New England Fishery Management Council
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MEETING SUMMARY

Scallop PDT Meeting

March 1, 2017

The Scallop PDT met in Boston, MA on March 1, 2017 to: 1) discuss the PDT workload based on 2017 Council priorities, 2) address analysis needs for 2017 work items and review preliminary analysis done for 2017 Council priorities (Flatfish Accountability Measures, Northern Gulf of Maine Management, Modifying Access Areas to be consistent with OHA2 changes, and Scallop survey methods peer-review follow-up), 3) receive a presentation on HabCam methods by Dr. Dvora Hart, and 4) discuss other business as necessary.

MEETING ATTENDANCE: Jonathon Peros (PDT Chair), Demet Haksever, Sam Asci, Trish Cheney, Dr. Bill DuPaul, Chad Keith (by webinar), Travis Ford, Ben Galuardi, Dr. Dvora Hart, Kevin Kelly, Dr. David Rudders, Danielle Palmer, Tim Cardiasmenos, and Dr. Cate O'Keefe. Mary Beth Tooley the Chair of the Scallop Committee, Liese Siemann of Coonamessett Farm Foundation, five members of the public attended.

KEY OUTCOMES:

- The PDT discussed flatfish AMs and began developing recommendations to inform Committee tasking. See page 8.
- The PDT discussed the Northern Gulf of Maine management area and began developing recommendations to inform Committee tasking. See page 15.
- Researchers engaged in conservation engineering work aimed at reducing impacts on small scallops updated the PDT on several ongoing projects. At this time, it does not appear that a gear modification to protect small scallops is ready to be explored in a Council action. The Scallop Committee may wish to de-prioritize this work in 2017.
- Dr. Hart presented abundance and biomass estimation methods for HabCam data to the PDT.

The meeting began at 10:04 am. After introductions, staff reviewed the agenda. One member of the public made the PDT aware of discussion that developed at the last SMAST Steering Committee meeting (February 24, 2017), where industry members expressed interest in moving scallops from deep water portions of the Nantucket Lightship to shallower water; he noted that Amendment 7 allowed this through a Framework. There were no proposed changes to the agenda at the outset of the meeting.

UPDATE ON FRAMEWORK 28 AND WORK PRIORITIES FOR 2017:

Staff explained that the proposed rule for Framework 28 came out on January 20, 2017, and that Council staff and GARFO staff have been working collectively to prepare the document for final submission. Council staff expected final submission to happen within the following week. GARFO staff later suggested that FW28 was on track for implementation by April 1st.

Staff guided discussion to work items for 2017, noting that no explicit tasking had come from the Scallop Committee (CTE) because they had not met yet. Thus, the goal outcome of the PDT meeting would be to develop input and recommendations which may shape and refine CTE tasking.

Of this list of 2017 work priorities, there two are regulatory requirements: (1) development of a specifications package for fishing year 2018 and 2019 (default); and (2) development of a flatfish accountability measure (AM) for Northern windowpane flounder, which falls under the priority of modifying flatfish AMs for Georges Bank/Southern New England yellowtail flounder. Staff explained that the Council was explicit in modifying these AMs to be more consistent with the current AMs for Southern windowpane flounder, potentially through the use of gear modifications. Further priorities include: (3) completion of the Limited Access General Category (LAGC IFQ) 5-year review, which is being addressed internally by Council staff with the goal of submitting a final report to the Council in June 2017; (4) modifying access areas to be consistent with OHA2, (5) address management measure changes in the NGOM beyond measures included in FW28, which included setting the NGOM TAC and restricting shell stock inside the VMS demarcation line north of 42°20'N which prohibits LA vessels from circumventing the DAS program by possessing and processing in excess of 50 US bu, (6) integrate findings from the scallop survey methods peer review before forming the coming year's specifications package, and (7) developing gear modifications to protect small scallops.

Staff described other ongoing items, including the upcoming RSA share day on May 4, 2017, tracking flatfish catch throughout the fishing year, and an upcoming programmatic review of the RSA program which will be a joint effort of the Council, NEFSC, and GARFO. Furthermore, staff noted that updated assessments for all 20 stocks will take place this year as part of a groundfish action. The results of these assessments will result in updated flatfish sub-ACLs for the scallop fishery.

Ensuing PDT discussion expressed concern in how flatfish sub-ACLs are allocated in light of how current projections show that the scallop fishery will almost certainly exceed them. The PDT also discussed updates on the timeline for OHA2; GARFO staff suggested the most recent update was to have a proposed rule by May, however, the timeline is still tentative.

FLATFISH AM-DISCUSSION:

Staff refreshed the PDT to the current Council policy in place for triggering a flatfish AM: if the scallop fishery meets or exceeds the flatfish sub-ACL, or if 150% of the fishery ACL is caught and the scallop sub-ACL is not exceeded, an AM is triggered. The Council has proposed a 'sunset clause', which would remove the 150% trigger for the next two years (contingent on approval of FW56 to the Groundfish FMP).

Staff presented background information on the current flatfish AM measures (see Doc. 2). Current yellowtail AM's in place for the LA fleet include seasonal closures depending on the sub-ACL overage for both GB yellowtail (SRA 562 & portion of 525) and SNE yellowtail (SRA 537, 539, and 612). There are three seasonal closure AM's for the LAGC IFQ dredge component (Closure 1: SRA 613, Closure 2: SRA 537, Closure 3: SRA 539), and one seasonal closure for the LAGC IFQ trawl component (SRA 612 & 613). Staff noted that AM closure areas for both dredge and trawl LAGC IFQ components only pertain to the SNE yellowtail stock area. The S. windowpane AM is a gear modification, requiring a 5 row apron west of 71° W. PDT members noted that a resource-wide proactive AM is in place which requires the use of a 7 row apron year-round.

