



## New England Fishery Management Council

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### MEMORANDUM

(Tables 2 and 3 are revised)

**DATE:** October 2, 2024  
**TO:** Scientific and Statistical Committee  
**FROM:** Scallop Plan Development Team  
**SUBJECT:** Atlantic Sea Scallop OFLs and ABCs for FY 2025 and FY 2026 (default)

This memorandum forwards information to support the development of overfishing limit (OFL) and acceptable biological catch (ABC) recommendations for Atlantic sea scallops for fishing year (FY) 2025 and the default values for FY 2026. The Scallop Plan Development Team (PDT) met several times between July 25 and October 1, 2024, to develop this memo.

#### **Overview**

To develop OFL and ABC recommendations, the PDT reviewed survey information from the 2024 field season, relevant fishery and observer data, the latest stock assessment information and peer review reports (from 2020), and prior SSC and PDT reports. The OFL and ABC recommendations were developed using parameters from the 2020 management track assessment and applying the ABC control rule. As in previous years, the PDT recommends changes to 1) scallop shell-height meat-weights relationships used to develop survey biomass estimates and 2) natural mortality assumptions used in the Scallop Area Management Simulation (SAMS) model for areas at the southern end of the range. The PDT's OFL and ABC recommendations for 2025 and 2026 (default) are summarized in Table 1.

Table 1 - Scallop PDT recommendations for OFL and ABC for FY 2025 and 2026 (default).

| Year | OFL (mt) | ABC (mt) |
|------|----------|----------|
| 2025 | 28,970   | 22,840   |
| 2026 | 30,031   | 23,437   |

#### **Methods to Develop OFL and ABC:**

##### Adjustments to the 2024 survey data:

- Shell-Height to Meat-Weight (SHMW) Relationships: For Georges Bank and the Mid-Atlantic, SHMW parameters were updated through SARC 65 (2018), and applied in the 2020 Management Track Assessment. As with previous years, the PDT recommends using area-specific SHMW parameter estimates from the recent dredge surveys conducted in the NLS-South area to account for slow growth in this region. Gulf of Maine specific shell-height meat-weight relationships have not been developed or reviewed as part of a stock assessment. The PDT recommends using SHMW parameter estimates from recent dredge surveys supplemented with meat weight data collected to support the drop camera surveys, except for Platts Bank and Machias Seal Island, where the PDT recommends using parameter estimates from only the dredge survey data.

#### Adjustments to projections for FY 2024 (SAMS model):

- Natural mortality: Natural mortality assumptions for the Virginia and Delmarva areas was increased in 2023 based on overestimated projections in these areas in recent years, despite the limited fishing in these areas. The PDT recommends keeping these increased M values in the SAMS model in these areas to attempt to improve forecast performance. Evidence from 2024 suggests continued elevated M in Delmarva and the Elephant Trunk. The PDT does not recommend further ad-hoc adjustments to M, but rather that the effects of warming temperatures in the Mid-Atlantic on natural mortality be investigated in the ongoing Research Track assessment. In the meantime, the Council should be advised that forecasts from the southern Mid-Atlantic may be overestimated.

#### FY 2025 & FY 2026 (default) OFL and ABC Calculation:

- Gulf of Maine: Survey frequency and intensity have increased in areas outside of the scallop survey strata north and east of Cape Cod, including the Gulf of Maine and Northern Gulf of Maine (NGOM) management unit. The 2024 surveys expanded coverage and included Machias Seal Island and exploratory areas along the coast of Maine. Following the SSC's past recommendation to include the Gulf of Maine as part of the OFL and ABC, the Scallop PDT evaluated the survey data from this region and included it with Georges Bank and the Mid-Atlantic in the calculation of the OFL and ABC.

#### ***2025 & 2026 OFL and ABC Calculations***

The updated OFL and ABC values for the Georges Bank and Mid-Atlantic regions are based on reference points from the 2020 management track assessment (OFL  $F=0.61$ ; ABC  $F=0.45$ ). Based on adjustments to the Scallop FMP through Amendment 21 and methods approved by the SSC in October 2021, scallops in the Gulf of Maine region (including the Northern Gulf of Maine management area) are now included in the overall OFL and ABC estimates. In the absence of reference points and a stock assessment model for the Gulf of Maine, the OFL and ABC estimates for the Gulf of Maine were derived using the Georges Bank  $F_{MSY}$  estimates from the 2020 management track assessment ( $F=0.46$  for OFL,  $F=0.32$  for ABC). This approach was recommended by the SSC in October 2021 and is explained in detail in the October 7, 2021, Scallop PDT memo to the SSC<sup>1</sup>. The Council concurred with the SSC's approach of including scallop biomass from the Gulf of Maine in the overall OFL and ABC.

