New England Fishery Management Council
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MEETING SUMMARY
Scallop PDT
J. Erik Jonsson Center, Woods Hole, MA
August 27th-28th, 2019

The Scallop PDT met on August 27th and 28th, 2019 in Woods Hole, MA to: *DAY 1*—(1) review 2019 scallop survey results, (2) discuss survey results and data treatment, (3) review relevant data for developing 2020/2021 specifications, (4) discuss next steps for FW32 specifications and timing, (5) discuss modeling decisions and the outlook for 2020/2021; *DAY 2*—(6) review follow-up analyses from Day 1, (7) review and discuss 2019 Gulf of Maine survey results, (8) review Amendment 21 options for Committee to consider, (9) discuss recommendations for 2020 Council priorities for the Scallop FMP, and (10) discuss any other business.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. David Rudders, Dr. Dvora Hart, Dr. Naresh Pradhan, Dr. Bill DuPaul, Danielle Palmer (on webinar), Dr. Rachel Feeney, Dr. Cate O'Keefe, Tim Cardiasmenos, Chad Keith, Mike Kersula, Travis Ford, and Dr. Dave Bethoney. Vincent Balzano, Chair of the Scallop Committee attended day 2 of the meeting, along with representatives of each survey group. There were approximately 26 members of the public present on Day 1 and approximately 20 on Day 2.

MEETING MATERIALS:
Doc.1) Meeting Agenda; *Scallop Survey Results—Short Reports*: Doc.2a) VIMS, Doc.2b) SMAST, Doc.2c) CFF, Doc.2d) NEFSC HabCam, Doc.2d2) NEFSC Dredge, Doc.2e) Maine DMR/UMaine Dredge Survey (GOM); Doc.3) Draft preliminary combined biomass estimates for 2019; *Information on Survey Data Treatment*: Doc.4a) VIMS SH/MW Analysis for NLS survey areas, Doc.4b) Recap of survey group call, August 20, 2019; Doc.5) Amendment 21 Discussion Document; Doc.6) Potential 2020 Scallop Work Priorities.

PRESENTATIONS:
Scallop Survey Presentations: P1.a) VIMS, P1.b) SMAST, P1.c) CFF, P1.d) NEFSC, P1.e) UMaine/ME DMR; P3) VIMS Nematode Update; P4) GMRI/MCFA NGOM EM Presentation; P5) NEFSC Observer Data Presentation; P6) CFF Update on Meat Quality in CAII.

BACKGROUND AND SUPPORTING INFORMATION:
B1) Scallop VMS data by SAMS area; B2) LPUE and landings/price data by market grade; B3) PDT memo to SSC re: FW30 OFL and ABC, October 4, 2018; B4) Projected Exploitable Biomass for FY 2019 and 2020 from FW30; B5) SARC 65 – Appendix 2: Shell Height/Meat

Weight Equations; B6) SARC 65 Assessment Summary Report; and B7) Final PDT Meeting Summary, July 24, 2019.

KEY OUTCOMES:

- The PDT reviewed the results of 2019 scallop surveys and began an initial discussion of potential 2020/2021 specifications.
    - After four years of unremarkable recruitment, the 2019 surveys observed recruitment on eastern Georges Bank, particularly in Closed Area II. Surveys in the Gulf of Maine also detected a strong recruitment event on Stellwagen Bank.
    - Surveys suggest high total mortality in the NLS-W, and much lower biomass than was projected in 2019 (~50 million lbs of meat weight less).

- The PDT recommended using shell-height meat-weight (SHMW) parameter estimates from SARC 65 for all SAMS areas, except the NLS-S-shallow, NLS-S-deep, NLS-W, and NLS-N. In these areas, the PDT recommends using SHMW parameters developed using data from the 2016-2019 VIMS survey to more accurately characterize the biomass in the Nantucket Lightship region.
- The PDT noted divergence in survey estimates in Closed Area II Access Area, the Hudson Canyon area, Elephant Trunk Flex, and the Nantucket Lightship West and Nantucket Lightship South-deep. VIMS, SMAST, CFF, and the NEFSC all agreed to work on subsequent analyses.
- The group discussed ways to approach the development of alternatives in Amendment 21.

The meeting began at 10:14 am. Council staff welcomed the PDT and members of the audience to the meeting and reviewed agenda items for the two-day meeting.