The PDT discussed spatial and temporal distribution of yellowtail/windowpane stocks. The PDT briefly discussed the discrepancy between recent sub-ACLs and overages in projected catch (198% proj. overage for GB YT, 272% projected overage for NWP). Staff also pointed to the possibility of using a multi-year average; this could align with the sunset provision to account for the scenario where the percentage of a sub-ACL fluctuates annually (i.e. one year could exceed sub-ACL, and the next year could come in lower than the sub-ACL). A PDT member noted that a multi-year average could be a good approach for GB yellowtail because typically catch is high when CAII AA is open, and low when the area is closed. It was further described that this may not be effective for N. windowpane because this species does not have the same seasonal distribution patterns as GB yellowtail.

Staff used haul level observer data to describe quarterly bycatch and d/K ratios of GB yellowtail and N. windowpane in the LA component from 2006-2011 by statistical reporting area (Doc. 2, Figures 3-10). Staff noted that there was a small percentage of observed tows in SRA 521 encountering NWP and even though some NWP was caught in 514, the sample size was very small.

A member of the PDT described that NWP distribution is largely dictated by depth and season; during the warmest months NWP are found in shallow water and in the coldest months are found in very deep water. It was suggested that during these months of extreme warm and cold, NWP are found mostly in areas where scallop fishing does not occur, and NWP catch is reflected in months where they transition from shallow water to deep water.

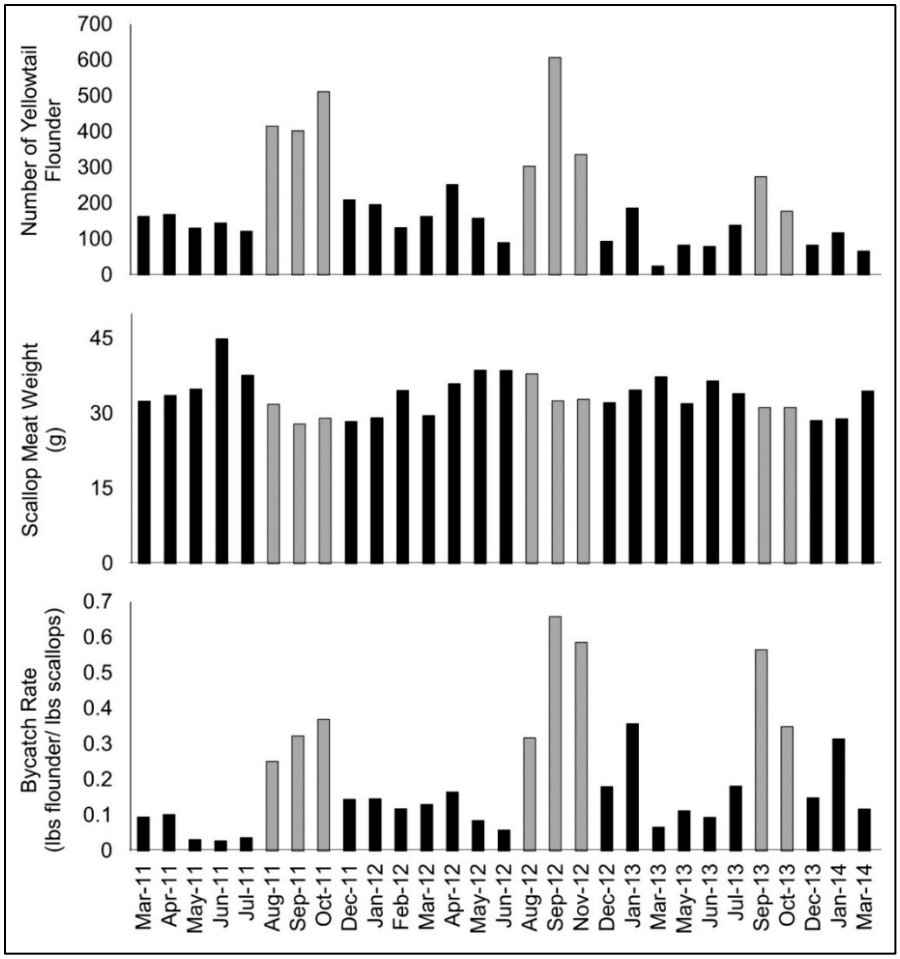
Staff referred to the approach taken previously by the PDT to create S. windowpane AM's, where an involved process used observer data to estimate SWP d/K ratios by ten minute squares, and informed PDT members of potential time-area closures. It was noted that ultimately a gear modification (5 row apron west of 71°) was chosen as the Council preferred alternative for the S. windowpane AM.

Presentation to PDT: *"Reduction of flounder bycatch in the sea scallop fishery on GB: the yellowtail vs. windowpane problem"*
Dr. Liese Siemann of Coonamessett Farm Foundation presented findings from the CFF seasonal bycatch survey relevant to GB yellowtail and NWP bycatch avoidance (Doc. 3). The dredge survey used a fix grid design and was conducted every four to six weeks from May 2011-March

2014 in the scallop access areas of CAI and CAII. Since 2011, one of the dredges used was a turtle deflector dredge (TDD) with a 7 row apron. The survey was designed to collect spatially and temporally specific information about groundfish bycatch and scallop mea yield in scallop access areas on GB.

Figure 1 describes the number of yellowtail caught, average scallop meat weight, and yellowtail bycatch rate (lbs flounder/lbs of scallops) in CAII between March 2011 and March 2014. The original yellowtail closures were between February 1st and June 15th; the CFF seasonal dredge survey findings show these months to have the lowest yellowtail bycatch and the highest scallop meat weight.

Figure 1. The number of yellowtail caught, average scallop meat weight, and yellowtail bycatch rate (lbs flounder/lbs of scallops) in CAII between March 2011 and March 2014.



