

Scallop PDT Meeting Summaries

July – October

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New England Fishery Management Council

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MEETING SUMMARY

Scallop PDT Meeting Mariners House, Boston, MA July 25th, 2018

The Scallop PDT met in Boston, MA on July 25th, 2018 to: 1) review and discuss preliminary analyses re: ‘considering the LAGC IFQ possession limit’ work priority, 2) discuss timelines and standardizing survey results for FW30, 3) review FY2018 VMS effort and landings/LPUE data, 4) review Gulf of Maine scallop catch by the MA DMF spring/fall trawl surveys, 5) review draft Scallop PDT memo to Groundfish PDT re: GB yellowtail flounder, and 6) discuss other business.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. Bill DuPaul, Dr. David Rudders, Dr. Dave Bethoney, Travis Ford, Ben Galuardi, Kevin Kelly, Carl Wilson, Dr. Dvora Hart, Dr. Demet Haksever, Chad Keith, Danielle Palmer, and Dr. Cate O’Keefe. Vincent Balzano, Chair of the Scallop Committee, was in attendance along with 7 members of the public.

MEETING MATERIALS

Doc.1) [Meeting Agenda; LAGC IFQ possession limit analysis](#); Doc.2a) [Discussion Document - updated v.2](#), Doc.2b) Preliminary economic simulations of LAGC IFQ trip limit changes; Doc.4) [Scallop Survey Data/FW30 planning Discussion Document](#); Doc.5) [Scallop catch by MA DMF spring/fall trawl surveys](#); Doc.6) [Scallop fishery VMS effort \(FY2018\) and landings data](#); Doc.7) [Draft Scallop PDT memo to Groundfish PDT re: GB yellowtail flounder](#); Doc.8) [2018 Scallop Work Priorities – Updated v.3](#).

KEY OUTCOMES:

- The PDT reviewed scenario analyses for LAGC IFQ trip limits. The PDT plans to revise assumptions in the model, and present them again on August 29th, 2018.
- The PDT recommends that the survey groups use SH/MW equations from SARC 65 for Georges Bank and the Mid-Atlantic, with depth and latitude as co-variates.
- The PDT recommends using VIMS survey data to estimate variation in SH/MW relationships in the Elephant Trunk-Flex area and all Nantucket Lightship SAMS areas.

The meeting began at 10:15 am. Jonathon Peros (PDT Chair) welcomed the PDT and members of the public to the meeting and briefly reviewed the agenda. The PDT was updated that the Council initiated Framework 30 to the Scallop FMP at their June 2018 meeting. Also, the scallop

benchmark assessment is nearing completion as the final report is being drafted; it was noted that the final report will be presented to the PDT at their August 2018 meeting.

Considering the LAGC IFQ Possession Limit—Preliminary Analyses

Council staff updated the PDT on progress with the “considering the LAGC IFQ possession limit” work priority. At their March 2018 meeting the Committee tasked the PDT to analyze the impacts of LAGC IFQ trip limit increases from 400 lbs to 1,200 lbs (in 200 lb increments) on revenue and lease prices. The Committee also expressed interest in understanding the distribution of active LAGC IFQ vessels that lease quota to better describe reliance of active vessels on the lease market. Council staff explained that preliminary analyses from Committee tasking would be presented to the PDT. The goals of discussion were to:

- Consider the caveats/assumptions associated with economic analysis—are scenario conditions representative of current LAGC IFQ fishery?
- Identify other factors that could influence model outputs to include in future analysis.
- Begin drafting key points based on available data.

The PDT reviewed distributional analysis (see section 1.4 of Doc.2a [Discussion Document - updated v.2](#)) and key findings. First, the distribution of the active LAGC IFQ fleet was described in terms of vessels, landings, and quota allocation, by vessel size group. Size groups were classified as vessels less than 50 ft, vessels 50 ft to 74 ft, and vessels 75 ft or greater. It was noted that this analysis aimed to describe trends in fleet diversity by active vessel size from FY2010 to FY2017. Key points included:

- From FY2010 to FY2017, an overall increase in active vessels less than 50 ft was seen in tandem with a decrease in larger vessels. It was suggested that this was likely due to vessels owners wanting to reduce trip costs by fishing smaller vessels.
- From FY2010 to FY2014, vessels less than 50 ft landed the majority of scallops, vessels 50 ft to 74 ft landed the second most, and vessels 75 ft or greater landed the least. From FY2015 to FY2017, vessels 50 ft to 74 ft landed the most while vessels less than 50 ft landed slightly less.
- Quota allocation to the active fleet remained relatively stable over the time period. Vessels less than 50 ft received 46-50% of the allocation to the active fleet, vessels 50 ft to 74 ft received 40-45%, and vessels 75 ft or greater received 9-11%.

The distribution of the active LAGC IFQ fleet was also described in terms of number of vessels, landings, and quota allocation, relative to the proportion of total quota holdings that were leased in from FY2011 to FY2017. Active vessels were categorized into ‘lease groups’, which were classified as: 0% of total quota holding was leased in, 25% or less of total quota holding was leased in, 25% to 50% of total quota holding was leased in, 50% to 75% of total quota holding was leased in, and 75% of total quota holding was leased in. The lease-group “lease out” referred to vessels that leased out quota and were still active in the scallop fishery at some level. It was

noted that all lease activity was included in analysis regardless of vessel affiliation (i.e. lease activity between two vessels with the same owner was included). Key points from analysis included:

- From FY2011 to FY207, a notable decrease of no-lease vessels was seen, while the proportion of active vessels leasing in 75% or more of total quota holdings increased.
- No-lease vessels were responsible for a decreasing proportion of scallop landings over the time period. An increasing proportion of landings were attributed to vessels that leased in a greater proportion of quota (i.e. lease groups 50 to 75%, 75% or greater).
- The proportion of base allocation to the active fleet received by no-lease vessels decreased substantially, from the majority 47% in FY2011 to 18% in FY2017. During this time, a clear increase in the proportion of base allocation going to ‘lease-out’ vessels was seen, from 3% in FY2011 to the majority 34% in FY2017.

Council staff also presented average fuel price (USD per gallon of diesel) on observed scallop trips by month from 2007 to May 2018. It was noted that fuel cost is a major factor in overall trip cost, and that high fuel prices were part of the Council’s rationale for raising the LAGC IFQ trip limit from 400 pounds to 600 pounds in 2011 (Amendment 15). Fuel prices fluctuated from 2007 to 2018, with the highest average price being \$4.38 per gallon in June 2008 and the lowest average price being \$1.70 per gallon in February 2016. Since February 2016, average price increased steadily to a most recent estimate of \$2.73 per gallon in May 2018.

PDT discussion:

The PDT noted that the distribution of vessels, landings, and allocation have remained relatively constant in terms of vessel size from FY2010 to FY2017. The PDT suggested that trends in distribution of the active fleet by lease group were indicative of vessels becoming more reliant on the lease market over time and noted that there appeared to be some quota consolidation among active vessels from FY2010 to FY2017. Further discussion noted that recent trip costs for LAGC IFQ vessels have been in the \$600-range.

Preliminary LAGC Trip Limit Model Simulation Analysis

Dr. Demet Haksever (Council staff) presented methods and preliminary outputs from the lease price model and scenario analyses. Average lease out prices were estimated for fishing years 2010 to 2017 by inactive LAGC IFQ permit holders that leased quota to different affiliations. Exploratory factors in the model included lease price per pound of scallops in 2017 dollars (“Leasepr”), ex-vessel price per pound of scallops in 2017 dollars (“Price2017”), trip costs per pound of scallops in 2017 dollars (“Trpcostplb”), affiliation group (“AFFGRP”, individual owner = 1, permit bank = 0), the number of vessels that were net leasers (i.e. lease-in, “Numvesco”), and a dummy variable for FY2016 to account for significantly greater allocation of quota that year and response of the lease market (“D2016”). Model variables accounted for approximately 90% of variation in lease price and were all statistically significant.

Estimated lease prices were used in simulation analysis to describe impacts of changing the possession limit on the lease cost, vessel revenue, and crew shares under two scenarios. The simulation scenarios were based on a vessel that lands 30,000 lbs annually, with 66% of the total caught on open trips and 34% caught on access area trips. These numbers were based on the 2017 average of total landings for vessels that derive 75% or more of their revenue from the scallop fishery and fished at least 10 days. Scenario A was focused on access area fishing conditions and included the following assumptions:

- Trip length was set to 0.69 days with a steam time of 0.34 days and 0.29 days of fishing time—these numbers were the average steam/fishing time from observed LAGC trips to access areas in 2015 to 2017.
- Trip length was not increased with an increase in possession limit. This assumes a best-case scenario in that vessels could catch 1,200 pounds as quickly as 600 pounds.

Scenario B reflected open area fishing conditions and included the following assumptions:

- Trip length was set to 0.89 days with a steam time of 0.19 days and fishing time of 0.70 days.
- Fishing time increased proportionally with increasing possession limit (i.e. assumes it will take vessels longer to catch more). This assumes lower productivity fishing conditions, though it may not take vessels proportionally more time to catch a higher possession limit.

Scenarios A and B were projected using two ex-vessel scallop prices per pound, \$9 per pound and \$12 per pound. Scenarios A and B were also projected at a range of the amount of quota a vessel leases in (i.e. 0%, 10%, 30%, 60%, and 100%) to describe impacts of modifying the possession limit in terms of lease activity. Simulation analysis also gauged impact on vessel and crew shares based on two different lay systems: a) vessel receives 48% of gross revenue, crew gets 52% of gross revenue, and the crew pays for trip and lease costs; and b) vessel receives 48% of gross revenue, crew receives 52% of gross revenue and pays for trip costs, and the vessel owner and crew share the lease costs.

It was noted that an unlimited amount of simulations could be run using different model assumptions and that Scenarios A and B are the first step in providing a range of impacts.

Scenario A (Access Area Conditions)—Summary of Results

- Vessel shares would remain constant if crew pays the lease, and would decline if vessel pays half of lease for possession limits 800 lb. or higher compared to the 600 lb. limit. However, a decline in the number of trips would benefit vessel owners by reducing the maintenance, repair and some other fixed costs.

- An increase in ex-vessel scallop per lb. price to \$12 would lead to higher lease prices reducing the net revenue after trip and lease costs for those vessels that lease 30% or higher of their annual landings, either reducing both vessel and crew share if lay system is lease costs are shared or crew shares if crew pays for the lease costs. Those that lease small amounts will gain from an increase in the possession limit. If ex-vessel price is \$9, those who lease a higher proportion of revenue including those that lease 30% would gain from an increase in the possession limit because the savings in trip costs would outweigh the increase in lease costs.

Scenario B (Open Area Conditions)—Summary of Results

- Vessel shares would remain constant if crew pays the lease, and would decline if vessel pays half of the lease for possession limits 800 lb. or higher compared to the 600 lb. limit. However, a decline in the number of trips would benefit vessel owners by reducing the maintenance, repair and some other fixed costs.
- Because of the small increase in lease prices under the open area condition, the changes in revenue net of lease and trip costs will be small, slightly positive for those who lease small amounts and negative for others that lease a larger proportion of their landings whether the ex-vessel price of scallops per lb. are \$9 or \$12 per lb. In either case, if crew pays lease costs, crew shares would decline considerably if leased pounds are close to 100% of landings. This is because, there would be very little reduction in annual trip costs under this scenario while lease costs increase.

General Conclusions

- The potential impacts of the increase in trip limits are not expected to be uniform across vessels, crew and vessel owners.
- The impacts will vary with the productivity of the areas fished with the leased quota, price of scallops, steam and fishing time, trip costs and crew lay formula.
- Vessel shares would remain constant if crew pays the lease, and would decline if vessel pays a specific percentage of the lease for possession limits 800 lb. or higher compared to the 600 lb. limit under a lay system where crew pays the trip costs.
- The net impacts of the increase trip limits on vessel owners would depend on the lay system as well as the degree of savings in maintenance, repair and some other fixed costs as higher trip limits reduce the number of trips.
- Changes in net revenue net of trip and lease costs depend on the changes in lease price and the proportion of quota leased by each vessel. If the increase in lease price is low, then especially those that lease a relatively small proportion of their landings could have an increase in the net revenue and crew shares regardless of the vessel lay system.

- Net revenue of the vessels that lease a larger proportion of their revenue could decline as lease prices increase due to higher trip limits. Crew shares could decline if crews pays all the lease.
- Crew shares could increase in some cases if lease costs are shared by the vessel owner and crew receives the trip cost savings according to the lay system.
- However, if lease costs increase significantly, this increase could outweigh the savings in trip costs for vessels that lease even 30% or lower of their quota,
 - This may lead to a decline in crew shares especially if crew pays the lease.
- Those vessels that *do not lease* could gain in all cases as the trip costs decline at higher trip limits.
- The IFQ permit owners who lease out their quota are expected to gain from an increase in trip limits due to the increase in lease prices.

Key elements of PDT discussion:

- The goal of simulation analyses is to provide a range of potential impacts, not to predict exact values of lease prices, crew shares, trip costs, etc., under each scenario. Therefore, it was suggested that simulation results be presented in terms of percent change from the 600-pound trip limit (i.e. instead of absolute values).
- The lease market accounts for both access area and open area fishing conditions, meaning it could be worthwhile to look at a weighted average of Scenario A and B in the next round of analysis.
- It was suggested that assumptions of fishing time and steam time used in simulation Scenarios A and B (i.e. based on observer data) could be revisited in future analysis to better portray typical fishery operations and account for any potential observer effect on trip length. It was noted that past analysis performed by a PDT member found no significant difference in trip length between observed and unobserved LAGC IFQ trips.
- An industry member present at the meeting felt that projected lease prices under an increased trip limit in Scenario A were much higher than reality and suggested that lease prices have typically not been greater than 35% of ex-vessel price in recent years.
- It was suggested that longer trip length as a result of increasing the possession limit could impact crew size.
- It was suggested that future analysis consider biological impacts of changing the possession limit, as well as impacts on bycatch and harvest rates in access areas.
- The PDT felt that, in general, modifying the possession limit would have positive economic impacts on some fishery participants and negative economic impacts on others.
- Some PDT members suggested that an incremental increase to the possession limit (i.e. to 800 lbs) could be more straightforward than an increase to 1,200 lbs.
- The group agreed that, based on the magnitude of potential economic impacts and controversy amongst industry members, facilitating stakeholder input via public hearings

may be worthwhile regardless of what type of management action this priority is addressed in (i.e. Framework, Amendment).

- The PDT discussed the potential impact that including LAGC IFQ trip limits could have on the implementation of FW30.

Follow-up items identified during PDT discussion included:

1. Update trip length and fishing time assumptions used in simulation analyses and allow for increasing trip length with an increasing possession limit in both scenarios (Sam Ascii, Demet Haksever, Chad Keith).
2. Describe crew sizes of active LAGC IFQ vessels using VTR and observer data (Sam Ascii).
3. Expand economic analyses to the entire universe of the LAGC IFQ fishery (i.e. not just active vessels), including stakeholders who only lease-out and(or) have permits in CPH. Describe impacts of modifying the possession limit on revenue of the fishery as a whole.

Scallop Survey Data & Framework 30 Planning

Council staff outlined several issues for the PDT to discuss in preparation for upcoming Framework 30 meetings. First, the PDT discussed the format of survey data when it is transmitted to the staff at the Northeast Fishery Science Center. Dr. Hart explained that it would be helpful if all survey groups used the standardized field names when submitting data to her and the New England Council. In response to a question about the databases housing survey information, Dr. Hart explained that all dredge data can be found in a centralized Oracle database housed at the Northeast Fisheries Science Center. The HabCam database, which was started by Woods Hole Oceanographic Institute, is also an Oracle database.

Survey Short Reports

Council staff explained each survey group would be requested to provide a survey “short report” in advance of the PDT meeting. The request stemmed from Council member and survey group suggestions that survey data be presented in a standardized way. The report is in addition to the presentation each group is asked to give in late August, and does not preclude survey groups from presenting data in a way they see fit. Within a standard survey “short report” the PDT recommended including sections on biomass estimates, exploitable biomass estimates, length-frequency plots for each SAMS area surveyed, charts/maps showing survey coverage and density/abundance, and special comments. The PDT recommended mapping data by pre-recruits (<35mm), recruits (35mm – 75mm), and animals larger than 75mm in a standardized report. Council staff noted that this does not preclude survey groups from binning data differently for other purposes. The PDT also discussed the idea of making the short report a requirement for successful RSA projects.

Key elements of the report discussed by the PDT:

1. Table of biomass and other survey outputs by SAMS area.

2. Length-frequency plots for each SAMS area surveyed in 5mm bins. Report total number measured or proportion and mean length.
3. Charts/maps of survey coverage and abundance (in numbers):
 - a. Pre-recruits: <35mm
 - b. Recruits: 35-75mm
 - c. Animals >75mm
4. Special Comments.
5. Exploitable biomass estimates for current FY.

Shell Height-Meat Weight Relationships

The PDT discussed the shell height meat weight (SH/MW) relationships that survey groups will use to estimate total biomass from their 2018 surveys. The group recommended that the new SH/MW equations that were developed through the most recent SAW/SARC 65 process be used to generate estimates of biomass for 2018. The PDT also recommended that VIMS dredge survey data to develop finer-scale SH/MW parameters in the Nantucket Lightship areas and the Elephant Trunk. The group briefly discussed utilizing distinct equations for each SAMS area, but ultimately felt that using the new SH/MW equations from the 2018 benchmark assessment, with depth and latitude as covariates, was the most appropriate way to proceed with generating estimates.

Figure 1 – Table A2-2 from SARC 65 working papers.

Table App A2-2: Shell height to meat weight relationships with covariates. “Clop” is 1 if a sample is in a closed or rotational area, and 0 otherwise. Only covariates that reduced AIC are included.

Georges Bank			Mid-Atlantic		
Variable	Estimate	Std. Error	Variable	Estimate	Std. Error
Intercept	-6.69	0.38	Intercept	-9.48	0.24
ln sh	2.878	0.027	ln sh	2.51	0.026
Depth	-0.0073	0.0003	mday	-0.0083	0.0086
Lat	-0.073	0.009	mday ²	-0.000134	0.000005
Clop	1.28	0.17	Depth	-0.0033	0.00045
ln sh:Clop	-0.25	0.04	Lat	0.021	0.005
			Clop	-0.031	0.008
			ln sh:mday	0.00525	0.0005
			mday:Depth	-6.5e-5	9.6e-6

Treatment of Dredge Survey Data in High Density Areas

Council staff explained that dredge estimates in high density areas were increased by a factor of three for the most recent time period in SARC 65, and noted that the PDT will need to consider how to treat dredge estimates from high density areas for initializing the SAMS model runs for Framework 30. Dr. Hart explained that there may be new information available on dredge efficiency in high density areas by the time the PDT meets in late August. As part of the 2018 survey cruise on the R/V Sharp completed comparison tows at 19 stations with 15 minute dredge tows, 10 minute dredge tows, and HabCam. There are 17 comparisons with data from the VIMS dredge survey, R/V Sharp dredge survey, HabCam V4. The group noted that VIMS and the University of Delaware are conducting research on dredge efficiency using an AUV. The status of the results of this work were unknown at the meeting.

PDT Recommendations:

- 1) The PDT recommends that the survey groups use SH/MW equations from SARC 65 for Georges Bank and the Mid-Atlantic, with depth and latitude as co-variates.
- 2) The PDT recommends using VIMS survey data to estimate variation in SH/MW relationships in the Elephant Trunk-Flex area and all Nantucket Lightship SAMS areas.
- 3) The PDT recommends presenting combined estimates for Closed Area I (Ex: CAI-NA + CAI-ACC) and the Mid-Atlantic Access Area (Ex: ET + ET-Flex + HC) when presenting results to managers.

VMS Effort (FY2018 to date) and Landings/LPUE Data

Ben Galuardi (GARFO) presented recent fishery data on landings, market grade, LPUE, and the distribution of effort in FY2018 (April through June). Key points from PDT discussion on this report included:

- Ex-vessel price varied between areas early in FY2018 but appeared to converge around \$8-\$9 per pound most recently in July.
- Open area LPUE for the LA component was the highest seen in the last five years at roughly 3,500 lbs per day. Reports from industry representatives in the audience suggested LPUE has also been very high in NLS-West and in parts of the MAAA.
- Aggregated VMS effort from April-June 2018 showed that Closed Area II extension has been supporting a large proportion of limited access open area fishing. Access area fishing appeared to be highly concentrated in the Hudson Canyon part of the MAAA, the shallow portion of NLS-S, and along the 50-fathom contour in CAI.
- The LAGC IFQ fleet appeared to concentrate the majority of CAI effort in the north west corner of the access area.
- Fishing in the NGOM was very concentrated on Stellwagen Bank and a very small area on southern Jeffreys Ledge (i.e. just east of Cape Anne).

Gulf of Maine Scallop Catch in MA DMF Trawl Surveys

Dr. Cate O'Keefe of the Massachusetts Division of Marine Fisheries (MA DMF) presented information on scallop catch in the Gulf of Maine by the spring/fall MA DMF trawl surveys from 1978 to 2017.

During the 2018 benchmark assessment, the SAW workgroup considered catch data from Gulf of Maine trawl surveys as a way to describe the spatial distribution of scallops over time in this data limited region. The MA DMF trawl survey is one of four regional trawl surveys in the Gulf of Maine and [Doc.5](#) includes figures and tables detailing scallop abundance, biomass, and length frequencies by season and year for the entire time series. It was suggested that this information could be considered in conjunction with other Gulf of Maine surveys when determining where future surveys should take place, evaluating the extent of potential SAMS areas in the Gulf of Maine, and to evaluate catch advice for this region in the future.

One member of the PDT suggested that it may be useful to compare the inshore MA DMF trawl data to offshore surveys to see if there is any correlation in distribution, abundance, and recruitment for the Gulf of Maine region as a whole. Another PDT member noted that NEFSC is currently reviewing shellfish survey strata and is considering re-stratifying boundaries within the current extent.

Scallop PDT Memo to Groundfish PDT re: GB Yellowtail Flounder

Council staff gave a brief overview of the draft Scallop PDT memo to the Groundfish PDT re: GB yellowtail flounder catch in the scallop fishery ([Doc.7](#)). The draft memo was similar to those sent to the Groundfish PDT in 2016 and 2017, but was updated to reflect recent Council actions and scallop fishery activity. The PDT provided a few brief points of input on the draft memo and felt it was ready to be finalized and sent to the Groundfish PDT later in the week.

Other Business

No other business was discussed. The meeting adjourned at 3:47 pm.



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MEETING SUMMARY Scallop PDT Coonamessett Inn, Falmouth, MA August 29th-30th, 2017

The Scallop PDT met on August 28th and 29th, 2018 Falmouth, MA to: (1) review results of SARC 65 – 2018 Scallop Benchmark Assessment, (2) review 2018 scallop survey results, (3) discuss survey data treatment, (4) discuss next steps for FW30 specifications and timing, (5) review relevant data for developing 2019/2020 specifications, (6) review updated LAGC IFQ trip limit analyses addressing PDT tasking from Committee, (7) review Framework 30 management measures and action plan, (8) discuss recommendations for 2019 Council priorities for Scallop FMP, and (9) discuss any other business.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. David Rudders, Dr. Dvora Hart, Dr. Demet Haksever, Dr. Bill DuPaul, Danielle Palmer, Dr. Cate O’Keefe, Tim Cardiasmenos, Kevin Kelly, Shannah Jaburek, Benjamin Galuardi, and Dr. Dave Bethoney. Vincent Balzano, Chair of the Scallop Committee attended day 1 of the meeting, along with representatives of each survey group. There were approximately 30 members of the public present in the audience each day.