Review of 2019 Scallop Survey Results

VIMS Dredge Survey of the Mid-Atlantic, NLS, CAI, and CAII

Sally Roman presented relevant information and key findings regarding the 2019 VIMS dredge survey of the Mid-Atlantic Bight (MAB), Nantucket Lightship (NLS), Closed Area I (CAI), and Closed Area II (CAII):

- The MAB survey domain has remained consistent since 2015 and a total of 450 dredge stations were completed in the MAB in 2019. 200 dredge stations were completed in the CAI and CAII survey domain and 135 dredge stations were completed in the NLS. The NLS-extension was dropped from the survey domain for 2019 and five additional survey stations were added in the NLS-West.
- Area swept biomass estimates were derived for each SAMS area using Yochum and DuPaul (2008) dredge selectivity parameters and length-weight parameters from SARC 65.
- In the MAB survey domain, smaller scallops (35-75 mm shell height) were observed in open areas around the "Gully" (i.e. rim of the Hudson Canyon) as well as spread out in the LI, HCS, and ET SAMS areas. The majority of larger scallops (> 75 mm shell height) were observed in the SAMS areas of the Mid-Atlantic Access Area, primarily within the ET, ET-Flex, and HCS, and to a lesser extent in the LI SAMS area.

- In the NLS survey domain, the majority of smaller scallops (i.e. 35-75 mm shell height) were observed in the NLS-S-deep SAMS area and consist of the 7-year-old class of animals that have experienced abnormally slow growth and have been tracked closely since 2015. Some larger scallops (i.e. > 75 mm shell height) were observed in the NLS-S-deep SAMS area, though a comparison of shell height to meat weight relationships suggest that these scallops have lower yield than similar sized scallops in other parts of the NLS. The majority of larger scallops have persisted in the NLS-West and the largest scallops were seen in the NLS-North, though densities in the NLS-North were lower than the other parts of the NLS and appeared to have a broader spatial distribution.
- In the CAI and CAII survey domain, substantial recruitment was seen along the southern border of CAII AA/northern border of CAII-extension and to a lesser extent in the eastern portion of CAII AA. The recruitment observed in the CAII survey domain appeared to follow the 50-fathom depth contour. Larger scallops (> 75 mm shell height) were also seen along the 50-fathom contour, but were mostly concentrated in the eastern peak of the CAII AA. There was limited overlap of larger scallops and recruits in CAII AA. In CAI, some smaller (35-75 mm shell height) scallops were seen in the northwest corner of the CL1-sliver SAMS area, and the majority of large scallops in CAI were aggregated along the 50-fathom contour in the CL1-sliver SAMS area.
- At least 15 scallops per station were sampled to inform shell height to meat weight (SHMW) relationships and meat quality observations. SHMW workups were used to estimate expanded length frequencies and included in a mixed effects model that estimates SHMW relationships for each SAMS area:
    - In the MAB, predicted SHMW relationships were similar across SAMS areas and less divergence was seen between SAMS areas compared to 2018. The DMV SAMS area had the smallest meat weight at a given height for the MAB survey domain.
    - For the NLS, predicted SHMW relationships appeared to be similar to 2018, with the NLS-S-deep SAMS area having the lowest SHMW relationship and only SAMS area within the NLS survey domain that was significantly different than the NLS-North.
    - In CAI AA, the SHMW relationship for CL1-Access SAMS area was significantly greater than the CL1-Sliver SAMS area, which is a change from 2018. Brief PDT discussion suggested the difference could be driven by a depth affect considering scallops in the CL1-Sliver SAMS area are mostly found in greater than 50 fathoms.
    - SHMW relationships were relatively consistent in the CAII survey domain, with the SHMW relationship for CL2-Access SAMS area being slightly greater than the CL2-Ext and SF SAMS areas.
- Length frequency (L-F) plots showing size distribution by SAMS area for the commercial dredge and survey dredge can be seen in pp. 11-29 of Doc.2a.
    - In the MAB, L-F plots did not give a strong signal of very small scallops (< 20 mm) in the ET like the CFF HabCam survey reported (see below); however, the VIMS survey did not overlap directly (spatially or temporally) with where the HabCam identified these smaller animals and it is unlikely that the survey dredge would retain these scallops due to them being very small (i.e. roughly thumbnail size). Relative L-F distribution in the DMV SAMS area suggested some

