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Eric Reid, *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: November 24, 2021

TO: Groundfish PDT

FROM: Scallop PDT

SUBJECT: **Scallop Fishery Bycatch Outlook for FY 2022**

This memo provides the Groundfish PDT with projected scallop fishery catch estimates for the four flatfish stocks for which the scallop fishery is allocated sub-annual catch limits (sub-ACLs): Georges Bank (GB) yellowtail, Southern New England/Mid-Atlantic (SNE/MA) yellowtail, northern windowpane, and southern windowpane. The Scallop PDT met via conference call on November 22, 2021 and November 24, 2021 to review bycatch projections and provided input to this memo through correspondence.

Bycatch projections of GB yellowtail, SNE/MA yellowtail, northern windowpane, and southern windowpane were calculated for the specifications alternatives being developed in Framework 34 (Table 1). The Scallop PDT is presenting bycatch estimates for FY2022 only, and notes that these bycatch estimates will be updated annually as part of the specifications process. Bycatch forecasts are based on modeled fishing behavior and landings projections, which increases the uncertainty of these estimates.

While not unexpected, the lack of observer data from 2020 and 2021 was problematic in the development of bycatch estimates for 2022. The PDT feels that the bycatch estimates developed in Framework 34 are best used to compare the relative differences between alternatives with respect to bycatch rather than as point estimates of catch.

Dealing with a low number of audited observed trips over this time period was exacerbated by trips clustered in the fall and winter. For example, observed trips in the Northern Flank (NF) SAMS area in the last 12 months (n=2) were limited to the fall and early winter of 2020; this timing aligns with seasonally high northern windowpane presence and resulted in skewed bycatch projections. As described below, the PDT expanded the time period of observer data and modified the approach to account for limited observer data over the past year. The low number of audited observer trips also means that calculating error for these estimates would be underestimated.

Framework 34 Overview:
Framework 34 will set fishery allocations for FY2022 and FY2023 (default). There are two spatial management options being considered by the Council which are very similar. One option establishes a closure of the New York Bight to protect recruits observed there in the 2021

surveys. The other option expands the area of this closure to include both the New York Bight and Hudson Canyon. Overall landings are expected to decline in FY 2022 from around 40 million pounds in FY 2021 to approximately 31-36 million pounds, depending on the Council's preferred alternative.

Both options would allocate two (2) 15,000 pound trips to Closed Area II Access Area and one (1) 15,000 pound trip to the Nantucket Lightship South. The Council is also considering allowing a limited amount of LAGC IFQ access area fishing in Closed Area I under both options. Much like in FY2021, FW34 considers closures on eastern Georges Bank to protect a large number of pre-recruits observed in CAII-East Access Area. In addition to scallop conservation, this closure is also expected to proactively mitigate impacts to Georges Bank yellowtail flounder and northern windowpane.

Table 1 - Overview of FY2022 projected scallop fishery bycatch estimates for the range of alternatives being considered in FW34, including the anticipated FY2022 scallop sub-ACL for each stock.

Alternative	Scenario		GB YT	SNE/MA YT	GOM/GB WP	SNE/MA WP
Anticipated 2022 sub-ACL		GB Closure	*19 mt*	*2 mt*	*31 mt*	*129 mt*
Alternative 2	2 trips to CAII AA at 15,000 per trip (30K total) 1 trip to NLS-South at 15,000 pounds 20-26 DAS New York Bight and Hudson Canyon Closed	CAII-East closed	15-19 mt	2-3 mt	89-115 mt	74-82 mt
Alternative 3	2 trips to CAII AA at 15,000 per trip (30K total) 1 trip to NLS-South at 15,000 pounds 20-26 DAS New York Bight Closed	CAII-East closed	15-19 mt	2-3 mt	86-111 mt	73-81 mt

Projection Methods and Caveats: Methods for developing bycatch estimates varied due to a lack of recent observer data. Discard to kept (d/K) ratios were estimated for windowpane and yellowtail stocks for Scallop Area Management Simulator (SAMS) area boundaries that were defined for development of FY2022 scallop specifications (see Map 3 and Map 4).