MEETING MATERIALS:

Doc.1) [Meeting Agenda](#); Doc.2) [SARC 65 Assessment Summary Report](#); *Scallop Survey results—Short Reports*: Doc.3a) [VIMS](#), Doc.3b) [SMAST](#), Doc.3c) [CFF](#), Doc.3d) [WHOI](#), Doc.3f) [NEFSC](#); Doc.4) [Draft preliminary combined biomass estimates for 2018; Information on Survey Data Treatment](#); Doc.5a) [VIMS SH/MW Analysis for ET and NL survey areas](#), Doc.5b) [VIMS Length Frequency Distributions for the ET and NL survey areas](#), Doc.5c) [Recap of survey group call, July 16, 2018](#); Doc.6) [Scallop VMS data by SAMS area \(April 2018 – July 2018\)](#); Doc.7) LPUE and landings/price data by market grade; *Kept and Discard Information from NEFOP Observer Program*: Doc.8a) [Scallop Meat Quality](#), Doc.8b) [Kept and discarded scallops by area/component](#); Doc.9a) [Framework 30 Action Plan](#); *LAGC IFQ Trip Limits*: Doc.10a) [Scenario Analyses of Possession Limits for the LAGC IFQ fishery](#), Doc.10b) [Summary points of preliminary impacts](#), Doc.10c) [LAGC IFQ vessel baseline restrictions](#), Doc.10d) [Information on LAGC IFQ crew size](#), Doc.10e) [Summary of trip cost model](#); Doc.11) [Draft 2018 Scallop Work Priorities and potential 2019 research priorities](#); and Doc.12) [Final PDT Meeting Summary, July 25, 2018](#).

PRESENTATIONS:

Scallop Survey Presentations: P1.a) [VIMS](#), P1.b) [SMAST](#), P1.c) [CFF](#), P1.d) WHOI, P1.e) NEFSC; P2) [SARC 65 Summary Presentation](#); P3) [VIMS Growth Presentation](#); P4) [VIMS Nematode Presentation](#); P5) [CFF Scallop disease presentation](#); P6) [SMAST Grey Meat Survey](#).

BACKGROUND AND SUPPORTING INFORMATION:

B1) [Link to LAGC IFQ program review webpage](#); B2) [LAGC IFQ Trip Limit Discussion Document](#); B3) [PDT memo to SSC re: FW29 OFL and ABC, October 7, 2017](#); B4) [Projected Exploitable Biomass for FY 2018 and 2019 from FW29](#); and B5) [SARC 65 – Appendix 2: Shell Height/Meat Weight Equations](#).

KEY OUTCOMES:

- The PDT reviewed key findings from the 2018 scallop benchmark assessment (SARC 65) including updated reference points, SHMW parameters, and data treatment recommendations for dredge data in high density areas.
- The PDT reviewed the results of 2018 scallop surveys and began an initial discussion of potential 2019/2020 specifications. While the overall biomass estimate increased from 2017 to 2018, the 2018 surveys did not detect strong signs of incoming recruitment.
- 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 2016-2018 VIMS survey to more accurately characterize the anomalous slow growth of animals in the NLS-S-deep, and observed difference in growth between other NLS SAMS areas.
- The PDT discussed survey dredge efficiency in high density areas. After reviewing survey results and analyses prepared by Dr. Hart for SARC 65, the PDT recommended that dredge data be increased by a multiple of three (i.e. consistent with a recommendation from SARC 65).
- The PDT reviewed analysis addressing Committee tasking re: impacts of modifying the LAGC IFQ possession limit, as well as other supporting information around this work priority.
- The PDT discussed candidate 2019 work priorities for the Scallop FMP.

The meeting began at 10:15 am. Council staff welcomed the PDT and members of the audience to the meeting and reviewed agenda items for the two day meeting.

Review Results of SARC 65—2018 Scallop Benchmark Assessment

Dr. Dvora Hart (NEFSC), lead scallop stock assessment scientist, reviewed highlights from the 2018 Scallop Benchmark Assessment. The 2018 assessment included four meetings of the stock assessment working group between February and May, and results were presented to the stock assessment review committee (SARC) in June. Updated methods and key findings from the assessment included:

- Shell height to meat weight (SHMW) and growth relationships appear to have been increasing since the mid 1990s. The increase in SHMW was likely a result of a fishing

effect, in that reduced fishing mortality over time has increased the number of larger scallop meats in the population.

- TOR-1: Landings by area have been higher in recent years and the Mid-Atlantic has been the dominant region relative to Georges Bank. LPUE (mt meats landed per 24-hour day with gear in the water) and fishing effort (24-hour days with gear in the water) have been increasing in recent years for all regions.
- TOR-2: Stratified mean biomass has been increasing relative to the entire dredge survey time series. Divergence was seen between the dredge and optical survey biomass estimates since 2014, likely due to incredibly high density areas causing a reduction in dredge estimates. The assessment assumed dredge estimates in high density areas were roughly a third of actual biomass based on comparisons with optical estimates over the time series.
- TOR-5: Similar to the 2014 assessment, Catch At Size Analysis (CASA) models were run for Georges Bank Open, Georges Bank Closed, and the Mid-Atlantic. Unlike previous assessments, SARC 65 methods assumed that natural mortality (M) varied by year; in the Mid-Atlantic and Georges Bank Open models juvenile M was variable, while M was variable at all sizes in the Georges Bank Closed model.
- Observed and estimated abundance/biomass, estimated recruitment, natural mortality, and estimated abundance at shell height were presented for each model (i.e. GB Closed, GB Open, Mid-Atlantic).
 - GB Closed: Observed abundance/biomass generally agree with estimates from CASA, with some variation in recent years. A spike in M in 2010-2011 corresponded with die offs of scallops observed in CAI and the northern part of CAII.
 - GB Open: This model was most problematic of the three, but contributes the least to overall biomass. Observed abundance/biomass from survey efforts have been estimating above CASA in recent years, suggesting the model is not totally capturing all mortality that is occurring in this region (though it is difficult to say whether the unaccounted mortality is F or M).
 - Mid-Atlantic: This model also appeared to be unable to account for all mortality occurring. Large recruitment classes were seen in 2002 and 2014 and large spikes in M were seen in 2003 and 2014, suggesting that increased mortality may be associated with large year classes and that there may be a density dependent dynamic between juvenile biomass and M .
- Combined GB Closed, GB Open, and Mid-Atlantic models: fully recruited fishing mortality has decreased since 2000 to an all time low most recently and fully recruited biomass is at its highest point in the time series. Excluding the slow growing animals in the deep water portion of NLS-S (i.e. “Peter Pans”), scallop biomass in 2017 was estimated to be 317,334 mt meats (roughly 700 million pounds) and fishing mortality was estimated to be 0.12.
- TOR-6: Reference points were estimated using the SYM model. The most recent period of data was used to estimate yield and biomass per recruit in meat weight, and stock-recruit curves were estimated using recruitment and spawning stock biomass estimates from CASA model runs. Age of recruitment for the purposes of the reference point models was set to three years old (previous assessments used two years old).

- MSY, F_{MSY}, and B_{MSY} estimates are given as a distribution, not as a point estimate. Estimates appeared to be uncertain for Georges Bank, and more so for Mid-Atlantic. The proposed SARC 65 reference points (i.e. median of all SYM runs) were: B_{MSY} = B_{TARGET} = 116,766 mt meats, B_{THRESOLD} = 58,383 mt meats, and F_{MSY} = 0.64. Estimates 2017 biomass was 317,334 mt meats (excluding slow growing scallops in the deep water portion of NLS-S SAMS). Estimated fishing mortality in 2017 was 0.12.
- Based on SARC 65 updated reference points, the stock is neither overfished nor is overfishing occurring.
- The SARC 65 panel was supportive of investigating the use of gonad weight as the metric of reference points in the future (as opposed to meat weight).

PDT discussion points:

- SHMW parameter estimates from SARC 65 appeared to be very similar to estimates from previous assessments; however, it is worth using the most recent estimates as they include more data and because changes in SHMW happen very slowly over time.
- The increase in BMSY is more likely attributed to changes in mortality and fishery selectivity as opposed to changes in growth.
- The only time series that has consistently sampled gonad weight is the NEFSC dredge survey. It was noted that there is limited data on seasonal gonad weight trends (unlike SHMW relationships).
- An industry member present in the audience suggested that fishery selectivity changes seasonally, using the Mid-Atlantic as an example. Dr. Hart agreed, and noted that it may be worthwhile for the Council to consider seasonal management to achieve optimum yield.

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

Sally Roman presented relevant information and key findings regarding the 2018 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 was the same as previous years. The CAII and NLS survey domains were mostly similar as previous years, except for fewer stations being assigned to the southern portion of the NLS extension.
- 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.
- At least 15 scallops per station were sampled to inform shell height to meat weight 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.
 - A trend of increasing meat weight at length was seen in the MAB SAMS areas; predicted relationships were similar to estimates for the MAB in 2017.
 - SHMW relationships were significantly different for all SAMS areas in the NLS.
 - A greater relationship was seen in the southern CAI SAMS area relative to the north.

- SHMW curves from the SF and CAII-S-EXT SAMS were lower than CAII-S-AC (i.e. the traditional CAII access area).
- Key points from L-F plots by SAMS area were:
 - Some recruitment was seen in BI, LI, NYB, and NYB-Inshore. The recruits seen in DMV were observed last year and are minimal in number relative to the other MAB SAMS areas.
 - Some recruitment was seen in NLS-N along with the same three year classes observed in the 2017 survey. No recruitment was evident in other NLS SAMS areas. The slow growing animals in NLS-S-Deep did not seem to grow over the past year. Minimal growth was seen in NLS-AC-W relative to last year.
 - Some recruitment was seen in all the CAI and CAII SAMS areas and mean length was around 100 mm.
- In the MAB, the majority of adult biomass was observed in the Elephant Trunk and Hudson Canyon. In the NLS, “Peter Pan” scallops in the deep water of NLS-S made up the majority of recruit biomass observed (i.e. 35-75 mm), while the majority of adult biomass was found in the NLS-W and shallow portion of the NLS-S. In CAI, one station along the western edge of CL1-AC-N made up almost all of observed recruit biomass, while larger animals were seen along the CAI ‘sliver’. In CAII, both recruit and adult biomass was spread across the open area of the SF/CAII-ext SAMS areas and the eastern part of CAII-S-AC.
- A comparison of SARC 65 and VIMS 2016-2018 SHMW parameters indicated that the SARC 65 parameters yielded higher biomass and average meat weight estimates.

PDT discussion points:

- It was suggested that SHMW estimates in the NLS-S were different from the previous year because an additional year of data was included in analysis, and because the 2017 and 2018 survey coverage included slow growing animals in NLS-S-deep more so than the 2016 survey.
- The group reiterated that no recruitment was evident in DMV, and that the commercial dredge caught zero scallops in the VIR SAMS area (i.e. south of DMV).

2018 SMAST Drop Camera Survey Results

Dave Bethoney of the University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST) presented methods and key findings from the 2018 SMAST drop camera survey of the NLS, CAI, Great South Channel, and the Gulf of Maine:

- 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.
- Some pre-recruits (<35 mm) and recruits (35-75 mm) were observed in the northern part of the SCH and in between CAI and NLS. Some recruit sized animals were also seen in NLS-W and in the deep water of NLS-S; however, these animals were observed in previous years as well.
- There was a bimodal size distribution of scallops seen in the SCH SAMS area indicating two year classes being present.

- There was a decrease of density mean SH in the NLS-N compared to the 2017 survey estimates.
- It was suggested that the difference in coverage and timing of surveys relative to fishing effort was likely driving differences seen in biomass estimates between survey groups.
- The Gulf of Maine survey was conducted on a 0.5 nmi² grid and covered Stellwagen Bank, southern Jeffreys Ledge, Ipswich Bay, and Platts Bank. Estimates were calculated using SARC 65 SHMW parameters for Georges Bank open areas.
 - Some smaller scallops were observed on Jeffreys Ledge. Most of the adult biomass was concentrated on Stellwagen Bank and in Ipswich Bay. SMAST coverage did not include stations in the deeper water along the edge of Stellwagen Bank where most NGOM fishing occurred in April and May.
 - Some of the Ipswich Bay stations overlapped with state waters; the biomass estimate included these stations.

PDT discussion points:

- A decline in density was seen in the NLS-S between 2017 and 2018. The NLS-S area estimate was driven by the large biomass of slow growing scallops in the NLS-S-deep.
- The group supported SMAST re-estimating biomass for Ipswich Bay including stations only in federal water.

2018 WHOI Survey of the NF, CAII HAPC, and MAB (HabCam v2)

Scott Gallager presented key findings from the Woods Hole Oceanographic Institute (WHOI) HabCam survey of the Northern Flank, Closed Area II HAPC, and Mid-Atlantic Bight:

- A rebuilt HabCam v2 was used for the WHOI survey, which now has identical electronics as HabCam v4 (NEFSC) and HabCam v3 (CFF) and can be used as a backup for either system.
- Approximately 3 million images were collected throughout the survey and around 200,000 images were annotated (~ 1:15 annotation rate). Roughly 50% of collected images were annotated at sea, while the remainder were annotated in the lab.
- Biomass was calculated using SARC 65 SHMW equations for Georges Bank and the Mid-Atlantic respectively. Abundance, expanded number at length, and biomass were estimated for each SAMS area. Biomass by SAMS area estimates were kriged using depth as a covariate.
- NYB SAMS estimates were split into three areas due to the northern most area being thickly settled. HCS also appeared to be well populated.
- The HabCam track in ET-Flex did not cover the highest density portion of the area that other surveys observed, which could be one reason length biomass estimates were so different from other surveys.
- The NF SAMS area was very patchy in terms of exploitable scallops, but some were observed adjacent to CL2-NA-N. The density of larger, older animals in CL2-NA-N seemed to have decreased since the 2017 survey suggesting some mortality. Some recruits were seen in CL2-NA-N.

PDT discussion points:

- WHOI used a different geostatistical method than NEFSC to estimate biomass by SAMS area. Therefore, WHOI estimates will serve only as a sensitivity to the final NEFSC estimates (i.e. which include WHOI HabCam data).
- WHOI did not reassemble estimates for NYB SAMS after splitting the area into three different parts; however, it was noted that SAMS estimates are additive and that the three separate estimates for NYB could be summed.
- The PDT noted the WHOI HabCam v2.2 length estimates appeared to be systematically lower than the dredge lengths in the Mid-Atlantic and requested further investigation of this issue.

2018 CFF Survey of the NLS (HabCam v3)

Jason Claremont presented key findings from the Coonamessett Farm Foundation (CFF) HabCam v3 survey of the Nantucket Lightship:

- HabCam was towed between 4.5 to 5 kts at a target altitude of 1.7 to 1.9 m throughout the NLS survey domain. Roughly 2.9 million images were collected, of which 7,143 were annotated (~1:400 annotation rate).
- The survey did not observe many prerecruits (< 35 mm) in the survey area but did see some higher densities of 35-75 mm animals in NLS-S-deep (i.e. mostly made up of 60-70 mm slow growing “Peter Pan” scallops that were observed in previous years). Animals 75 mm and larger were most dense in the NLS-W and NLS-S-shallow.
- Growth in the NLS-W appeared be far slower than expected between the 2017 and 2018 surveys, possibly due to some density dependent dynamic occurring. A similar trend was also apparent in other NLS SAMS areas.
- There appeared to be an increase of sea stars and predation interactions in the NLS compared to previous years, which could be an explanatory factor when discussing fluxes of natural mortality in this area.

PDT discussion points:

- It was suggested that the timing of the CFF survey in NLS-W relative to fishing effort could be contributing to the seemingly slow growth observed between the 2017 and 2018 surveys; however, others felt that slow growth in the NLS-W was more likely due to density dependent factors due to the incredibly high biomass of animals in the area.
- Relative density estimates seemed to have decreased in the NLS-S-deep between the 2017 and 2018 surveys, suggesting there may be some mortality occurring in this area in the absence of fishing.

2018 NEFSC Dredge and HabCam Survey

Dvora Hart (Northeast Fisheries Science Center) presented key findings from the 2018 NEFSC dredge and HabCam (v4) surveys of Georges Bank and the Mid-Atlantic:

- 117 dredge stations were completed on GB and HabCam tracks covered most of GB and the DMV SAMS area.
- Some paired-tow experimental work was also done in the ET to further investigate dredge efficiency in high density areas.
- Collectively, HabCam surveys on Georges Bank in 2018 by NEFSC, CFF, and WHOI resulted in the best coverage of the time series.
- The dredge survey observed both prerecruits (< 35 mm) and recruits (35-75 mm) in the SCH and in the Northern Edge. An older cohort was also observed in the SCH which will likely be harvestable size in 2019.
- The larger animals (> 75 mm) in the NLS-ext were observed concurrently with fishing effort, although the NEFSC dredge survey completed stations in this area before most other survey groups.
- Scallops were also observed at survey stations north of the SCH SAMS boundary (i.e. outside of SAMS area boundary, but within shellfish survey strata).

Survey Data Treatment

Scallop Fishery VMS Effort, April-July 2018

Sam Asci (Council staff) presented information on the spatial distribution of fishing effort thus far in FY2018 relative to SAMS area boundaries. VMS pings from the LA and LAGC IFQ components in April through June of 2018 were aggregated by 3 nmi squares. A speed filter of 2 to 5 kts was applied to isolate fishing activity. Then, total VMS hours were summed by SAMS area using the zonal statistics spatial analyst tool in ArcMap 10.5. Key takeaway points from the presentation and PDT discussion included:

- The majority of effort between April and July 2018 was in Georges Bank SAMS areas (65%), specifically in open areas within the CAII-ext and Southeast Parts (SF SAMS area).
- Most Mid-Atlantic effort was directed in open areas with the LI and NYB SAMS areas, while effort in the MAAA was concentrated in HCS and along the northeast border of the ET-Flex SAMS areas. There was very little/no fishing in Delmarva for the third year in a row.
- In the NLS-S access area, over 90% of effort was directed in NLS-S-shallow. Roughly 75% of effort in Closed Area I access area occurred in the northern area which was formerly an EFH closure (i.e. CL1-NA-N SAMS area).
- Fishing outside of SAMS boundaries occurred north of Provincetown, inside the NGOM, and in waters along the southeast border of BI SAMS.
- Very little effort was seen in the SCH SAMS area, and no effort was seen in DMV or NF.

L-F and SHMW Relationships in the ET and NLS

Sally Roman (VIMS) presented details on length frequencies and estimated SHMW relationships in the ET and NLS due to unusual growth patterns observed in high density areas in recent years. Key takeaway points from the presentation and PDT discussion were:

- Predicted SHMW relationships for the Mid-Atlantic SAMS areas did not indicate that growth in the high-density portion of ET-Flex was significantly lower than the rest of the SAMS area. Growth in the high-density part of ET-Flex also appeared to be consistent with ET-Open and other Mid-Atlantic SAMS areas.
- A comparison of predicted SHMW relationships in NLS SAMS areas indicated that growth in NLS-S-deep was significantly lower than the other areas.
- The PDT agreed that SAMS projections for the NLS-S-deep, NLS-S-shallow, NLS-AC-N, and NLS-W should use VIMS 2016-2018 SHMW parameter estimates, and that SARC 65 SHMW parameter estimates should be used for NLS-ext.

Dredge Efficiency

Dvora Hart (NEFSC) presented information regarding the on-going paired tow experiment conducted in the ET in 2018 to inform treatment of dredge biomass estimates in high-density areas when combining estimates from all survey groups:

- The NEFSC dredge surveyed 19 stations in the ET. 17 of these stations were paired with VIMS dredge survey stations. HabCam survey tracks in the experimental area yielded roughly 18,700 images.
- At the paired dredge stations, estimates from the 15-minute tows done by VIMS were compared to estimates from the 10-minute tows done by the NEFSC dredge survey. Biomass estimates at the paired tow stations were compared to HabCam estimates.
- Preliminary findings from the comparison work did not suggest biomass estimates from 15-minute tows vs 10-minute tows in high density areas to be significantly different.
- No final results were presented at this meeting, and the PDT plans to follow-up on this analysis at a later date.

Nematode Prevalence in the Mid-Atlantic

Dave Rudders presented VIMS survey findings from 2015 to 2018 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:

- Nematodes prevalence was initially heaviest in the far southern range of the fishery, specifically in DMV and the 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).
- When considering the spatial extent of nematodes and recent fishing effort, it appears that meat quality is impacting fishing behavior (i.e. vessels are avoiding areas with high nematode prevalence).

- 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. It was suggested that allocating fishery effort based on ‘effective biomass’ (i.e. biomass that is likely to be fished) may be appropriate when moving forward.

[Update on Gray Meat Distribution](#)

Susan Inglis (SMAST) presented preliminary results from the 2017-2018 SMAST grey meat scallop survey in Closed Area I. Dr. Inglis’ work was supported through the Scallop RSA and Staltonstall-Kennedy awards. Takeaway points from the presentation and PDT discussion include:

- There was a large outbreak of gray meat scallops in Closed Area I observed in 2011. SMAST survey efforts in Closed Area I aim to better understand how grey meat infection of animals in this area changed over time (i.e. in size and severity), and to inform the size range of scallops that are most susceptible to infection.
- Dr. Inglis suggested that gray meat scallops are infected with a two-host parasite, where scallops are the intermediate host and waved whelks are the primary host.
- Some grey meats were observed mostly in the central part of the traditional CAI AA in 2017, whereas in 2018 the most dense aggregations were found in deeper water of the northeast corner of the access area (i.e. ‘sliver’).
- The PDT noted that the area with highest grey meat prevalence in 2018 was also fished heavily since the start of FY2018.

[Nematode and Grey Meats from Observer Data](#)

Lacy from the Northeast Fishery Observer Program (NEFOP) presented a summary of observer data on kept/discharged scallops infected with nematodes or grey meats. Key takeaway points from the presentation and PDT discussion were:

- In 2016, observer protocol has integrated the collection of meat quality data, specifically records of nematode and grey meat prevalence. Since distinguishing an infected vs. not infected scallop can be difficult, observers are instructed to take pictures of suspected nematodes/grey meats to verify accuracy.
- Records indicate that some vessels fishing in the MAAA have landed scallops infected with nematodes, amounting to a total of 4,600 lbs since 2016.
- Since 2016, only two trips have recorded grey meat observations on Georges Bank. It was suggested that grey meats are usually discarded in the shucking house, meaning it’s possible that some grey meats could have gone unsampled.

DAY 2

Discard and Kept Data from Observer Program

Tyler Staples of the Northeast Fisheries Observer Program presented aggregate scallop discard and kept data from observed scallop trips in fishing years 2016-2018 (2018 data updated through June). Key points from the presentation and PDT discussion were:

- A relatively higher scallop discard rate observed on Georges Bank open trips in 2018 were likely driven by data points from NLS-ext, which was opened through FW29 after several years of closure.
- There appeared to be minimal discarding in the NLS-W and NLS-S access areas in 2018.
- Very little discarding was observed in CAI, though vessels did appear to be targeting larger scallops in the area.
- In the MAAA, average SH of kept scallops seemed to decrease in 2018 relative to 2016. This is likely due to the very strong 2013 YC recruiting into the fishery.
- A member of the audience felt it worthwhile to compare NEFOP records with CFF seasonal bycatch survey records to see how consistent they are.

Figure 1 - Scallop Discard to Kept Ratios by access and open areas for LA and LAGC IFQ components.