recruitment had occurred, but this is relative to the very low biomass for the DMV SAMS overall. The mean SH in the commercial dredge within the MAB survey domain was greater than 100 mm.
    - In the NLS survey domain, there was a slight bump of smaller scallops observed in the NLS-North which is consistent with recent years.
    - In CAI, L-Fs from both the survey and commercial dredge suggested mean shell height of greater than 100 mm.
    - L-F plots indicated that recruitment had occurred in all three SAMS areas within the CAII survey domain (i.e. CL2-Access, CL2-Ext, SF). Pictures from the VIMS survey in CAII suggested that some one-year-olds were captured in the dredge; however, the L-F distribution suggests that both one- and two-year-old's were present in CAII at the time of the 2019 survey.
- A comparison of biomass estimates between the dredge and optical surveys suggests that reduced dredge efficiency in high density areas (i.e. NLS-West, NLS-S-deep) continues to be an issue. In CAII, it was suggested that survey strata 61 may need to be restratified as the current stratification could be driving the divergence between the dredge and HabCam estimates in CAII AA.
- Biomass estimates using SARC 65 and VIMS 2016-2019 SHMW parameters were compared for SAMS areas in the NLS survey domain. Estimates based on SARC 65 SHMW parameters appeared to be overestimating biomass and the PDT agreed that using predicted SHMW relationships from recent VIMS dredge surveys (i.e. 2016-2019) would provide more accurate biomass estimates for the NLS SAMS areas.
- A significant number of clappers were observed in survey stations in the NLS-West. The percentage of clappers to total scallop catch ranged from 1-26% and the L-F distribution of clappers and live scallops were very similar; it was suggested that this may be an indication of higher than expected discard mortality in the NLS-West, potentially as a result of high grading and(or) deck loading.

Key points from PDT discussion:

- The PDT noted some divergence between the VIMS and SMAST drop camera biomass estimates for CAI and discussed whether the large VIMS tow in the northwest corner of the survey domain was driving an overestimate. Considering the tow in question was in a relatively small survey strata, it is unlikely that it was impactful to the total biomass estimate for the area.
- It was suggested that the high clapper to live scallop ratio observed in the NLS-West could indicate a combination of natural mortality and discard mortality if scallops were brought on deck and discarded without being shucked. The PDT felt this was supported by the similarity in L-Fs of clappers and live scallops in the NLS-West.
- In the CAII survey domain, the largest scallops were observed in the eastern peak of CAII AA and the smaller scallops were aggregated along the southern edge of CAII AA, with some overlap in between. The dredge survey did not detect signs of higher predation in CAII.
- The recruitment seen in the MAB survey domain was far below the magnitude of recruitment seen in CAII but was consistent with the level of recruitment seen in the MAB annually.

- It was noted that the area where recruitment was seen in the MAB overlaps with wind energy planning areas—a member of the audience suggested the survey information be used to describe the importance of this area to the resource and fishery.

2018 SMAST Drop Camera Survey Results

Dr. Dave Bethoney of the University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST) presented methods and key findings from the 2019 SMAST drop camera survey of the NLS, CAI, Great South Channel, Northern Flank, and the Mid-Atlantic Bight:

- SMAST estimates of abundance, biomass, mean meat weight, and mean shell height were based on quadrat still images from the high-resolution digital still camera. SARC 65 SHMW parameter estimates were used in biomass and mean meat weight calculations, except for the NLS SAMS areas which used VIMS 2016-2019 SHMW parameter estimates.
- A review of total biomass by SAMS area in the Georges Bank survey domain suggested a large biomass of older scallops in the CAII North HAPC. A substantial decrease in biomass was seen in CAI AA between the 2018 and 2019 drop camera surveys in this area. For Georges Bank, the bulk of biomass continues to be concentrated in the NLS, primarily in the NLS-S-deep and NLS-West. Higher densities seem to persist in CAI-Sliver as well as in the NLS-West.
- There was a significant decline in biomass between the 2018 and 2019 survey of the NLS-West. Projections for this area for 2019 were around 40,000 mt, but the 2019 drop camera survey estimate was roughly 13,000 mt. Despite this decline in biomass, density estimates from other parts of the NLS- with scallops did not change much between 2018 and 2019. The similarity in density for areas with scallops in 2018 and 2019 could suggest that the decrease in biomass may not be driven by natural mortality, but rather from fishery removals and higher discard mortality.
- An increase in biomass was seen in the NLS-S-deep between 2018 and 2019 which appears to be driven by some growth occurring over the past year (i.e. roughly 15 mm). A large decrease in density in the NLS-S-deep was observed between 2017 and 2018; however, density appeared to be similar between 2018 and 2019.
- A set of smaller scallops were observed in the northwest peak of CAI, and the smaller animals observed in the GSC in 2018 have continued to grow and were estimated to be recruit size at the time of the 2019 survey. The recruits in the GSC do appear to have some overlap with larger scallops and fishing effort does appear to be happening close to the recruits.
- In CAII North HAPC, the majority of scallops appear to be old and encrusted with epifauna. This area has typically been thought of as a refuge for larger seeding scallops; however, the 2019 survey did not indicate another year class coming into the resource meaning a downturn in biomass could be expected there in the future.
- A comparison of CAI AA between 2017 and 2019 suggests a decline in density has occurred over time, though the 2019 estimate suggested that density is still exploitable.
- The 2019 drop camera survey covered the entirety of the MAB and suggested similar findings as the VIMS dredge survey. A spattering of recruitment was observed in the SAMS areas adjacent to the Hudson Canyon which is typical for this area annually. Some pre-

recruits (< 35 mm SH) were observed in the southern part of ET-Open. There were a lot of larger scallops observed in ET-Open despite there being little to no fishery activity there in FY2018.

