VIMS, SMAST and NEFSC all saw small scallops there. Not much fishing there – consider closing the entire area.
ii. CFF – Very small seed scallops in the most northeastern portion of the NLS-S-Deep. Saw some in the CAII too. Settlement on bryozoan in two areas. Northeastern NLS-S-D highest density seed area found in CFF's 2021 survey. Average densities in high abundance seed areas in northeastern NLS-S-D ~15/m^2, with ~30/m^2 in small 15 min long section. Few images with 30-100 seed per image.
1. FOLLOW-UP:
a. CFF mention in the short report. (others too if you saw them)
b. CFF identify general area and share with SMAST and VIMS.
i. Polygon for the other groups.
c. CFF share the photos (maybe put one in the short report too).
iii. DR: Take a hard look around the gully in the MAB, multiple YCs, possible closures.
1. VIMS – put together some thoughts.
iv. DR – VIMS: CAII, southeast parts. Candidate for restratification.
1. Anyone who wants to comment in the short reports.

5. SH/MW Equations:

a. Bottom line, no changes from last year. See Table 4 for which SH/MW to use for each SAMS area.
b. For Georges Bank and the Mid-Atlantic, we will continue to use the SH/MW equations from SARC 65, which are provided on page 4.
c. For the NLS-S area, we will use the special SH/MW equation from SARC 65. Council staff have also asked VIMS to develop an area specific SH/MW equation for the NLS-S (see #6).
d. For the NGOM and GOM area, we will use the Hart 2020 SH/MW equation that is provided below. SMAST provided this equation in excel form as well.
i. Maine DMR/UMaine are preparing a SH/MW estimate for 2021 using data from their recent dredge survey. They will be providing estimates using both the Hart 2020 estimate, and the DMR/UMaine 2021 estimate. The group may wish to consider using the a SH/MW relationship based on the most recent dredge data.
1. ME DMR – Cameron agreed to update with a GLM model.
a. GLM
b. GLM with depth and latitude covariates

i. **Consistent with approaches being used by the PDT, and in SARC 65.**
ii. **DMR send the equation to SMAST, SMAST will produce another estimate.**

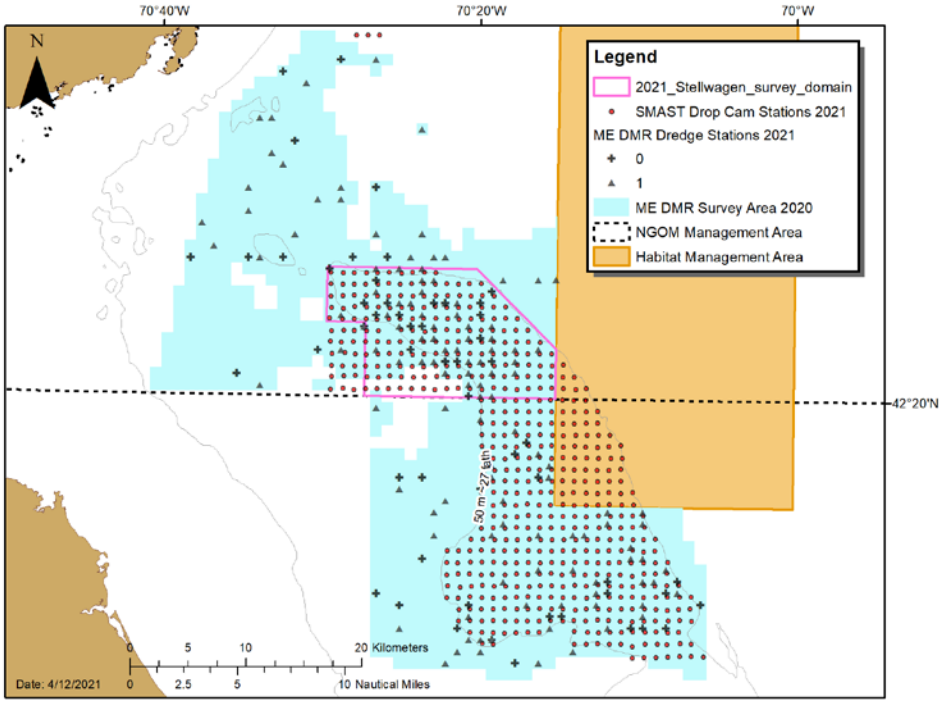
ii. The SMAST survey covered Jeffrey's Ledge, Platts Bank, and Ipswich Bay (in addition to Stellwagen). Consider appropriate SH/MW for those areas if there is interest in using the 2021 DMR/UMaine data for Stellwagen.

1. The Hart 2020 estimate.

6. **SH/MW Sensitivity Analyses for NLS-South:** VIMS agreed to update the SH/MW analyses that they have provided to the PDT in the past for all areas of the NLS region. We are most interested in NLS-South for FY2022. Survey groups should provide a comparison of NLS-S biomass estimates using SARC 65 and VIMS 2016-2021 SH/MW estimates for the upcoming meeting on August 18, 2021. (See Table 4). This data will be provided in a new table in the survey short report.
7. **Dredge efficiency** in high density areas may be an issue again this year in the NLS-South. VIMS agreed to provide this sensitivity analyses (i.e., efficiency reduced by 0.3) in their short report.