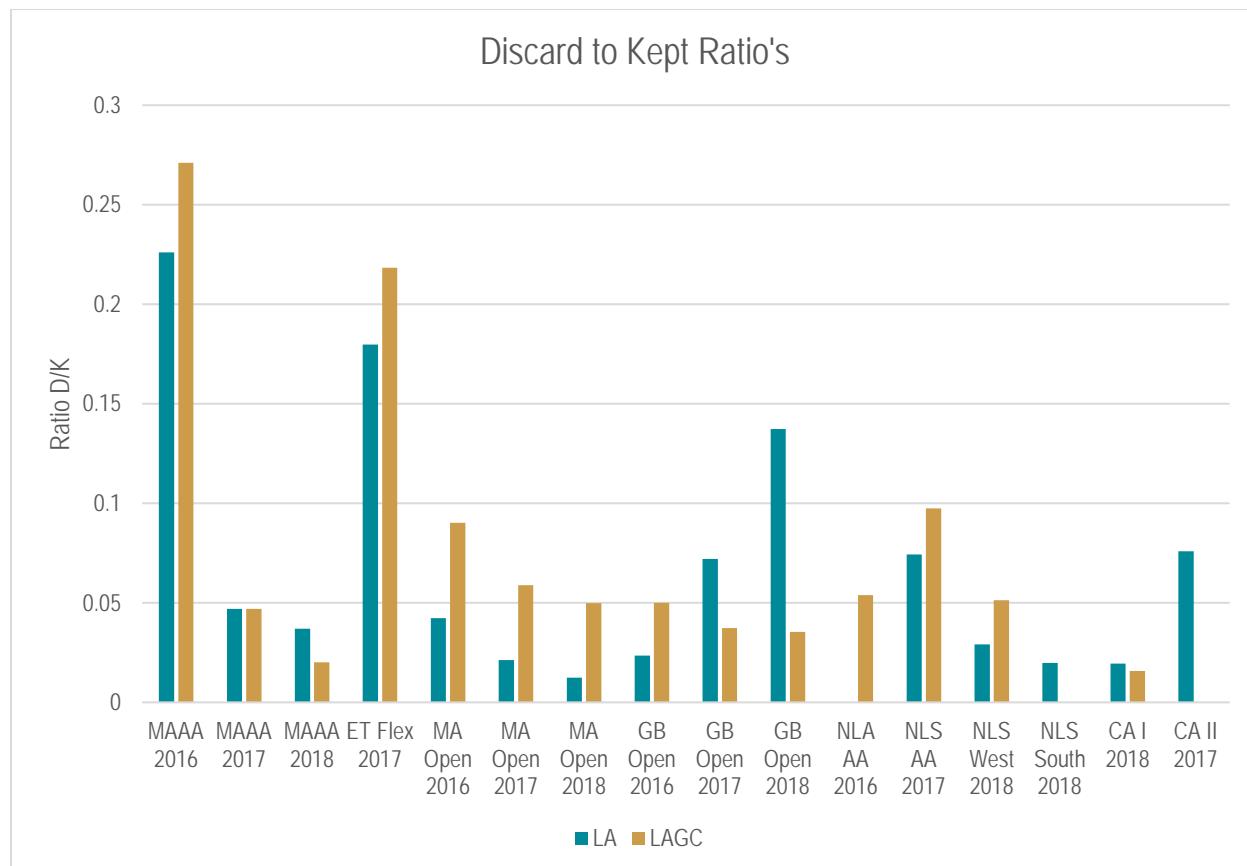


Figure 2 - Comparison of 2016 - 2018 kept and discarded scallops in the Mid-Atlantic Open (LA only)

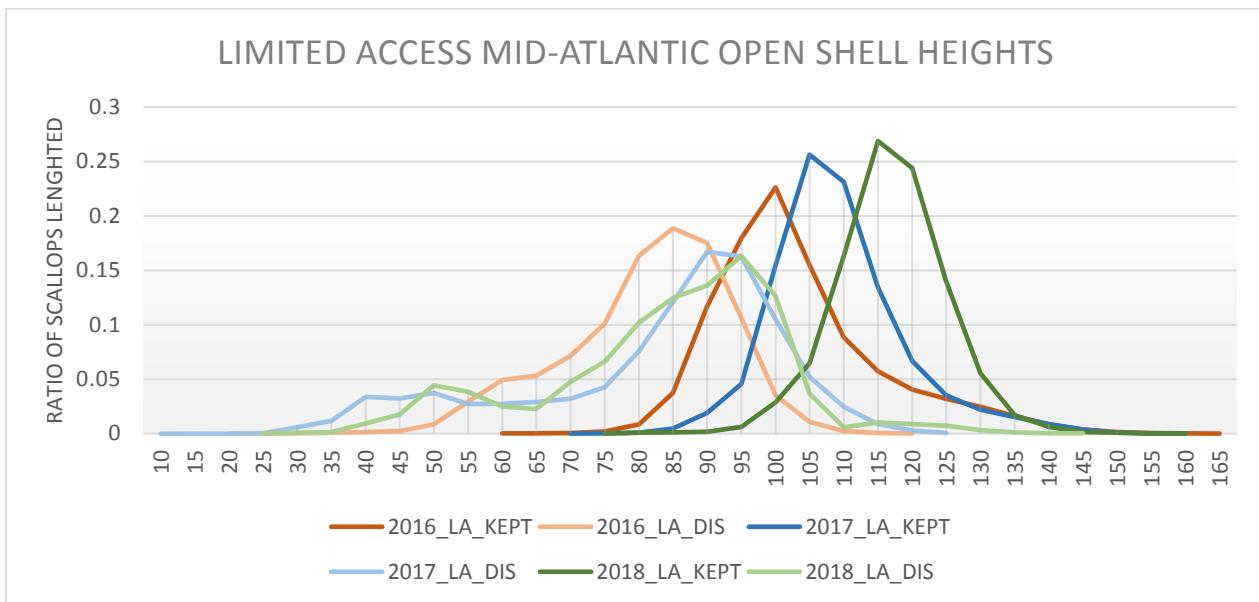
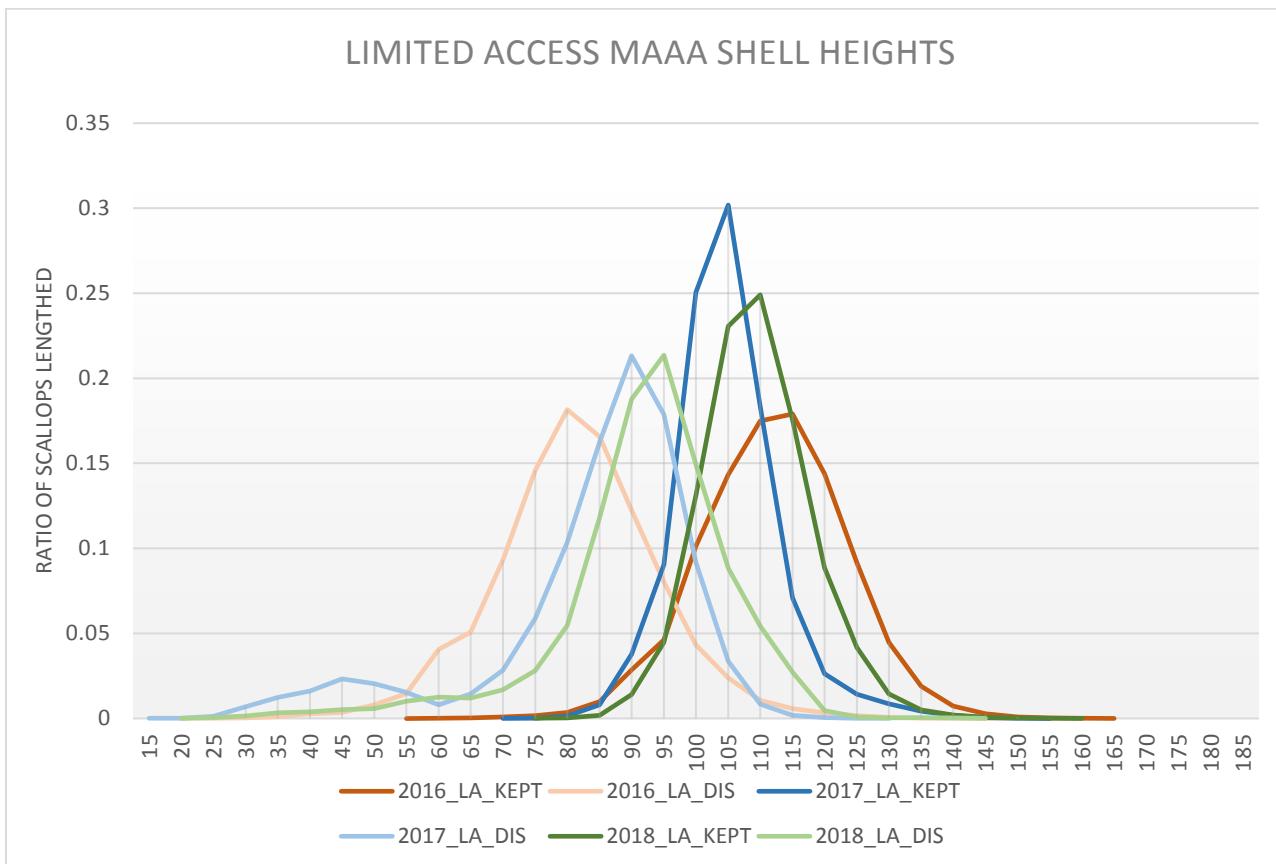


Figure 3- Comparison of 2016 - 2018 kept and discarded scallops in the Mid-Atlantic Access Area (LA only)



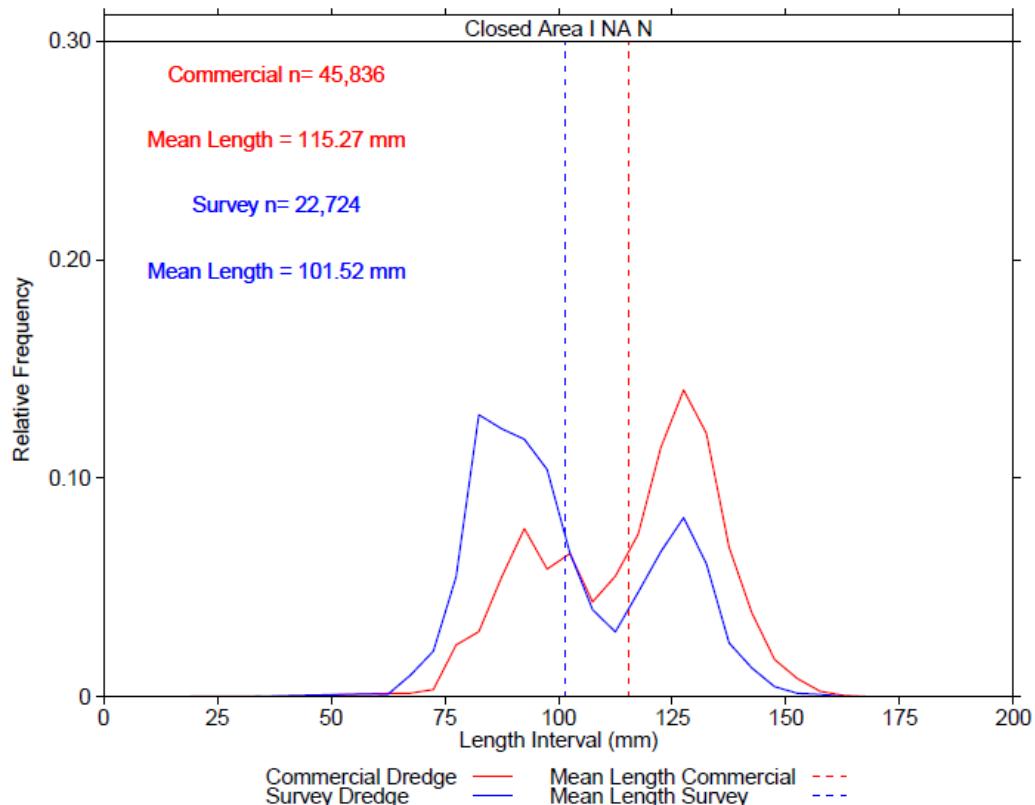
Review of Survey Data Treatment Decisions

The PDT continued discussion from Day 1 on how to treat survey data and provided initial input on potential spatial management options in 2019. Discussion points and input are summarized by rotational area here.

Closed Area I

- Minimal recruitment was observed in 2018 survey efforts.
- The majority of animals observed in the 2018 surveys were in the “sliver”, which is also where most of CAI fishing has occurred thus far in FY2018.
- Market grades reported from CAI thus far in FY2018 have been mostly U10s, U12s, and 10/20s.
- Two cohorts were observed in 2018 (Figure 1), the larger of which will be 9 years old and the younger will be 4 years old in 2019.
 - There was some discussion of potentially closing part of CAI in 2019 to relieve the younger year class of scallops in the area. This was flagged as a follow up item; however, the majority of the PDT did not support a closure in CAI.
- CAI AA can likely support a full-time trip in FY2019.

Figure 4. Relative length frequencies from the 2018 VIMS survey of CLI-NA-N.



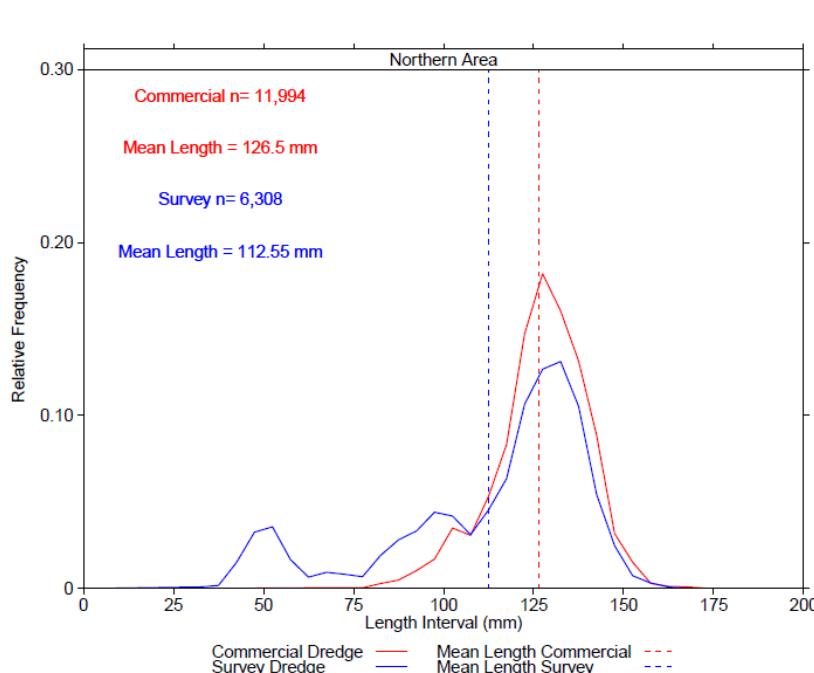
Closed Area II

- CAII AA could support a full-time trip in 2019; however, the PDT feels there is less urgency to fish this area in 2019 relative to other available access areas because:
 - Three cohorts were observed in CAII, the oldest of which will be 5 years old and has additional growth potential if not fished in 2019.
- The PDT acknowledged that the 2019 GB yellowtail sub-ACL may be considerably lower than recent years and recognized that the majority of GB yellowtail bycatch comes from CAII AA.

NLS-N

- The PDT noted that scallops in the NLS-N are typically larger on average than the other NLS rotational areas.
- Three cohorts were observed in the NLS-N in 2018 (Figure 2).
- The NLS-N also seemed to have above average recruitment in 2018 relative to other surveyed areas.
- Due to the greater growth potential for this area and presence of recruits, the PDT identified NLS-N as a candidate closure for FY2019.

Figure 5. Relative length frequencies from the 2018 VIMS survey of NLS-N.



SAMS_Area	Length	Commercial	Survey
NLS_AC_N	32.5	0.0	5.5
NLS_AC_N	37.5	0.0	11.0
NLS_AC_N	42.5	0.0	94.5
NLS_AC_N	47.5	0.0	205.4
NLS_AC_N	52.5	0.0	224.8
NLS_AC_N	57.5	2.8	105.2
NLS_AC_N	62.5	4.8	41.4
NLS_AC_N	67.5	0.0	59.0
NLS_AC_N	72.5	0.0	51.8
NLS_AC_N	77.5	4.6	43.0
NLS_AC_N	82.5	34.1	120.5
NLS_AC_N	87.5	58.1	177.3
NLS_AC_N	92.5	124.2	209.7
NLS_AC_N	97.5	203.9	278.0
NLS_AC_N	102.5	419.1	264.0
NLS_AC_N	107.5	368.1	196.3
NLS_AC_N	112.5	639.4	286.4
NLS_AC_N	117.5	998.7	400.8
NLS_AC_N	122.5	1,764.2	671.4
NLS_AC_N	127.5	2,182.3	799.8
NLS_AC_N	132.5	1,924.6	827.5
NLS_AC_N	137.5	1,576.5	663.9
NLS_AC_N	142.5	1,061.8	342.8
NLS_AC_N	147.5	380.6	156.0
NLS_AC_N	152.5	182.2	46.6
NLS_AC_N	157.5	36.1	19.8
NLS_AC_N	162.5	14.5	5.2
NLS_AC_N	167.5	11.0	1.0
NLS_AC_N	172.5	2.8	0.0

NLS-S-Deep

- Scallops in the NLS-S-deep have continued growing at an abnormally slow rate, have small meats (i.e. 50 count at best), and are not fully recruited to the 4" dredge ring.
- The group noted that "this is about as good as its going to get". Additional work on fecundity and biological processes of these animals is underway, although it is likely they are not contributing much in terms of reproduction.
- There was a decline in density observed between the 2017 and 2018 SMAST survey of this area, suggesting some mortality was occurring in the absence of fishing. It was also suggested that some density dependence and(or) environmental factors may be driving mortality in the NLS-S-deep.
- The PDT felt that there is no biological reason not to harvest these animals and that AP input would help guide development on the best way to harvest them.

NLS-W

- Two full time trips were allocated to the NLS-W in FY2018. Fishing thus far in FY2018 has been reportedly good in the NLS-W, with landings being mostly U10s and 10/20 count.
- This area is dominated by one large year class with a mean SH of roughly 100 mm. Animals will be 7 years old in 2019.
- Very little growth was observed between the 2017 and 2018 survey effort in the NLS-W. It was suggested that VIMS shell height data from the NLS-W be used to develop a specific growth equation for this area (follow-up item for September 5th PDT call).
- Due to the extraordinarily high biomass of harvestable scallops observed in the 2018 surveys, the PDT identified the NLS-W as a candidate area for multiple trips in FY2019.

NLS-S-Shallow

- The NLS-S was allocated one full-time trip in FY2018. Essentially all effort to date has been concentrated in the shallow (i.e. < 70 m depth) portion of the access area, with landings being mostly U10s and 10/20 count.
- The PDT noted that this area may not be able to support a trip in FY2019, and that it either be combined with the NLS-W to facilitate access in FY2019, or be closed along with NLS-N until 2020.

MAAA

- Concentrations of scallops in the MAAA continue to be infected with nematodes and appear to be driving fishing behavior in terms of where effort is directed. No effort was reported south of the ET-Flex thus far in FY2018.

- The 2018 biomass estimate for the unfished southern part of ET-Open was 5,460 mt, roughly 53% of total biomass in ET-Open.
- Not much recruitment was evident in the MAAA in 2018 and the large year class of animals dominating the area will be 6 years old in 2019.
- The PDT felt that the MAAA was a candidate area for multiple trips in FY2019.

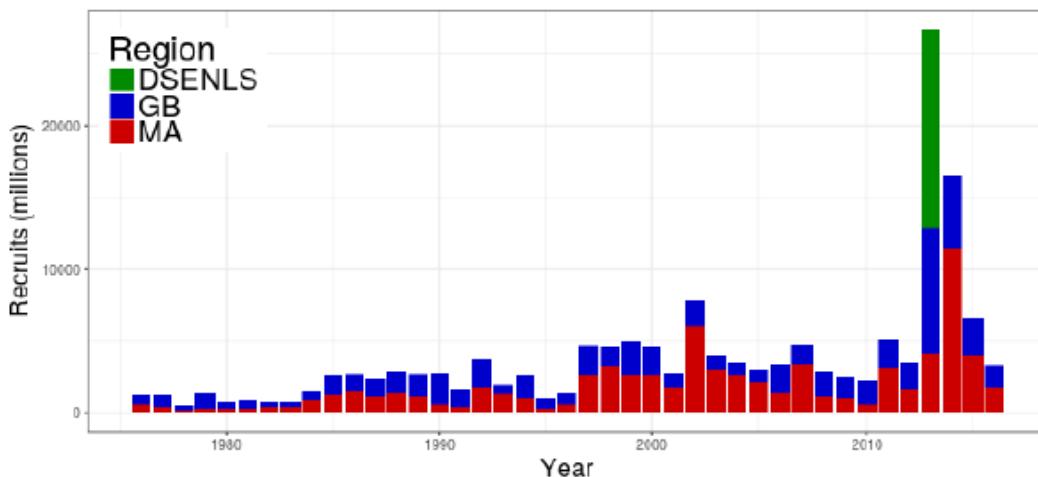
Delmarva

- An order of magnitude reduction in biomass was observed between the 2016 and 2018 surveys of DMV.
- The recruits observed in this area in 2017 were not observed again in 2018.
- There has not been any fishing in DMV for several years and the area was not included in the bounds of the MAAA in FY2018.
- DMV is at the southern extent of the range; the downward trend in recent years suggests some environmental factors may be impacting the success of animals in this area.
 - The PDT does not expect fishing to occur in DMV in the future unless something changes.

Thoughts on Recruitment

- No signs of strong recruitment were observed in the 2018 surveys.
- The small pulses of recruitment that were observed were found in SCH, BI, CAII-N. There were also varying indicators of recruitment in LI and NYB between the dredge and HabCam surveys.
- A member of the public noted that sand dollars are predators of juvenile scallops, and that the WHOI HabCam survey reported higher densities of sand dollars than previous years. It was suggested that sand dollars may be an indication of spat predation.
- The PDT acknowledged that recent years have not followed the massive recruitment event seen in 2012 and 2013 (Figure 3), but that 2018 recruitment seemed rather typical and even slightly better compared to the long-term trend.

Figure 6. Sea scallop recruitment (age 1) by region, 1975-2016. Regions are: Mid-Atlantic (MA, red), Georges Bank (GB, blue) and the deep-water, southeast corner of Nantucket Lightship Closed Area (DSENLS, green) (source: Figure A5 from SARC 65 report).



Thoughts on FY2019 DAS and AA Trips

- The majority of exploitable biomass is within rotational areas that are dominated by the large year class of animals that will be 7-9 years old in FY2019. The recruitment that was observed was seen in open areas.
 - In light of this, The PDT recommended that effort continue to be focused in access areas, and that open area DAS continue to be allocated at a conservative level.
- In addition to the updated SARC 65 reference points, the PDT recommended using $F = 0.48$ (i.e. SARC 59 reference point) as a sensitivity when running the SAMS model with other FY2019 specification alternatives.

2019 NGOM Management Discussion

- A member of the PDT suggested that Jeffreys Ledge could be a candidate closure due to the large pulse of recruitment observed by the 2018 SMAST survey.
 - The PDT noted that rotational closures there may not be possible under the current management measures in place for the NGOM.
 - Many felt that vessels would not fish Jeffreys due to the minimal level of adult scallops observed there relative to the recruits.
- The 2018 survey saw low densities on Platts Bank suggesting this area may not be targeted heavily in FY2019.
- The PDT felt that Stellwagen Bank and Ipswich Bay would likely be the focus of most NGOM fishing in FY2019 due to the higher densities observed there.

- The PDT recommended using updated data to project exploitable biomass for each area surveyed in 2018 and basing the FY2019 NGOM TAC on areas that are most likely to be fished (i.e. the same approach used to set the FY2018 NGOM TAC).