- Images from recent SMAST drop camera surveys are available to the public at the following link: http://bit.ly/scallopsurvey

Key points from PDT discussion:

- Based on past AUV work done in CL1-Sliver, it was suggested that this area may have poor visibility which could impact optical survey estimates. Dr. Bethoney noted that visibility issues with the drop camera are mostly in silty areas with no water movement, which is not the case for CL1-Sliver. At the request of the PDT, Dr. Bethoney re-examined drop camera images, and reported that less than 1% of the images were affected by poor visibility.
- The densities of recruitment observed in the MAB, specifically the southern part of ET-Open and DMV SAMS areas, were not extraordinarily high. Settlement of pre-recruits can sometimes be an indicator of recruitment the following year. In DMV there have been several recent examples that suggest that the small year class observed in 2019 may or may not sustain in the future.

2019 CFF HabCam Survey of CAII, NLS, and ET

Jason Claremont presented key findings from the Coonamessett Farm Foundation (CFF) HabCam survey of CAII, NLS, and the ET:

- In CAII and the Southern Flank, pre-recruits (35-75 mm scallops) were observed broadly across the survey area. Observations of > 75 mm SH scallops suggested that strong recruitment had occurred in the southern portion of CAII AA, along the northern boundary of CAII-ext, and extending into the SF. Similar to other survey findings, larger animals appeared most prevalent in the eastern peak of CAII AA. A clear spatial break between the recruits and larger animals was not evident in CAII AA; however, larger scallops appear to be distributed farther east than the recruits. Though scallops < 20 mm cannot be accurately quantified, animals in this size range were observed patchily across the survey area.
- In the NLS, there were no observations of high densities of incoming year classes. The majority of recruit-size scallops were observed in the NLS-S-deep SAMS area, though it was acknowledged that these are the slow growing 7-year-old animals that have been tracked, not actually recruits. Larger scallops (> 75 mm SH) were observed across the survey domain, though the highest densities in the NLS-West appear to be retracting over time. Scallops between 75 and 100 mm SH were highly concentrated in the NLS-West and NLS-S-deep, while > 100 mm SH animals were distributed widely across the NLS-N. A comparison of L-F in the NLS-West between 2018 and 2019 suggests that little to no growth occurred over the past year and that some growth was apparent in the NLS-S-deep. Similar to other survey findings, a substantial decrease in biomass was observed between 2018 and 2019 in the NLS-West while an increase was estimated for the NLS-S-deep.
- In the ET survey area, high densities of < 20 mm scallops were concentrated along the northern border of the ET-Flex SAMS area. Densities of pre-recruits (35-75 mm SH)

were generally low across the survey area. Some recruitment was observed in the southern extent of the ET-Open SAMS area, but at lower densities than what the SMAST drop camera observed in this area. Larger scallops (> 75 mm SH) were distributed across the area, with notably higher densities in the ET-Flex SAMS area. It was suggested that the HabCam biomass estimate for the ET (based on combined data from the CFF and NEFSC survey) were being driven mostly by the non-random NEFSC HabCam tow which focused on the high density aggregation in the ET-Flex.

PDT discussion points:

- It was suggested that a spatial management closure be considered to protect some of the recruitment observed in CAII, CAII-ext, and the SF.
- HabCam track spacing is not consistent by survey area or from year to year—track length and spacing is largely dependent on time availability and the spatial extent that needs to be surveyed. Tracks can also shift depending what is on the seafloor (e.g. ship wrecks, sand waves, other obstructions, etc.). Based on track spacing work conducted in the past, the 2019 CFF HabCam tracks are considered "intensive". Dr. Hart noted that more intensive tracks are done in productive areas and less intensive tracks are done in less productive areas—this is done to improve precision in estimates for areas with both higher and lower scallop density. Transects need to be close enough to support multidirectional estimates (i.e. estimating anisotropy).
- It can be difficult to differentiate between a clapper and live scallop using HabCam images; it is also difficult to differentiate between clappers and cut shells in areas where there are lots of cut shells (i.e. NLS-West). The SMAST drop camera is able identify clappers, identifying scallops in areas with a lot of cut shells is more difficult than differentiating between clappers and live scallops.
- Mr. Claremont suggested that it is important to formalize a communication between survey groups before and after the surveys are done to improve workflow across the board and help synthesize data products. Some agreed this is a good idea but also noted that direct collaboration can be difficult due to the competitive nature of the Scallop RSA program. Staff noted that this topic is on the list of potential 2020 Council priorities and will be discussed later in the year.

