New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

DRAFT MEMORANDUM VERSION 1

DATE: November 27, 2020

TO: Groundfish Committee

FROM: Groundfish Plan Development Team

SUBJECT: **Draft Environmental Impacts Analysis for Framework Adjustment 61**

This draft memorandum (version 1) includes the following draft environmental impacts analysis:

- *Attachment 1* - Biological impacts– status determination criteria;
- *Attachment 2*- Economic impacts – status determination criteria, white hake rebuilding, and some preliminary analysis of specifications (i.e., changes in sub-ACLs from FY2021-FY2022); and
- *Attachment 3*- Scallop Plan Development Team (PDT) memo to Groundfish PDT on groundfish bycatch in the scallop fishery.

The PDT will prepare an updated version 2 for the Council's December meeting.

6.2 IMPACTS ON REGULATED GROUNDFISH AND OTHER SPECIES – BIOLOGICAL

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies stocks. Changes in fishing mortality may result in changes in stock size. Impacts on essential fish habitat and endangered or threatened species are discussed in separate sections. Impacts are discussed in relation to impacts on regulated multispecies (groundfish) and other species. The impacts associated with the measures are anticipated to not be significant in comparison to the No Action alternatives.

Throughout this section, impacts are often evaluated using an analytic technique that projects future stock size based on a recent age-based assessment. These projections are known to capture only part of the uncertainties that are associated with the assessment projections. There is evidence, that in the case of multispecies stocks, that the projections tend to be overly optimistic when they extend beyond a short-term period (i.e., 1-3 years). This means that the projections tend to over-estimate future stock sizes and under- estimate future fishing mortality. These uncertainties in the projection methodology should be considered when reviewing impacts that use this tool. Long term projections (greater than 3 years) should not be over interpreted since they are imprecise and are often overly optimistic. The uncertainty estimates (90% confidence intervals on SSB) from the projections do not cover the true uncertainty in the population. This is the justification for why the SSC did not use the projection uncertainty estimates to determine the scientific uncertainty buffer between the ABC and the OFL.

6.2.1 Action 1 – Status Determination Criteria

A management track assessment for GB winter flounder and SNE/MA winter flounder, along with 7 other groundfish stocks, was completed in September 2020. The assessment determined that GB winter flounder and SNE/MA winter flounder are both overfished and overfishing is not occurring (Table XX in Affected Environment). The peer review accepted both the GB winter flounder age-structured VPA assessment model, and the SNE/MA winter flounder age-structured ASAP assessment model. The peer review recommended updating biological references points for both GB winter flounder and SNE/MA winter flounder.

For GB winter flounder, the assessment and the peer review recommended updating the current MSY biological reference points (calculated from the model stock-recruitment relationship) to proxy-based reference points (F40%, SSB40%) to match the Gulf of Maine winter flounder stock and recommendations of a panel review in 2019. Similarly, for SNE/MA winter flounder, the assessment and the peer review recommended updating the MSY biological reference points calculated in previous assessments (based on the model stock-recruitment relationship) to proxy-based reference points (F40%, SSB40%), as recent recruitment is consistently and significantly below predicted values, and most other groundfish stocks assessed by the NEFSC use F%SPR to estimate reference points.

6.2.1.1 Alternative 1 - No Action

Impacts on regulated groundfish

Under Alternative 1 (No Action), there would be no revisions to the status determination criteria (SDC) for GB winter flounder and SNE/MA winter flounder (Table 2 in Draft Alternatives), and numerical estimates for these two stocks would not change (Table 3 in Draft Alternatives) since the 2018 and 2019 groundfish stock assessments. 2020 management track assessments were completed for GB winter flounder and SNE /MA winter flounder, and so the use of values from the previous assessment would conflict with using information from the most recent assessment. Previous 2018 and 2019 assessments

used MSY biological reference points (calculated from the model stock-recruitment relationship). The 2020 assessment peer review recommended updating to proxy-based reference points (F40%, SSB40%) for both GB winter flounder and SNE/MA winter flounder, as most groundfish stock assessments use proxy-based reference points.

Alternative/No Action would not be expected to have direct or indirect impacts on groundfish species. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts on regulated groundfish species are neutral.

Impacts on other species

Alternative 1/No Action would not be expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts on other species are neutral.