LAGC IFQ Possession Limit Discussion

Council staff outlined presentation topics to be discussed by the PDT re: on-going analysis addressing potential impacts of modifying the LAGC IFQ possession limit. The following sections summarize key findings and PDT discussion points by topic.

Summary of Trip Variable Cost Model

- Updated observer data (1997-2017) were used in the trip variable cost model to estimate trip cost for LA, LA/LAGC IFQ combo, LAGC IFQ, and LAGC NGOM vessels from 2010 to 2017.
- The dependent variable used in the estimation model was FFIWOS (i.e. fuel, food, ice, water, oil, supplies). Independent variables included: vessel length, horsepower, crew size, fuel price, and a dummy variable for LAGC IFQ and small dredge vessels.
- The regression model explained roughly 79% of variation in trip cost.
- Fuel price was the main driver for trip cost, making up roughly 75% of total trip variable cost.
- Trip costs for LAGC IFQ vessels followed a similar trend seen for LA vessels but at a reduced magnitude. Generally, trip cost per day peaked in 2011, decreased to the series low between 2015 and 2016, and appears to be increasing slightly in 2017.
- LAGC IFQ vessel trip cost per day was roughly 35% of LA vessels.
- The PDT recalled reviewing fuel price trends at their last meeting and felt it important to highlight the recent increase of fuel prices to the Committee.

Active LAGC IFQ Crew Size (FY2010-FY2017)

- LAGC IFQ vessels are not held to a crew size limit.
- The majority of active LAGC IFQ vessels had 3 or 4-person crews between FY2010 and FY2017.
- Average vessel size appeared to be correlated with crew size (i.e. smaller vessels had smaller crews, larger vessels had larger crews).
- The PDT noted that an incremental increase of the possession limit (i.e. to 800 lbs) probably would not increase average crew size, but that a larger increase (i.e. to 1,200 lbs) might.

Baseline Restrictions in LAGC IFQ Fishery

- Vessel replacement and(or) upgrade restrictions apply to all limited access fisheries within NEFMC/MAFMC jurisdiction, except for limited access American lobster permits, NEMS Handgear A permits, and LAGC IFQ permits.
- Vessel replacements and(or) upgrades may not exceed 10% of the vessel baseline length and 20% of the vessel baseline horsepower. The baseline specifications refer to the length and horsepower of a vessel when it was first issued a limited access permit.

- LAGC IFQ permits are not held to baseline restrictions, unless associated with a permit suite that has other limited access permits with baseline restrictions.
- Table 1 displays the number of LAGC IFQ permits currently limited by vessel baseline restrictions. Roughly half of all LAGC IFQ permits are subject to vessel baseline restrictions.
- The PDT expressed interest in knowing how many active LAGC IFQ vessels are subject to vessel baseline restrictions.

Table 1. The number of LAGC IFQ permits currently limited by vessel baseline restrictions in other fisheries. Data includes all active, inactive, and CPH permits.

LAGC IFQ with baseline limiting permit	LAGC IFQ without baseline limiting permit (i.e. LAGC only or w/Lobster)	Total
168	134	302
56%	44%	

Considerations of Modifying the LAGC IFQ Possession Limit

- Council staff presented broader potential impacts from changing the possession limit to be considered in addition to economic impact analysis. These supporting considerations included potential impacts on the scallop resource, essential fish habitat, protected resources, and non-target species.
- Modifying the possession limit reduces that number of trips needed to land quota, but would not change overall allocations, landings, or rotational management.
- The range of the LAGC IFQ fishery could expand at a higher trip limit, but not to areas that aren't already fished by the LA component.
- Vessels would continue targeting areas with high-LPUE, meaning area swept would not be expected to increase at a higher possession limit. This indicates little change would be expected in terms of impact on the resource, EFH, protected resources, and non-target species relative to the 600-pound trip limit.
- Overall, the LAGC component makes up 5.5% of the entire fishery, meaning that any impact from changing the possession limit could be expected to be minimal relative to the fishery as a whole.

Economic Impacts of Modifying the LAGC IFQ Trip Limit

- Dr. Demet Haksever presented updated simulation analysis that incorporated PDT input from the July 25th meeting.
- NEFOP data from observed LAGC IFQ trips were used to update the simulation assumptions of trip length for access area and open area trips.

- Trip length was a combination of transit time and time spent fishing. Simulation analysis assumed that fishing time increases proportionally with an increase in the trip limit, but that transit time remains the same.
- Other assumptions used in simulation analysis included:
 - Average vessel landings from open areas were 59% of the total, access areas landings were 41% of the total (average in 2016 and 2017)
 - Access area trip length = 0. 94 days or 22.5 hours at 600 lb. Of the total access area trip length, steam time=0.4 days or 9.6 hours, and total fishing time (TFT) = 0.54 days or 12.9 hours.
 - Open area trip length =1.08 days or 26.47 hours. Of the total open area trip length, steam time =0.25 days, and total fishing time = 0.85 days.
 - Leased pounds are distributed in the same proportion of open and access area landings.
 - Overall lease price was the weighted average of corresponding percentage distribution of landings by area (59% from open and 49% from access areas, the average of 2017 fishing year data).
 - Total landings from all areas for an average vessel were assumed to be 30,000 lb. Trip costs were assumed to be \$589 per day at sea.
 - Fixed costs were assumed to be \$43,870 per year, maintenance and repair costs were assumed to be \$20,330 per year, for a total of \$64,200.
 - Maintenance and repair costs are assumed to be a function of annual day-at-sea spent by each boat, which is equivalent to trip length*number of trips. While trip length increases at higher trip limits relative to 600 lb., the number of trips decline as possession limit increases. As a result, annual day-at-sea, thus maintenance and repair costs, are lower at higher possession limits compared to 600 lb. trip limit: by about 8% lower at 800 lb. 12% lower at 1000 lb. and 15% lower at 1200 trip limit.
 - Scenarios were projected for two different average ex-vessel price scallop price per lb., \$9 and \$12, as well as for varying degrees of leasing, including at 0%, 12.5%, 37.5%, 62.5% and 87.5% corresponding to mid-points of ratios of net leasing to landings using a quartile grouping.
 - Crew shares and vessel profits were estimated using two different lay systems: a) the vessel share is 48% of gross, the crew share is 52% of gross, and crew pays for trip and lease costs; and b) the vessel share is 48% of gross, the crew share is 52% of gross, and the vessel owner and crew share lease costs.
- Key findings from simulation analysis included:
 - The potential impacts of an increased trip limit are not expected to be uniform across vessels, crew, and vessel owners.
 - Vessels that do not lease would be expected to benefit from an increased trip limit in all cases, because trip and maintenance/repair costs decline at higher trip limits.
 - The permit owners who lease out their quota are expected to benefit from an increase in trip limits due to the increase in lease prices in all scenarios.

- At higher trip limits, the impacts on active vessels would vary with the productivity of the areas fished with the leased quota, the price of scallops, steam and fishing time, trip costs, savings in maintenance and repair costs, and the crew lay formula.
 - Net revenue at a higher trip limit depends on how much lease price increases (and associated lease cost), the savings gained from reduced annual trip costs (due to fewer DAS needed to fish quota at higher trip limit), and the proportion of total landings from leased quota.
 - If the increase in lease price is low (for \$9 scenario), those that lease a relatively small proportion of their landings (such as 37.5% or less) could have an increase in the net revenue and crew shares regardless of the vessel lay system. This is because the savings in trip costs will outweigh the increase in lease costs at those levels as annual number of trips and as steam time spent for fishing decline at higher possession limits.
 - However, if lease price increase is high (as in \$12 scenario), net revenue net of lease prices and crew shares could decline even if a vessel leases 37.5% of their landings.
 - For vessels that lease a significant proportion of their landings, vessel shares would remain constant if crew pays the lease and would decline if vessel pays half of the lease for possession limits 800 lb. or higher compared to the 600 lb. limit. However, profits could increase if less time at sea and lower number of trips lowers the maintenance and repair costs for vessels that are not in the top leasing groups.
 - An increase in trip costs per day-at-sea (such as due to increase in fuel prices) would increase the benefits of higher trip limits and(or) reduce the loss from the increase in lease prices. For example, a 20% increase in trip costs per DAS leads to larger savings in the trip costs at higher trip limits and increases crew shares for vessels that lease in 50% or less of total landings. Crew shares could decline at higher possession limits for vessels that lease more than 50% of total landings.
 - In general, all scenario analyses show that profits would increase if crew pays the lease costs and could decline for top leasing groups if vessel owner pays half of the lease despite the decline in maintenance and repair costs.
 - Crew shares could increase except for the top leasing group for \$12 scenario if lease costs are shared by the vessel owner and crew receives the trip cost savings according to the lay system. If lease costs increase significantly, this increase could outweigh the savings in trip costs for vessels.
 - If a trip limit increase were implemented only for access areas, the direction of the results would be similar to the simulations provided for the open areas. However, lease prices increase less in this case.
- Simulation analysis was also conducted using 2017 data to estimate aggregate economic impacts on the LAGC IFQ fishery as a whole at varying possession limits. Key findings from the aggregate impact analysis include:

- At higher trip limits, vessel profits could increase for all lease groups if the crew pays lease costs. However, if crew and vessel owner share the lease costs, profits could decline for vessels that lease more than 50% of total landings.
- If an increase in lease price reduces crew shares below what could be earned in alternative occupations (i.e. opportunity costs of labor), either the crew lay formula would need to adjust, or the demand for leased quota would decrease, meaning the magnitude of increased lease prices may not be as great in some cases.
- The analysis was based on conservative assumptions of changes in total fishing time and trip length at varying trip limits. If vessel owners upgrade their gear and the capacity of the vessel to catch more scallops at each tow, trip lengths and trip costs per lb. of scallops could be lower than estimated here, which could lead to a higher increase in lease prices.
- If the lease price increases for each trip limit is higher than estimated, the magnitude of costs and benefits would be greater than estimated here.
- If the decline in maintenance and repair costs is overestimated, the change in profits will be lower.

PDT discussion points:

- The PDT agreed that increasing the trip limit from 600 lbs would benefit some participants, while negatively impacting others in the LAGC IFQ fishery, and that the magnitude of positive/negative impacts depends on the trip limit (i.e. incremental trip limit increase = lower impact, notable trip limit increase = greater impact), ex-vessel price, and the proportion of total landings that a vessel leases in.
- The PDT highlighted that the demographic that makes up the majority of the active LAGC IFQ fleet (i.e. vessels and crews that lease-in 50% or more of total landings) could be the most negatively impacted by an increased possession limit.
- Some industry members present in the audience felt that increasing total fishing time proportionally with the trip limit was overestimating how trip length (and trip cost) might change. The PDT acknowledged this may be the case for certain situations where fishing conditions are optimal but noted a goal of simulation analysis was to encompass the range of fishing conditions experienced by all active vessels.
- Simulation analysis is not able to account for vessels that are paying back a bank loan used to purchase quota because these financial records are not available. An industry member noted that, in recent years, typical loan payments for purchased quota closely tracked with lease costs per pound in the open lease market. It was also suggested that early in FY2018, it was cheaper to lease quota than to finance it.
- The PDT supported the methods used and interpretation of findings re: analysis of modifying the LAGC IFQ possession limit, and felt it was ready for review by the AP and Committee at their September 13-14th, 2018 meeting.

Review Draft Action Plan for Framework 30

Council staff reviewed the scope and objectives of Framework 30 to the Scallop FMP. At present, FW30 will include measures for: 1) fishery specifications for fishing year 2019, default measures for fishing year 2020; and 2) standard default measures. It was noted that anticipated alternatives to be included in FW30 do not address each 2018 work priority identified by the Council.

The objectives for FW30 include: set specifications including ABC/ACLs, DAS, access area allocations for LA and LAGC, hard-TAC for NGOM management area, target-TAC for LAGC incidental catch and set-asides for the observer and research programs for fishing year 2019 and default specifications for fishing year 2020. Consider modifying access area boundaries, consistent with partial approval of OHA2. Develop standard default measures that would streamline the specifications process by reducing the number of alternatives contained in each specifications process.

There were no questions of PDT discussion on this agenda item.

Discuss Recommendations for 2019 Council priorities for Scallop FMP

Council staff reviewed the list of current work priorities and opened discussion to the PDT on potential 2019 work priorities. Key points from PDT discussion included:

- Regarding the 2018 work priority “Modifying access area to be consistent with OHA2”, the PDT acknowledged that AA boundaries were adapted as much as possible within the legacy closure areas following the approval of OHA2 in FW29. The PDT supported a broader assessment of rotational management and evaluation of the current access area boundaries relative to the rotational management criteria developed in Amendment 10.
 - The timing of such an assessment should consider future RSA survey coverage and awards to ensure the appropriate survey data is available.
- The PDT recommended that measures to address DAS and IFQ carryover be included on the list of potential 2019 work priorities.
- The PDT and members of the audience supported removing “gear modifications to protect small scallops” from the list of potential 2019 priorities.
- The PDT discussed “adjustments to the scallop industry funded observer program (NGOM coverage, etc.)” as a potential 2019 work priority.
 - The group noted that addressing the lack of monitoring in the NGOM management area fits in with the on-going NGOM multi-year priority and would most likely be considered in an Amendment action.
 - Many variables go into estimating observer compensation rates, meaning adjusting observer coverage would probably require a look at the observer set-aside.
 - The PDT identified electronic monitoring (EM) as a reasonable option for the NGOM fishery.

- The PDT requested that GARFO provide in-season estimates of scallop fishery flatfish bycatch on a more frequent basis. These estimates are necessary when projecting next year's flatfish bycatch for specification alternatives.

Other Business

No other business was discussed. The meeting adjourned at 3:59 PM.



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John F. Quinn, J.D., Ph.D, *Chairman* | Thomas A. Nies, *Executive Director*

MEETING SUMMARY

Scallop PDT Meeting

Conference Call

September 5th, 2018

The Scallop PDT met by conference call on September 5th, 2018 to: 1) review and discuss growth of animals in the Nantucket Lightship area, 2) discuss the spatial distribution of multiple cohorts in Closed Area I, 3) review adjusted biomass estimates from the SMAST drop camera survey of Ipswich Bay, 4) review preliminary combined survey estimates and PDT recommendations for specifications, and 6) discuss other business.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. Bill DuPaul, Dr. David Rudders, Dr. Dave Bethoney, Shannah Jaburek, Ben Galuardi, Kevin Kelly, Carl Wilson, Dr. Dvora Hart, Dr. Demet Haksever, Tim Cardiasmenos, Danielle Palmer. Mr. Travis Ford (GARFO) and Ms. Sally Roman were in attendance along with 4 members of the public.

KEY OUTCOMES:

- **2019 Harvest:** The PDT recommends continuing to focus effort in access areas, and to continue to back off effort in open areas for the following reasons:
 1. Animals in Closed Area I, Nantucket Lightship-West, and the Mid-Atlantic access areas will be 6, 7, and 9 years old in 2019, and are ready for harvest.
 2. The majority of recruitment observed in the 2018 surveys is in open areas.
- The PDT plans to continue growth analyses for areas in the Nantucket Lightship because these estimates have short-term management implications.
- The PDT discussed the distribution of two cohorts of harvestable-size animals in Closed Area I, but does not recommend closures as a tool to maximize yield of the smaller year class.

The meeting began at 10:03 am. Jonathon Peros (PDT Chair) welcomed the PDT and members of the public to the meeting and briefly reviewed the agenda.

Growth in the Nantucket Lightship-West

A review of VIMS length-frequency data from the Nantucket Lightship-West suggested slower than expected growth by animals in this area between the 2017 and 2018 surveys. Ms. Sally

Roman (VIMS) presented an analysis of growth in the NLS-W using methods described in Hart and Chute (2009).

Shells were collected at random stations throughout the NLS survey domain in 2016 and were collected systematically in 2017 and 2018 (i.e. every third station). Shells from the NLS-West SAMS area for 2016-2018 were queried from all shells collected from the NLS survey. Mean growth parameters (L_∞ and K) were estimated following the methods described in Hart and Chute (2009) using a random intercept model (L_∞ only) due to sample size. Scallops less than 40 mm and shells with only two annual ring measurements were excluded. Dr. Hart noted that one increment is not enough to estimate random effects on L_∞ or K.

The estimated L_∞ value of 119.02 using recent VIMS data is lower than the L_∞ of 143.9 estimated for Georges Bank by Hart and Chute (2009), and the L_∞ of 151.15 estimated for the NLS in SARC 65 (see Table 1). The mean K value of 0.56 estimated using recent VIMS data is greater than both the K value of 0.427 reported for Georges Bank in Hart and Chute (2009) and the K value of 0.3966 reported for the NLS in SARC 65.

PDT discussion: The PDT noted that growth assumptions in the Nantucket Lightship-West are very important because they have implications for harvest in 2019 (i.e. level of allocation to this area) and the overall estimate of acceptable biological catch (ABC). If growth is overestimated in this area, the ABC for the resource could be overestimated. Conversely, underestimating growth could impact short-term management advice for rotational management. The group noted that growth in all areas of the NLS was considered in the development of Framework 29 and suggested that growth analyses be expanded to include other SAMS area in the Nantucket Lightship.

Observed growth in the Nantucket Lightship has been highly variable in recent years (i.e. not following a typical von Bertalanffy growth curve), meaning there is uncertainty in growth relationships in this area. The PDT also noted that growth rings are delayed a year, meaning that you would see the 2017 growth ring in 2018. It was also noted that SARC 65 estimated L_∞ and K for the NLS-S-deep SAMS area separately from the rest of the NLS.

Table 1 – Comparison of mean K and L_∞ parameter estimates with standard errors.

	Year	K	SE K	L_∞	SE L_∞
VIMS 2016-2018 NLS-West	16 – 18	0.56	0.03	119.02	2.36
SARC 65 NLS (Appendix A1, Table A1-2, p.4)	12 – 16	0.3966	0.0055	151.15	4.4
Hart and Chute (2009)		0.427		143.9	

Key Points:

- Growth assumptions for the NLS-West have short-term management implications. It is important to fine-tune estimates of L_∞ and K (growth) in this area because these animals are getting older (will be 7 years old in 2019) and represent a large portion of harvestable scallops within Georges Bank access areas.
- Growth relationships are uncertain, and the sample size for areas in the NLS from recent years is small. Additional analysis is warranted to help better understand growth in this area.

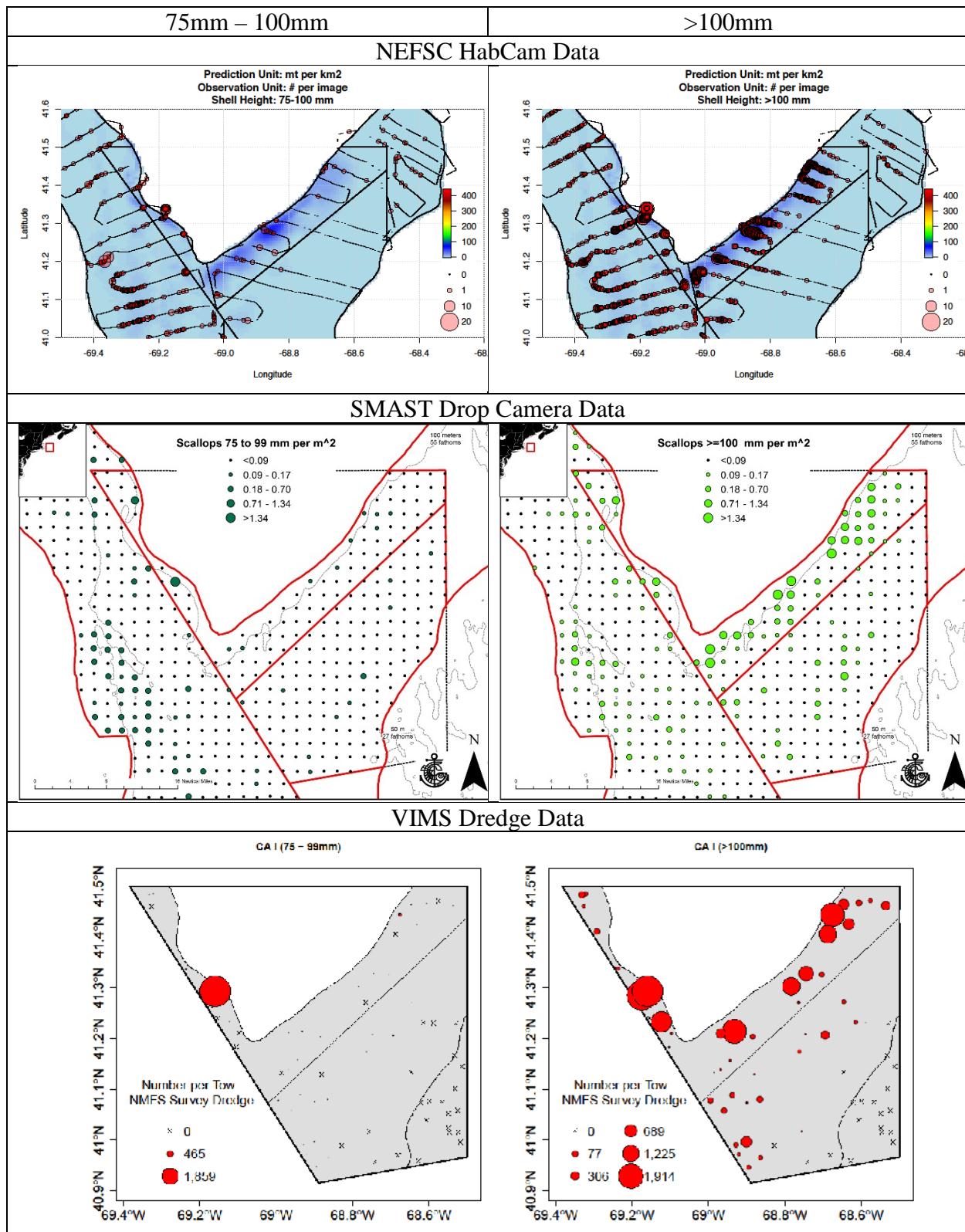
Follow-up:

- VIMS (Dr. Dave Rudders and Sally Roman)
 - Send 2018 NLS-W and NLS-S-deep growth data to NEFSC
 - Look at depth for stations where shells were collected
- NEFSC (Dr. Dvora Hart)
 - Use available data to model growth in NLS areas
 - *Update during PDT call:* For NLS-W, a strong negative year effect appeared to be causing a substantial reduction in L_∞ . Use VIMS 2018 data from NLS-W and NLS-S-deep to model growth.
 - Potentially include a period effect to encompass increments from 2016-2018, we may be seeing a cohort effect.

Closed Area I – Multiple Cohorts

On August 29th, 2018 the Scallop PDT noted that length-frequency plots suggest that there are two cohorts of animals in Closed Area I, and felt that additional work could help determine if a closure should be considered to maximize yield of the younger year class. To help address this issue, the PDT requested that SMAST, VIMS, and the NEFSC provide additional maps showing the spatial distribution of animals in the 75mm – 100mm size range, and animals larger than 100mm in and around Closed Area I. Length frequency plots for Closed Area I and the South Channel are contained in the survey short reports prepared by SMAST, VIMS, and the NEFSC.

Figure 1 - Spatial Distribution of two cohorts in Closed Area I, binned by animals in the 75mm - 100mm range (left), and animals >100mm (right).



PDT discussion: The PDT noted that juveniles may have better success when they settle near adults, but that scallops can utilize other habitats as well. The animals that are 80mm this year will likely be ~100mm next year. At 100mm, the animals still have growth potential, but are likely recruiting the 4" rings of the dredge. The PDT noted that part of the current CAI access area is geographically distinct from the rest of the access area, particularly the western sliver of CAI-NA-N adjacent to the SCH SAMS area.