The OFL and ABC estimates for 2025 are lower than the 2024 (default) projections that were recommended by the SSC last year. The 2025 biomass projections indicate a slight decline in biomass from 2024 levels. Biomass remains well below the exceptionally high levels observed between 2015-2019, and this overall decline is attributed to the extraordinarily large 2012- and 2013-year classes being fished down and the absence of comparably strong recruitment in subsequent years. The biomass projection for 2026 is slightly higher than the estimate for 2025 due to the growth of a large set of scallops on Georges Bank in the Closed Area I Sliver and the Nantucket Lightship South. The majority of biomass for the stock is contained on Georges Bank (i.e., roughly 77% of total biomass according to the 2024 surveys).

Around half of the population is considered exploitable (Table 2). The PDT cautions that if higher than expected natural, incidental, or discard mortality occurs, biomass estimates will be overestimated, especially for 2026.

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<sup>1</sup> <https://s3.us-east-1.amazonaws.com/nefmc.org/1.3-211007-Memo-PDT-to-SSC-RE-ABC-OFL-2022-2023.pdf>

Table 2 - Estimated biomass (mt) and exploitable biomass (mt) for FY 2025.

|               | Biomass | Exploitable Biomass | Percent Exploitable |
|---------------|---------|---------------------|---------------------|
| Georges Bank  | 74,313  | 36,126              | 49%                 |
| Mid-Atlantic  | 22,806  | 12,129              | 53%                 |
| Gulf of Maine | 6,627   | 5,575               | 84%                 |

Table 3 - 2025 Scallop ABC (mt, excluding discards) estimates by region.

|               | ABC    | Percent Total of ABC |
|---------------|--------|----------------------|
| Georges Bank  | 12,013 | 67.1%                |
| Mid-Atlantic  | 4,506  | 25.2%                |
| Gulf of Maine | 1,384  | 7.7%                 |

### ***Shell Height Meat Weight Parameters***

The PDT has recommended deviations from the SARC 65 SHMW parameters in recent years in an effort to accurately characterize scallop condition in specific regions. The PDT has focused most on the Nantucket Lightship Region to account for unique growth of the 2012-year class in this area. The PDT recommends using SHMW parameters based on the last eight years of dredge survey data for biomass calculations of the NLS-South. While biomass has declined substantially in this area, given the unique growth characteristics of scallops in this area, the PDT recommends utilizing biological data from recent dredge surveys of the area to better inform SHMW relationships when projecting biomass. The PDT also notes that the difference in biomass estimates based on SARC 65 versus 2016-2023 dredge parameters for the NLS-South is small.

Figure 1 – 2024 shell height meat weight curves for the NLS region from the 2024 VIMS dredge survey. This figure refers to the previously used NLS-South-Deep area and does not refer to the new NLS-South area that was adopted by the PDT in September 2024.

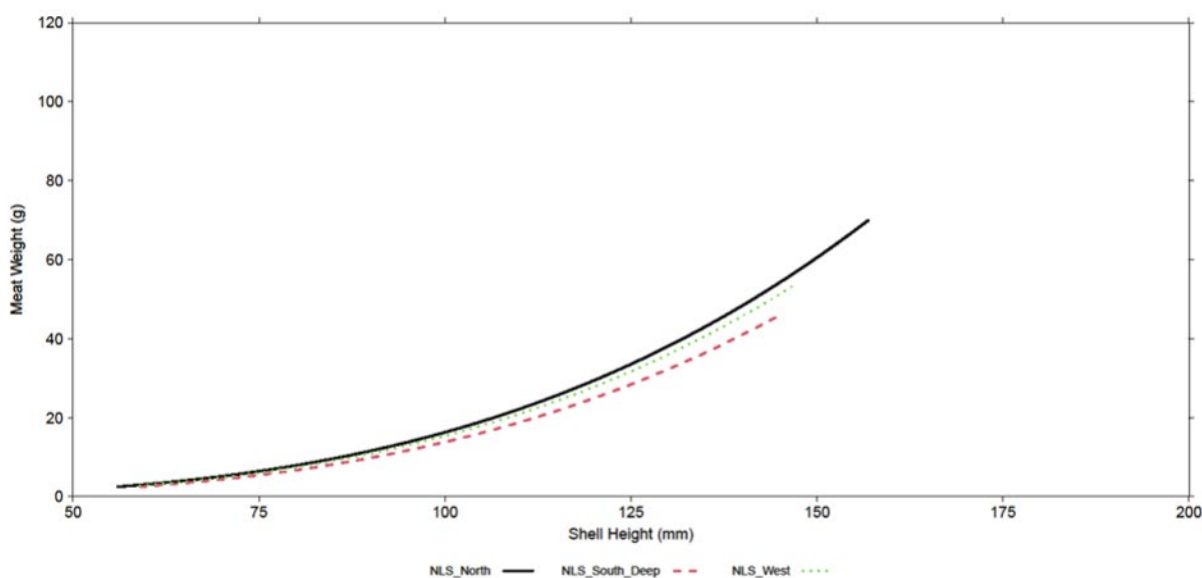


Table 4 – Comparison of biomass estimates from the 2024 SMAST drop camera survey using different shell height meat weight equations in the NLS-South. All values are for scallops greater than or equal to 40 mm in shell height. This table refers to the

previously used NLS-South-Deep area and does not refer to the new NLS-South area that was adopted by the PDT in September 2024.