6.2.1.2 Alternative 2 – Updated Status Determination Criteria

Impacts on regulated groundfish

Alternative 2 would adopt revised SDCs for GB winter flounder and SNE/MA winter flounder (Table 4 in Draft Alternatives). The NEFSC conducted management track assessments in 2020 for several stocks, including GB winter flounder and SNE/MA winter flounder. This option updates the SDCs and numerical estimates of the SDCs for these stocks (Table 4 and Table 5 in the Draft Alternatives), based on the peer review recommendations. Previous 2018 and 2019 assessments used MSY biological reference points (calculated from the model stock-recruitment relationship). The 2020 assessment peer review recommended updating to proxy-based reference points (F40%, SSB40%) for both GB winter flounder and SNE/MA winter flounder, as most groundfish stock assessments use proxy-based reference points.

Alternative 2 would not be expected to have direct or indirect impacts on groundfish species. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts on regulated groundfish species are neutral.

Impacts on other species

Alternative 2 would not be expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts on other species are neutral.

6.5 IMPACTS ON HUMAN COMMUNITIES- ECONOMICS

Introduction

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that before any federal agency may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2) (C)). The MSA stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Section 1010627, 109-47).

The National Marine Fisheries Service (NMFS) provides guidelines to use when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007). Where possible, cumulative effects of regulations are identified and discussed. Non-economic social concerns are discussed in Section 6.6. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. It is assumed throughout this analysis that changes in revenues would have downstream impacts on income levels and employment; however, these are only mentioned if directly quantifiable.

6.5.1 Action 1 – Status Determination Criteria

6.5.1.1 Alternative 1 - No Action

Economic Impacts

Under Alternative 1/No Action there would be no revisions to the SDCs for GB winter flounder and SNE/MA winter flounder, the numerical estimates for these stocks would not change since the 2018 and 2019 groundfish stock assessments.

Under Alternative 1, there would not be any immediate economic impacts, since it does not alter the current methodology used for setting the ABC for each species. Long term impacts of Alternative 1 would be that biomass targets would be based on outdated information, increasing the risk of overfishing over the long run, and eroding long-run fishery profits as a result.

Overall, Alternative 1 is expected to have negative economic impacts. Compared to Alternative 2, impacts would be positive in the short run but negative in the long run.

6.5.1.2 Alternative 2 – Updated Status Determination Criteria

Economic Impacts

Under Alternative 2, SDCs for GB winter flounder and SNE/MA winter flounder would be changed following the outcome of the 2020 management track assessments. This would result in a lower MSY for each stock, and consequently, lower ACLs, compared to No Action/Alternative 1. In the short run, the lower ACLs for these species may result in fishermen experiencing lower net revenues as a result of anticipated catch reductions.

Alternative 2 is expected to have positive long run economic impacts relative to Alternative 1, since updating SDCs for both stocks according to the most recent scientific assessments ensures decreases the

likelihood of overfishing or the stock becoming overfished over the long run which allows for maximized fishery revenues.

Overall, Alternative 2 is expected to have low negative economic impacts. Compared to Alternative 1, short run economic impacts are expected to be negative and long run economic impacts would be positive.

6.5.2 Action 2 – Formal Rebuilding Program

6.5.2.1 Alternative 1 - No Action

Commercial Groundfish Fishery Economic Impacts

Maintaining quotas under No Action would provide neutral or positive economic impacts relative to Alternative 2. The impacts of No Action relative to Alternative 2, Option C would be similar if quotas were set at 75%FMSY under No Action. Under Alternative 2, Options A and B, reducing quotas would negatively affect the groundfish fishery, but largely to the extent that catches could constrain the harvest of other targeted species, which would decrease total groundfish revenue and potentially increase variable costs to the extent that avoiding bycatch of white hake would shift fishing practices away from those that are cost minimizing and revenue maximizing. Recent catches of white hake in the commercial groundfish fishery have increased somewhat from around 1,500 mt in FY2015 and FY2016 to over 2,000 mt in FYs 2018 and 2019. This increased catch is despite declining commercial groundfish ACLs which decreased from 4,343 mt in FY 2015 to 2,735 mt in FY 2019. Because of increased catch and a decreasing ACL, utilization has increased as a result from 37% in FY 2015 to 76% in FY 2019. Utilization was similarly high in FY 2018 at 77%. Similar to other groundfish stocks, average prices declined from a high of $2.14 in FY2014 to a low of $1.26 in FY2018.