Key Points:

- While there is some overlap, the two cohorts observed in the 2018 surveys appear to be in separate areas of CAI.
- The PDT does not support a closure in Closed Area I. The larger animals are predominately in the eastern portion of the CAI-NA-N sliver, while the younger year class is in the western portion of the area.
- In general, 4 year old animals that are around 100mm are susceptible of the 4" rings of the dredge, but still have growth potential.
- The larger of the two cohorts in CAI-NA-N will be 9 years old in 2019, and are being fished in 2018.
- Members of the PDT did not support the consideration of closures for small areas, particularly without a clear plan for how to treat the opening. For example, the western portion of CAI-NA would be too small to become an access area.

Scallop Surveys of the Great South Channel, and new Habitat Management Areas

As an extension of the Closed Area I discussion, GARFO staff pointed out that some of the South Channel SAMS area is overlapped by the Great South Channel Habitat Management Area (GSC HMA). The PDT recommended re-estimating biomass for SCH SAMS area excluding survey data within the GSC HMA. The PDT also discussed excluding data from inside the closure when calculating projected landings because it is not available to the fishery.

Follow-up:

- SMAST and NEFSC remove data points that are within the new GSC HMA, and re-estimate biomass for the SCH SAMS area.
 - SMAST reported on the call that there were 38 stations in the GSC HMA.
- Consider modifying the SAMS boundary so that it does not include portions of the GSC HMA, which is closed to scalloping.
- Council Staff circulate the shape files and coordinates of the GSC HMA.

SMAST estimates of biomass in federal waters of Ipswich Bay

The 2018 SMAST drop camera survey of Ipswich Bay included stations in both state and federal waters. At the August 28/29 meeting, the PDT requested that SMAST re-estimate scallop biomass in the federal waters portion of the Ipswich Bay survey domain. The SMAST stations in

the Gulf of Maine were 1km apart. Biomass and mean meat weight were calculated using the 65th SARC shell-height to meat-weight parameter estimates for Georges Bank open areas.

Figure 2 - 2018 SMAST Drop Camera Survey - Scallop Density per m² in Ipswich Bay.

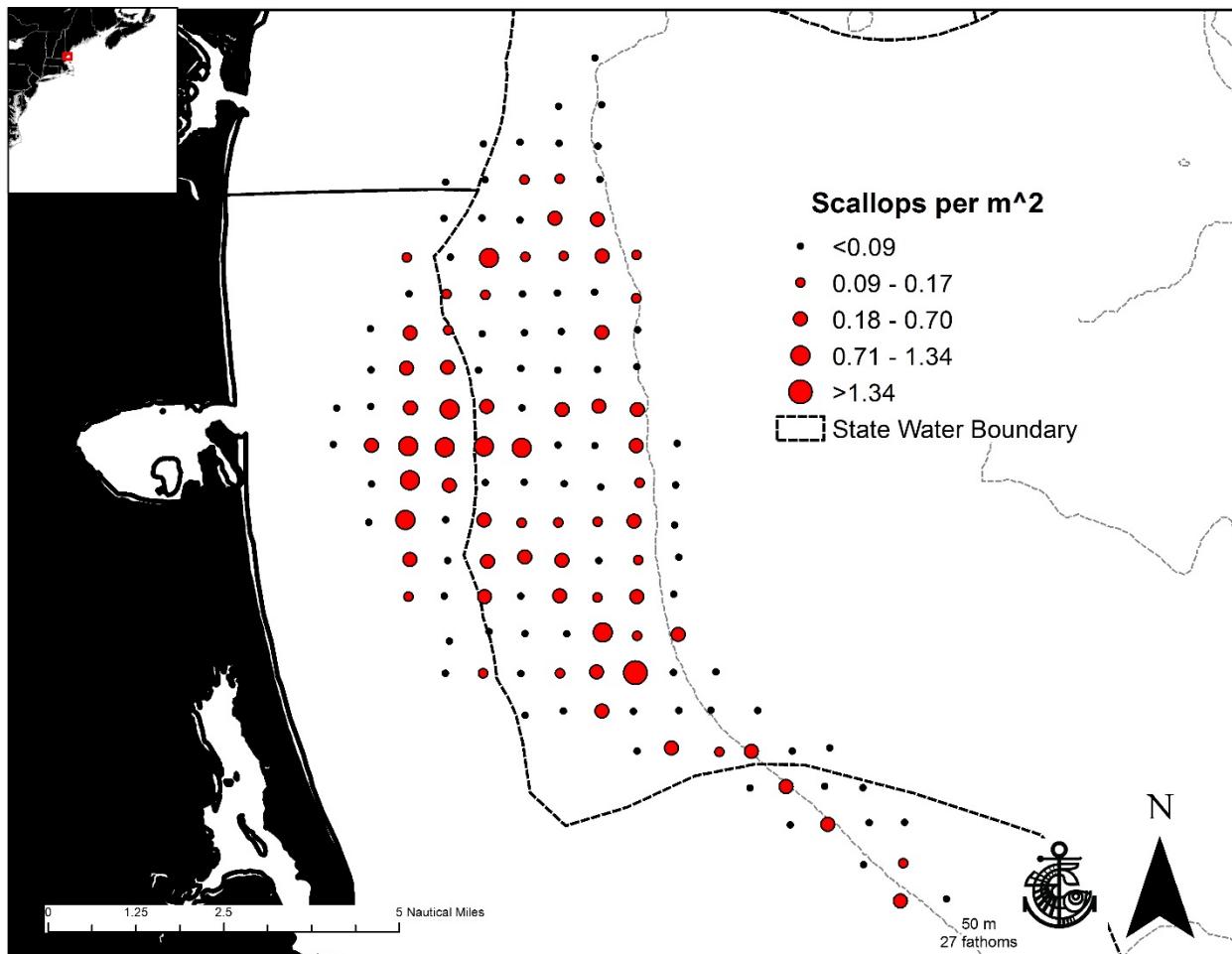


Table 2 - Total Biomass estimates from 2018 SMAST drop camera survey in the Ipswich Bay survey area. Stations were 1 km apart and meat weights were estimated following the Georges Bank 65th SARC shell-height to meat-weight formula for open areas (clop = 0). Biomass estimates were rounded to the nearest 10 tons.

Ipswich Bay	NumMill	BmsMT	SE	MeanWT	Avg. SH (mm)	Sc per m ²	Stations
All	21	410	70	19.6	85.3	0.15	140
Ipswich Bay – Federal	13	290	70	21.7	88.6	0.14	96

Key Points:

- The lengths of scallop observed in state and federal waters were very similar.
- The change in biomass (reduction) is driven by reducing the number of stations included in the estimate, not a change in the density of scallops or size of the animals.

- Result of re-estimation: Decline in biomass estimate that could be used in setting 2019 TAC for NGOM (410 mt in the entire survey area, 290 mt in federal waters).

Follow-up:

- The PDT suggests that SMAST communicate results of surveys inside Massachusetts state waters with MA DMF.
- GARFO and Council staff outline the regulations for NGOM fishing inside state waters.

Updated Combined Survey Biomass Estimates

The PDT reviewed version two (v.2) of the combined survey estimates which will be used to initialize the projection model (SAMS). Updates included the application of VIMS 2016-2018 SHMW parameters for the NLS-N, NLS-W, NLS-S-shallow, and NLS-S-deep for the dredge, drop camera, and HabCam biomass estimates. The dredge estimates in the NLS-W and NLS-S-deep were also increased by a factor of three, consistent with a data treatment recommendation from SARC 65. The PDT noted that excluding the dredge estimate from the average of this area would result in similar biomass estimates as increasing the dredge estimate by a factor of three. The group noted that the abundance estimates also need to be increased (mean meat weights for the dredge in NLS-W and NLS-S-deep were incorrect in v.2 of the combined estimates). Dr. Scott Gallagher (WHOI) is continuing to investigate the why HabCam v.2.2 lengths were systematically lower than lengths collected by the survey dredge and HabCam v.4 in the Mid-Atlantic. If an issue is identified, there may be some changes to HabCam estimates that utilize data collected by v2.2. Dr. Hart noted that there was general agreement between the dredge and HabCam v2.2 on eastern Georges Bank. One issue could be that water clarity can impact stereo estimates of the vehicles altitude. Council staff stated they would update the PDT as more information becomes available, and noted that the estimates are subject to change.

Follow-up for v.3 of combined estimates:

- Update the dredge abundance estimates for the NLS-S-deep and NLS-W
- Update HabCam 2018 exploitable biomass estimates.
- Update on investigation of why HabCam v2.2 lengths are systematically lower than dredge lengths in the Mid-Atlantic.

Outlook for 2019 and 2020 Specifications

The PDT recapped their initial discussion on the outlook for 2019/2020 specifications and discussed several issues in more detail. See Table 3 for a summary of discussion points and recommendations for 2019 rotational management.

Key Points:

- **2019 Harvest:** The PDT recommends continuing to focus effort in access areas, and to continue to back off effort in open areas for the following reasons:

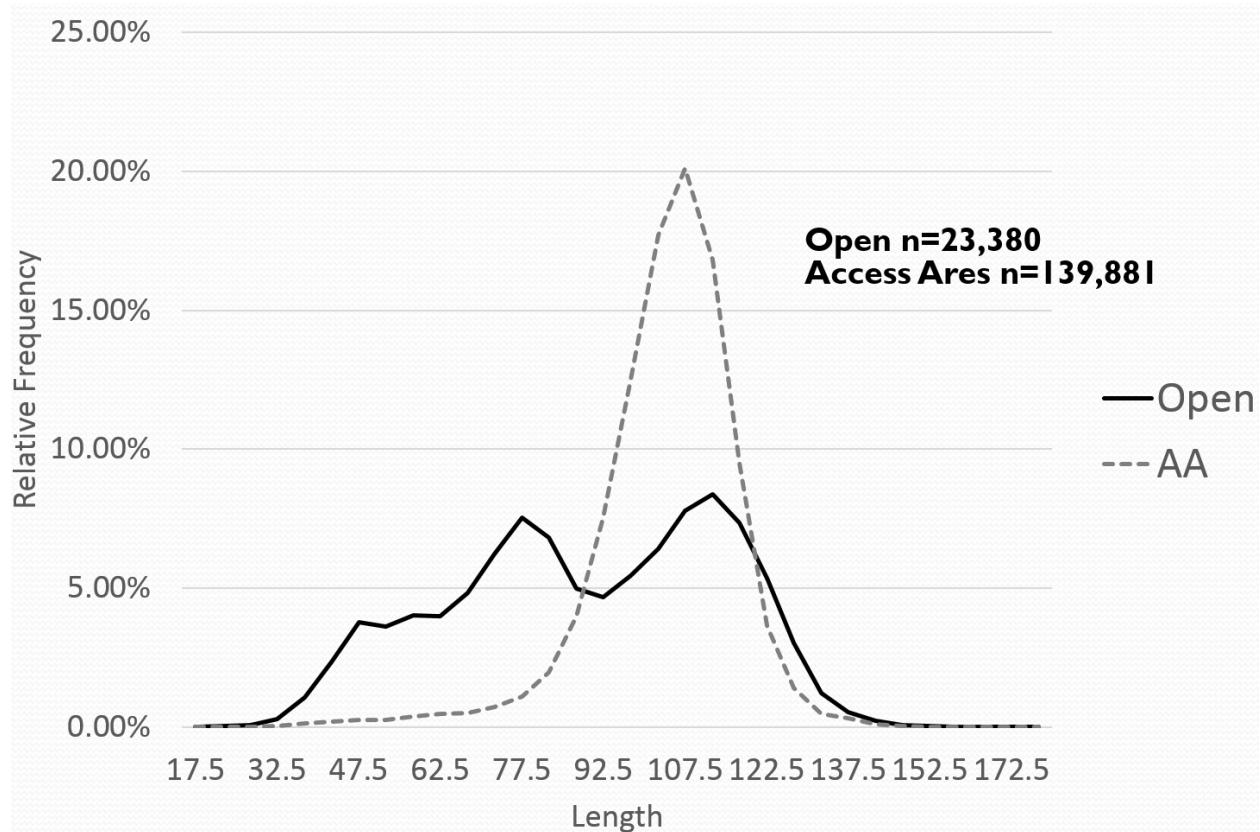
1. Animals in Closed Area I, Nantucket Lightship-West, and the Mid-Atlantic access areas will be 6, 7, and 9 years old in 2019, and are ready for harvest.
 2. The majority of recruitment observed in the 2018 surveys is in open areas.
- Small amounts of recruitment were observed in the South Chanel, southeast parts (CAII-S, CAII-ext, SF), Block Island, Long Island, and New York Bight.
 - Mid-Atlantic Access Area: There is one dominant year class in the Mid-Atlantic Access Area (Hudson Canyon and Elephant Trunk) that will be 6 years old in 2019. The 2018 surveys did not detect recruitment in these areas. The PDT discussed the possibility of multiple trips to the MAAA in 2019.
 1. The PDT does not think that the southern portion of the Elephant Trunk (south of 48.5° Latitude) will be fished in 2019 due to meat quality issues.
 - There is one dominant year class in the Nantucket Lightship-West and Nantucket Lightship-South that will be 7 years old in 2019. The 2018 surveys did not detect recruitment in these areas.
 1. The NLS-S-shallow is being fished in 2018. This area is not expected to support a full trip in 2019 on its own. However, it could be combined with the NLS-West, or harvest could be delayed.
 - There are three year-classes in the NLS-N, and some recruitment was observed in 2018. The PDT does not recommend fishing this area in 2019.
 - It appears that CAII could support a trip in 2019. However, the 2018 surveys detected three cohorts in this area. The oldest cohort will be five years old in 2019, and have additional growth potential.
 1. Relative to other available access areas (CAI, NLS-West, MAAA), there is less urgency to harvest the scallops in CAII. Animals in those areas will be 9, 7, and 6 in 2019.
 - Reference points will be updated following SARC 65 – the F (fishing mortality) associated with the OLF and ABC/ACL will increase to F=0.64 from F=0.48.
 - The slow-growing animals in the NLS-S-deep will be 7 years old in 2019. The 2018 surveys detected a reduction in density, and very little growth. Preliminary 2018 survey biomass estimates for this area suggest that there are over 3 billion animals and around 35 thousand metric tons of biomass. The mean weight per animal is around 10g.
 1. PDT Consensus: There is not a biological reason to not harvest these animals.
 2. The PDT has tracked the growth of these animals since they were first detected, and they are not growing normally. The fecundity of these animals is questionable, and the SHMW relationship is smaller than other animals in the NLS that are part of the same 2012 cohort. This suggests that there may be environmental and(or) density dependent factors limiting their potential to reproduce or grow to sizes expected in other areas of the NLS.
 3. If the Council considers recommending harvest of these animals, the PDT noted that short-term changes in crew sizes and trips limits could help to support harvest

from this area. The PDT did not support using a smaller ring to aid harvest in the short-term, noting that the commercial dredge with a 4" ring and the survey dredge on the 2018 surveys captured a similar length distribution of animals.

Follow-up:

- Calculate the LA ACT based on SARC 65 reference points.
- VIMS: Provide meat quality data from 2018 survey of the NLS-S-deep area.
- Staff and GARFO: How would harvest of animals in the NLS-S-deep be accounted for in the ACL flowchart?
- Staff: Coordinate with groundfish PDT to obtain bycatch estimates.

Figure 3 - Comparison of scallop length frequencies in access areas and open bottom in the Mid-Atlantic. Source: 2018 VIMS dredge survey



Other Business

The next in-person scallop PDT meeting will be on September 28th, 2018 in Plymouth, MA. The meeting adjourned at 12:20 pm.

References:

- Hart, D. R., & Chute, A. S. (2009). Estimating von Bertalanffy growth parameters from growth increment data using a linear mixed-effects model, with an application to the sea scallop *Placopecten magellanicus*. *ICES Journal of Marine Science*, 66(10), 2165-2175.

Table 3 - Summary of PDT discussion points and recommendations for potential 2019 rotational management.

Area	# of cohorts	Recruitment?	Fished in 2018?	Candidate For:
NLS-N	3	Average	No	Closure. PDT feels that the NLS-North is not ready.
NLS-S Shallow	1	None observed	Yes - 1 trip	Opening if combine with NLS-WEST, or WAIT for FY 2020.
NLS-S Deep	1	None observed	Open, not fished	Not all animals recruited to dredge, but susceptible to capture in high densities
NLS-W	1	None observed	Yes - 2 trips	Multiple trips
CAII-S-AC	3	Some (average?)	No	Potential trip
CAI-NA	2	None observed	Yes - 1 trip	Potential trip
CAI-AC	2	Minimal	Open, some effort	Combine with other areas, open bottom?
MAAA	1	None observed	Yes - 2 trips	Multiple trips

Table 4 - Preliminary Combined Survey Biomass Estimates (version 2). This is NOT the final version and will be updated again. See summary section for additional details.

Sheet1

Region	Subarea	Dredge					DropCam					Habcam					Mean			
		Num	Bmsmt	SE	MeanWt	Ebms	Num	Bmsmt	SE	MeanWt	Ebms	Num	Bmsmt	SE	MeanWt	Ebms	MeanNum	MeanBms	SE	MeanWt
GB	CL1ACC	26.4	1137	138	43.2	1004	82	2700	550	33	2200	31.3	763	7	24.3	46.7	1533	189	32.8	
GB	CL1NA	325.0	8889	1432	26.2	5949	358	10850	2150	30	8850	349.7	14786	1869	42.3	344.3	11508	1063	33.4	
GB	CL-2(N)	380.2	7461	2927	19.6	5053						131.6	3025	243	23.0	255.9	5243	1469	20.5	
GB	CL-2(S)	344.3	8875	688	25.8	6165						248.5	7128	112	28.7	296.4	8001	348	27.0	
GB	CL2Ext	375.2	7230	688	19.3	4434						336.1	8086	144	24.1	355.7	7658	351	21.5	
GB	NLSAccN	107.7	3614	192	33.6	3267	127	3855	602	30.3	3178	115.3	3585	20	31.1	116.7	3685	211	31.6	
GB	NLAccS-Shallow	196.3	2111	426	10.8	1377	330	4120	2122	12.5	2131	393.2	4964	59	12.6	306.5	3732	722	12.2	
GB	NLAccS-Deep	1247.9	30963	935	24.8	2460	5442	40709	7596	7.5	7882	3742.0	31785	1289	8.5	3477.3	34485	2587	9.9	
GB	NLS-W	798.4	44790	1806	56.1	108	3482	58521	12549	16.8	29792	2237.1	41155	4443	18.4	2172.5	48155	4478	22.2	
GB	NLSExt	4.2	137	13	32.3	12592	93	2188	1836	23.5	1385	12.5	274	30	21.9	36.6	866	612	23.7	
GB	NF	46.4	502	312	10.8	372						51.2	1119	294	21.9	48.8	810	215	16.6	
GB	SCH	648.6	9453	2153	14.6	5449	458	6804	630	14.9	3817	364.8	9365	288	25.7	490.5	8541	754	17.4	
GB	SCH-45											3.3	110	0	33.9	3.3	110		33.9	
GB	SF	274.4	4403	513	16.0	2698						315.7	7027	108	22.3	295.1	5715	262	19.4	
GB	TOTAL	4775.0	129565	4576	27.1	50928						8332.4	133171	5017	16.0	8246.2	140044	4802	17.0	
MAB	BI	217.8	2572	244	23.7	928						52.8	407	5	7.7	135.3	1490	122	11.0	
MAB	LI	428.2	8813	471	13.4	6122						746.2	8838	1364	11.8	587.2	8826	722	15.0	
MAB	NYB	512.7	6667	771	28.9	3197						259.4	2539	162	9.8	386.0	4603	394	11.9	
MAB	MA inshore	50.4	931	170	45.8	596						65.6	481	1	7.3	58.0	706	85	12.2	
MAB	HCSAA	786.6	13529	853	15.8	7596						563.2	7867	310	14.0	674.9	10698	454	15.9	
MAB	ET Open	714.7	15126	710	11.7	10544						730.2	10272	426	14.1	722.5	12699	414	17.6	
MAB	ET Flex	887.6	18018	1197	16.6	11546						996.7	21264	1826	21.3	942.2	19641	1091	20.8	
MAB	DMV	63.0	1150	161	35.0	772						51.5	1098	49	21.3	57.3	1124	84	19.6	
MAB	VIR	65.7	86	19	55.7	0						3465.4	52766	2345	15.2	65.7	86	19	1.3	
MAB	TOTAL	3726.9	66891	1896	17.9	41300						3629.0	59871	1508	16.5					
TOTAL	TOTAL	8501.9	196456	4953	23.1	92227						#####	185937	5539	15.8	11875.2	199915	3715	16.8	



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DRAFT MEETING SUMMARY

Scallop PDT Meeting Hotel 1620, Plymouth, MA September 28, 2018

The Scallop PDT met in Plymouth, MA on September 28th, 2018 to: 1) review and discuss updates to 2018 scallop survey biomass estimates, 2) review and discuss preliminary OFL and ABC estimates for FY 2019 and FY 2020 (default), including growth parameters for slow growing animals in the Nantucket Lightship West, 3) review Scallop Committee and Council tasking for potential spatial management in FW30, and 4) address other issues to be considered in FW30, such as measures to reduce fishery impacts, NGOM TAC considerations, and recent flatfish bycatch.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Ascii, Dr. David Rudders, Shannah Jaburek, Ben Galuardi, Kevin Kelly, Carl Wilson, Dr. Dvora Hart, Dr. Demet Haksever, Chad Keith, Dr. Cate O'Keefe, and Mr. Vincent Balzano (Scallop Committee Chair). Three members of the public attended this meeting.

KEY OUTCOMES:

- The PDT recommended additional updates to the combined survey biomass estimates for 2018. Specifically, correcting the abundance estimates for the dredge survey in the Nantucket Lightship.
- In the NLS-West:
 1. The PDT recommends reducing the L_{∞} (maximum length) and k (growth) estimates for projecting biomass in 2019 to reflect the slow growth observed between the 2017 and 2018 surveys.
 2. The PDT recommends adjusting the fishery selectivity curve applied to the NLS-West. The current fishery selectivity in GB Closed selects for larger animals and does not capture the ~100 mm animals (majority of biomass in the area) that are already in the fishery.
- The PDT recommends further examination the 2019 NLS-S-deep exploitable biomass estimate.

- **PDT SAMS Run Recommendation:** The PDT recommends continuing to focus effort in access areas, and to continue to back off effort in open areas and proposed the following SAMS run:
 1. Seven Full-Time Limited Access AA trips with 15,000 lb trip limits in the following areas:
 - 1 trip in Closed Area I Access Area
 - 3 trips in the Nantucket Lightship West Access Area
 - 3 trips in the Mid-Atlantic Access Area
 2. Set the open area DAS equal to a fishing mortality rate of F=0.25.

The meeting began at 9:43 am. Jonathon Peros (PDT Chair) welcomed the PDT and members of the public to the meeting and briefly reviewed the agenda.

1. Update WHOI HabCam V2.2 estimates

At the August 28, 2018 meeting, the PDT noted that WHOI length data appeared to be systematically lower than other length estimates in the Mid-Atlantic. WHOI HabCam data from EGB and MA cruises were updated after a coding/software issue was discovered. The shell heights in pixels were being multiplied by mm/pixel factor twice, which added a small random error since the mm/pixel value is close to 1. The net impact of correcting this error is that HabCam lengths increased, and now more closely align with VIMS dredge data. In some instances (BI, LI, NYB, HCS), the biomass estimates increased by a factor of approximately two.