2019 NEFSC Dredge and HabCam Survey

Dr. Dvora Hart (Northeast Fisheries Science Center) presented key findings from the 2019 NEFSC dredge and HabCam surveys of Georges Bank and the Mid-Atlantic:

- In the Mid-Atlantic, HabCam (i.e. both NEFSC and CFF) surveyed all SAMS areas which represents the best coverage to date for this region. In the ET, one-year-old pre-recruits were observed in the northern part of the area while the adult distribution was consistent with recent years in being highly concentrated in the ET-Flex area. Very low densities were observed in the DMV SAMS area. One concentrated high-density aggregation of larger animals appeared to be driving the biomass estimate in the HC SAMS area. No notable

densities of scallops were observed in the inshore-MAB SAMS areas. As noted in other surveys, some pre-recruits and recruits were observed in open areas around the southern rim of the Hudson Canyon, which is typically a productive area. Overall, very little recruitment was observed in the MAB aside from a small pulse in the HC and ET.

- For Georges Bank, 105 dredge tows were completed and combined HabCam (i.e. NEFSC and CFF) efforts covered the NLS, CAII, CAII-ext, and SF. A moderately strong signal of pre-recruits (35-75 mm SH) were observed along the 50 fathom depth contour throughout the SF SAMS area and into CAII-ext and CAII AA. Two patches of larger scallops (> 75 mm SH) were observed in CAII AA, one that overlapped with the smaller year class and the other which was concentrated in the eastern portion of CAII AA. Similar to findings from other surveys, the majority of adult biomass on Georges Bank was concentrated in the NLS-West and NLS-S-deep, and to a lesser extent in CAII-North HAPC and the eastern portion of CAII AA. The dredge survey detected some pre-recruits around Pollock Rip (i.e. northwest of CAI AA) and also in southern CAII. Some recruitment was observed in the Channel which is typical for this area, while the most prevalent recruitment seen across Georges Bank was in the SF SAMS area.
- A comparison of mean biomass across all surveys by SAMS area suggested that projections for 2019 (i.e. from FW30) were relatively close to what the 2019 surveys observed, with the exception of the NLS-West which saw a substantial decrease in biomass relative to the 2019 projection. Generally, estimates from optical and dredge surveys were relatively consistent in areas without very high density but dredge efficiency appears to still be an issue in the NLS-West and NLS-S-deep. Unlike in 2018, the ET-Flex dredge estimate did not appear to diverge as much from the optical surveys—it was suggested that this could be due to the efficiency issue occurring at only a few stations in the ET-Flex.
- The NEFSC HabCam track in the ET-Flex was focused on the very high density concentration. Dr. Hart explained that geostatistical methods technically do not need to be "random", and felt that the intensive track in the highest density part of ET-Flex was not biasing the overall estimate for that area.

Key points from PDT discussion:

- It was noted that the NEFSC HabCam mean meat weight estimate for the ET-Flex appeared to be higher than other estimates (31 g) and it was suggested that this might be a result of the intensive tracks over larger animals in the ET-Flex, and potentially a cause for the HabCam biomass estimate being much higher than other surveys.
- Continued discussion of the NLS-West pointed towards marginal growth, increased total mortality, and higher discard mortality as potential reasons for the significant drop in biomass observed between 2018 and 2019.

Survey Data Treatment

SHMW Parameter Estimates for the NLS

Sally Roman (VIMS) provided an update on estimated SHMW relationships in the NLS based on VIMS data from 2016 to 2019. The presentation covered the methods used for estimating the

SHMW relationships for NLS SAMS areas and provided a comparison of biomass estimates based on SARC 65 SHMW relationships versus VIMS 2016-2019 SHMW relationships. Overall, the PDT was in support of using VIMS 2016-2019 SHMW relationships for biomass estimates in the NLS SAMS areas because it reflects the most recent and comprehensive information available for this part of the resource and is consistent with the approach used in 2018.

Divergence in CAII AA Estimates

The PDT discussed the divergence between the VIMS dredge survey and HabCam biomass estimates in CAII AA. It was suggested that the dredge estimate may be higher due to how survey stations were allocated within strata 61 (i.e. shellfish survey strata within CAII AA)—this strata includes areas with low productivity and high productivity, with the higher productivity area being in the deeper part of the strata. As a follow up sensitivity, the PDT suggested restratifying strata 61 based on the 40 fathom depth contour to determine if this is the cause for the divergence in dredge vs. HabCam estimates for CAII. It was noted that this highlights the need for restratification of survey strata by the NEFSC.