Findings from 2011-2014 suggested yellowtail and NWP do not follow the same seasonal shifts (Figure 2, Figure 3). More NWP were caught than yellowtail in the access areas of CAI and CAII during the time series.

Figure 2. The number of yellowtail and NWP caught in CAI by the CFF seasonal bycatch survey from 2011-2014.

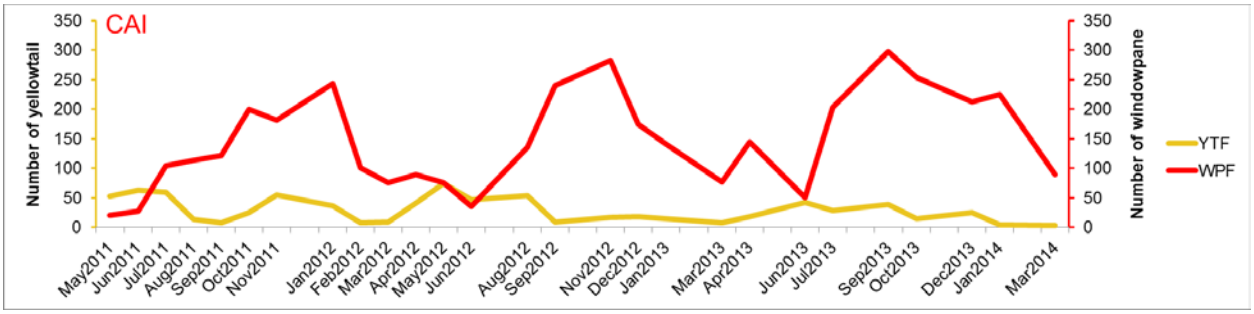
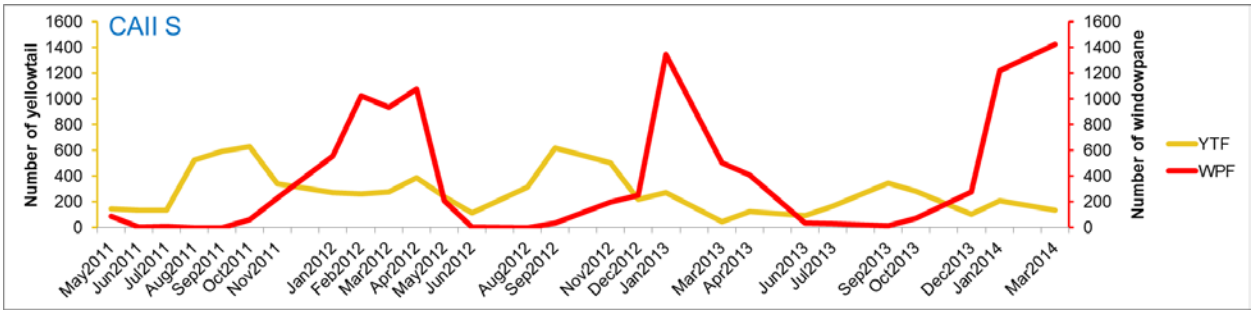


Figure 3. The number of yellowtail and NWP caught in CAII S by the CFF seasonal bycatch survey from 2011-2014.



Generally, NWP catch peaked when yellowtail catch was low in both CAI and CAII S. From August 2015-present, surveys conducted in CAII N and portions of open area on northern GB (Open N) showed much higher NWP catch than yellowtail flounder.

Figure 4. The number of yellowtail and NWP caught in CAII N by the CFF seasonal bycatch survey from 2015-present.

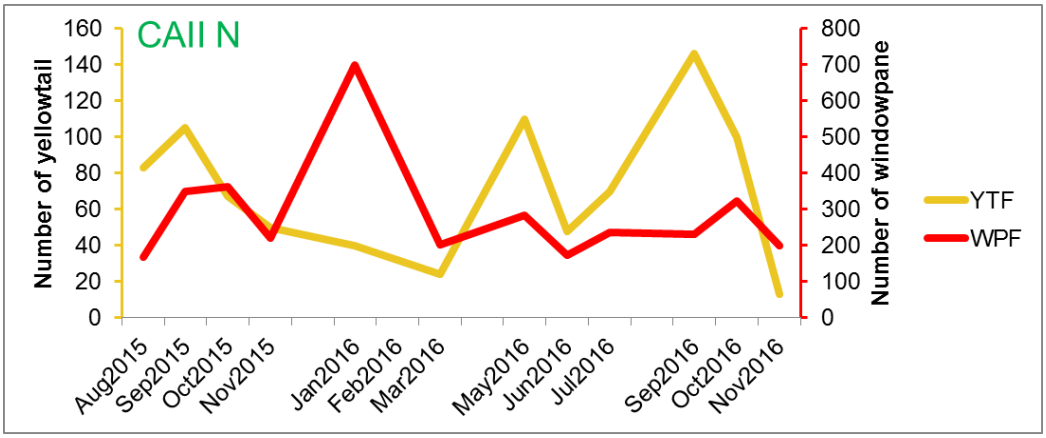
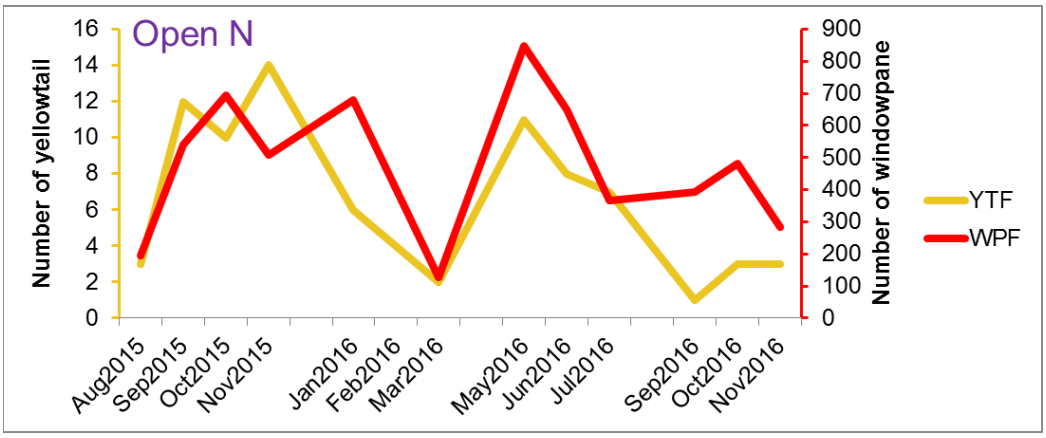