HabCam estimates were re-run by the NEFSC using CFF and NEFSC data, as well as updated WHOI data. Because of some random partitioning of data in the modeling process (KRIG+GAM) some updated estimates are slightly different than what was presented originally, even though same data were used. The PDT reviewed a side-by-side comparison of the initial HabCam estimates in the Mid-Atlantic, as well as the updated estimates and the VIMS dredge data.

PDT Discussion:

- The dredge survey provides direct measurements of scallops, which is a reason to continue dredge surveys of the resource.
- The PDT noted that some of the updated/corrected HabCam biomass estimates are now higher than the dredge. The group also noted a divergence in average meat weights for the dredge and HabCam in some areas. There were not many scallops sampled in some of the open Mid-Atlantic SAMS areas, and if the distribution is patchy the difference could be explained as different size classes being observed. In the ET-Flex SAMS area there was a 7g difference between the dredge and HabCam (HabCam is higher than the dredge). Again, random variation could be one reason for this difference between the surveys.
- Updated length-frequency plots of the HCS SAMS area suggest that there may be some recruitment in this area, though the dominant cohort will be six years old in 2019.

Follow-up:

- Council Staff: Follow-up with Scott Gallagher on the HabCam coding issue and check to see if there were any potential coding issues with the 2016 (HabCam v.4) and 2017 (HabCam v.5) estimates from WHOI on Eastern Georges Bank.
- Continue to investigate additional ways of combining survey estimates (ex: GeoSAMS).
- Pursue the re-stratification of the shellfish survey strata to better capture the scallop resource. Stratification was identified as a reason why the dredge may have missed an area off Long Island where HabCam observed scallops.

Table 1 - Updated 2018 HabCam survey biomass estimates

SAMS4D	NumMi 1	BmsM T	BmsMTS E	MeanW t	AvgSize	Num PerM2	Num Annotated
CL1ACC	31	796	8	25.5	135.8	0.03	1768
CL1NA	353	14843	2089	42.1	137.1	0.32	4016
CL-2(N)	154	5400	341	35.1	114.3	0.35	10288
CL-2(S)	260	7125	907	27.4	102.8	0.08	4709
CL2Ext	332	7956	1131	24	101.2	0.21	2598
NLSAccN	112	3585	17	32	120.6	0.1	1904
NLSAccS- Shallow	374	4964	36	13.3	94.9	1.29	507
NLSAccS- Deep	3686	31790	1681	8.6	78.4	5.04	1220
NLS-W	2262	41155	2568	18.2	99.3	1.55	2156
NLSExt	13	321	20	24.7	102.2	0.03	625
NF	57	1466	200	25.8	83.8	0.03	24603
SCH	363	9302	254	25.6	105.1	0.08	16385
SCH-45	3	96	0	34	86.3	0.02	258
SF	297	7048	887	23.7	93.8	0.07	5768
BI	61	942	36	15.4	87.5	0.08	3466
LI	827	20597	3383	24.9	100.6	0.06	41748
NYB	354	5779	148	16.3	92.6	0.07	18830
MA inshore	86	766	3	8.9	77.7	0.02	20212
HCSAA	583	13109	923	22.5	109.2	0.13	23962
ET Open	776	17936	716	23.1	117.5	0.29	26263
ET Flex	1013	27486	1682	27.1	117.3	0.56	25794
DMV	50	1168	70	23.2	106.2	0.01	10741

Figure 1 - Comparison of HabCam (left) and dredge (right) length frequency plots for Hudson Canyon South SAMS area. Note that there may be some recruitment in the HCS SAMS area.

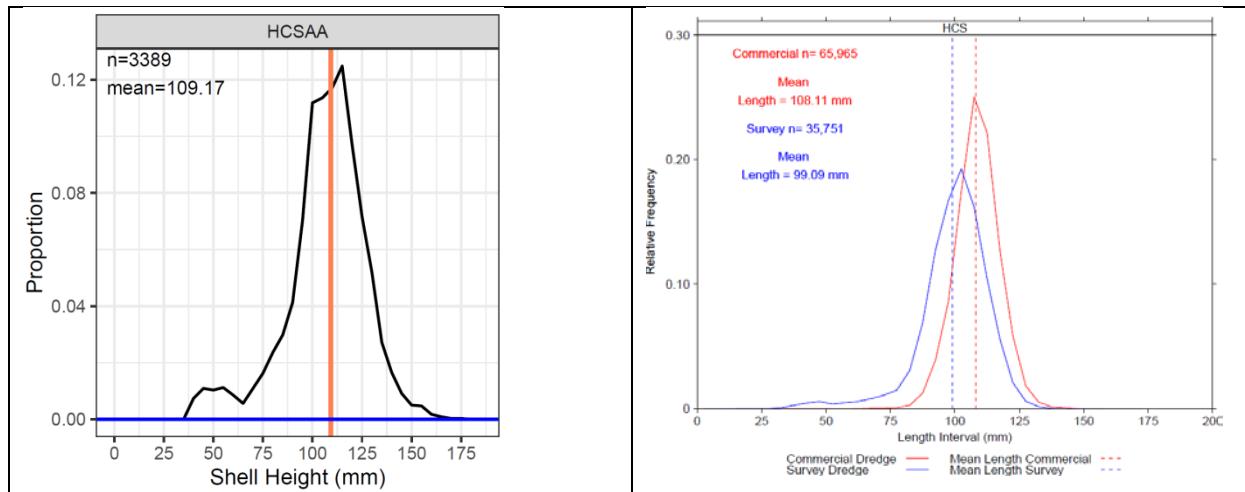
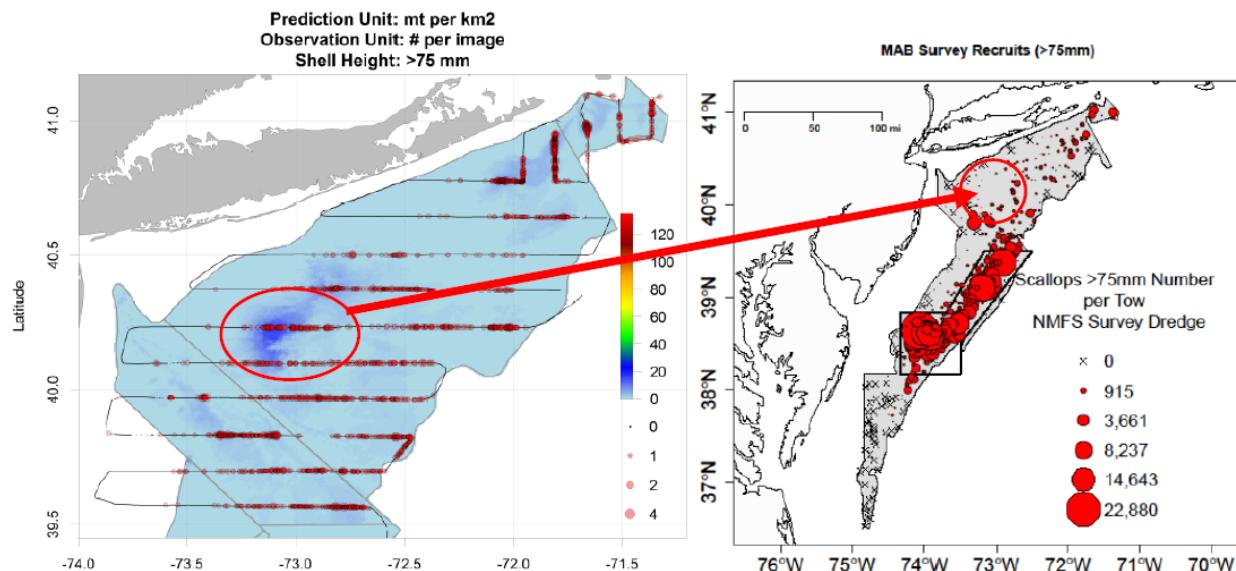


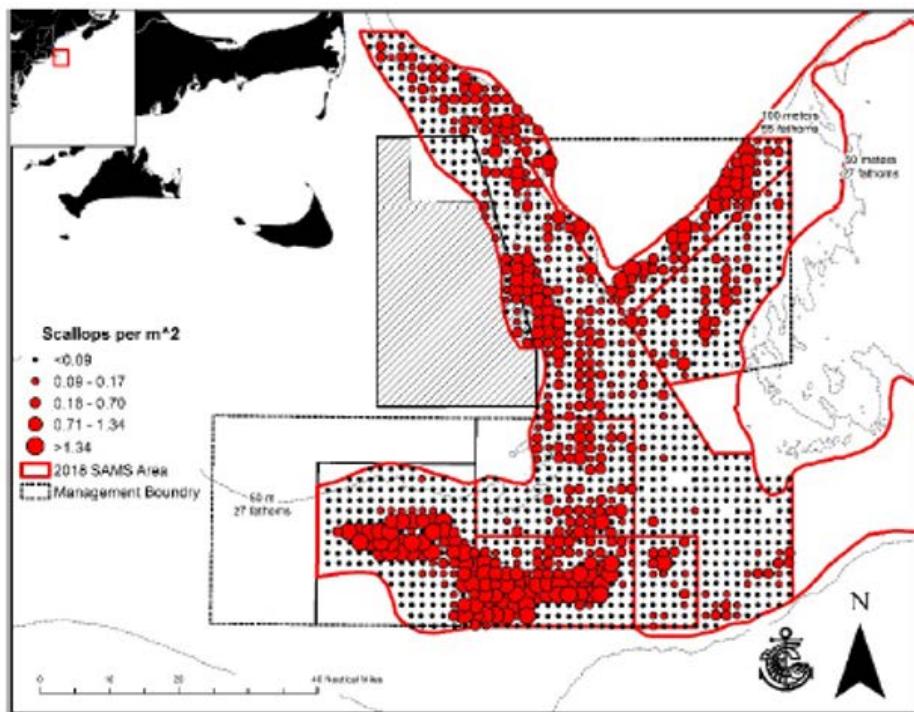
Figure 2 - Spatial distribution of HabCam (left) and dredge (right) surveys in the Mid-Atlantic. The red circles and arrows indicate an area of Long Island (LI) where scallops were observed in the HabCam, but not surveyed by the dredge.



2. Updated Great South Channel Survey Estimates

On Sept. 5, 2018 the PDT noted that there is overlap between the Great South Channel (GSC) Habitat Management Area (HMA) and the South Channel (SCH) SAMS area. The PDT recommended re-estimating biomass for the SCH SAMS area excluding survey data within the GSC HMA. The PDT also discussed excluding data from inside the closure when calculating projected landings because it is not available to the fishery. SMAST updated their estimate prior to the meeting, which showed a 650 mt change in overall biomass (6,800 mt → 8,150 mt). This change (650mt) is equal to SE of the initial estimate.

Figure 3 –Scallop density per m² at 2018 SMAST drop camera survey stations on Georges Bank based on digital still camera observations. Forty stations were within the Great South Channel HMA.



PDT Discussion:

- Dr. Hart explained that the NEFSC had updated the HabCam estimate for this area to exclude the survey track that fell within the overlapping portion of the GSC HMA and SCH SAMS boundary. The HabCam survey did not see a lot of scallops inside the HMA.
- The HabCam estimate within the habitat area was 233 mt. This estimate is lower than the SMAST estimate and is likely a function of where the survey work occurred.
- There were no dredge survey tows within this area in 2018.

Follow-up:

- Update the 2018 combined survey estimates with revised estimate for South Channel SAMS area (complete).
- Update the SAMS boundary shapefile to reflect the exclusion of the HMA.

3. Updated Combined Biomass Estimates for 2018 Surveys

The group reviewed data treatment decisions from earlier meetings, which included using the 2016-2018 scallop SH/MW data from VIMS in areas of the Nantucket Lightship. In NLS-S-deep and NLS-W SAMS areas, the PDT has recommended increasing the dredge biomass and abundance estimates by a factor of three. The group noted that while the biomass estimates for the dredge in NLS have been updated, the abundance estimates still need to be increased to account for reduced dredge efficiency in high density areas. This was causing the mean weight (g) estimates to be artificially high in the NLS-S-deep and NLS-West. Dr. Hart reiterated that the

updated version of the combined biomass reflects the updated SAMS area boundary in the South Channel (SCH), which excludes areas that overlap with the new Great South Channel HMA.

This year, scallop projections by SAMS area for 2019 were provided with the 2018 biomass estimates (Table 7). The percent change column from 2018 to 2019 applies to estimates of biomass, not exploitable biomass. Current fishing year (2018) removals need to be accounted for when running the SAMS model. This year, Dr. Hart used VMS data provided by GARFO and Council staff to apportion open area removals. As data is only available through the first few months of the fishing year, some judgement needs to be made about where fishing may occur during the remaining months of the fishing year. The PDT felt that it is unlikely that a substantial amount of open area fishing will occur in the CAII-ext later this winter.

Follow-up:

- Update the 2018 combined survey estimates with abundance estimates from the dredge survey in the NLS-West and NLS-S-deep. Review mean MWT (g) estimates for in these areas.

Table 2 - Updated biomass and abundance estimates for NLS-W and NLS-S-deep, which have been increased by a factor of 3 to account for reduced dredge efficiency.

Total biomass (mt and number) for the survey dredge, increased by a factor of 3.			
SAMS Area	Total Biomass (mt)	SE Biomass (mt)	Total Number
NLS_AC_S_DEEP	30,962.64	935.42	3,743,754,886.50
NLS_West	44,789.67	1,806.32	2,395,219,713.30

4. Scallop Growth and Selectivity in the Nantucket Lightship West Area.

Dr. Hart presented work on scallop growth in the Nantucket Lightship West SAMS area. Only 59 shells have been aged from the area, and all are part of the 2012 year class. These were modeled by:

$$\text{ring2} \sim \text{ring1} + \text{lat} \text{ with random effect on the intercept only.}$$

The random effect accounts for variation between individuals. Dr. Hart explained that there were only enough data to do this for the intercept. Random effects are on L^∞ and K, and are allowed to vary in the model. These estimates were applied at the mean scallop-weighted latitude in the area (based on the HabCam model), giving mean $L^\infty = 119:1$ and K = 0.487. By comparison, the estimates in SARC-65 for NLS-W were $L^\infty = 146.8$ and K = 0.432. Dr. Hart explained that the new NLS-West growth parameters were used in the SAMS model when calculating the OFL and ABC for 2019 and 2020.

PDT Discussion:

The PDT again noted the lack of growth between 2017 and 2018 surveys and felt that the length-frequency plots from survey data (mean ~100 mm) were consistent with an L infinity of 119 mm as these scallops will be 7 years old in 2019. In other words, if L infinity is 145 mm, a 6 year old animal should not be 100 mm. The group did note that a lack of growth does not mean that the

animals will not continue to grow in subsequent years. Food availability is a major driver of growth in these high-density areas.

Later in the meeting, the PDT noted that while the 2019 projection of biomass is around 40,000 mt in the NLS-West, the projection of exploitable biomass is 8,301 mt (roughly 20% of the total biomass). Dr. Hart explained that the GB CLOSED selectivity curve was being used to calculate exploitable biomass for all access areas on Georges Bank, and that this curve is shifted to the right to account for the fishery selecting larger animals. Applying this to the NLS-West with a reduced L_∞ results in a lower estimate of exploitable biomass. The PDT recommended using the GB OPEN curve to select a larger proportion of these slow growing animals that are already being harvested by the fishery.

Table 3 - Comparison of Growth Parameters in the Nantucket Lightship Area.

	Year	K	SE K	L_∞	SE L_∞
NEFSC analysis for NLS-West, Sept. 28, 2018		0.487		119.1	
VIMS 2016-2018 NLS-West, Sept. 5, 2018	16 – 18	0.56	0.03	119.02	2.36
SARC 65 NLS (Appendix A1, Table A1-2, p.4)	12 – 16	0.3966	0.0055	151.15	4.4
Hart and Chute (2009)		0.427		143.9	

PDT Recommendations and Follow-up:

- Reduce the L_∞ in the Nantucket Lightship West to 119.1 and use K =0.487.
- Run SAMS with SARC 65 L_∞ and K values as a sensitivity.
- In the NLS-West, apply the GB OPEN selectivity curve to account for the majority of harvestable animals being ~100 mm (i.e. smaller than what the fishery typically selects in GB access areas) in 2019 and beyond.

5. Reference Point Updates

Scallop biological reference points were updated in SARC 65 (2018). Council staff explained that updated reference points values would be used to calculate OFL and ABC values for Framework 30. In the Scallop FMP, the OFL is set equal to F_{MSY} which was calculated to be $F=0.64$. The ABC/ACL is the F rate associated with a 25% chance of exceeding the OFL ($F=0.51$). The LA ACT, which accounts for management uncertainty, is set at a 25% probability of exceeding the ABC.

Table 4 - Comparison of SARC 59 and SARC 65 OFL and ABC F values.

	Definition in Scallop FMP	SARC 50 (2010)	SARC 59 (2014)	SARC 65 (2018)
OFL	F_{MSY}	F=0.38	F=0.48	F=0.64
ABC=ACL	25% probability of exceeding the OFL	F=0.32	F=0.38	F=0.51
LA ACT	25% probability of exceeding the ABC	F=0.28	F=0.34	TBD
B_{MSY}	B_{TARGET}	125,358 mt	96,480 mt	116,766 mt
1/2 B_{MSY}	$B_{THRESHOLD}$	62,679 mt	48,240 mt	58,383 mt
MSY		24,975 mt	23,798 mt	46,531 mt
Estimated Biomass	(40+mm shell height)	129,700 mt	132,561 mt	317,334 mt*
Overfished?	$B < B_{THRESHOLD}$	No	No	No
Overfishing?	$F < F_{THRESHOLD} = F_{MSY}$	No	No	No

*SARC 65 estimate of 2017 biomass including the small, slow growing scallops ("Peter Pans") in the NLS-S-deep was 380,389 mt.

PDT Discussion:

- The PDT noted that the F_{MSY} values have increased in the last two assessments, and it is now set at F=0.64.
- The PDT notes that F_{MSY} is less stable as it increases. The yield-per-recruit curve had kept values relatively conservative in the Mid-Atlantic, however that was not the case in the most recent benchmark. There is considerable uncertainty around the Stock-Recruit relationship.
- Scallops are managed using rotational management, and fishery allocations are derived from projected landings associated with spatial management. In recent years, the annual projection landings (APL) have been far below the OFL and ABC, such that these values are not constraining.

Follow-up:

- Staff to review language in Amendment 15 regarding the LA ACT, and work with Dr. Hart on calculating the new F value for FW30.

6. FY 2019 and FY 2020 OFL and ABC Estimates

Dr. Hart presented preliminary OFL and ABC values to the PDT, noting that they would need to be re-done based on the PDT's earlier recommendations. The group notes that discard and incidental mortality estimates were updated in SARC 65. Discards are assumed at 11% of the biomass (0.11 on Georges Bank, .06 in the Mid-Atlantic).

Follow-up:

- Run SAMS model at F=0.64 to calculate the OFL, and F=0.51 for the ABC, and provide estimates of discards.

7. Review of Committee and Council 2019 SAMS Run Tasking

Council staff updated the PDT on recent tasking from the Scallop Committee and full Council. The Committee tasked the PDT with three runs, while the Council added a “7 trip” option with access to Closed Area II South Access Area. The runs are shown in Table 5.

PDT Discussion: The PDT noted that the Council tasking included access to Closed Area II, an area that the PDT did not recommend for harvest in 2019. Council staff explained that this run came from the AP, and the rationale presented at the Council meeting for including this run was to learn more about the potential yellowtail bycatch from this area. There are enough scallops in CAIIS to support a FT LA trip in 2019, and the PDT anticipates over 6 million pounds of scallop meats to come from Eastern Georges Bank over the next two years (assuming an access area trip is allocated). The group noted that the overall GB YT TAC will be lower in 2019. The scallop fishery is allocated 16% of the US Share of GB YT. Some members of the PDT felt that if the Council wants to allocate a FT LA trip to CAII, there should be enough YT available to scallop fishery to cover anticipated bycatch. The PDT noted the amount of fishing that has occurred in eastern Georges Bank, and felt that if YT continues to be a concern there should be some consideration for how the open areas are fished. There was some discussion about allocating half trips to areas like Closed Area II, though support for this concept was mixed, and GARFO confirmed that the Elephant Trunk-Flex approach used in FW28 was challenging to implement and administer.

The PDT noted that the 2019 exploitable biomass projections for the Mid-Atlantic and the NLS-West (after adjustments to selectivity) suggest that both areas can support multiple trips. Some concern was expressed about taking a full 18,000 lb trip from CAI, though the projection indicates that the area can support a trip there.

A member of the public suggested that it would be helpful to have some economic projections ready for the AP and Committee meetings in October. They also suggested that the Council should work to optimize GB yellowtail allocations in 2019 because it is unclear what the allocations will be next year.

PDT Recommendations and Comments:

- a. If given the choice between fishing open bottom vs. the Mid-Atlantic Access Area, Closed Area I, or the NLS-West Access Area, the PDT supports fishing in access areas. These access areas all have a single dominant cohort that is being fished in 2018.
- b. Keep the NLS-S-shallow closed in 2019, and consider combining this area with the NLS-N in 2020.
- c. The recruitment that was detected in 2018 appears to be in highly productive areas like the South Channel, NLS-N, southeast parts of Georges Bank, Long Island, and the Mid-Atlantic Bight. These are places where scallops tend to grow

quickly (and normally). Reducing F in the open bottom could benefit these animals.

- d. Proposed PDT SAMS Run:
 - i. Set open bottom F=0.25
 - ii. 7 FT LA trips at 15,000 lbs per trip.
 - 1. 1 trip in Closed Area I
 - 2. 3 trips in NLS-West
 - 3. 3 trips in MAAA
- e. In FW30 process, consider ways to combine the SAMS outputs to expand the universe of options that are available. For example, use the range of DAS associated with different F rates with different spatial management options.

PDT Follow-Up:

- Look at where RSA compensation fishing has occurred so far this year.
- Provide results of SAMS runs to Demet by October 12, 2018. This would allow enough time to complete economic analyses ahead of the October 23/24 meetings.
- Work to have bycatch estimates ready for the joint AP/CTE meetings in October.
- Council staff and GARFO staff – follow-up on how flatfish bycatch estimates are being stratified for access areas in the NLS.

Table 5 - Overview of PDT tasking to-date for FW30 spatial management

Area	Default Measures	Status Quo	CTE 1	CTE 2	CTE 3	Council 1	PDT 1
Open area F	18 DAS	F=0.295	F=0.295	F=0.35	F=0.4	F=0.3	F=0.25
FT LA trip limit	18,000	18,000	18,000	18,000	18,000	15,000	15,000
CAI	Closed	1 trip + carryover	1 trip	1 trip	1 trip	1 trip	1 trip
CAII	Closed	Closed	Closed	Closed	Closed	1 trip	Closed
NLS-N	Closed	Closed	Closed	Closed	Closed	Closed	Closed
NLS-S	Closed	1 trip	Closed	NLS SW - 3 trips	Closed	Closed	Closed
NLS-W	Closed	2 trips	3 trips		2 trips	3 trips	3 trips
MAAA	1 trip	2 trips	2 trips	2 trips	2 trips	2 trips	3 trips
Total FT trips	1	6	6	6	5	7	7
Total AA lbs per FT vessel	18k	108k	108k	108k	90k	105k	105k

1. No proposed changes to SAMS boundary areas (Same as FW29).
 - a. MAAA (Mid-Atlantic Access Area) would continue to be Hudson Canyon, Elephant Trunk Open, and Elephant Trunk Flex.
 - b. CAI (Closed Area I) would continue to be the CAI-Acc and CAI-N, the same configuration as the access area in FW29.
2. No proposed changes to open area (open bottom). Same configuration as FW29 open bottom.
3. CTE 2: The NLS-SW access area boundary would include all of the NLS-S (both shallow and deep) and all of the NLS-W.