Another follow-up sensitivity suggested was to redo the HabCam biomass estimate using a weighted average statistical approach and compare it to the geostatistical approach to see if this is driving an under estimate for CAII AA.

Dredge Efficiency

The PDT discussed methods for adjusting dredge efficiency in high density areas. Dredge efficiency is estimated from an experiment under a certain set of circumstances—it is apparent that these same circumstances do not apply for the NLS-West, NLS-S-deep, and other high-density areas. Work is under way to empirically answer how high density might change dredge efficiency. At this point, reducing efficiency of 0.4 by 1/3rd is the approach used as it was developed through SARC 65 and has precedence from data treatment in recent years. The PDT recommends that methods be more formulaic in the future with how dredge efficiency is accounted for, particularly if it deviates from the empirical approach used currently.

Nematode Prevalence in the Mid-Atlantic

Dave Rudders presented VIMS survey findings from 2015 to 2019 relative to nematode prevalence in the Mid-Atlantic. VIMS has tracked nematode prevalence in this area for the last four years, focusing on the range of infected scallops and the intensity of infestation (how many lesions). Takeaway points from the presentation and PDT discussion include:

- Nematode prevalence was initially heaviest in the far southern range of the fishery, specifically in DMV and southern part of the ET. The spatial extent expanded slightly north in 2016 and appeared to be contracted in 2017 relative to 2016. The 2018 survey suggests nematode distribution was very similar to what was observed in 2016, except with some sporadic occurrences being observed farther north (i.e. in NYB and LI SAMS). In 2019, the nematode prevalence appears to have been reduced over the entire sampling range, especially in the southern range of the MAB survey area (i.e. DMV, southern ET). The intensity of the nematode also appeared to be reduced in 2019 compared to 2015-2018.
- The cause of the reduction in nematode prevalence and intensity in 2019 is uncertain. It was suggested that a change in turtle behavior could be a potential driver considering turtles are known intermediate hosts for the nematode parasite.

- Elevated fishing mortality due to high discards and the redistribution of effort are important points to remember when considering fishery specifications in areas with high nematode persistence. Over time, it appears that vessels have largely avoided nematode infected scallops due to the lower ex-vessel price they receive—it was suggested that vessels prefer fishing lower density areas farther to the north that are not subject to nematode infection because of how low the price is for nematode infected scallops that can be caught in higher densities to the south.

Discard and Kept Data Update from Northeast Fisheries Observer Program

Tyler Staples of the Northeast Fisheries Observer Program presented aggregate scallop discard and kept data from observed scallop trips in fishing years 2016-2019 (2019 data updated through June). Key points from the presentation and PDT discussion were:

- There appeared to be signs of discarding in the NLS-W in 2019, but not as high as might be expected based on the significant reduction in biomass in this area observed between 2018 and 2019. Fishing behavior in the NLS-West in 2019 suggested vessels would make two to four tows and then transit away from the high density area to lay up and cut. Observers noted that most vessels would not have clear decks before putting the next tow of scallops on deck.
- Observers did record a lot of clappers in the NLS-West, estimated at roughly 22,000 lbs for observed LA trips in 2019 (compared to roughly 4,000 lbs of clappers observed on open area LA trips in 2019).

Update on Scallop Meat Quality in CAII (CFF)

Dr. Liese Siemann of CFF presented information on meat quality in CAII and surrounds based on data collected through the CFF Seasonal Bycatch dredge survey. Specifics on the meat quality information can be accessed in P6) CFF Update on Meat Quality in CAII. There was limited PDT discussion on this topic, aside from acknowledging that the outlook for CAII and surrounds is very positive with regard to meat quality (i.e. little to no gray meats observed, or other meat quality issues).

Review of Survey Data Treatment Decisions

The PDT continued discussion from Day 1 on how to treat survey data and provided initial input on potential spatial management options in 2020. Discussion points and input are summarized below.

VIMS CL1-Sliver Sensitivity Analyses

The PDT had noted some divergence between the VIMS dredge and SMAST drop camera estimates for the CL1-Sliver SAMS area. It was suggested that a VIMS dredge station that observed very high density was potentially driving the overall estimate for this SAMS area to be high. As a sensitivity, this very high-density station was removed from the estimate, and lead to a marginal reduction in the overall biomass estimate for CL1-Sliver. Excluding the high-density station, the VIMS dredge estimate was still roughly double the SMAST drop camera estimate. The PDT felt that there was no justification for throwing out valid dredge data and felt

comfortable with using the average of the VIMS and SMAST estimates in this area moving forward.