Figure 5. The number of yellowtail and NWP caught in the open area of northern GB by the CFF seasonal bycatch survey from 2015-present.



The presenter suggested that trends in CAII N and Open N may be similar to those in CAII S, further noting that seasonal trends in NWP catch in Open N are not yet obvious based on the current data available. A PDT member commented that yellowtail are not as prevalent on northern GB as southern GB, and that the open area of northern GB would not likely be an area of concern in terms of yellowtail bycatch.

Figure 6. CFF catch of yellowtail and NWP and the theoretical weight of a 130 mm scallop in relation to the current closure time frames for CAII S.

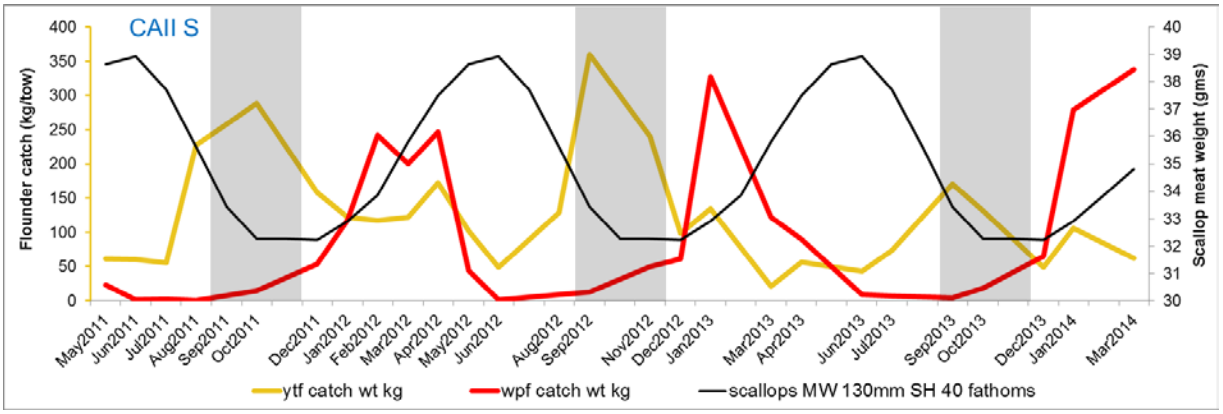


Figure 6 describes an overview of findings from the CFF seasonal bycatch survey in relation to the theoretical meat weight of a 130 mm scallop and current seasonal closures in CAII S. A member of the PDT stated that even when CAII S is open, not much fishing occurs in the area during January and February (even though CFF findings show January and February to be peak months for NWP catch). Furthermore, it was suggested that delaying access to CAII S until May 1st would be beneficial because this is when NWP bycatch is the lowest and scallop yield is the highest. The PDT plans to investigate monthly effort on Georges Bank.

The presentation concluded with a summary of CFF's previous and on-going gear modification work (see Doc 3, slide 13). Staff initiated a discussion point regarding the difference in bycatch reduction between a 5 row apron vs. 8 row apron (2012 RSA project) and the 5 row apron vs. 7

row apron (on going RSA project from 2015). It was noted that both projects showed a significant reduction in bycatch, however, the 5 row apron vs. 8 row apron findings showed a much greater reduction in bycatch than the 5 row vs. 7 row findings. Further discussion emphasized the hanging ratio of the CFF sample dredges (5 row- 1.5:1, 7 row- 2:1) to be an important factor in bycatch reduction, particularly when gear modifications are being considered as a potential AM. Additionally, a representative of CFF identified the importance of not reducing scallop catch through gear modification.

The PDT continued discussing details on current gear modifications in the scallop fishery. A turtle deflector dredge and turtle chain mat are required when fishing west of 71° W between May and November. This seasonal requirement was extended when the TDD and turtle chain mat gear modifications were combined. As stated previously in the meeting, a maximum 7-row apron is now required fishery-wide. A PDT member explained that there are currently no fishery-wide regulations on hanging ratio; current hanging-ratio regulations only pertain to the gear modification AM for S. windowpane.

In reference to Table 1, a member of the PDT suggested the PDT consider the increase in NWP bycatch from the LA fleet to be reflective of an increase in the NWP stock, as opposed to strictly an increase in LA effort in CAII S. Another member of the PDT agreed partially, however, they suggested that the increase in NWP bycatch between FY2011 and FY2014 could be attributed to both an increase in fishing effort and increase in the overall NWP stock, with the rationale that it was unlikely the NWP stock had tripled over the course of three years. Further PDT discussion noted that CAII S typically sees an increase in effort during the month of April; this could prove to be problematic because NWP are still prevalent in CAII S during April. It was suggested that a potential route to avoid increased NWP bycatch rates in CAII S would be to delay access to the area until May 1st. PDT members acknowledged the utility in determining actual fishing effort in CAII S during months where the area could have been accessed by the LA fleet, focusing on the months which produced the highest NWP bycatch.