An initial review of recent observer data suggested that the limited number of records from 2020-2021 were skewed to the time of year when bycatch of windowpane was high (i.e., fall through early spring months). The PDT elected to modify the typical approach used to project bycatch[1] to account for the lack of recent observer coverage in 2020 and 2021 as a result of the pandemic. Based on the skewed seasonality of more recent observer records, windowpane d/K

[1] See 2019 memo for description of past bycatch projection methods: https://s3.amazonaws.com/nefmc.org/Doc.6-191115-MEMO-Scallop-Bycatch-Estimates-to-GF-PDT.pdf

ratios were stratified into "high" and "low" bycatch seasons to better capture the relationship between observed d/Ks and the timing of landings expected by area in FY2022. This stratification was done for both open areas and access areas using data from FY2019 – 2021. The high windowpane bycatch season was defined as October through April and the low bycatch season was defined as May through September. These seasonal strata were based on observed trends in bycatch previously documented by the PDT[2] as well as seasonal bycatch data on eastern Georges Bank collected by Coonamessett Farm Foundation[3]. The seasonal strata were the same for both northern and southern windowpane given the similarity in seasonal movement for both stocks (i.e., shallow water in summer months shifting to deeper water in fall-early spring). Dealer reported landings by area and season from FY2020 were used to determine how to apportion projected landings by season and area for FY2022 (i.e., during the high and low bycatch seasons). Weighted d/Ks for windowpane were calculated for SAMS areas based on the seasonally stratified observer data from 2019-2021 and the assumption of landings within the strata. Using data from 2019-2021 and stratifying d/Ks seasonally improves the estimate compared to using data from only the high bycatch season from the last 12 months. Yellowtail d/K estimates were not weighted based on a seasonal stratification because this species tends to have a weaker seasonal fluctuation compared to windowpane.

The PDT also used an alternate method for developing bycatch estimates in CAII-SW. Due to low observer coverage resulting from the pandemic, limited data were available for the CAII-SW SAMS area from 2020-2021 to inform bycatch projections (n=1 in CAII-SW). Data were also limited because the fishery has operated periodically in CAII; for example, prior to FY2020 and FY2021, the last time the fishery had access to CAII was in FY2017. For this area, the d/K ratio from the last year with available observer data in Closed Area II (i.e., FY2017) were adjusted using the below equation to account for changes in exploitable biomass over time. The bycatch projection for CAII-SW were based on an average of the adjusted d/Ks from FY2017 and the d/K estimate from available data in 2020-2021. This adjustment was made for both northern windowpane and GB yellowtail.

For each strata, the baseline D:K ratio was projected forward using changes in exploitable scallop biomass (B):

$$D{:}K_{proj} = D{:}K_{obs}\left(\frac{B_{obs}}{B_{proj}}\right)$$

Bycatch was then estimated from the projected catch:

$$bycatch = \left(D{:}K_{proj}\right) * Land_{proj}$$

For all other areas, the PDT used the most recent 12 months of data.

[2] Analysis of windowpane and yellowtail seasonality on Georges Bank can be found in Appendix II of Framework 29, here: https://s3.amazonaws.com/nefmc.org/FW29-Appendix-II-Flatfish-AM-development-Draft-for-preliminary-submission.pdf

[3] Coonamessett Farm Foundation seasonal bycatch survey report at 2021 Scallop Research Share Day can be found here: https://s3.amazonaws.com/nefmc.org/Doc.9.a-2021-RSA-share-day-short-report-Seasonal-bycatch-survey.pdf

PDT Discussion: The majority of open area and access area fishing effort is expected to occur on Georges Bank. This is based on several factors: 1) access area trips are only being considered for areas on Georges Bank (i.e., CAII, NLS-South); 2) open areas of eastern Georges Bank hold the majority of open area exploitable biomass and area expected to have higher catch rates than open areas elsewhere in the resource; and 3) lower anticipated catch rates in the Mid-Atlantic region as well as the area closures being considered in Framework 34 of the NYB and(or) Hudson Canyon will likely push effort that would have occurred in these areas onto Georges Bank. The projection model forecasts that vessels will likely target higher density areas of eastern Georges Bank, specifically the Southern Flank (SF) SAMS area, and to a lesser extent the Northern Flank (NF) SAMS area (Map 3) while on open bottom trips. Both of these areas fall within the Georges Bank yellowtail and northern windowpane stock areas. There is less certainty in the bycatch projections for open areas because actual fishing behavior may not reflect predictions from the SAMS model. For example, if there is more open bottom fishing in the Mid-Atlantic than expected, bycatch of southern windowpane flounder may be higher than forecast, and northern windowpane bycatch may be lower. The projections are based on forecasts of scallop biomass and fishing behavior and also are subject to error associated with the flatfish bycatch data used in the bycatch calculation; the PDT notes that these variables could result in error as high as 50% (i.e., bycatch projections could be 50% higher or lower than estimated).