|                                     | Biomass estimate using:<br>VIMS equation. | Biomass estimate using:<br>SARC 65 specific |
|-------------------------------------|-------------------------------------------|---------------------------------------------|
| <b>NLS South</b>                    |                                           |                                             |
| Average meat weight (g)             | 2.0                                       | 1.5                                         |
| Biomass (mt)                        | 3411                                      | 2496                                        |
| Standard error                      | 1710                                      | 1252                                        |
| Exploitable average meat weight (g) | 6.8                                       | 5.8                                         |
| Exploitable biomass (mt)            | 124                                       | 106                                         |
| Exploitable standard error          | 62                                        | 53                                          |

### ***Natural Mortality in Virginia and Delmarva (from 2023 memo to SSC)***

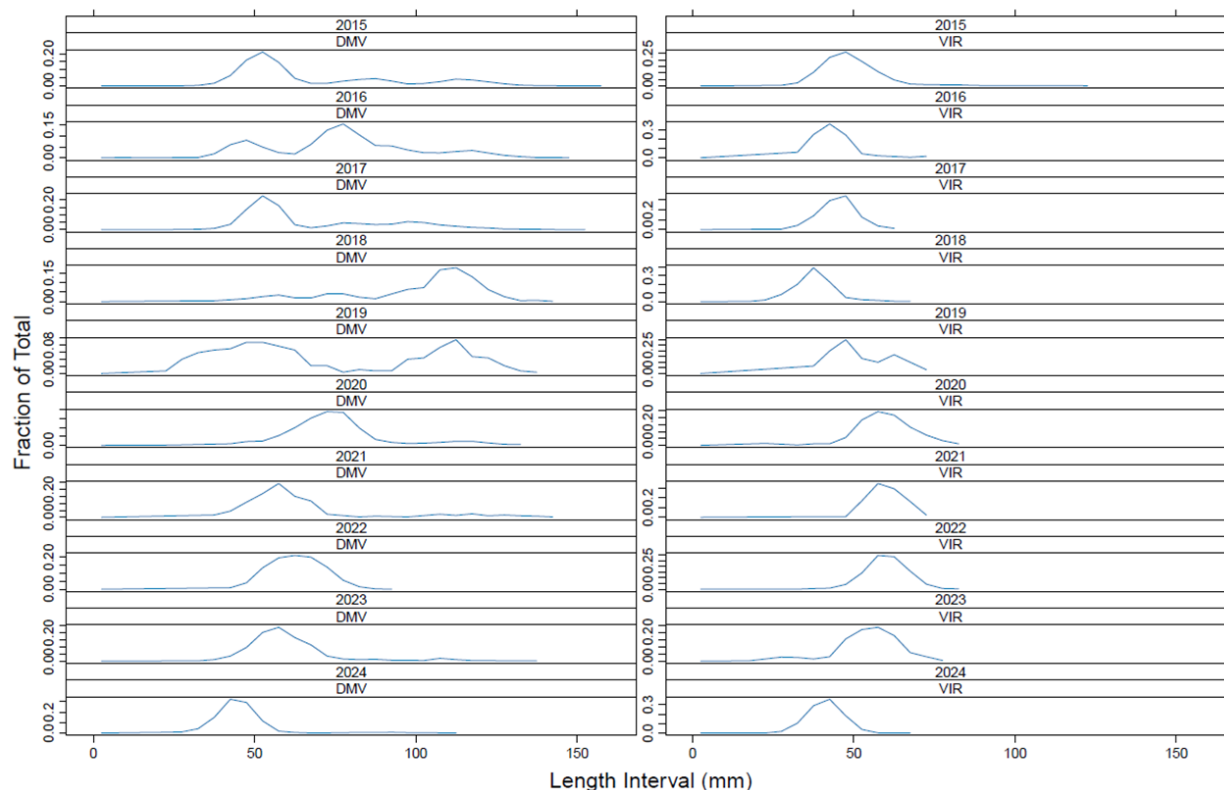
Projections in Virginia and to a lesser extent Delmarva have consistently overestimated biomass and abundance in recent years, despite the limited fishing in these areas. Length-frequency distributions from dredge surveys suggest elevated levels of mortality in these areas at older ages (Figure 2). The PDT suspects that natural mortality has increased in these areas due to warming waters in the southern extent of the scallop resource, particularly in adult scallops, which is consistent with findings from Zang et al. 2022.