6.5.2.2 Alternative 2 – Revised Rebuilding Strategy for White Hake

Commercial Groundfish Fishery Economic Impacts

There are no differences in economic impacts between Alternative 2 and the No Action alternative in FY 2021. There are differences in impacts along the rest of the 10-year rebuilding time horizon outlined in each of the Options (A, B or C), and each of the Options may have neutral to negative economic impacts relative to a No Action alternative. The impacts of No Action relative to Option C would be similar if quotas were set at $75\%F_{MSY}$ under No Action.

If we assume that quotas as projected in each rebuilding scenario remain in place for the duration of the rebuilding time frame and also that the fishing industry is able to capture 100% of the allocated quota, it is possible to compare the net-present value (NPV) of the different rebuilding scenarios in 2020 dollars. To compare alternative benefit streams over time, discount rates of 0%, 3%, and 7% were selected to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the Social Rate of Time Preference (SRTP) (NOAA 2003). In addition, the Executive Branch's Office of Management and Budget recommends a discount rate of 7% to estimate the rate of return on average investments. Both discount rates (3% and 7%) are included here for the purpose of comparison with a 0% discount rate as a baseline. NPVs are calculated through 2031, the selected T_{target} and T_{max} timeframe for rebuilding this stock.

This analysis assumes all allocated fish of particular stock are caught in each year, varying by fishing mortality target in each Option and reduced by a discount rate. Here, Alternative 1 (the No Action alternative) is the same as Alternative 2/Option C, but zero landings after 2021 (F=0) are included in the analysis for the sake of comparison. Total value is calculated in each year by applying an average price

from historical price and landings information for white hake (2006-2020). Average price from all years because there was not a significant relationship between price and quantity data across all years needed to predict prices. This analysis does not account for the potential revenue changes associated with other stocks. Because the analysis occurs at the species level, it does not account for catch of other grades or stocks in each scenario, changes in price are a lower bound on price changes since it assumes catch of other stocks are zero. Therefore, estimates should be compared in relative terms and not by absolute values.

Results illustrate that if mortality targets specified in each Option are maintained through the entire rebuilding period (T_{max}, or 10 years), that NPV is directly related to the proportion of allowable catch permitted in any Option (Table 1). Therefore, regardless of discount rate (0%, 3% or 7%, Alternative 1/No Action and Alternative 2/Option C allows the largest fishing mortality rate ($75\%F_{MSY}$), results in the largest NPV relative to the other options, while Option A would confer the lowest value over time. Comparing across options under Alternative 2, Option C would increase NPV by 22% compared to Option A and, regardless of choice of discount rate, while there is roughly only a 4% increase between Options B and C. Therefore, impacts of the Options, when compared against each other, show that Option A likely has negative impacts relative to the status-quo Option (Option C and No Action), while Option B has relatively low negative impacts.

However, because all the Options under Alternative 2 have the same T_{target}, but have different probabilities of attaining the target, this analysis does not consider likely rebuilding dates (>50% probability of SSB_{MSY}) if the stock rebuilds sooner than the target rebuilding date of 10 years. Mortality rates could be increased in subsequent years, which would further decrease the differences in NPV between the three Options.

Table 1- Net Present Value of white hake 10 year projected catches (millions of $2018) for different rebuilding options (Alternative 2/ Option A, B, C), F=0, and F_{MSY} , a low recruitment scenario of 75% F_{MSY} and discount rates (0%, 3%, and 7%).

	NPV by Rebuilding Option (millions of $2020)					
Discount rate	F=0	**2.A**($50\%F_{MSY}$)	**2.B**($70\%F_{MSY}$)	**2.C**($75\%F_{MSY}$)	$75\%F_{MSY}$ (low recruitment)	F_{MSY}
0	*4.59*	*58.87*	*72.77*	*75.95*	*60.44*	*88.75*
3	*4.59*	*50.04*	*61.85*	*64.58*	*52.03*	*75.62*
7	*4.59*	*41.10*	*50.80*	*53.06*	*43.43*	*62.28*

6.5.3 Action 3 – Specifications

Table 2- Comparison of commercial (sector and common pool) groundfish sub-ACLs (mt) for FY2020 and proposed FY2021, including the percent change between years. Proposed FY2021 sub-ACLs as indicated under Alternative 2/Revised Specifications.