As described above, there are significant data limitations associated with the above projections. In a typical year, observer coverage is administered throughout the year with the goal of meeting a predetermined target level that would result in precise bycatch estimates. In this scenario, the most recent 12 months of data are considered to be representative of actual bycatch on a spatial and temporal scale. However, due to limited observer records as a result of the pandemic, the only data that are available in the last 12 months are from months when windowpane bycatch is at its seasonal peak (i.e., fall through early spring). The PDT elected to stratify d/K values by season and to expand the observer records used to include 2019 to 2021 to address these issues. While the same seasonal strata were applied to estimates of both northern and southern windowpane, the PDT plans to revisit the stratification next year to ensure that seasonal strata are representative for both stocks. The PDT also notes that error estimates (i.e., CVs) of bycatch projections using only 2020-2021 data and not stratifying would be underestimated because the underlying assumption that observed hauls are random samples would be invalid.

While the PDT believes that the modified bycatch projection approach yields more realistic estimates than just using the last 12 months of data, the projections are forecasts (with error) and should not be interpreted as precise estimates. For example, the bycatch of northern windowpane is projected to be 20 times higher from open areas on Georges Bank than in rotational access areas, despite roughly 1/3 of total projected landings coming the CAII access area. The PDT believes that stratifying bycatch estimates by SAMS area is appropriate because projected landings are stratified at this scale; however, this approach can lead to forecasts that are difficult to reconcile with the seasonal movements of flatfish stocks in Closed Area II (see CAII-EXT and SF in Table 2). Realized bycatch may be higher or lower than forecasted, which is supported by previous experiences. Past estimates have been both over- and under-estimated realize bycatch, even in years when significant data limitations were not a major obstacle.

The northern windowpane bycatch projections for FY2022 exceed the anticipated scallop fishery sub-ACL, but does not exceed the ABC for this stock (2022 ABC = 160 mt). This is not the first time that the PDT has projected that the northern windowpane sub-ACL could be exceeded; for

example, the PDT anticipated a northern windowpane sub-ACL overage in fishing year 2020 and the year end catch estimates proved that to be the case, with the scallop fishery catching 34.8 mt (~290% of its sub-ACL). As a result of this overage, the reactive large accountability measure for northern windowpane will be triggered for FY2022, meaning a gear restriction will be required for all fishing occurring in Closed Area II for the entirety of FY2022. FY2022 will be the first year that the modified gear is required on Georges Bank and the PDT expects it will have a positive effect on bycatch of both Georges Bank yellowtail and northern windowpane flounder. If the bycatch in CAII is underestimated, use of the modified gear in CAII in FY2022 is expected to decrease bycatch of both northern windowpane and GB yellowtail.

While northern windowpane remains at low levels relative to historic biomass, the 2020 assessment update[4] noted that area swept biomass for this stock has continually increased since 2017. The swept area biomass of northern windowpane was estimated at 12,505 mt in 2019, and with increasing biomass comes the potential for increasing scallop fishery bycatch of this stock. However, achieving observer coverage targets for the remainder of FY2021 and throughout FY2022 will offer better insight into this trend in the future. Looking forward, as observer data becomes available from directed LAGC fishing in the Northern Gulf of Maine management unit, the PDT will be able to estimate bycatch of northern windowpane from that part of the fishery.