To estimate natural mortality in these areas, the Beverton-Holt length-based estimator was applied:

$$Z = \frac{K(L_{\infty} - \bar{L})}{\bar{L} - L_c}$$

to the mean of the 2018-2021 >40 mm size frequencies observed in these two areas, using  $L_c = 42.5$  mm. The result was an adjusted Z for Virginia of 4.2, which was assumed to be all attributed to natural mortality given that no fishing occurs in this area. For Delmarva, adjusted Z was equal to 0.66 (i.e., 0.6 attributed to natural mortality, 0.06 attributed to fishing mortality given that some fishing has occurred here during the 2018-2021 timeframe).

Figure 2 - Length frequency from the VIMS dredge survey of Delmarva (DMV) and Virginia Beach (VIR) from 2015 - 2024. (Source: Dr. David Rudders, VIMS)



### ***Overly Optimistic Projections and Adjustments to the SAMS Forecasting Model:***

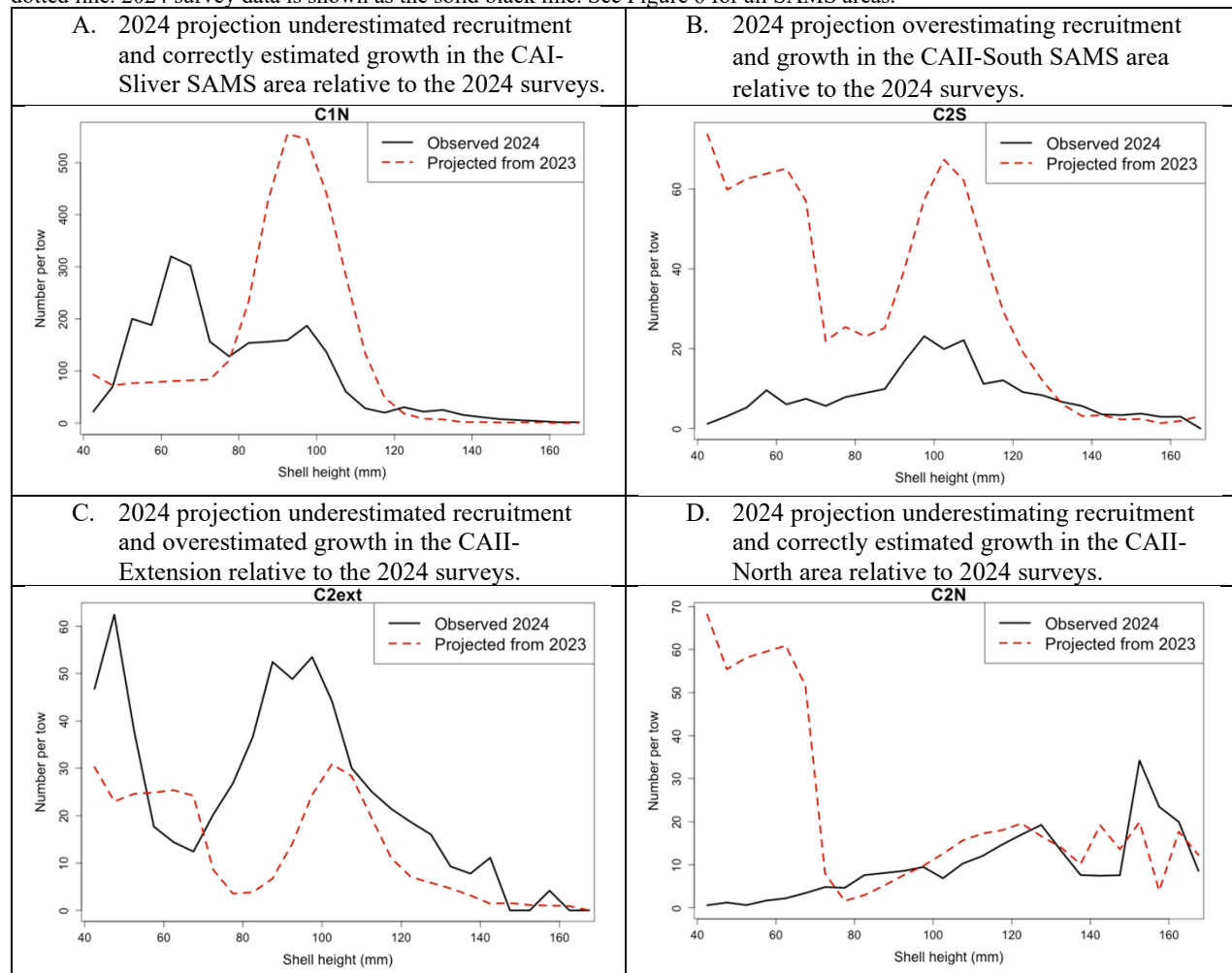
The PDT has tracked the forecasting performance of the SAMS model in recent years and has compared the survey estimates with projections since SARC 65 (i.e., 2019-2023) by calculating the projection error. The projection error is calculated as  $100 \times (\text{predicted biomass} - \text{observed biomass}) / \text{predicted biomass}$ . Positive error means the projection was an overestimate, and negative error means the projection was an underestimate. 2023 projection error calculations are documented in the October 4, 2023 Scallop PDT memo to the SSC<sup>2</sup>. The PDT did not calculate projection error for 2024 projections.