		Commercial groundfish sub-ACL		
	Stock	**FY2020**	**FY2021**	**% Change**
Allocated Stocks	GB Cod	1,073	1,093	2%
	GOM Cod	468	270	-42%
	GB Haddock	121,864	76,622	-37%
	GOM Haddock	18,267	10,281	-44%
	GB Yellowtail Flounder	95	64	-33%
	SNE/MA Yellowtail Flounder	15	16	4%
	CC/GOM Yellowtail Flounder	688	692	1%
	American Plaice	2,937	2,682	-9%
	Witch Flounder	1310	1,317	1%
	GB Winter Flounder	522	563	8%
	GOM Winter Flounder	287	281	-2%
	SNE/MA Winter Flounder	539	288	-47%
	Redfish	11,231	9,677	-14%
	White Hake	2,019	2,019	0%
	Pollock	23,989	18,549	-23%
Non-allocated Stocks	GOM/GB Windowpane Flounder	38	108	184%
	SNE/MA Windowpane Flounder	48	43	-11%
	Ocean Pout	92	50	-46%
	Atlantic Halibut	77	73	-5%
	Atlantic Wolffish	82	86	4%

Table 3- Comparison of other fisheries sub-ACLs (mt) for FY2020 and proposed FY2021, including the percent change between years. Proposed FY2021 sub-ACLs as indicated under Alternative 2/Revised Specifications.

Fishery	Stock	FY2020	FY2021	% Change
Recreational Groundfish	GOM Cod	193	193	0%
	GOM Haddock	6,210	5,295	-15%
Sea Scallop	GB Yellowtail Flounder	19	12	-35%
	SNE/MA Yellowtail Flounder	2	2	0%
	GOM/GB Windowpane Flounder	12	31	160%
	SNE/MA Windowpane Flounder	143	129	-10%
Midwater Trawl	GB Haddock	2447	1,539	-37%
	GOM Haddock	183	156	-15%
Small-Mesh	GB Yellowtail Flounder	2	1.5	-26%
Other Sub-components – Large-Mesh Non-Groundfish[1]	SNE/MA Windowpane Flounder	196	177	-10%

[1]The value for Other Sub-components for SNE/MA Windowpane Flounder includes the other sub-component value for Large-Mesh Non-Groundfish Trawl Fisheries.

Attachment 3

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

MEMORANDUM

DATE: November 24, 2020

TO: Groundfish PDT

FROM: Scallop PDT

SUBJECT: **Scallop Fishery Bycatch Outlook for FY 2021**

Due to delays in the 2020 scallop surveys as a result of COVID-19, the Scallop PDT has not calculated bycatch projections yet. In lieu of updated bycatch projections for the four flatfish stocks with scallop sub-ACLs at this time, the Scallop PDT has compiled the recommendations from the recent Scallop Committee meeting on November 12, 2020, and available data from scallop surveys and observer records. The Scallop PDT plans to send another memo in January 2021 after projections are completed.