Aside from northern windowpane, projections for all other stocks allocated a sub-ACL are at or below the anticipated sub-ACLs for FY2022. The southern windowpane projections are notably lower compared to projections from the past several years. This is a result of effort shifting out of the Mid-Atlantic region (i.e., out of the southern windowpane stock area), and onto Georges Bank. The Nantucket Lightship South has been an area with higher southern windowpane catch; while this area is expected to support scallop effort in FY2022, the level of effort is expected to be lower compared to FY2021 and FY2020, which also contributed to the southern windowpane projected bycatch decreasing.

Table 2 - Estimated FY2022 bycatch for GB YT and NWP from Alternative 3, 24 DAS sensitivity, by SAMS area (mt).

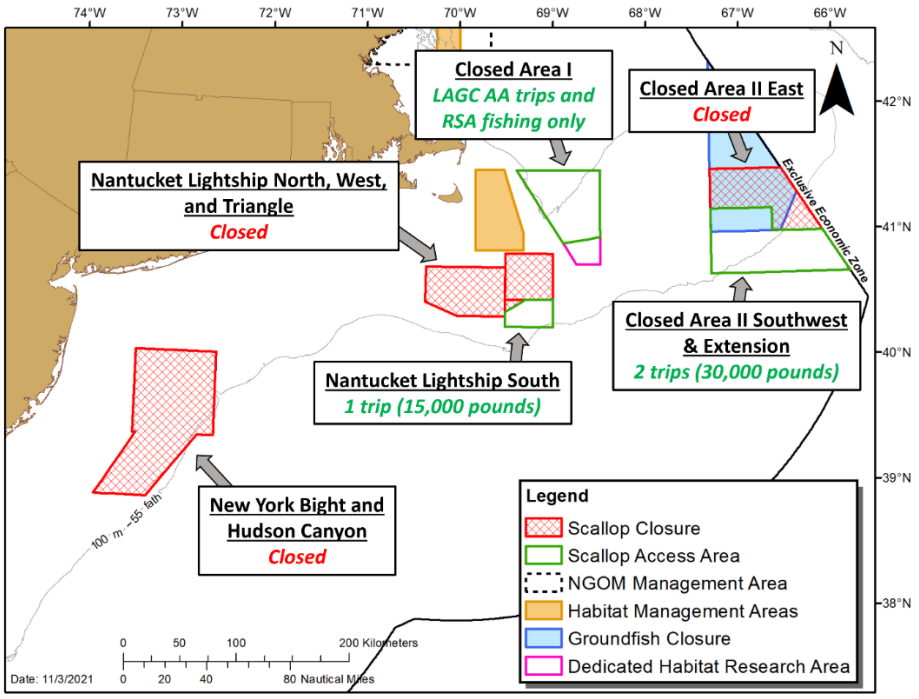
	CA1-N	CA1-M	CA2-SE	CA2-SW	CA2-Ext	SCH	NF	SF
Georges Bank Yellowtail Flounder								
2022	0.24	0.12	0	2.24	0.15	0.98	3.46	9.82
Northern Windowpane Flounder								
2022	0.47	3.39	0	1.2	0	28.2	5.93	59.84

Table 3 – Estimated FY2022 bycatch for SNE YT and SWP from Alternative 3, 24 DAS sensitivity, by SAMS area (mt).