8. FY2017 Year End Report

Mr. Benjamin Galuardi presented the results of the FY 2017 Scallop Year End report. The Scallop fishery harvested 32% of the OFL, and 52% of the 2017 ABC. The majority of discussion was around how state waters catch is estimated.

PDT Follow-Up:

- The PDT needs to estimate state waters catch for FW30, Council staff provide estimates of catch from recent year end reports.
- Follow-up on data sources for state waters landings estimates. Look at Maine DMR website for recent state-waters catch data.
 - The data used in the GARFO report are only from federal dealers.
- Breakdown of state waters landings by state.

9. NLS-Hatchet

Mr. Chad Keith will provide an update on fisheries occurring inside of the NLS-Hatchet at the next PDT call. The purpose of this discussion is to consider the potential bycatch that could be expected if this area were to re-open to scallop fishing (previously part of a groundfish and habitat closure). Mr. Keith explained that most of the fishing that had occurred in this area were exempted fishing trips which were trying to avoid certain species.

10. Measures to Reduce Fishery Impacts

The goal of this discussion was to identify possible measures in FW30 that could be developed to reduce impacts on the scallop resource or other species, such a flatfish.

PDT Recommendations

- Based on earlier discussions about Georges Bank yellowtail, the PDT recommended considering:
 - A seasonal closure of the CAII-Ext from Aug. 15 – Nov. 15 to reduce impacts on Georges Bank yellowtail flounder.
 - Restricting RSA compensation fishing in CAII and CAII-ext to reduce impacts on Georges Bank yellowtail flounder.
- Consider limiting RSA compensation fishing in CAI.

PDT Follow-up:

- Review observer data from August 1 – 14 and November 16 – 30.
 - Look at d/K ratios during these time periods.
- Review bycatch analysis completed in FW29, prepare update for future PDT meeting.

11. Northern Gulf of Maine

Council staff recapped the approach that the Council used to set the NGOM TAC in 2018 through FW29 and explained that this process was reviewed and approached during the most recent benchmark assessment.

The PDT discussed where the fishery may occur in 2019 based on available survey data. Fishing is likely to occur on Stellwagen Bank, which still holds the largest animals in the four survey areas. The PDT noted that there could be conditions where Ipswich Bay gets fished.

With regard to survey efforts, the group noted that there is a considerable amount of fixed gear in the Gulf of Maine, which can make towing difficult.

PDT Recommendations:

- Model the four survey areas individually (as was done in FW29 for Jeffreys Ledge and Stellwagen)
 - Platts Bank
 - Jeffreys Ledge
 - Ipswich Bay
 - Stellwagen Bank
- Do not fish at or above F_{MSY}
- Consider a range of conservative F_{TARGET} rates, which should be <70% of the Georges Bank reference point for F_{MSY} . Last year the PDT looked at $F=0.15$, $F=0.18$, $F=0.2$.
- SARC 65 document is still in prep; PDT will look at final Georges Bank F_{MSY} reference point when the document is available.
- Consider setting the TAC based on areas where the fishery is likely to be active in 2019. This would be a more conservative approach to TAC setting in the NGOM.

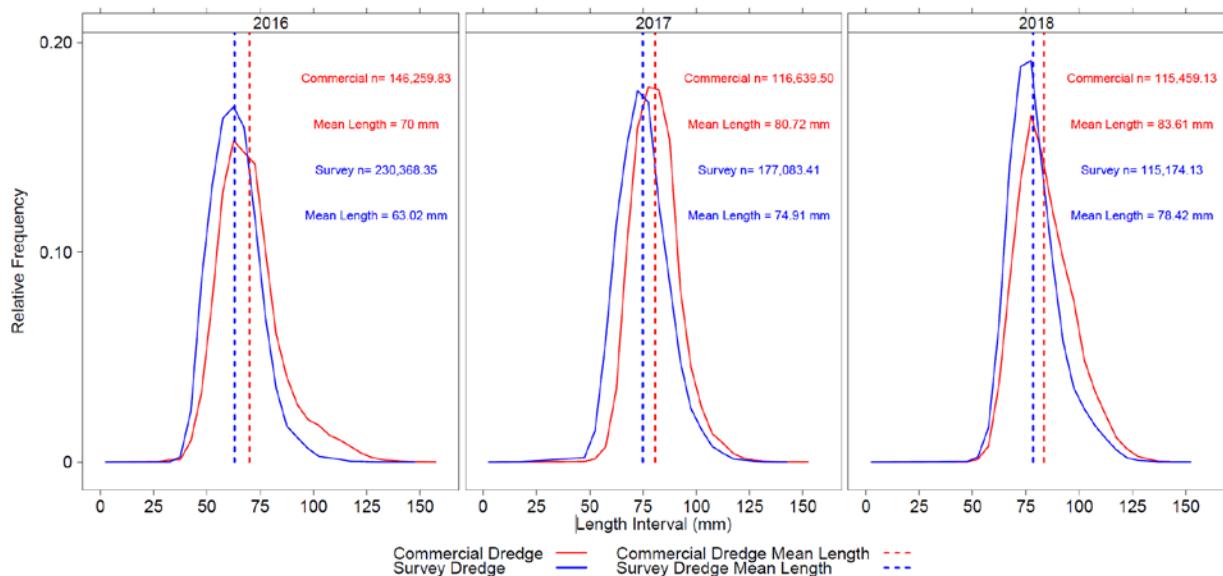
12. NLS-South-deep

The PDT noted that the Council has signaled interest in continuing discussions on how to harvest some of the slow-growing scallops in deep water of the Nantucket Lightship. The PDT has tracked the growth of these animals for several years and spent time during the Aug. 28/29 and Sept. 5 meetings discussing them.

PDT Discussion:

- The PDT was interested in whether or not the commercial dredge (4" ring) captures small scallops. The following plot shows survey and commercial dredge L-F in NLS-S-deep. Note the overlaps in distribution between the survey and commercial drags.

Figure 4 - Length frequency plots from VIMS dredge survey of NLS-S-deep from 2016, 2017, and 2018.



- Considerations:
 - This issue has the potential to become very complicated.
 - Aim to do something simple to start.
 - Timing is a concern relative to other priorities, and the age/condition of the animals.
 - This area is very close to other access areas. A conservative buffer should be considered around any harvest area.
 - These animals were excluded from the CASA models and are not currently in our new reference points.
 - They are part of the scallop stock, and are included in the SAMS model.
 - There are allocation considerations to the LA and LAGC IFQ.
 - Any allocation should be equitable.
 - Could use a VMS declaration code.
 - Shell-stocking has pros/cons. If you have shell stock – it is clear what you are doing in terms of enforcement.
 - Could think of this as BACI. Should aim to look at the impact.
 - The PDT does not support reducing the ring size from 4".
 - Potential workaround: Could consider using a 4" liner and not changing the rings. –

PDT Follow-up:

- Look into how these animals could be accounted for in the ACL flowchart.

Table 6 - Comparison on 2018 Mid-Atlantic survey biomass estimates between HabCam 1 (8/23/18), HabCam 2 (9/28/18), and VIMS dredge (8/1/18).

	Total Num (mil)	Total Biomass (mt)	SE Biomass (mt)	AvgSize (mm)	Density (scal/m^2)	Avg MW (g)
BI						
HabCam 1	53	407	5	71.5	0.07	7.7
HabCam 2	61	942	36	87.5	0.08	15.4
VIMS	218	2,572	244	77.69	0.25	12.01
DMV						
HabCam 1	52	1,098	49	106.2	0.01	21.3
HabCam 2	50	1,168	70	106.2	0.01	23.2
VIMS	63	1,150	161	99.23	0.02	18.53
ET Flex						
HabCam 1	997	21,264	1,826	112.5	0.56	21.3
HabCam 2	1,013	27,486	1,682	117.3	0.56	27.1
VIMS	888	18,018	1,197	104.53	0.76	20.57
ET Open						
HabCam 1	730	10,272	426	101.1	0.27	14.1
HabCam 2	776	17,936	716	117.5	0.29	23.1
VIMS	715	15,126	710	107.18	0.36	21.51
HCSAA						
HabCam 1	563	7,867	310	85	0.13	14
HabCam 2	583	13,109	923	109.2	0.13	22.5
VIMS	787	13,529	853	99.09	0.27	17.28
LI						
HabCam 1	746	8,838	1,364	74.9	0.06	11.8
HabCam 2	827	20,597	3,383	100.6	0.06	24.9
VIMS	428	8,813	471	98.3	0.03	20.62
MA Inshore						
HabCam 1	66	481	1	65.6	0.02	7.3
HabCam 2	86	766	3	77.7	0.02	8.9
VIMS	50	931	170	92.49	0.02	18.58
NYB						
HabCam 1	259	2,539	162	75.8	0.05	9.8
HabCam 2	354	5,779	148	92.6	0.07	16.3
VIMS	513	6,667	771	85.4	0.12	13.37

Table 7 - Preliminary Combined 2018 Survey Biomass Estimates (version 3), with 2019 SAMS run projections by area. This is NOT the final version and will be updated again. See summary section for additional details.

Region	Subarea	Dredge				DropCam				Habcam				Mean				2019 Projections		
		Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Bmsmt	%Change	ExpBmsmt
GB	CL1ACC	26.4	1137	138	43.2	82	2700	550	33	31.0	796	8	25.5	46.6	1544	189	33.1	1681	8.8%	1013
GB	CL1NA	325.0	8889	1432	26.2	358	10850	2150	30	353.0	14843	2089	42.1	345.4	11527	1107	33.4	7149	-38.0%	6131
GB	CL-2(N)	380.2	7461	2927	19.6					154.0	5400	341	35.1	267.1	6431	1473	24.1	7333	14.0%	4103
GB	CL-2(S)	344.3	8875	688	25.8					260.0	7125	907	27.4	302.2	8000	569	26.5	10129	26.6%	4791
GB	CL2Ext	375.2	7230	688	19.3					332.0	7956	1131	24.0	353.6	7593	662	21.5	6016	-20.8%	4773
GB	NLSAccN	107.7	3607	192	33.5	127	3855	602	30.3	112.0	3585	17	32.0	115.6	3682	211	31.9	4096	11.2%	2555
GB	NLSAccS-Shallow	196.3	2111	426	10.8	330	4120	2122	12.5	374.0	4964	36	13.3	300.1	3732	722	12.4	2747	-26.4%	895
GB	NLSAccS-Deep	1247.9	30963	935	24.8	5442	40709	7596	7.5	3686.0	31790	1681	8.6	3458.6	34487	2612	10.0	37909	9.9%	16084
GB	NLS-W	798.4	44790	1806	56.1	3482	58500	12550	16.8	2262.0	41155	2568	18.2	2180.8	48148	4312	22.1	40062	-16.8%	8301
GB	NLSExt	4.2	137	13	32.3	93	2188	1836	23.5	13.0	321	20	24.7	36.7	882	612	24.0	542	-38.5%	525
GB	NF	46.4	502	312	10.8					57.0	1466	200	25.8	51.7	984	185	19.0	1260	28.1%	908
GB	SCH	648.6	9453	2153	14.6	453	6150	550	13.6	351.0	9130	254	25.6	484.2	8244	746	17.0	12990	57.6%	8052
GB	SCH-45	0.2	7	2	41.1					3.0	96	0	34.0	1.6	52			32.2		
GB	SF	274.4	4403	513	16.0					297.0	7048	887	23.7	285.7	5726	512	20.0	5697	-0.5%	4066
GB	TOTAL	4775.2	129565	4576	27.1					8285.0	135675	4110	16.4	8230.0	141032	5604	17.1	137611	-2.4%	62197
MAB	BI	217.8	2572	244	23.7					61.0	942	36	15.4	139.4	1757	123	12.6	3106	76.8%	1673
MAB	LI	428.2	8813	471	13.4					827.0	20597	3383	24.9	627.6	14705	1708	23.4	13943	-5.2%	8450
MAB	NYB	512.7	6667	771	28.9					354.0	5779	148	16.3	433.4	6223	392	14.4	7365	18.4%	3627
MAB	MA inshore	50.4	931	170	45.8					86.0	766	3	8.9	68.2	849	85	12.4	1124	32.5%	899
MAB	HCSAA	786.6	13529	853	15.8					583.0	13109	923	22.5	684.8	13319	628	19.4	13481	1.2%	7286
MAB	ET Open	714.7	15126	710	11.7					776.0	17936	716	23.1	745.4	16531	504	22.2	22792	37.9%	12941
MAB	ET Flex	887.6	18018	1197	16.6					1013.0	27486	1682	27.1	950.3	22752	1032	23.9	18029	-20.8%	17277
MAB	DMV	63.0	1150	161	35.0					50.0	1168	70	23.2	56.5	1159	88	20.5	1627	40.4%	841
MAB	VIR	65.7	86	19	55.7									65.7	86	19	1.3	301	250.9%	12
MAB	TOTAL	3726.9	66891	1896	17.9					3750.0	87783	3958	23.4	3771.3	77380	2194	20.5	81768	5.7%	53006
TOTAL	TOTAL	8502.1	196456	4953	23.1					12035.0	223458	5706	18.6	12001.3	218412	6018	18.2	219379	0.4%	115203



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John F. Quinn, J.D., Ph.D, *Chairman* | Thomas A. Nies, *Executive Director*

DRAFT MEETING SUMMARY

Scallop PDT Meeting

Conference Call

October 3, 2018

The Scallop PDT met by conference call on October 3, 2018 to: 1) review and discuss updates to 2018 scallop survey biomass estimates, 2) make recommendations on OFL and ABC estimates for FY 2019 and FY 2020 (default), including growth parameters for slow growing animals in the Nantucket Lightship West, 3) review and recommend an estimate for state waters catch, and 4) discuss available observer data in the NLS-Hatchet.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. David Rudders, Dr. William DuPaul, Shannah Jaburek, Ben Galuardi, Danielle Palmer, Tim Cardiasmenos, Kevin Kelly, Carl Wilson, Dr. Dvora Hart, Dr. Demet Haksever, Chad Keith, Dr. Cate O'Keefe, and Dr. Dave Bethoney. Seven members of the public attended this meeting.

KEY OUTCOMES:

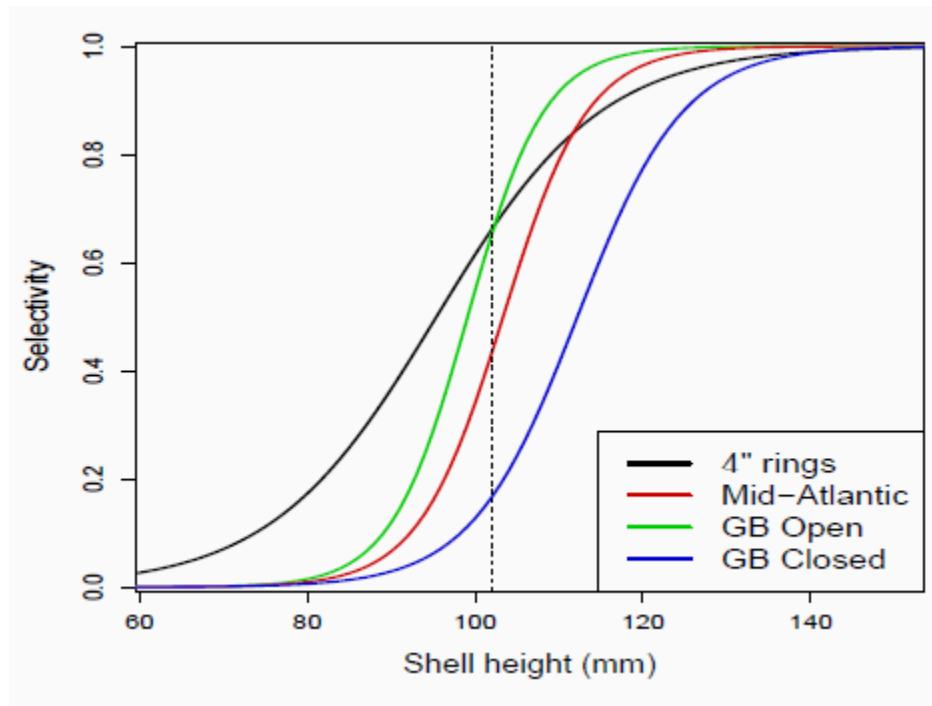
- The PDT recommended that OFL and ABC values for 2019 and 2020 be presented to the SSC at their October 10th, 2018 meeting. These recommendations are outlined in the October 4, 2018 memo to the SSC.
- The PDT reviewed estimates of exploitable biomass by SAMS area for 2019 and 2020, and continued developing recommendations for spatial management in FW30.
- The PDT recommended that the state waters landings estimate in FW30 be updated to reflect the average of the previous three years of landings information. The updated estimate is 662,607 lbs, roughly 300 mt.
- The PDT reviewed observer data from the NLS-Hatchet from other fisheries. The group noted that there are no signs that this area holds commercial densities of scallops and recommends considering the opening of this area through an action that is not time sensitive.

The meeting began at 10:02 am. Jonathon Peros (PDT Chair) welcomed the PDT and members of the public to the meeting and briefly reviewed the agenda.

Fishery Selectivity

At the September 28, 2018 meeting, the PDT discussed applying the Georges Bank Open (GB Open) selectivity curve in the NLS-West SAMS area, and investigating the 2019 exploitable biomass estimate for NLS-S-deep. Dr. Hart presented four selectivity curves: the 4" ring curve from Yochum and DuPaul (2008), and selectivity curves of the three CASA models (Georges Bank Open, Georges Bank Closed, and Mid-Atlantic) from SARC 65 (Figure 1). Dr. Hart explained that the CASA selectivity curves are the combination of gear selectivity, fishery selectivity (i.e. the size of animals targeted by Captains), and selectivity due to discards.

Figure 1. Selectivity curves of a commercial dredge with 4" rings and of the three CASA models reviewed in SARC 65 (GB Open, GB Closed, Mid-Atlantic).



Key points and discussion:

- There was some question about the shape of the Yochum and DuPaul (2008) 4" ring selectivity curve. Dr. Bill DuPaul suggested that the L50 of the 4" ring selectivity curve should be around 100 mm.
- The Mid-Atlantic curve is shifted to the right of the GB Open curve, this is likely because of fishery selectivity in the MAAA (i.e. vessels targeting larger scallops compared to GB Open).
- Realized selectivity curves are much sharper than gear selectivity alone.

Follow up:

- Examine the parameters of the 4" ring selectivity curve.

2018 Combined Biomass Estimates and ACL/OFL Calculations

Dr. Hart updated the 2018 survey estimates, consistent with the PDT's recommendations from the September 28, 2018 meeting (address dredge abundance and meat weights for the NLS-West and NLS-S-deep). The SAMS model was run at an F= 0.51 to calculate the ACL and F= 0.64 for the OFL. The 2020 OFL and ACL estimates assume all areas were fished at F= 0.51 in 2019. The projections assume Georges Bank Open selectivity for the Nantucket Lightship West and Nantucket Lightship South deep areas. Table 1 shows the OFL and ABC calculations for 2019 and 2020, including estimates of discards. Biomass, landings, and discards are in metric tons. Table 2 shows the percentage of the resource that is considered exploitable in 2019 and 2020. Table 3 provides a comparison of exploitable biomass using different selectivity curves for the NLS-West and NLS-South-deep. Landings projections decline as larger year classes are fished over time.

Table 1 – Scallop PDT recommendation for OFL and ABC for Framework 30, Fishing years 2019 and 2020 (default).

Year	ABC-Land	ABC-Disc	ABC-Tot	OFL-Land	OFL-Disc	OFL-Total
2019	57003	5986	62989	66791	6630	73421
2020	46028	4915	50943	53994	5453	59447

Table 2 - Estimated biomass and exploitable biomass for FY 2019 and FY 2020.

Year	Biomass	Exploitable Biomass	Percent Exploitable
2019	218,394 mt	144,731 mt	66%
2020	175,859 mt	114,930 mt	65%

Table 3 - Comparison of exploitable biomass estimates for NLS areas using updated selectivity curves from the CASA model and 4" ring selectivity.

SAMS Area	4" Ring Estimate of Exploitable Biomass	GB Closed Estimate of Exploitable Biomass	GB Open Estimate of Exploitable Biomass
NLS-West	-	8,301 mt	31,926 mt
NLS-S-Deep	16,084 mt	-	10,435 mt

PDT Discussion and Outlook for 2019 and 2020:

The PDT reviewed projection model outputs by SAMS area and continued to develop recommendations for spatial management in FW30. Estimates of exploitable biomass, OFL, and ABC in 2019 and 2020 shown in Table 4 correspond to fishing each SAMS area at F=0.64 (OFL) and F=0.51 (ACL).

Table 4 - Estimates of exploitable biomass, ACL, and OFL by SAMS area for 2019 and 2020.

Subarea	ExpBms19	Land19ACL	Land20ACL	Land19OFL	Land20OFL
		F=0.51	F=0.51	F=0.64	F=0.64
HCS	8816	3541	2933	4150	3448
Vir	19	62	124	75	146
ETOp	14386	5356	4111	6247	4815
ETFlex	19382	7050	4350	8212	5067
Dmv	985	433	457	509	539
NYB	4438	2235	2083	2625	2440
LI	9440	4177	3282	4899	3832
Inshore	2725	1386	1462	1625	1714
TotalMA	60191	24240	18802	28342	22001
C1NA	6413	2002	1118	2326	1302
C1Acc	1182	423	351	494	413
C2NA	5289	1978	1455	2314	1704
C2Acc	6222	2465	2122	2891	2495
NLSW	31926	11590	7309	13575	8527
NLSN	2995	1094	857	1278	1004
NLSSSh	1137	646	611	764	714
NLSSDeep	10435	5044	5697	6034	6798
C2Ext	4864	1802	1323	2100	1542
NLSExt	527	166	89	193	104
Sch	8425	3524	4512	4110	5308
NF	922	343	365	401	429
SF	4202	1685	1415	1968	1652
TotalGB	84539	32762	27224	38448	31992
Total	144730	57002	46026	66790	53993

- Using the GB Open selectivity curve, the NLS-S-deep accounts for ~7% of exploitable biomass in the fishery. The OFL estimate for the NLS-S-deep area in 2019 accounts for ~9% of the total 2019 OFL land estimate.
- **Closed Area I:** A full trip at 18,000 lb for FT LA vessels translates to roughly 2,700 mt of expected removals. Dr. Hart expressed some concern about the ability of CAI to support a FT LA trip at 18,000 lbs because: 1) if biomass is overestimated, realized F could be much greater than projected for 2019, and 2) if meat quality impacts 10-20% of the animals in the access area, ‘effective biomass’ (i.e. biomass that the fishery would target) would be less than projected for 2019.
 - The PDT has recommended considering a FT LA trip at 15,000 lbs (~4.9 million lbs of removals, or ~2,200 mt). A FT LA trip at 15,000 lbs is expected to result in an F of less than 0.64 in CAI.
- **Nantucket Lightship-West:** Fishing the NLS-West at $F=0.51$ is expected to generate landings of 11,590 mt, or ~26 million lbs. The PDT suggests that this area can easily

handle three trips and acknowledges that the market grade may be 20-30 count or 30-40 count based on the lack of growth between 2017 and 2018.