Estimating Abundance and Biomass for Stellwagen Bank in the NGOM

1. The Council/PDT need estimates from the *same area of Stellwagen Bank inside the NGOM* from both survey groups (SMAST and ME DMR/UMaine). The process for combining estimates will be the same as we use for the rest of the resource when we have multiple surveys for the same area. We will be taking an average of the available data, which will be used in the forward projection.
2. We are looking for ME DMR/UMaine and SMAST to provide estimates of abundance, biomass, SE, mean meat weight, average shell height, and density for the area outlined in pink below (these are all of the fields in the survey short report). Sam Asci has circulated the shape file with these boundaries to both survey groups. This area was informed by the 2019 and 2020 surveys of Stellwagen, several years of VMS data, and is where the majority of fishing in the NGOM is likely to take place in FY2022. SMAST, DMR, NEFSC, and Council staff discussed this area in April of 2021.



a.

3. Survey groups can **post-stratify to generate an estimate for the area in pink.** The same goes for your coverage south of 42 20' (if needed). While it is not ideal to post-stratify, we do this in other parts of the resource when SAMS areas change. The PDT can discuss variance estimates in the fall when we review the data. From the first survey group call on April 1, it was clear that aligning the drop camera and the dredge after the fact was not going to involve or require a statistical approach.
4. In earlier discussions we decided to wait to see how much biomass was estimated in the open areas of Stellwagen Bank south of 42'20 (and outside of the WGOM closure). If we have an indication of the biomass in this area, we can discuss requesting SMAST and ME DMR/UMaine to develop an estimate from a common area.
    a. Follow up – see above.
5. We don't have set survey strata in the NGOM, but we are trying to move in that direction so that we have defined survey areas/SAMS areas for generating estimates for management in the future.
    a. First order of business will be MA and GB.
    b. This would be in addition to that work.
    c. SSWG – circle back.

Shell-heigh meat-weight for 2021 biomass estimates

SARC 65 SH/MW Equations (Same from 2018, 2019, 2020): The SARC 65 benchmark assessment developed shell-height to meat-weight equations for the Mid-Atlantic and Georges Bank, as well as a separate equation for the slow-growing scallops in the deep water of the Nantucket Lightship area ("Peter Pan scallops", along the 70 meter depth contour).

Survey groups should develop biomass estimates using following the SARC 65 questions:

- NLS-South: For the potion of the Nantucket Lightship South Access Area, survey groups should use the following equation:

$$W=\exp(-11.84 + 3.167*\ln(\text{shell height}))$$

- Georges Bank and the Mid-Atlantic—Survey groups should use the following equations worked up by Dr. Dave Bethoney and Sally Roman for the rest of Georges Bank and the Mid-Atlantic:

  Mid-Atlantic:

  W = exp(-9.48 + 2.51*ln(shell height) + -0.1743 + -0.059094 + -0.0033*depth + 0.021*latitude + -0.031*Clop + 0.00525*(ln(shell height)*21) + -0.000065 *(21*depth))

  Georges Bank:

  W = exp(-6.69 + 2.878*ln(shell height) + -0.0073*depth + -0.073*latitude + 1.28*Clop + -0.25*(ln(shell height)*Clop))

  Mday is 21
  Shell height is in mm
  Depth is in m
  Latitude is in decimal degrees
  Clop covariate is 1 in the former groundfish closed areas or access areas and 0 in the open areas (includes NLS-EXT[1] and CAII-EXT)

Hart 2020 Gulf of Maine SH/MW Equation:

Hart SH/MW equation with covariates:

- New SH/MW equation, based on 2019 dredge survey:

$$W = \exp(-281.91 + 72.42 \ln L - 0.212 \ln D + (71.13 - 18.16 \ln L) \ln h)$$

where h is shell height (mm), L is latitude (deg), D is depth (m), and W is meat weight (g).

Covariates 2019 ME DMR dredge survey (excel formula from SMAST)

[1] Note that the NLS-EXT SAMS area was dissolved into the GSC SAMS area for 2019.

MW = EXP(-281.905+72.415*LN(Counts!$S$2)-(0.212*LN(Counts!$Q$2))+(71.13-(18.16*LN(Counts!$S$2)))*LN(G4))/1000

ADD the ME DMR/UMaine equation, when available.
Dvora – issue with LOG-LOG, inflating sample size, samples at the same station are not independent. Usually doesn't bias estimate, but biases the variance so that variance is underestimated (less serious). More serious, with the LOG-LOG transform, you have to transform it back, and it is biased. DMR/Maine did the LOG-LOG in 2021 to be consistent with what was done in 2019.

Dvora suggests using the mixed GLM. Log-Link and a GAMM.