At the stock-wide level, the model performed well in estimating total biomass. While Georges Bank biomass was underestimated, the most substantial divergence in projections and survey results was in the Mid-Atlantic, where there appears to be systematic overestimation of abundance and biomass. The PDT suspects that environmental drivers, particularly at the southern extent of the range, is contributing to elevated levels of M. While the PDT continues to recommend an adjustment to M and Z in the Virginia Beach and Delmarva areas, 2024 surveys suggest that M is also elevated in Closed Area I. 2024 optical surveys noted high sea star predation in the area. The PDT noted that there is an ongoing research track assessment and felt that further adjustments to M should be handled systematically in the ongoing research track assessment.

<sup>2</sup> [https://d23h0vhsm26o6d.cloudfront.net/3\\_231004-Memo-PDT-to-SSC-RE-ABC-OFL-2024-2025-Final.pdf](https://d23h0vhsm26o6d.cloudfront.net/3_231004-Memo-PDT-to-SSC-RE-ABC-OFL-2024-2025-Final.pdf)

The SAMS model considers area-specific (i.e., by SAMS area) growth parameters (i.e.,  $L_{\infty}$ , K) when making forward projections of biomass. The 2020 management track assessment adjusted growth rates to account for the recent slower than expected growth. This was a change from the 2018 benchmark assessment, which estimated growth in 2012-2016 to be the fastest on record. The PDT discussed the variability in growth rates used in the model over the past three years and noted that growth assumptions that are faster than realized growth could contribute to overly optimistic projections. Staying with the recommendation made in 2020, 2021, 2022, and 2023 to address this issue, the PDT recommends that SAMS area-specific assumptions of  $L_{\infty}$  be scaled down proportionally from the most recent CASA period (i.e., 2012-2016) to the slowest growth period for the different regions included in CASA (i.e., 1993-1996 for Georges Bank, 1975-1977; 1987-2003; 2006 for Mid-Atlantic; Table 10). For areas in the Gulf of Maine, the PDT recommends using growth parameters from Georges Bank, consistent with the 2023 approach.

Figure 3 - Comparison of 2024 L-F projections (based on 2023 data) with 2024 survey data. Projections are shown as the red dotted line. 2024 survey data is shown as the solid black line. See Figure 6 for all SAMS areas.