A member of the PDT commented that the two obvious tools available in determining NWP AMs are gear modifications and spatial/temporal data on NWP distribution, further pointing to the fact that spatial and temporal data is largely predicated on the current spatial management of the resource, which could potentially change with OHA2. It was recommended that as NWP and GB yellowtail AMs are developed (and/or modified), the PDT should consider how differently Georges Bank may be managed in the extended future.

A member of the public suggested that seasonally closing smaller zones within an access area may be a beneficial solution, with the rationale that seasonal bycatch rates of flatfish may not be uniform across an entire access area. They suggested the PDT identify bycatch 'hotspot' zones on a finer spatial scale, and delay access to said zones while allowing access to the rest of the area. PDT members discussed how realistic this option was based on the data available; a representative of CFF affirmed that the current CFF seasonal bycatch data may not be enough to identify hotspots of yellowtail, but that it may be possible for NWP.

A member of the PDT pointed out that NWP do not exist only in CAII S, but throughout the entirety of Georges Bank. To this point, staff reaffirmed that understanding seasonal effort across

Georges Bank will be a critical first step in pinpointing candidate flatfish AM areas. Staff acknowledged that fishing effort will be directed by the location and timing of these AMs; therefore, it will be important that forthcoming AMs do not conflict with each other and instead move towards the overarching goal of reducing flatfish bycatch.

Members of the PDT suggested that the Council propose no AMs be triggered unless 100% of the total flatfish ACL is exceeded (an approach employed in the groundfish fishery as part of Framework 47). The rationale was that AMs are conservation measures designed to protect stocks from overfishing and prevent overages of catch limits; when an AM for a species which is not overfished is triggered and the total ACL is not exceeded, the AM is acting as a punitive measure to the scallop fishery as opposed to one of conservation.

The PDT noted that seasonal closures to reduce bycatch could also result in optimizing scallop meat yield. Based on the information presented to the PDT, members agreed that scallop meat weight was highest when NWP bycatch was low (after April).

Staff acknowledged that the PDT's discussion largely surrounded avoiding certain areas of Georges Bank with high NWP abundance until the end of April. Part of an AM could be to delay the opening of CAII S to avoid NWP bycatch, and to increase yield of scallop meat weights.

PDT follow-up:

(1) Investigate the seasonal change in effort on Georges Bank (focusing on landings and number of trips) – Ben Galuardi, GARFO APSD.
(2) Use observer data to examine seasonal catch of NWP and GB yellowtail as a function of depth – Dr. Dvora Hart.

Key considerations and potential approaches to developing and modifying accountability measures for Northern windowpane flounder and Georges Bank yellowtail:

(1) The PDT discussed two primary tools for developing flatfish accountability measures: 1) gear modifications designed to reduce flatfish catch; and 2) time/area closures. The PDT also noted that the Council may consider variations to these approaches, such as a multi-year averaging, or AM triggers that consider stock status (ex: reduction in AM if stock is not overfished and overfishing is not occurring).
(2) The Northern windowpane stock area includes Georges Bank and the Gulf of Maine. Observer data from GB and the GOM suggests that the majority of Northern windowpane catch is within the GB YT stock area (522, 525, 561, 562). The Council could consider focusing AMs for Northern windowpane in these areas.
(3) Data from the CFF monthly bycatch survey in CA II suggests that yellowtail catches are highest from late summer to November, while catch of Northern windowpane peaked from January – April.
(4) The Council could consider delaying the opening (close) of CA II Access Area to reduce bycatch of Northern windowpane and optimize meat yields.
(5) The PDT plans to investigate the spatial/temporal distribution of flatfish by depth. The Council could task the PDT to identify seasonal bycatch 'hotspot' zones within SRA's and/or access areas.

(6) The Council could consider using a gear modification (i.e. 5-row apron) as a possible AM for Georges Bank yellowtail and Northern windowpane flounder.
(7) The improved status of windowpane (Groundfish FW 55, 2016 Update Assessments) may be contributing to the recent increase in Northern windowpane catch estimates.

Table 1. Georges Bank yellowtail and NWP catch in the scallop fleet from FY2011-FY2014 (Source: CFF).

Georges Bank yellowtail catch in the scallop fleet			
Fishing year	**Total catch all fisheries (mt)**	**Scallop LA catch estimate (mt)**	**Number of months scallop fleet had CAll S access during peak yellowtail abundance (Aug - Nov)**
2011	179.84	83.86	4
2012	199.22	135.11	4
2013*	354.81	15.98	0
2014	214.67	36.49	0

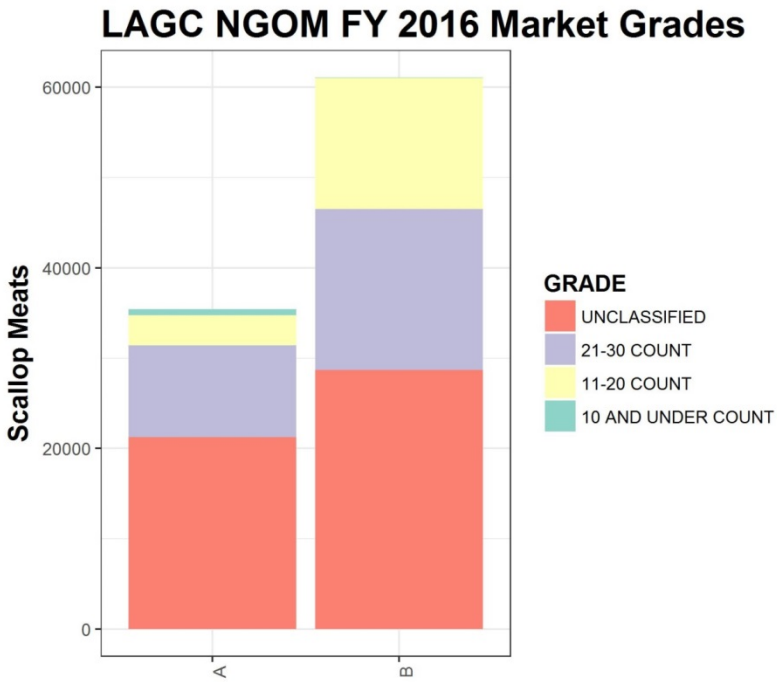
Northern windowpane catch in the scallop fleet			
Fishing year	**Total catch all fisheries (mt)**	**Scallop LA catch estimate (mt)**	**Number of months scallop fleet had CAll S access during peak windowpane abundance (Jan - Apr)**
2011	179.84	32.72	1
2012	199.22	34.85	1
2013*	354.81	63.37	2
2014	214.67	95.37	4