CAII HabCam Estimates by Strata

The PDT revisited discussion on the divergence of VIMS dredge and HabCam estimates in CAII, focusing on the theory that poor stratification in CAII could be driving the VIMS dredge to overestimate. The PDT suggested a follow-up analyses to be reviewed at the next meeting, which would re-estimate strata 61 for "productive" and "unproductive" sub-strata, divided by the 40-fathom depth contour.

SMAST ET Follow-Up

Following up on past discussion regarding how the SMAST estimate in the ET-Flex and ET-Open may change if only scallops > 40 mm SH were included in the calculation. Dr. Bethoney presented this sensitivity and noted that a knife edge estimate for only > 40 mm SH scallops slightly increases mean meat weight in the ET-Open SAMS and did not change the estimate in ET-Flex. The PDT felt that data used in the SMAST estimate was not a problem, and suggested more sensitivity analyses be conducted for the HabCam estimate, specifically re-estimating biomass in ET-Flex using a range of methods (i.e. design-based, model-based, simple mean). It was also suggested that a sensitivity be done using CFF HabCam data in the ET for comparison.

Continued Discussion on the NLS-West

The PDT focused in on the significant decrease in biomass in the NLS-West estimated between 2018 and 2019. Generally, the 2019 survey data and estimation methods did not appear to be causative for the decrease, and the group considered other potential reasons for the drop in biomass. Some thought the decrease could be attributed to fishing practices, specifically deck loading and high grading which caused a spike in discard mortality. Others suggested that the NLS-West could have been subject to higher than normal natural mortality, although information on predators in the area did not compellingly support this theory. It was also suggested that, though unlikely, the 2018 biomass estimate and 2019 projection may have been overestimated, and that it will be important to exclude this as a reason before moving forward. Several industry representatives felt that operational discards (i.e. deck loading, and shoveling scallops back over after dying on deck) were likely to blame and felt strongly that workshops should be held to inform fishermen of more sustainable fishing practices.

Overall, the PDT acknowledged that allocating access to highly concentrated areas such as the NLS-West is a relatively new occurrence, and that the drop in biomass in the NLS-West be used as a lesson when considering similar options in the future.

2019 UMaine/Maine DMR Dredge Survey of the GOM

Cameron Hodgdon (UMaine) presented key findings from the UMaine/Maine DMR dredge survey of the NGOM. Key points from the presentation include:

- Survey coverage was slightly different than the 2016 survey (i.e. next most recent UMaine/ME DMR dredge survey)—survey stations in the area of Mount Desert Island and

on Fippennies Ledge were dropped, and the portion of Stellwagen Bank south of the NGOM was added in 2019.

- A review of the distribution of 35-75 mm scallops indicated that a high level of recruitment had occurred on Stellwagen Bank and to a lesser extent on Southern Jeffreys Ledge. Larger scallops (> 75 mm SH) were distributed across the southern extent of the survey domain and overall catch was lower in the northern extent (i.e. MSI, Platts Bank) relative to the southern extent.
- L-Fs for all survey areas estimated mean shell height to be 63 mm—this size distribution was driven by the extraordinarily high catches of < 55 mm scallops in Stellwagen Bank. Excluding catch from Stellwagen Bank, mean shell height across the survey area was ~110 mm.
- Based on known growth rates for Stellwagen Bank, most of the large year class observed there could be expected to reach approximately 75 mm in March 2020, over 101 mm by February 2021, and fully selective to the 4" ring by June 2021.
- There is direct overlap of the recruit class and larger year class on Stellwagen Bank.
- Outside of Stellwagen Bank, the highest densities and most exploitable biomass were observed on southern Jeffreys Ledge.
- A comparison of estimates between the 2016 and 2019 surveys suggests that total biomass in the NGOM has decreased over time, but abundance has increased.

Key points from PDT discussion:

- It was noted that dredge efficiency is typically reduced for the smaller size class of scallops observed on Stellwagen Bank—based on this, the significant recruitment observed could be underestimated. Regardless, the PDT acknowledged the magnitude of the incoming year class on Stellwagen as some of the strongest recruitment seen in recent history and felt that a spatial closure should be considered to protect it.
- The PDT noted the overlap of larger scallops and recruits on Stellwagen, and how this area has supported almost all of the directed fishing in the NGOM in recent years, as well as consistent fishing by LAGC IFQ vessels on southern Stellwagen (i.e. south of the NGOM boundary).
- Specific to the potential for spatial management for Stellwagen Bank, it was noted that the size distribution observed makes this area a candidate for closure under the rotational management criteria established in Amendment 10. The PDT also suggested that a closure be considered for the entirety of Stellwagen Bank (i.e. not just the portion inside of the NGOM), which spans from roughly 42° 30' N to 42° 10' N. Based on the high densities of exploitable scallops on southern Jeffreys and also in Ipswich Bay, the PDT felt that a closure on Stellwagen Bank would not prohibit a viable NGOM fishing opportunity in 2020.