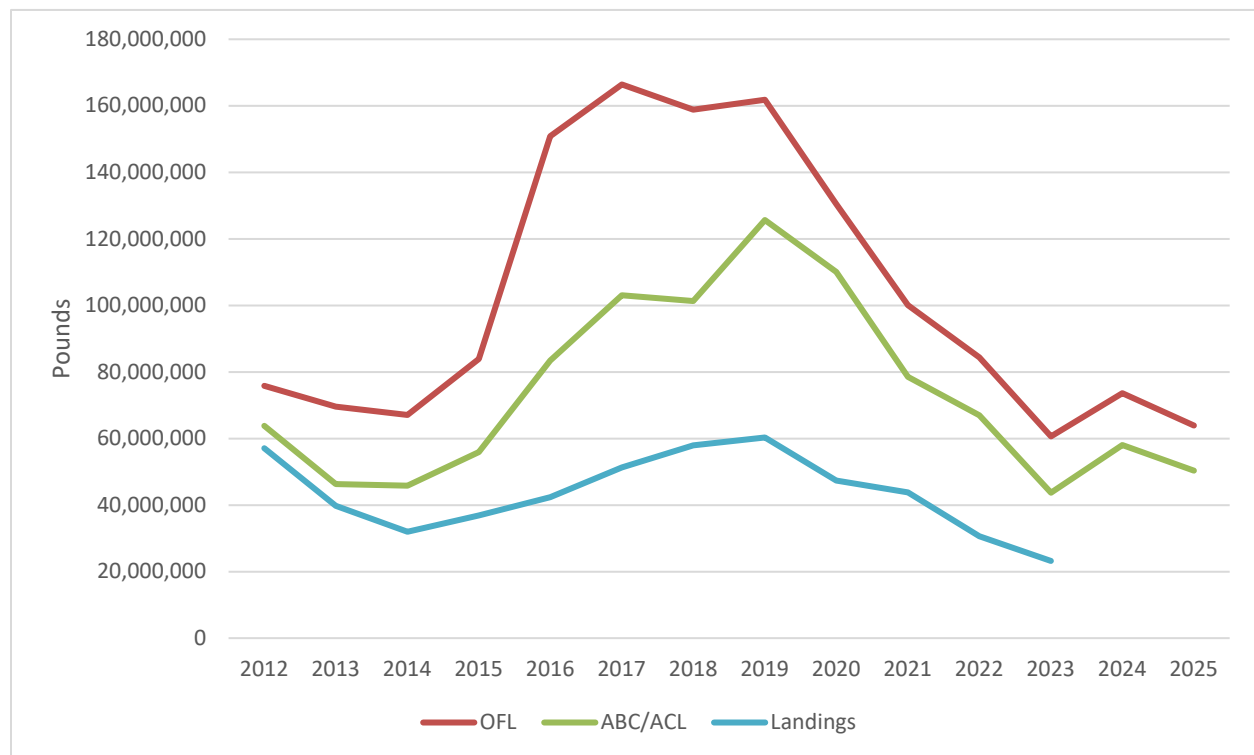


### ***Recruitment and Outlook***

While scallop biomass is projected to increase between 2024 and 2025, the increases are driven by the continued growth of two-year old scallops on Georges Bank, and in particular the Nantucket Lightship South and Closed Area I – Sliver. Recruitment in both the Nantucket Lightship and Closed Area I – Sliver is considered to be strong, but not at the magnitude of the 2012 or 2013 year classes. In the Mid-Atlantic, pre-recruits were observed in the Elephant Trunk region, and to a lesser extent in the New York Bight region. Scallop biomass in 2024 was estimated to be 93,499 mt, far lower than the recent peak biomass estimated in 2017 of 265,277 mt.

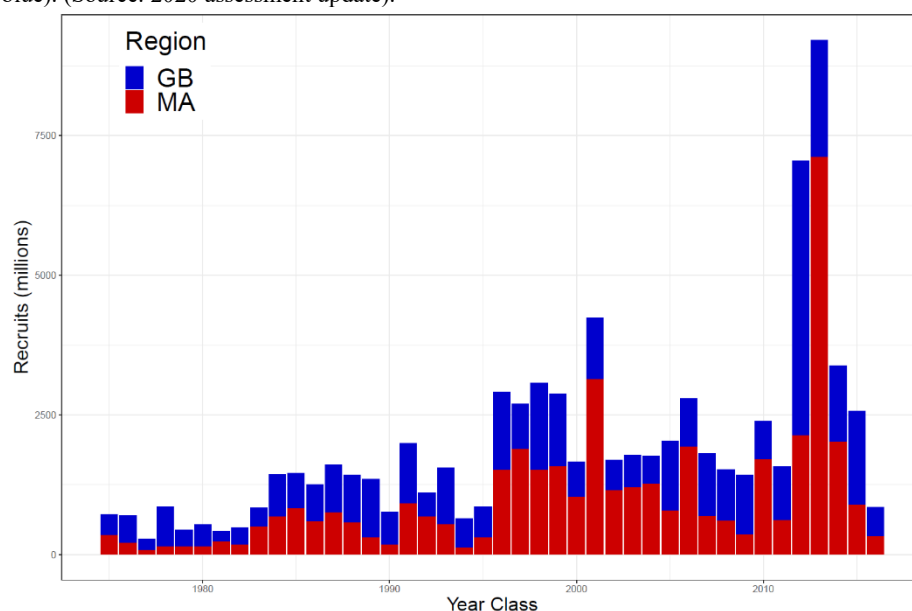
The Council is considering rotational closures of NLS-S and the Elephant Trunk in FY2025 with the goal of optimizing yield of the juvenile scallops. Opportunities for access area fishing will be constrained to Area I and Area II on Georges Bank for FY 2025. Pre-recruits observed in the Nantucket Lightship and Elephant Trunk are susceptible to natural mortality at this life stage.

Figure 4 - Scallop Fishery total landings (2011-2023), OFL and ABC for Georges Bank and the Mid-Atlantic (2011-2025), with 2024 estimates.<sup>3</sup>



<sup>3</sup> The 2022, 2023, and 2024 estimates include biomass from the Gulf of Maine.

Figure 5 - Sea scallop recruitment (age 1) by region, 1975-2016. Regions are: Mid-Atlantic (MA, red) and Georges Bank (GB, blue). (Source: 2020 assessment update).



### ***Scallop Rotational Management***

While the OFL and ABC establish bounds for resource removals, in recent years, scallop rotational management has resulted in realized harvests (and corresponding fishing mortality rates) below these legal limits, however discard rates and discard mortality are uncertain. Fishery allocations are based on an average  $F$  that is below the reference points for this fishery. For example, in fishing year 2024, the ABC is 21,497 mt (not including discards), whereas fishery Annual Projected Landings were 11,609 mt. Based on initial discussions of rotational management alternatives for FW39, it is reasonable to expect that fishery removals in FY2025 will continue to be below the OFL and ABC estimates recommended in this memo. The Council considers a range of additional issues and uncertainties as part of the annual rotational management process, such as the proportion of available biomass that the fishery is likely to target ('effective biomass'), discard rates and mortality, and projection model uncertainty.