NORTHERN GULF OF MAINE MANAGEMENT- DISCUSS BACKGROUND INFORMATION, ANALYSES, AND DATA NEEDS:

Staff briefly reviewed the PDT's work on NGOM management throughout the past year, describing how survey data were used to set the TAC for FY2017, and urged the PDT to consider how the TAC for FY2018 will be set (keeping in mind there will be no survey of the NGOM in 2017).

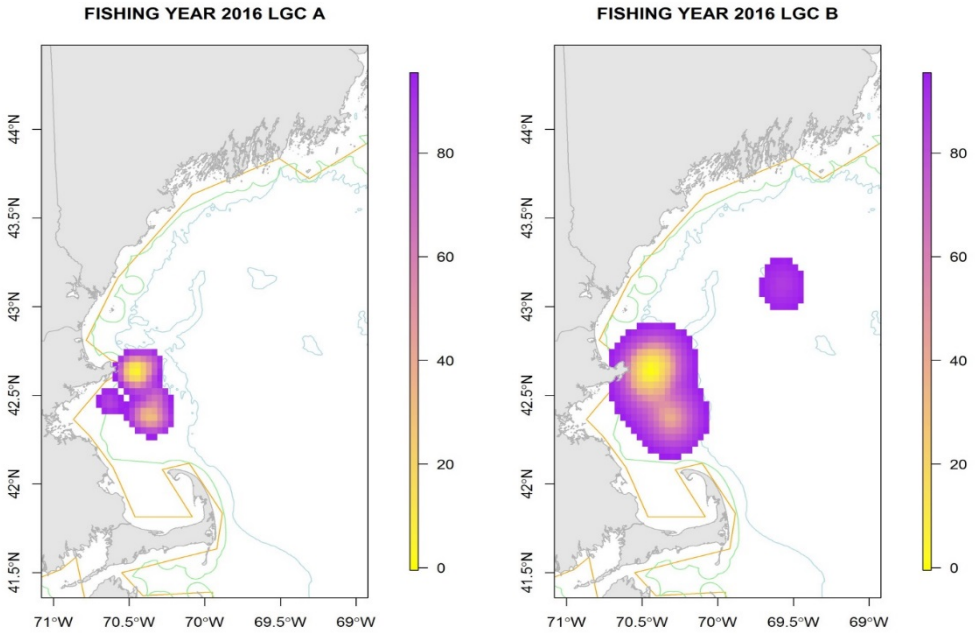
GARFO staff presented a combination of VTR and dealer data which reflected spatially specific effort, landings, and market grades of scallops by permit type for FY2016 in the NGOM (Doc 4a). The market grades of scallops landed by LAGC NGOM and LAGC IFQ vessels in FY2016 showed large portions to be 'unclassified' (Figure 7); it was suggested that 'unclassified' may refer to scallops landed in-shell. Further PDT discussion noted that it is more likely that unclassified scallops referred to ungraded 'run', as in-shell landings occur rarely in this region.

Figure 7. NGOM landings by grade 2016.



Kernel density plots ('heatmaps') of LAGC NGOM and LAGC IFQ activity showed the majority of trips by both permit types occurring east and southeast of Cape Ann, MA (Figure 8).

Figure 8. Kernel density plot (heatmap) of LAGC NGOM fishing trips by permit type. Colors indicate density of trips; lower numbers (yellows) indicate more dense areas while higher numbers (purples) indicate less dense areas (the tail of the spatial distribution).



Further analysis using VTR landing reports described long-term landing trends in each statistical area of the NGOM by permit category from 1996 to 2016. Because permitting structure within

the scallop fishery had changed during this extended time period, trips with ≥1,000 lbs were attributed to the LA fleet and trips with <1,000 lbs were attributed to the LAGC fleet. Analysis suggested that LA and LAGC landings from SRA 514 have been consistently greater than the other SRAs in the NGOM from 1996-2016.

PDT discussion clarified that though both LAGC and LA vessels use VMS, only LAGC vessels declare trips in the NGOM; LA vessels fishing in NGOM are strictly under DAS management. It was noted that VMS data could be used to identify LA trips within the NGOM; however, this approach proved difficult in FY2016 because LA vessels often fished both inside and outside of the management area during the same trip.

LA landings in the NGOM by permit category for FY 2016 were presented to the PDT (Table 2). It was clarified that only VTR reports which geolocated LA vessels within the bounds of the NGOM management area were used in landings estimates. FY2016 marked the first year LA vessels had targeted the NGOM since its inception in FY2008, landing approximately 292,000lbs. The majority of landings were attributed to full time LA vessels, whereas the majority of trips were attributed to part time small dredge LA vessels.

Table 2. Limited Access totals for FY2016 in the NGOM management area.