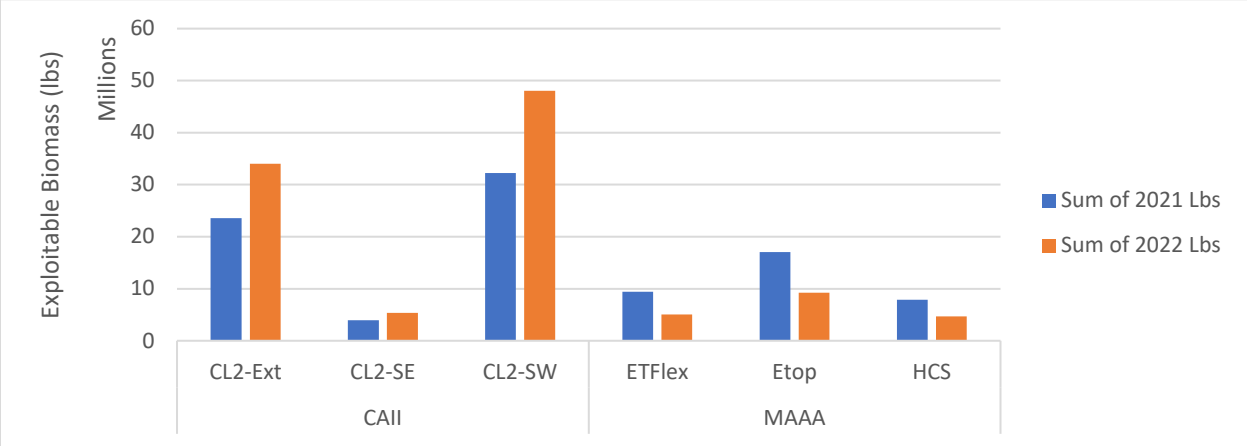
Framework 33 Overview:
Framework 33 will set fishery allocations for FY2021 and FY2022 (default). All specification alternatives that are currently being developed would allocate a mix of four access area trips across the following areas: Closed Area II Access Area (CAII-Southwest and/or CAII-Extension), the Mid-Atlantic Access Area (MAAA), and the Nantucket Lightship South (NLS-South) (see Table 2 for details). The Council is also considering allowing a limited amount of LAGC IFQ access area fishing in Closed Area I. FW33 will also consider closures on eastern Georges Bank to protect a large number of pre-recruits observed in CAII-Southeast 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 FY2020 projected scallop fishery bycatch estimates for the preferred alternative in FW32, including the anticipated FY2020 scallop sub-ACL for each stock.

Alternative	Scenario		GB YT	SNE/MA YT	GOM/GB WP	SNE/MA WP
Anticipated 2021 sub-ACL		GB Closure	*~12 mt*	*~2 mt*	*~31 mt*	*~129 mt*
FW32 Preferred	2 MAAA: 18k 1 CAII East: 18k 1 NLS-S-Deep: 18k ½ CAI: 9k ½ NLS-N: 9k 24 DAS	CAII-Southwest closed (area = 1,525 nmi^2)	23.2 – 23.3	2.06-2.3	31.2-32.91	135.17-142.92
Notes: See 2019 memo for bycatch methodology: https://s3.amazonaws.com/nefmc.org/3e_191115-MEMO-Scallop-Bycatch-Estimates-to-GF-PDT.pdf						

Scallop Fishery Projections for 2021 and 2022: The 2020 scallop surveys found that the majority of the resource is now concentrated on eastern Georges Bank. This is a shift from recent years in which most of the biomass has been concentrated in the Nantucket Lightship region and in the Mid-Atlantic Access area. Preliminary projections for the Closed Area II (CAII) region estimated exploitable biomass at 60 million pounds in 2021 and 87 million pounds in 2022 (assuming ~6 million lbs of landings during 2021)(Figure 1). Exploitable biomass in the Mid-Atlantic Access Area (MAAA) for 2022 is estimated to be around 19 million pounds across all three management areas after fishing the area in 2021. While recent projections have been overly optimistic, the fishery wide outlook is that the majority of potential access area fishing in 2022 will likely be in the Closed Area II region. The PDT predicts that CAII area may be able to support multiple access area trips in 2022 based on current projections.

Figure 1 - Predicted exploitable scallop biomass in the Closed Area II region and Mid-Atlantic Access Area for 2021 and 2022, assuming some fishing in both areas in 2021.



Scallop PDT Discussion To-Date:

1. Based on the range of fishery allocations under consideration in Framework 33, last year's bycatch estimates are a reasonable approximation of what is likely to be estimated for FY 2021 (see Table 1). Bycatch in CAII may be lower for yellowtail flounder based on the spatial distribution of scallops in the area. If the fishery focuses effort in the CAII-SW, tow times will likely be short due to the high densities of scallops observed in this area (Figure 3).
2. The FY2021 specifications will not be implemented until May or June of 2021. This is likely to change some fishing behavior and will amount to the continued closure of some access areas until the new specifications are in place, including the majority of Closed Area II (i.e., CAII-SW and CAII-Ext). The fishery is not going to start until May or June which may reduce impacts on yellowtail and windowpane because observed catch rates of the flatfish species have tended to decline in the late spring/early summer relative to the start of the scallop fishing year (April 1).
3. Through FW32, the Council extended the August 15 – November 15 seasonal closure of Closed Area II by two weeks for FY2020. The Council may evaluate the closure periods of CAII in the development of FW33. We expect this to come up at the December 12, 2020 Committee meeting.
4. Bycatch projections are based on the most recent available observer records for a strata (i.e. in this case, SAMS area). Since no new observer data is available in CAII for