### ***Responses to SSC Recommendations made in 2023:***

In October 2023, the SSC recommended the OFL and ABC as developed by the PDT. The SSC made other comments and recommendations, which the PDT responds to here:

1. *SSC Comment: The SSC recommended a thorough examination of the impacts of ecosystem and climate change on population dynamics through the ongoing Sea Scallop Research Track Stock Assessment. Furthermore, a description of these observations should be included in the Mid-Atlantic State of the Ecosystem Report. The SSC noted that it is imperative to translate the known vulnerability of sea scallops to climate change into an action plan for this fishery, and noted that the variety of available data streams (e.g. dredge, HabCam, drop camera) make this an ideal case study to examine the implications of climate change on northeast US fisheries and to help plan for potential impacts on other species that have dynamics that are less well understood.*

PDT Response: The research track assessment review has been set for April of 2025. The TORs for the 2025 research track assessment are provided below. The evaluation of changes in stock dynamics and investigation of the environmental drivers affecting the productivity of the stock will be considered in the ongoing Research Track through TOR 1: “Identify relevant ecosystem and climate influences on the stock. Characterize the uncertainty in the relevant sources of data and their link to stock dynamics. Consider findings, as appropriate, in addressing other TORs. Report how the findings were considered under impacted TORs.” The PDT understands that the Research Trach Working Group is in the process of addressing TOR 1, and that while the effects of climate and ecosystem change on population dynamics can be accounted for adjustments to natural mortality, no new environmental parameters will be added to the CASA model.

## References:

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Table 5 – Final combined survey estimates for 2024 by SAMS areas, including values from the GOM and Northern Gulf of Maine Management Area.

**2024 Survey Estimates- Final version - Sep 16, 2024**

|            |               | Dredge      |              |             |            | Drop Camera |              |              |            | HabCam      |              |            |             | Mean        |              |             |            |
|------------|---------------|-------------|--------------|-------------|------------|-------------|--------------|--------------|------------|-------------|--------------|------------|-------------|-------------|--------------|-------------|------------|
| Region     | Subarea       | Num         | Bmsmt        | SE          | MeanWt     | Num         | Bmsmt        | SE           | MeanWt     | Num         | Bmsmt        | SE         | MeanWt      | Num         | Bmsmt        | SE          | MeanWt     |
| GB         | CL1-Sliver    | 1180        | 14025        | 4747        | 11.9       | 1052        | 13103        | 9235         | 12.5       | 1064        | 16755        | 438        | 15.7        | 1099        | 14628        | 3464        | 13.3       |
| GB         | CL1-Access    | 5           | 108          | 39          | 20.8       | 81          | 1773         | 2166         | 21.8       | 26          | 894          | 102        | 34.4        | 38          | 925          | 723         | 24.7       |
| GB         | CL1-S         | 0.04        | 0.1          | 0.1         | 2.5        | 14          | 596          | 719          | 42.9       | 3           | 67           | 28         | 22.3        | 6           | 221          | 240         | 39.1       |
| GB         | CL2-N         | 209         | 8154         | 3605        | 39.0       | 365         | 12625        | 2464         | 34.6       | 303         | 12837        | 82         | 42.4        | 292         | 11205        | 1456        | 38.3       |
| GB         | CL2-S         | 169         | 4910         | 1494        | 29.1       | 234         | 5703         | 718          | 24.4       | 222         | 6427         | 174        | 29.0        | 208         | 5680         | 556         | 27.3       |
| GB         | CL2-Ext       | 273         | 3838         | 1227        | 14.1       | 253         | 4090         | 636          | 16.2       | 215         | 3668         | 131        | 17.1        | 247         | 3865         | 463         | 15.7       |
| GB         | SF            | 637         | 5364         | 906         | 8.4        | 1188        | 8451         | 5004         | 7.1        | 1292        | 10162        | 308        | 7.9         | 1039        | 7992         | 1698        | 7.7        |
| GB         | NLS-N         | 26          | 594          | 152         | 22.8       | 279         | 1762         | 2145         | 6.3        | 37          | 168          | 89         | 4.5         | 114         | 841          | 717         | 7.4        |
| GB         | NLS-S         | 6677        | 9089         | 4418        | 1.4        | 4652        | 10416        | 4204         | 2.2        | 2897        | 10564        | 710        | 3.6         | 4742        | 10023        | 2047        | 2.1        |
| GB         | NLS-W         | 110         | 878          | 45          | 8.0        | 159         | 3799         | 4028         | 23.9       | 140         | 3011         | 11         | 21.5        | 136         | 2563         | 1343        | 18.8       |
| GB         | NF            | 104         | 1068         | 318         | 10.2       | 112         | 1781         | 950          | 15.9       | 100         | 1987         | 158        | 19.9        | 106         | 1612         | 338         | 15.3       |
| GB         | GSC           | 637         | 5364         | 906         | 8.4        | 623         | 8637         | 6049         | 13.9       | 261         | 5446         | 267        | 20.9        | 507         | 6482         | 2041        | 12.8       |
| <b>GB</b>  | <b>TOTAL</b>  | <b>8846</b> | <b>39366</b> | <b>6166</b> | <b>4.4</b> | <b>7961</b> | <b>59633</b> | <b>10641</b> | <b>7.5</b> | <b>5496</b> | <b>55231</b> | <b>877</b> | <b>10.0</b> | <b>7434</b> | <b>51410</b> | <b>4110</b> | <b>6.9</b> |
| MAB        | BI            | 56          | 683          | 161         | 12.1       |             |              |              |            | 25          | 323          | 21         | 12.9        | 41          | 503          | 81          | 12.4       |
| MAB        | LI            | 837         | 7026         | 461         | 8.4        |             |              |              |            | 629         | 7200         | 98         | 11.4        | 733         | 7113         | 236         | 9.7        |
| MAB        | NYB           | 192         | 2179         | 126         | 11.3       |             |              |              |            | 218         | 2176         | 20         | 10.0        | 205         | 2178         | 64          | 10.6       |
| MAB        | MAB-Nearshore | 6           | 56           | 6           | 9.3        |             |              |              |            | 20          | 149          | 4          | 7.5         | 13          | 103          | 4           | 7.9        |
| MAB        | HCS           | 1022        | 4995         | 409         | 4.9        |             |              |              |            | 758         | 3843         | 20         | 5.1         | 890         | 4419         | 205         | 5.0        |
| MAB        | ET            | 1765        | 6776         | 622         | 3.8        |             |              |              |            | 1374        | 5185         | 23         | 3.8         | 1570        | 5981         | 311         | 3.8        |
| MAB        | DMV           | 46          | 141          | 24          | 3.1        |             |              |              |            | 149         | 384          | 7          | 2.6         | 97          | 263          | 13          | 2.7        |
| MAB        | VIR           | 119         | 397          | 126         | 3.3        |             |              |              |            |             |              |            |             | 119         | 397          | 63          | 3.3        |
| <b>MAB</b> | <b>TOTAL</b>  | <b>4043</b> | <b>22253</b> | <b>908</b>  | <b>5.5</b> |             |              |              |            | <b>3173</b> | <b>19260</b> | <b>107</b> | <b>6</b>    | <b>3668</b> | <b>20955</b> | <b>457</b>  | <b>5.7</b> |