NGOM Limited Access 2016	number of trips	number of permits	Sum of total
Full time	14	5	187,127
Full time small dredge	3	3	15,362
Part time small dredge	21	5	90,028
Grand Total	**38**	**13**	**292,517**

PDT discussion moved to how some LA vessels may have possessed more than 50 bu of shell stock inside of the VMS DAS line north of 42°20' N in FY2016. It was the understanding of some PDT members that management allowed this to accommodate a small, in-shell scallop fishery, which operated out of Portland, ME (Framework 14). Further, PDT members confirmed that vessels in MA state waters must be transiting directly to port to land and are not allowed to stop and shuck scallops 'off the clock'.

Staff briefly described background information on the development of the NGOM program, and presented information regarding permit and landings trends of the NGOM program by state (Doc 4). Overall, NGOM landings from LAGC vessels comprised less than 20% of the annual TAC until FY2013, were appreciable effort of LAGC NGOM vessels targeting Platts Bank increased landings ~7 times previous years. LAGC IFQ vessels typically fished the southern portion of the management area. In FY2015 and FY2016, IFQ effort and landings increased markedly, as vessels targeted areas east and southeast of Cape Ann.

All active LAGC IFQ and LAGC NGOM permits (excluding LA vessels with LAGC permits) fishing in the NGOM from FY2010-FY2016 were homeported in MA, ME, and NH. Between FY2010 and FY2013, the majority of active vessels fishing in the NGOM were from MA and ME. From FY2013 to FY2016, the number of active vessels fishing in the NGOM from MA and ME increased each year, while the number of active vessels from NH remained mostly stable.

A member of the PDT commented that number of active vessels from ME seemed lower than expected based on the number of NGOM permits that are held by ME fishermen. Further PDT discussion attributed this to the establishment of the LAGC and NGOM programs through Amendment 11; many vessels did not qualify for IFQ permits at the time, but did qualify for NGOM permits. A PDT member confirmed that there were roughly 40 vessels in Maine with NGOM permits; however, that number fluctuates yearly because LAGC NGOM and LAGC Incidental permits can be transferred between each other. It was further noted that the qualification period for LAGC NGOM permits is over, and that no more NGOM permits will enter the fishery.

Table 3. The number of active NGOM & IFQ permitted vessels fishing in the NGOM from FY2010-FY2016 by state. Note that active NGOM & IFQ permitted vessels are combined for FY2011 and FY2012.

FY		NGOM	IFQ
2010	MA	6	
	ME	3	
	NH	3	
2011 & 2012	MA	4	
	ME	5	
	NH	4	
2013	MA	6	
	ME	7	
	NH	5	
2014	MA	3	5
	ME	10	
	NH	6	
2015	MA	4	7
	ME	11	
	NH	6	
2016	MA	4	8
	ME	18	
	NH	6	

Table 4. The number of trips taken and landings from NGOM and IFQ fleets by homeported state from FY2010-FY2016. Note that trips and landings from FY2010-FY2012 are combined.

	MA		ME		NH	
FY	Trips	Landings	Trips	Landings	Trips	Landings
2010-2012	120	11,168	74	7,174	69	4,645
2013	32	9,780	182	27,614	198	18,056
2014	145	13,488	150	23,425	259	20,929
2015	335	39,443	100	10,114	273	23,219
2016	207	33,793	273	41,993	78	12,479
TOTAL	839	107,672	779	110,320	877	79,328

Staff presented the number of trips taken and landings of LAGC NGOM and IFQ vessels between FY2010 and FY2016 by homeported state (Table 4). From FY2010-FY2012, the most trips taken and most landings were from MA vessels. From FY2013 to FY2014, the most trips taken were from NH vessels, whereas the most landings were from ME vessels. FY2015 saw the most trips taken and most landings from MA vessels. In FY2016, a peak high number of trips taken and landings were seen from ME vessels.

A member of the PDT clarified that landings from IFQ vessels are subtracted from both the NGOM TAC and the vessels personal IFQ, and that a vessels personal IFQ is set based on an assessment which does not include NGOM scallops as part of the resource. Further discussion elucidated that the qualification criteria for IFQ permits (through A11) included landings from all regions (including scallops landed from the Gulf of Maine).

In FY2016, the NGOM TAC was exceeded by roughly 29,000 lbs. Measures are being taken so that such an overage does not occur again in FY2017. Because there is a lag in dealer data, the number of trips declared in the NGOM will be used as a reference point to determine when the TAC will likely be met.

Staff guided discussion to focus on ways that NGOM removals could be better tracked. Observer coverage of LA trips in the NGOM would be a reasonable way to track removals. The PDT also discussed modifying the current VMS declaration system to include an option which would require LA vessels to 'call in' when fishing open area DAS in the NGOM.

Discussion shifted to address potential ways in which the process of setting the NGOM TAC be improved. The GOM – and NGOM – are data poor relative to Georges Bank and the Mid-Atlantic. The NGOM area has been sporadically surveyed. PDT members noted TAC setting for the NGOM can be challenging due to the irregularity of surveys in the area, and uncertainty surrounding removals from the area.

PDT follow-up:

(1) The PDT is planning to track the 2017 NGOM fishery. –Ben Galuardi, GARFO
(2) The PDT is seeking direction from the Committee and Council before proceeding additional work.