FY2020, bycatch projections for CAII will be based on observer records from FY2017, the last time the scallop fishery was fishing in this access area. Projecting future bycatch based on time-lagged data increases the uncertainty of the estimates, and the PDT notes that FY2021 projections may be over- or under-estimated.

5. The PDT notes that flatfish bycatch projections are forecasts (with error) and should not be interpreted as precise estimates. In general, the PDT feels that estimates represent a reasonable approximation of catch that may occur. Review of past estimates has shown that projections have been both over-estimated and under-estimated relative to realized catches. It is important to note that the methods and underlying assumptions used for in-season catch accounting may vary from the methods used by the Scallop PDT to project catch. To capture some of this uncertainty, the PDT plans to develop a range of flatfish bycatch estimates using varying methods. In addition to the standard d:K method (see 2019 memo for bycatch projections methodology), the PDT discussed using observed flatfish catch per dredge hour applied to projected dredge hours by SAMS area for FY2021. Both approaches would produce bycatch estimates by SAMS area (i.e., not CAII as a whole), meaning differences in bycatch trends will be captured on a finer spatial scale and allow for comparisons to be made between varying spatial management configurations that are being developed for CAII through FW33.
6. In light of there being no updated observer data to inform bycatch trends in CAII, the PDT will be conducting a suite of sensitivity analyses using other data sources to scale observed flatfish catch rates from FY2017 to what might be considered a more realistic rate for FY2021. The sensitivity analyses will consider 1) recent TRAC reports, 2) VIMS survey dredge flatfish catch per tow from CAII between 2017 and 2020, and 3) flatfish catch data from the CFF seasonal dredge survey in Closed Area II from 2017 to 2020. The PDT acknowledges that there are caveats associated with these data sets, but also notes that using these time series' may help managers better understand the potential impacts of scallop fishing in CAII in FY2021 in addition to projections based on FY2017 observer data.
7. If the 2021 bycatch projections are similar to projections for FY2020, it is worth noting that projected bycatch is roughly equivalent to the scallop fishery sub-ACLs for SNE/MA yellowtail and GOM/GB windowpane, but greater than the sub-ACLs for GB yellowtail and SNE windowpane flounder (Table 1). Bycatch projections for the preferred alternative in FW32 exceeded the FY2020 sub-ACL for GB yellowtail by roughly 4 mt.
8. Alternatives under consideration in Framework 33 would allocate access area trips to rotational areas with high densities of scallops, meaning tow times and associated bycatch are expected to be reduced in access areas.
9. The fishery interacts with GB yellowtail and GOM/GB windowpane at a higher rate when fishing in CAII relative to other parts of the resource. All FW33 specifications options are considering allocations to Closed Area II, along with spatial closures that are anticipated to mitigate impacts to the GB yellowtail and GOM/GB windowpane flounder stocks. For example, the area that is being fished in FY2020 (CAII-SE) is likely to close in FY2021 and FY2022 to protect pre-recruits that were observed in this area, which would also relieve fishing pressure in an area that overlaps with GB yellowtail and GOM/GB windowpane.
10. Aside from possible fishery access to the CAII Access Area, access area effort will be directed to the MAAA, where scallops are currently found in high densities. The remainder of rotational harvest is likely to come from the NLS-South, with some potential for limited LAGC fishing in CAI. Recent bycatch estimates of SNE/MA

yellowtail have been very low in the MAAA and the NLS-South. CAI bisects the GB and CC/GOM yellowtail stock areas; however, yellowtail bycatch is anticipated to be low in CAI overall. The PDT does not anticipate much fishing in CAI if it is open based on the 2019 and 2020 surveys, and fishing behavior in 2020.