VIMS 2016 – 2021 SH/MW Equation for NLS-South:
Survey groups should also use finer-scale SH/MW parameters provided by VIMS to develop biomass estimates in the Nantucket Lightship South. A full SH/MW analysis of the Nantucket Lightship has been included on the OneDrive site. Here is the equation you can use for the sensitivity.

For the NLS-South
W=exp(-22.64+(2.87*ln(shellheight))+(-0.23*ln(depth)+(0.33*latitude)+ -0.24)

Biomass Estimates for Short Reports/September 1, 2021 PDT Meeting:

- **Comparison of biomass estimates in the NLS-South.** Prepare two sets of biomass estimates for all Nantucket Lightship areas using the SARC 65 and VIMS 2016-2020 SH/MW parameters as a sensitivity analysis:

Table 1 - Estimation areas in the Nantucket Lightship using SARC 65 and VIMS 2016 - 2021 data.

	SARC 65 special equation	
NLS-South-Deep	Note: use specific equation, which is provided above.	

- **SH/MW in the survey short report:** survey groups should report estimates using the SARC 65 SH/MW equations for all areas, and the specific equation for the NLS-South. See Table 4. The PDT will discuss the biomass and abundance estimates, and make a decision as a group about which SH/MW parameters are appropriate to use for determining final 2021 estimates.

Table 2 - SH./MW equations to be used in the survey short report.

GB	SHMW equation for the short report	Sensitivity
CL1-Access	SARC 65	
CL1-Sliver	SARC 65	
CL1-South	SARC 65	
CL2-North	SARC 65	
CL2-Southeast	SARC 65	
CLS-Southwest	SARC 65	
CL2-Ext	SARC 65	
NLS-North	SARC 65	
NLS-South	SARC 65 specific equation	VIMS 16-21 SH/MW
NLS-West	SARC 65	
NF	SARC 65	
GSC (entire area)	SARC 65	
GSC-North	SARC 65	
GSC-Middle	SARC 65	
GSC-South	SARC 65	
SF	SARC 65	
MidAtlantic		
BI	SARC 65	
LI	SARC 65	
NYB	SARC 65	
MAB-Nearshore	SARC 65	
HCS	SARC 65	
ET Open	SARC 65	
ET Flex	SARC 65	
DMV	SARC 65	
Gulf of Maine		
Stellwagen – NGOM – Agreed to Area	Hart 2020	DMR 2021 - GLM
Ipswich - NGOM	Hart 2020	
Ipswich – MA State	Hart 2020	
Jeffreys - NGOM	Hart 2020	
Platts - NGOM	Hart 2020	
GOM – South 42 20’	Hart 2020	
WGOM Closure	Hart 2020	

Dredge Efficiency in High Density Areas:

While the NLS-S is getting fished, there is potential for continued divergence in dredge and optical estimates in high-density areas of the Nantucket Lightship (i.e. NLS-S-Deep) Conducting a sensitivity by adjusting dredge efficiency by factor of 3 (SARC 65) would be a reasonable starting point for this discussion. VIMS agreed to provide this sensitivity in their short report using a reduced dredge efficiency of 0.13. No new analyses related to dredge efficiency are expected at the upcoming PDT meeting. Council staff will work with VIMS to determine if the sensitivity can be completed by the August 18, 2020 survey group meeting.

NORTHERN STELLWAGEN

[Dredge surveys – compare biomass estimates in high density areas using a reduced dredge efficiency]

	No adjustment		Reduced efficiency (*0.13)	
	NumMill	BiomassMT	NumMill	BiomassMT
NLS-South **Alternative q in that area? Look at the density and biomass estimates.**				
Other areas of concern? **NSB – DMR analysis.** **-Sensitivity.** **(setup a call with Amber)**				

Potential for follow-up discussion at the PDT.

1. **Recruitment:** Preliminary reports suggest some recruitment was observed in 2020. Interest in following up on these observations in 2021:
    a. **Seed in the Mid-Atlantic:** CFF and VIMS reported seeing seed in the Long Island and New York Bight SAMS area. Seed reported near the Texas Tower in the LI SAMS area. The PDT has discussed looking into protecting aggregations of smaller scallops in these areas for 2022.
    b. **Southeast Parts and Southern Flank:** CFF and VIMS reported observing recruitment in their 2020 surveys, with high densities of small scallops in the eastern part of Closed Area II access area that is currently open to fishing.
    c. **Nantucket Lightship West:** From the 2021 surveys, reports of some seed in this area from dredge and HabCam surveys.
2. **Source/Sink**
    a. **Discussion at PDT about closing areas in the NYB/HCS region.** Hart paper that was presented at the RSA Share Day.
    b. **WGOM Closure Area.** Something to continue to track. SMAST has at least 2 years of data in there. Linkages to other parts of the resource?
        i. **Cashes Ledge Closed Area.**
        ii. **Dvora – Increase in the GOM lately has not been due to climate change. Rotational closures in state waters and long-term closures in federal waters. Management can consider this. Cause/effect in these areas.**
3. **Other thoughts?**