Key considerations and potential approaches to Northern Gulf of Maine management measures:

(1) Fishery data from Gulf of Maine (GOM) and NGOM management area indicates that both effort and removals from the GOM area and the NGOM have varied considerably since the inception of the NGOM program and permit category in 2008. LAGC landings peaked in 2016. This was also the first year that LA vessels recorded landings from the NGOM management area, (based on VTR information).
(2) The results of the 2016 ME DMR/UMaine dredge survey showed stronger recruitment and higher biomass estimates in areas off of Cape Ann than the previous survey in 2012.
(3) LA and LAGC vessels operate under different rules when fishing in the Gulf of Maine. LA vessels use DAS when working in the Gulf of Maine, and report landings by the statistical reporting area (SRA) they fished in. LAGC vessels either fish in the NGOM management area at 200 lbs a day, or south of 42° 20' N, where LAGC IFQ vessels can possess 600 lbs a day. These reporting differences means that LA landings from the NGOM area can be estimated, but are not precisely known.
(4) The Council may consider revising reporting requirements to enable more precise tracking of landings from the NGOM management area.
(5) There is very little observer coverage of trips fishing in the NGOM management area. The PDT does not have a recommendation for monitoring the area at this time, and feels that guidance and tasking from the Council is needed before a PDT recommendation could be developed. The PDT noted that biological data collected from observed trips is used in scallop management.
(6) TAC setting for the NGOM can be challenging due to on the irregularity of surveys in the area, the uncertainty surrounding removals from the area.

MODIFICATION OF ACCESS AREAS TO BE CONSISTENT WITH OHA2-DISCUSSION:

Scallop fishing will not be allowed in areas that may open through the OHA2. A follow-up scallop action will be required to grant access to any new areas that open. The PDT discussed the status of OHA2 (no proposed rule or final rule), and the outlook for opening new areas for FY2018. The group focused on how to approach modifying access areas to be consistent with OHA2 in the scenario where the final rule is published after the PDT completes a specifications package for the following fishing year. A PDT member confirmed that if this scenario transpired, performing SAMS model runs which account for new access area boundaries would be relatively straightforward, as long as SAMS areas were not split. If the final rule is not approved until the late fall or winter of 2017, it may prove difficult to make changes in time to open areas for the start of FY 2018. Potential options for modifying existing access areas were discussed; the consensus of the PDT was that many variables will dictate how each access area is modified, and that the best approach will be to address each access area on an individual basis.

Key considerations to modifying scallop access areas to be consistent with OHA2:

(1) Access to scallops in areas that may open through the OHA2 (ex: CAI N, NLS HMA, Northern Edge) will require a two-step process. The Council would need to 1) specify if the area will be a rotational access area or an open area, and 2) develop a harvest recommendation based on the biomass estimates and SAMS runs.

FOLLOW UP ON SURVEY PEER REVIEW:

Staff described the formation of a PDT sub-group (Dr. Bill DuPaul, Dr. Dvora Hart, Dr. Cate O'Keefe, Mr. Jonathon Peros, and Dr. David Rudders) which will be tasked with addressing a sub-set of issues raised at the scallop survey peer-review: This group will report through the full PDT. The group has not met, and the PDT reviewed some of the issues that the group may explore this year:

(1) Explore ways to combine survey estimates (TOR 5), including situations when there may be a large divergence between estimates (ex: dredge and HabCam in NLS-NA, related to dredge efficiency in high density areas, and variance estimates).
(2) Explore dredge efficiency in high density areas (TOR 4).
(3) Explore the likely under-estimation of biomass variance estimates from HabCam surveys (TOR 4).

PRESENTATION ON HABCAM (DR. DVORA HART):

As part of the follow-up to the scallop survey peer-review, Dr. Dvora Hart gave a presentation to the PDT on recently published work focused on the design and population estimation for HabCam sea scallop surveys (refer to slides). The article, *A comparison of methods to estimate abundance and biomass from belt transect surveys* appeared in Limnology and Oceanography: Methods and was co-authored by Jui-Han Chang and Burton Shank, HabCam estimates employ geostatistical methods as opposed to basic statistics because they allow density estimates at specific locations (as opposed to just the overall mean), and because traditional statistical methods are not valid for continuous transect sampling. As opposed to traditional fisheries surveys, model-based surveys/methods (i.e. HabCam) do not require randomization, but do make assumptions about the population (i.e. spatial autocorrelations).

The geostatistical (kriging) methods used to generate estimates of population density use a weighted average from nearby observations. When observations are very far apart (and spatial information may not be relevant), the estimate is the simple mean of the data. Ordinary kriging is based on the assumption that there are no large scale trends in a population. This is not true for scallops, as the expected scallop density varies by depth, substrate type, etc. Generalized additive models (GAM) are used to address large scale trends (first order effects) in the HabCam data. However, the GAM model assumes that the underlying data is independent, though we know that HabCam data is autocorrelated (images are annotated every 50 meters). HabCam data is also zero inflated – almost 90% of the annotated images do not detect scallops as opposed to a normal distribution of data. HabCam biomass estimates are generated using a variogram, which is done

through a two-step process where the results of a GAM model are combined with the small aggregation estimates (ordinary kriging). There are 14 variogram areas/models, some of the areas follow management areas such as Elephant Trunk and Hudson Canyon, though not all areas follow management boundaries.

Dr. Hart explained that several methods for estimating biomass were tested. The GAM model, which is used to generate biomass estimates for the assessment and management purposes, showed a slight bias, and performed better than the mixed effects GAM (GAMM) and ordinary kriging. In tests using simulated data and data from other scallop surveys (dredge, dropcam) the GAM model at 750 meter segments performed best.

The GAM with ordinary kriging method with data averaged over 750m segments to estimate scallop abundance and biomass for the GB and MAB stock in 2016. Stratified mean estimates with careful stratifications were also developed to provide a comparison to the model-based estimates Population/biomass estimates are used in stock assessment models (SAMS and CASA) to estimate stock status, as well as setting total allowable catch for each management regions each year. These methods can also be used to develop maps of recruitment/exploitable biomass, which allow us to accurately determine boundaries of new rotational closures to protect small scallops and areas to reopen (or keep open). Dr. Hart explained that when multiple HabCam surveys are done in the same year (ex: WHOI, Arnie's, NEFSC), all of the biomass estimates are generated by the NEFSC. Dr. Hart concluded the presentation with a discussion on survey design.

Other Business:

The meeting concluded at 4:02pm with no other business discussed.