11. The PDT acknowledges that there will continue to be some additional uncertainty around the SNE/MA windowpane projections due to anticipated access to high densities of scallops in the NLS-South. This area has not been targeted in the past by the scallop fishery, meaning observer data are limited and the associated bycatch rates are uncertain (i.e. projections for the NLS-South use the NLS-North d/K considering these areas are adjacent to each other). Observers were not deployed on scallop vessels until August of FY2020 due to public health concerns stemming from the COVID-19 pandemic, meaning there is a very limited amount of new data to inform bycatch rates for FY2020. Realized SNE/MA windowpane bycatch could swing upwards or downwards from the range presented in Table 1 depending on fishing practices in the NLS-South. For example, should vessels fish in the areas of extraordinarily high-density, overall bycatch could be expected to decrease relative to the values provided in Table 1 if scallop catch rates are higher than projected. Conversely, should vessels target the lower density "edges" of the concentrated scallop aggregation, scallop catch rates could be lower, thereby increasing bycatch above the values presented in Table 1. As in the 2019 memo on bycatch, the PDT notes that the range of SNE/MA windowpane bycatch projections from Framework 32 for FY2020 (Table 1) are a realistic representation of a mix of these fishing practices (i.e. some vessels fishing high densities, others fishing lower densities).
12. The scallop fishery continues to use rotational management as a way to improve yield-per-recruit. In practice, *F* is reduced to zero in the years prior to an opening of an area. On the temporal scale of fishing years, effort in Closed Area II Access Area is periodic and is reflected by intermittently high catches of GB yellowtail, GOM/GB windowpane, and scallops in the stock area. In years when CAII AA is not fished, bycatch of GB yellowtail and GOM/GB windowpane decreases considerably, and scallops are caught elsewhere.

Figure 2 – Example spatial management configuration for FY2021 being analyzed through FW33.