- **Nantucket Lightship-North:** The PDT maintained the recommendation to keep the NLS-North area closed in 2019. Fishing the area at $F=0.51$ would result in 1,094 mt of removals, which is less than what would be expected from allocating an 18,000 lb or 15,000 lb trip to FT LA vessels. The PDT discussed combining this area with the NLS-S-shallow for closure in 2019 and for a potential trip in 2020.
- Using the same LA trip limit for all access areas makes things easier for enforcement and allows vessels to trade trips. A lower trip limit (15,000 lbs) may relieve some pressure on access areas. The difference between an 18,000 lb trip and a 15,000 lb trip is about 1 million pounds.
- Biomass from Block Island is combined with the MAB Inshore area and contributes the majority of biomass to the MA Inshore area. There was PDT support for estimating BI as a separate area for continuity with survey efforts, and to better enable the PDT to track the projections of recruitment seen in BI this year.
- The PDT noted that the 2017 CASA estimate of biomass was higher than the 2018 combined biomass estimate by ~100,000 mt. The group recognized that changes were made to the SH/MW estimates in the NLS areas in the 2018 biomass estimates relative to 2017 CASA estimates, and that the SAMS model (on the whole) partitions the scallop resource on a finer spatial/temporal scale than CASA. One major source of uncertainty is the exceptionally strong year class in the Nantucket Lightship that settled in sub-prime habitat and is not exhibiting normal growth. Between 2017 and 2018, surveys detected a decline in scallop density per meter squared in high density areas, particularly in the NLS-S-deep.
 - It should be noted that the CASA and SAMS models are used for different purposes in scallop management – the CASA model is used with the SYM model to calculate and determine biological reference points, while SAMS is a fine-scale projection model used to develop short-term fishery allocations.

Table 5 - Summary of PDT Input on Spatial Management for FY 2019 and FY 2020.

Access Area	2019	2020
Closed Area II South	Closed	Combined Access Area
Closed Area II Extension	Open-Bottom	
Closed Area I North	Combined Access Area (1 trip)	Closed
Closed Area I Access		Closed
Nantucket Lightship North	Closed	Combined Access Area
Nantucket Lightship South-shallow	Closed	
Nantucket Lightship West	Multiple trips	Multiple trips
Mid-Atlantic Access Area	Multiple trips	Multiple trips
Nantucket Lightship South-deep	Not growing normally - 2019 Priority	

Limited Access Annual Catch Target (LA ACT):

The LA ACT is used to account for management uncertainty and is defined as the fishing mortality rate at which there is a 25% probability of exceeding the total ACL. Another way to explain the management uncertainty buffer is that if the fishery targets an F=0.34, there is a 75% chance that realized F will be less than 0.38. The PDT noted that there is more uncertainty as F increases, and that it is more difficult to accurately target a higher F. The group noted that a method for calculating the ACT was not defined in Amendment 15, and that LA ACT was 0.04 less than the F associated with the ACL in SARC 50 and SARC 59. The PDT suggested that given the larger uncertainty around targeting a higher F, it may be reasonable to use a larger ACT buffer than in the past two benchmark assessments. The group discussed using F=0.46, but wanted to document the methods used to arrive at the LA ACT before moving forward.

State Waters Catch Estimate:

The Scallop PDT reviewed the FY 2017 Scallop Year End report on Sept. 28, 2018. The report is prepared by NOAA Fisheries on an annual basis and is an indicator of federal scallop fishery performance relative to OFL, ABC, and ACLs. One reason for reviewing this information is that an estimate of state waters landings is included in each specification package. State waters catch is accounted for in the ACL flowchart as part of the total OFL, as are removals from the NGOM management area.

Council staff reviewed state waters catch estimates from final year end reports from 2011 – 2017. Over this time period landings have been much higher than the estimated state waters catch for 2017 of 140,000 lbs. GARFO staff explained that these tables reflect landings from

federal dealers only. The PDT also reviewed [landings data from Maine DMR from 1991 – 2017](#). Kevin Kelly pointed out that state of Maine landings represent landings data from state only dealers, which would be outside of the estimate provided by GARFO (which only uses data from federal dealers). Mr. Kelly also pointed out that dealers were not required to report scallop landings to the state prior to 2008.

Method for Estimating State Waters Catch: Mean of the last three years of state landings data from GARFO scallop year end reports.

Fishing Year	Estimated Total State Waters Landings
2011	941,791
2012	654,966
2013	271,568
2014	622,745
2015	536,618
2016	766,566
2017	684,637
Last 3 Year Average	662,607

The PDT recommended that the state waters landings estimate in FW30 be updated to reflect the average of the previous three years of landings information. The updated estimate is 662,607 lbs, roughly 300 mt.

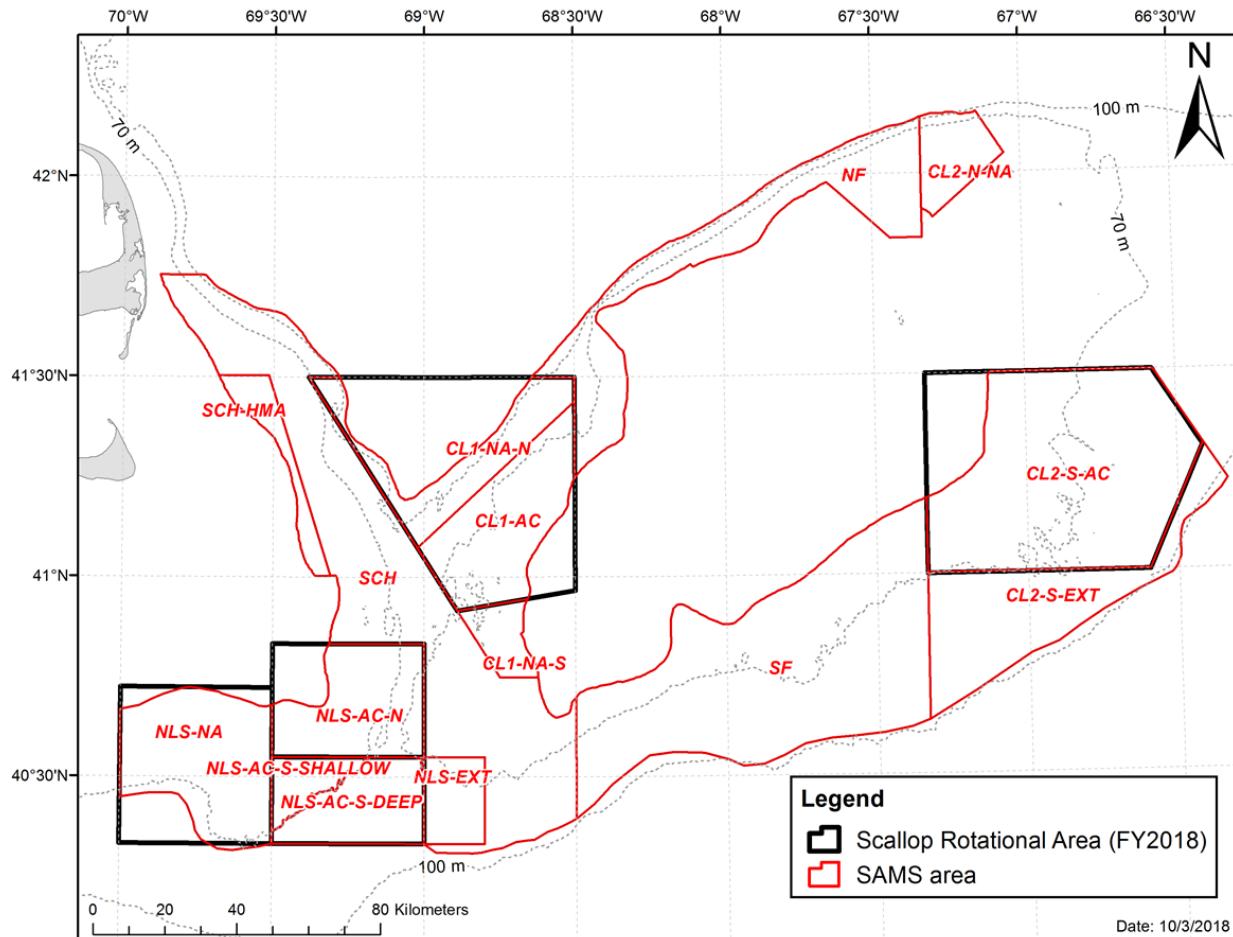
Drafting PDT Memo to SSC:

Council staff reviewed the draft consensus statement with the PDT and outlined other sections of the draft memo. The group agreed to finalize the memo through correspondence. On the call, the group followed-up on the overlap of the Great South Channel HMA and the South Channel (SCH) SAMS area. The PDT recommended portioning the area in an updated version of the 2018 SAMS model but did not recommend stratifying estimates in both areas. Instead, the PDT recommended dropping stations and observations within the GSC HMA and refining future survey to exclude the portion of the SCH that overlaps with the HMA. This focuses resources on areas that are accessible to the scallop fishery. The group discussed flagging meat quality issues and ‘effective biomass’ in the memo to the SSC to better describe how the fishery operates, while noting that this was not a TOR and that the focus is on setting the OFL and ABC.

Follow-up:

- Council staff to circulate a draft of the PDT memo to the SCC for final review.
- Circulate the new Georges Bank SAMS area configuration that accounts for the overlap between the GSC HMA and the South Channel SAMS area.

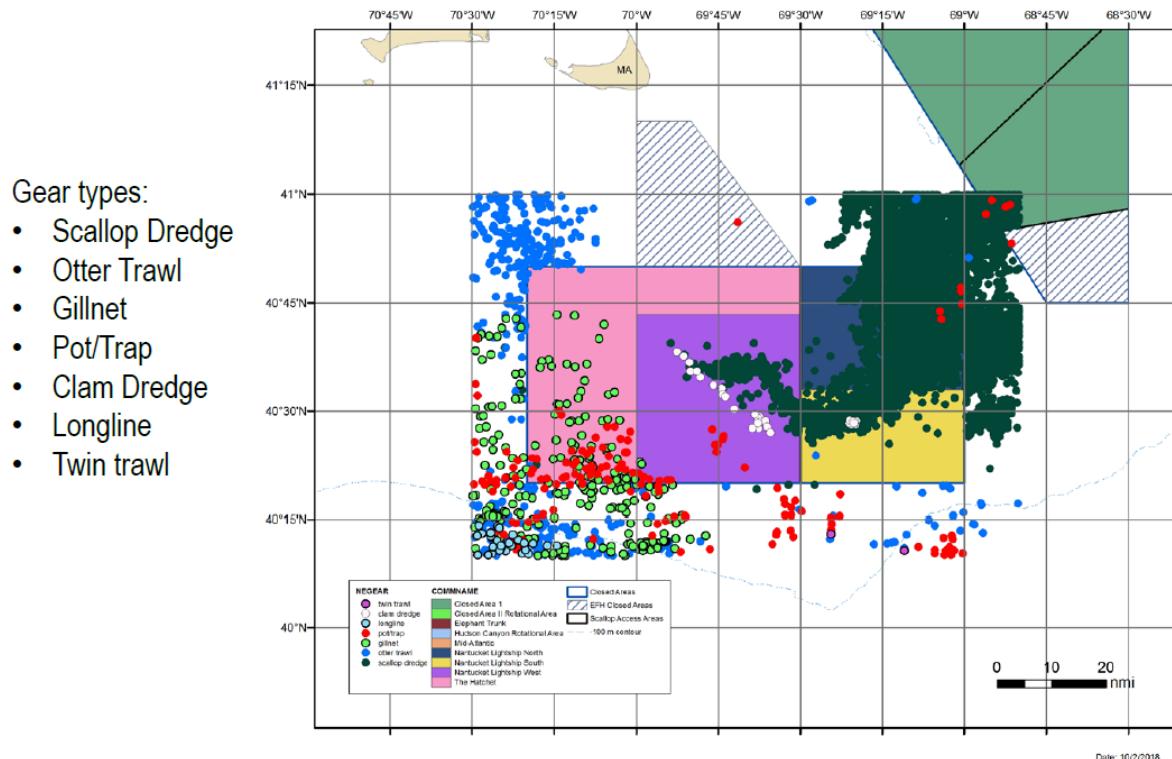
Figure 2 – Updated 2018 SAMS area boundaries in the South Channel.



Nantucket Lightship-Hatchet

Council staff explained that the NLS-Hatchet area was not re-opened to scallop fishing through FW29. The area remained closed as a precautionary approach in the development of FW29. Mr. Chad Keith presented a suite of observer data from NEFOP and IFM programs in the 2011 to 2018 time period from all observed fisheries and gear types operating within a 10 nmi buffer of the original Nantucket Lightship groundfish closure area. There were very few observed trips within the current NLS-Hatchet area that use gear designed to capture scallops (i.e. most records were from targeted fisheries such as large mesh gillnet and pot/trap trips).

Figure 3 - Observer data from all NEFOP and IFS programs between 2011 and 2018 within 10 nmi of the NLS groundfish closed area.



Observer data from all NEFOP and IFS programs, 2011 – 2018
Area was buffered by 10 min (~10 nmi) on each side of the Nantucket Lightship Closed Area

PDT comments and recommendations:

- There are no signs or signals that this area holds scallops. Therefore, there is not a pressing need to re-open this area in the short term.
- Review trawl survey data from within this area to further inform species composition.
- The PDT recommends considering the opening of this area through an action that is not time sensitive (i.e. not FW30).
- Review available data from hauls using bottom tending mobile gear capable of catching scallops in the NLS-S-deep SAMS area.

As part of this discussion, the PDT commented on fishing in the NLS-West. Animals in the northern portion of the area were estimated to have the highest yields, while animals to the south were expected to have lower yield. Council staff planned to follow-up with survey groups to look into comparing VMS data with survey data in a single plot.

Other Business

The PDT plans to have another call ahead of the October 23rd joint PDT/AP meeting in Boston, MA.



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DRAFT MEETING SUMMARY

Scallop PDT Meeting

Conference Call

October 16, 2018

The Scallop PDT met by conference call on October 16, 2018 to: 1) review and discuss updates to 2018 scallop price mode, 2) discuss projections for FY 2019 allocations, 3) review agenda and expectations for upcoming joint PDT/AP meeting, and

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Sam Asci, Dr. David Rudders, Dr. William DuPaul, Shannah Jaburek, Ben Galuardi, Kevin Kelly, Dr. Dvora Hart, Dr. Demet Haksever, Chad Keith, Dr. Cate O'Keefe, and Dr. Dave Bethoney. Mr. Travis Ford from GARGO and several members of the public joined the conference call.

Key Outcomes:

- The PDT recommended developing TAC options for each sub-area of the NGOM from the SMAST survey using a F=0.2 and F=0.25. *Rationale:* The NGOM is still a data-poor area with no biological reference points. The 2018 surveys of the area suggest that while density on Stellwagen Bank has decreased, animals on Stellwagen exhibited growth between 2017 and 2018. The 2018 survey campaign included new areas from the 2017 efforts – specifically Ipswich Bay and Platts Bank.

The meeting began at 10:03 am. Jonathon Peros (PDT Chair) welcomed the PDT and members of the public to the meeting and briefly reviewed the agenda.

Scallop Price Model¹

Dr. Demet Haksever presented the updated price model, which includes the 2017 fishing year data. The main objectives of the price model are to 1) explain the main determinants of the scallop ex-vessel prices on an annual basis; 2) project revenues for alternatives in each Council action using outputs from the biological simulation model (SAMS); 3) predict prices within a reasonable range without depending on too many assumptions about the exogenous variables.

¹ Past iterations of the price model are described in appendices of recent scallop framework actions, and are available on the Council's website. The FW29 price model can be found here:

<https://s3.amazonaws.com/nefmc.org/FW29-Appendix-I-Economic-Model-Draft-for-preliminary-submission.pdf>

Dr. Haksever explained that there is no unique price level corresponding to a specific amount of scallop landings. For example, landings at 55 million pounds to 60 million pounds, the average annual price has ranged from <\$6 per lb. to >\$10 per lb. Similarly, for the price of U10 scallops. At 8 million to 9 million lb., the price of U10s varied from \$9 to \$14. A review of ex-vessel prices showed a decline in recent years as landings have increased. Not surprisingly, a steep decline in the average price in 2018 corresponded with an increase in landings. Dr. Haksever noted that the price model accounts for Japanese and Canadian imports. The group noted that there can be differences in size and quality of scallop imports.

Interest was expressed in seeing data around the number of importers, exporters, and scallop processors. The PDT noted that in some national reports NOAA Fisheries reports data on frozen inventory. The group was interested in seeing this data for scallops and thought that it could help explain changes in daily and monthly prices. Dr. Haksever felt that adding this information could complicate the model.

The PDT noted that imports (volume) are likely correlated to quantity of domestic production, and that the US fishery impacts the global market for scallops.

Key Points:

- The models for U10 and 11+ scallops explain 90% of the variation in price over time. In recent years, the price mode estimates price within a 5% of realized ex-vessel price.
- U10 landings increased in recent years, if the amount of U10 landings drops we can expect to see a price premium for this market grade.
- The SAMS model seems to underestimate U10 landings by 10% - 20%.
- The model outputs are not intended to be forecasts of future prices or taken as point estimates of what fishery revenues will be. Instead, they estimate how ex-vessel price may change if landings and size composition change, holding all other factors constant, for the purpose of comparing one alternative to another.
- Estimated prices in the framework from the price model should not be used for other management issues like setting the RSA common price. If stable spatial management remains relatively stable, then it may be more appropriate to compare results between years.

SAMS Projection Runs

Projection runs (from Committee and Council tasking) were not available for this meeting. The first round of outputs is expected by close of business on October 18, 2018. Council staff requested that runs be completed as quickly as possible to allow time for the PDT and Scallop Advisors to review the results before their joint meeting on October 23, 2018.

NGOM F_{Target} Estimates

The Scallop PDT discussed potential F_{TARGET} rates to use in calculating the NGOM TAC for 2019 and 2020. At the September 28, 2018 meeting the PDT recommended that the Council consider a range of conservative F_{TARGET} rates, which the PDT defined as being <70% of the Georges Bank reference point for F_{MSY} from the last benchmark assessment. Last year several F rates were considered in the development of NGOM TAC alternatives ($F=0.15$, $F=0.18$). The Council's preferred alternative for the NGOM TAC in FW29 used a $F=0.18$.

The PDT noted that the final SARC 65 report is still in preparation and is not yet available. Members of the PDT did note that earlier drafts of the SARC 65 report calculated the F_{MSY} for Georges Bank at $F=0.49$ using gonad weight (not meat weight). While this is not the official F_{MSY} for Georges Bank, Council staff suggested it was a reasonable proxy to base discussions around.

PDT Recommendations:

- Develop TAC options for each sub-area of the NGOM from the SMAST survey using a $F=0.2$ and $F=0.25$. *Rationale:* The NGOM is still a data-poor area with no biological reference points. The 2018 surveys of the area suggest that while density on Stellwagen Bank has decreased, animals on Stellwagen exhibited growth between 2017 and 2018. The 2018 survey campaign included new areas from the 2017 efforts – specifically Ipswich Bay and Platts Bank.

NGOM Default Measures

In the absence of any management changes in the NGOM, Council staff anticipate the NGOM fishery to begin as a derby on April 1. Staff went on to explain that if there is a delay in the implementation of a new TAC that is lower than the default TAC in a given year (ex: default TAC = 100,000 lbs, and proposed TAC = 50,000 lbs), there is a chance that the fishery could exceed the incoming TAC before NOAA could take action to close that portion of the NGOM (if the new TAC is not yet in place). The result would be an overage, subject to a pound for pound payback.

While this scenario may be unlikely, the PDT discussed potential approaches to address situations where the incoming TAC is lower than default TAC, and a derby fishery is expected at the start of the fishing year. Some suggestions included setting the default TAC to zero until the Framework gets implemented. The rationale for this approach was that meats are larger in May (conservation benefit), the Council has taken a conservative approach to TAC setting in the NGOM, weather is generally better in May. The PDT also noted that the industry may prefer an earlier start to allow for participation in other fisheries.

The PDT recommends that two years of projection values be prepared following surveys in the NGOM because there are no dedicated surveys in this area and no new information may be available for projections in the following year.

RSA Compensation Fishing

As follow-up from the September 28, 2018 and October 3, 2018 meetings the PDT reviewed where RSA compensation fishing occurred by area in 2017 and 2018.

Table 1 - Proportion of RSA compensation harvest by rotational area.

RSA Fishing	Percent caught	
Area	2017	2018 (27% landed)
ET	0%	0%
MAA	12%	19%
OPEN	88%	27%
CAI	0%	18%
NLSS	0%	20%
NLSW	0%	16%
Grand Total	100%	100%

After reviewing the data, the PDT affirmed its earlier recommendations to not allow RSA compensation fishing in:

1. Closed Area I to reduce impacts on available harvest (recommending 15,000 lb trip).
2. Closed Area II and Closed Area II-ext to reduce impacts on Georges Bank yellowtail flounder.

The PDT felt that the distribution of RSA compensation fishing in 2018 was a good thing since one area was not being targeted. GARFO staff noted that there was an uptick in commercial landings on RSA trips in 2018. As part of this discussion, the PDT reviewed the anticipated scallop fishery allocations for Georges Bank yellowtail flounder for 2019, as well as a timeseries of scallop allocations and catches of GB YT.

Table 2 - Breakdown of the GB YT allocations to the scallop fishery (mt) for FY2017, and 150% of the sub-ACL.

	YT ABC	US Share	Scallop 'ABC'	Scallop 'sub-ACL'	150% of sub-ACL
	FY2017	76%	16%	95% of ABC	
US TAC (106 mt)	140 mt	106 mt	~17 mt	~17 mt	~25mt

Table 3 - Recent GB yellowtail TACs and scallop fishery sub-ACLs and catches. Values are shown in metric tons (mt).

FY	Total Shared TAC	US % Share	US TAC (mt)	% US TAC Caught	Scallop sub-ACL	Scallop catch	% Scallop ACL Caught
FY2010	1,500	64%	1,200	68%	146	17.6	12.1%
FY2011	2,650	55%	1,458	76%	200.8	83.9	41.8%
FY2012	1,150	49%	564	68%	156.9	164.0	104.5%
FY2013	500	43%	215	43%	41.5	37.5	90.4%
FY2014*	400	82%	328	37%	50.9	59.0	115.9%
FY2015*	354	70%	248	28%	38	29.7	78.1%
FY2016*	354	76%	269	12%	42	2.1	5.0%
FY2017*	300	69%	207	44%	32	52.6	164.3%
FY2018*	300	71%	213	n/a	33	23.9**	72%
FY2019	140	76%	106	n/a	~17	n/a	n/a

* retention of GB yellowtail prohibited for scallop fishery
**2018 in-season estimate as of August 28, 2018.

2020 Default Measures

The scallop PDT discussed the potential for an access area trip as part of 2020 default measures. Staff explained that the Council has recommended developing standard default measures for setting out-year default allocations for the LA and LAGC IFQ through FW30. The Council has proposed two new measures, which will be voted on at the December Council meeting.

1. Default specifications: Set DAS and LAGC IFQ quotas at 75% or previous years allocations.
2. Allocate 5.5% of access area allocations to the LAGC IFQ component for access area fishing.

The PDT reviewed exploitable biomass estimates for OFL ($F=0.64$) and ABC ($F=0.51$) in the Mid-Atlantic Access Area and Nantucket Lightship West for 2019 and 2020 (Table 4).

Table 4 - Exploitable biomass estimates for MAAA and Nantucket Lightship-West for 2019 and 2020.

	Subarea	ExpBms19	Land19ACL	Land20ACL	Land19OFL	Land20OFL
MA	HCS	8816	3541	2933	4150	3448
MA	ETOOp	14386	5356	4111	6247	4815
MA	ETFlex	19382	7050	4350	8212	5067
GB	NLSW	31926	11590	7309	13575	8527

The PDT recommended moving forward the option for access area fishing in the MAAA and/or the NLS-West under 2020 default measures.

The meeting adjourned at 11:54 a.m. No other business was discussed.

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