NGOM Scallop Camera Monitoring Project 2019

Mark Hagar (Gulf of Maine Research Institute) and Mary Hudson (Maine Coast Fishermen's Association) presented information on year 1 of the electronic monitoring (EM) pilot project in the NGOM scallop fishery. The goal for this project is to develop a robust EM program that will

inform the development of camera monitoring in the NGOM, and to test the utility of camera monitoring on scallop vessels in general. Three NGOM vessels were equipped with cameras for the 2019 NGOM season. After receiving input from fishermen and fishery dependent data collectors, the data capture objectives were established as: counts of groundfish, scallop shell height measurements, kept scallops, discarded scallops, presence/absence of starfish and sand dollars, and fishing effort data (i.e. linked to tow length and GPS location information). Information on realized camera coverage and sample intensity can be found in P4) GMRI/MCFA NGOM EM Presentation. Main takeaways from year 1 of the pilot project were: 1) EM can be a useful tool to collect data from scallop vessels including counting groundfish, measuring scallop shells, estimating kept and discarded scallops, collecting effort information, and anecdotal data collection (for example, sand dollars). Key points from PDT discussion following the presentation:

- The current cost of outfitting a small scallop vessel with cameras can range between $7K-$10K. This represents a relatively small portion of an EM budget in that resources needed to review the data are more costly.
- The cameras and processor used in the NGOM project are capable of supporting Artificial Intelligence (AI) learning capabilities and could feasibly be taught to collect all the information of interest (e.g. shell height, scallop counts, flatfish species and length, etc.).
- Data storage can be an expensive part of EM programs when conducted on a large scale. Efficient and inexpensive data transmission and storage will be an important part of making EM economically viable moving forward.
- Related to defining a standard sampling rate, a member of the PDT suggested oversampling to start out, and using an expansive data set to determine what level of sampling is needed for accurate estimates of catch and bycatch.
- It was suggested that a lot of information can be recorded without the use of a camera, but that having cameras on fishing vessels holds people accountable for what is reported and could ultimately improve overall reporting accuracy.

A21: Committee Tasking to Develop Options for Allocation Shares

Council staff presented a range of potential ways that the Council could think about determining an allocation split in the NGOM management unit. The Scallop PDT discussed several options for developing an allocation share for LA, LAGC IFQ, and LAGC NGOM permit holders.

- To support the development of Amendment 21, the PDT has assembled data on the number of active LAGC NGOM permits, the number of trips taken per vessel per year in the NGOM, total trips taken per year, and average landings per trip. The PDT has also gathered data on the seasonality of the NGOM fishery, and the proportion of revenue derived from directed scallop fishing in the NGOM relative to other fisheries.
- If the Council has a particular vision for this component of the fleet, then the Council might consider the number of permits and number of trips (at 200 lbs) that would participate in the fishery in a given year. Multiplying number of vessels (active, or total permits) by number of trips by the trip limit would result in an estimate of total removals in a given year. The PDT

noted that there could be some activation of latent effort in the future (~40 active boats in 2019 of ~100 total NGOM permits). The group also noted that, depending on the relative size of the TAC, LAGC NGOM fishing practices could change in the future. The group also noted the comments received during Amendment 21 scoping suggested the current fishery participants are happy with the way the fishery is currently being administered, and like that the majority of fishing occurs at the start of the fishing year.

- The PDT discussed considering allocation options at different biomass levels within the NGOM management unit – and completing the above exercise to illustrate how the LAGC NGOM component could be impacted at different levels of allocation.
- The PDT noted that the NGOM TAC split decision in Frameworks 29 and 30 was considered temporary, and that an allocation decision in Amendment 21 will be the new allocation standard for this area.
- The PDT noted that harvest from the NGOM management unit has been a relatively small portion of the overall harvest. The LA fleet operated in the NGOM in 2016 and 2017 under DAS when catch rates (LPUE) were higher.

Discuss Recommendations for 2020 Council priorities for Scallop FMP

Council staff reviewed the list of current work priorities (see Doc.6) and solicited input from the PDT related to potential 2020 work priorities for the Council to consider. PDT discussion was brief, but highlighted the importance of addressing issues related to how GB yellowtail is managed between the Groundfish and Scallop FMPs, and also suggested that the "evaluation of rotational management" and "LA performance review report" priorities be combined considering that there would likely be significant overlap between the two.

Other Business

No other business was discussed. The meeting adjourned at 2:42 PM.