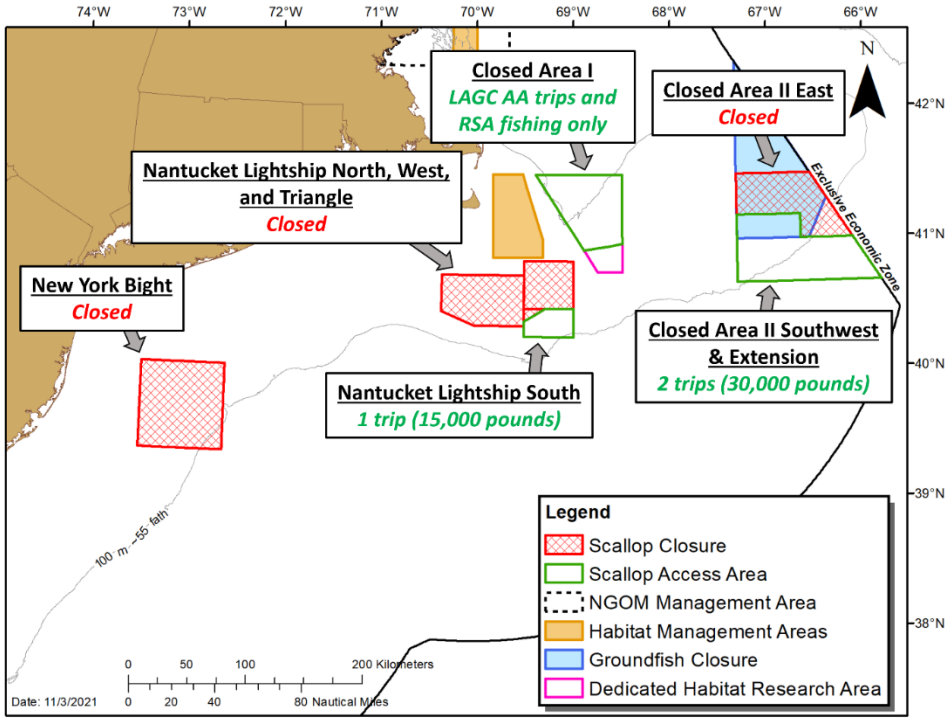
	NLSS	SCH	HCS	ETOp	ETFl	DMV	NYBOp	NYBCl	LI	Inshore
Southern New England/ Mid-Atlantic Yellowtail										
2022	0.24	1.6	0	0	0	0	0	0	0.33	0
Southern Windowpane Flounder										
2022	47.53	5.62	0.29	0.14	0.05	0.06	5.9	0	14.27	3.41

[4] Northern windowpane flounder 2020 assessment update report: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2020_FLD_GMGB_RPT.pdf

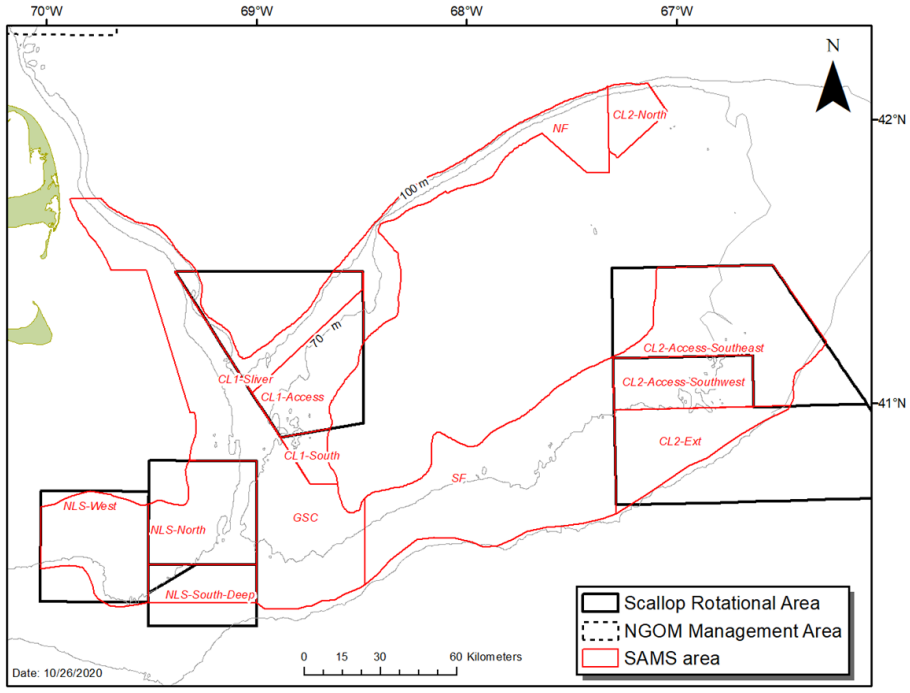
Map 1 – Potential FY2022 spatial management under Alternative 4.3.2 in Framework 34.



Map 2 – Potential FY2022 spatial management under Alternative 4.3.3 of Framework 34.



Map 3 – The 2021 Georges Bank SAMS areas used for scallop and flatfish bycatch projections in FW34.



Map 4 – The 2021 Mid-Atlantic SAMS areas used for scallop and flatfish bycatch projections in FW34.