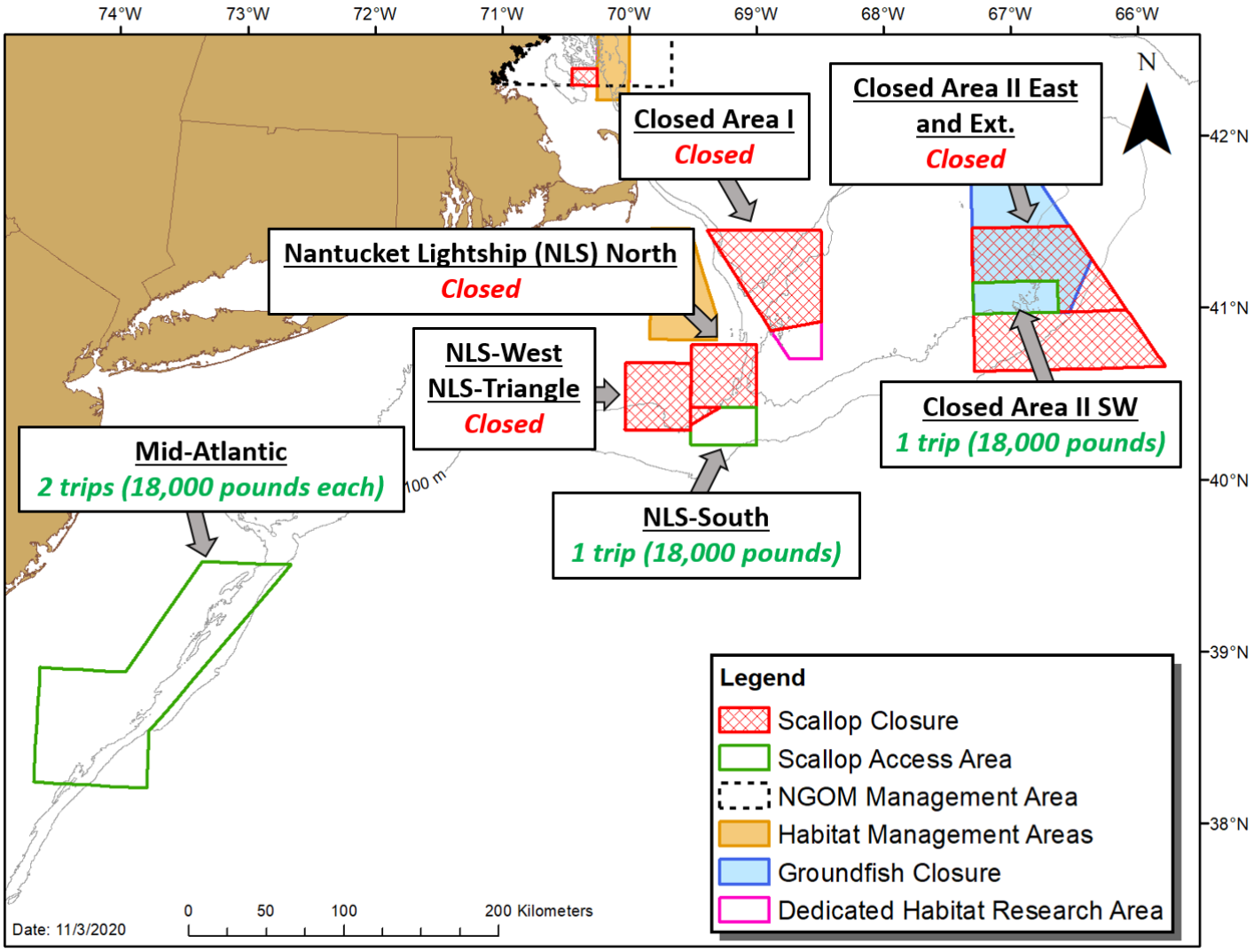


Table 2 - Range of Scallop Committee tasking for possible rotational management configurations in FW33 (Nov. 12, 2020).

	Required	Comparison	PDT Rec.	NEW RUN	NEW RUN	NEW RUN	NEW RUN	NEW RUN
	Default	Status Quo	PDT BASE Run 1	CTE 1 (AP1)	CTE 2 (AP2)	CTE 3 (AP 4)	CTE 4 (AP 5)	CTE 5 (AP 6)
Open area F	TBD, 18 DAS	F=0.33	24 DAS	24 DAS w/ CAI open	20 DAS	22 DAS	26 DAS	28 DAS
Open area LPUE			1,799	1,799	1,799	1,799	1,799	1,799
FT LA trip limit	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Total AA Pounds			*72,000*	*72,000*	*72,000*	*72,000*	*72,000*	*72,000*
CL1-Access	CLOSED	1/2 Trip (Flex)	CLOSED	OPEN BOTTOM	CLOSED	285 LAGC Trips (171,000 lbs)	571 LAGC Trips (342,000 lbs)	CLOSED
CL1-Sliver	CLOSED		CLOSED	OPEN BOTTOM	CLOSED			CLOSED
CL1-South	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
CL2-North (HAPC)	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
CL2-SE	CLOSED	1 AA Trip	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
CL2-SW	CLOSED	CLOSED	1 AA trip	1 AA trip	1 AA trip	1 AA trip (SW & EXT as 1 area)	1/2 trip	1 AA Trip
CL2-Ext	CLOSED	CLOSED	CLOSED	CLOSED	1/2 FLEX to MAAA		1/2 trip	1 FLEX to MAAA
NLS-North	CLOSED	1/2 Trip	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
NLS-South-Deep	CLOSED	1 AA Trip	1 AA Trip	1 AA Trip	1 AA Trip	1.5 AA Trips	1 AA Trip	1 AA Trip
NLS-West	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
NF	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
GSC	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
SF	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
BI	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
LI	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
NYB	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
MAB-Nearshore	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
HCS	1 trip MAAA	2 AA trips MAAA	2 AA trips MAAA	1.5 AA trips MAAA, 1/2 FLEX to NLS-S	1.5 AA trips MAAA	1.5 AA trips MAAA	2 AA trips MAAA	1 AA trip MAAA
ET Open								
ET Flex								
DMV	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM	OPEN BOTTOM
				CAI open bottom with 24 DAS		1/2 trip equivalent of LAGC IFQ trips @600lbs a day in CAI	1 trip equivalent of LAGC IFQ trips @600lbs a day in CAI.	
							We can run another DAS (26) or we can juggle this around to have 22 or 28 DAS with CAI open bottom.	

Figure 3 – Predicted biomass (mt per km^2) from the 2020 HabCam survey of eastern Georges Bank relative to FY2020 scallop management boundaries (black) and SAMS areas (red).