|                    |                                      |              |              |             |             |             |              |              |             |                                                |              |              |             |             |
|--------------------|--------------------------------------|--------------|--------------|-------------|-------------|-------------|--------------|--------------|-------------|------------------------------------------------|--------------|--------------|-------------|-------------|
| GOM                | Stellwagen<br>South-SMAST            | 43           | 860          | 167         | 20.0        | 40          | 427          | 71           | 10.7        |                                                | 42           | 644          | 91          | 15.5        |
| GOM                | Stellwagen<br>South-Outside<br>SMAST | 1            | 46           | 22          | 35.5        |             |              |              |             |                                                | 1            | 46           | 22          | 35.5        |
| GOM                | Stellwagen<br>South - Total          | 44           | 906          | 168         | 20.5        |             |              |              |             |                                                | 43           | 690          | 93          | 16.1        |
| NGOM               | WGOM Closure                         |              |              |             |             | 69          | 2640         | 261          | 38.3        |                                                | 69           | 2640         | 261         | 38.3        |
| NGOM               | Fippennies                           |              |              |             |             | 31          | 699          | 194          | 22.5        |                                                | 31           | 699          | 194         | 22.5        |
| NGOM               | Cashes                               |              |              |             |             | 3           | 77           | 52           | 25.7        |                                                | 3            | 77           | 52          | 26          |
| NGOM               | Stellwagen-<br>SMAST                 | 32.5         | 1196         | 643         | 36.8        | 34          | 944          | 693          | 27.4        |                                                | 33           | 1070         | 668         | 32.0        |
| NGOM               | Stellwagen-<br>Outside SMAST         | 4.2          | 149          | 75          | 35.5        |             |              |              |             |                                                | 4            | 149          | 75          | 35.5        |
| NGOM               | Jeffreys-SMAST                       | 12.1         | 341          | 305         | 28.2        | 7           | 163          | 48           | 23.3        |                                                | 10           | 252          | 177         | 26.4        |
| NGOM               | Jeffreys-Outside<br>SMAST            | 5.4          | 215          | 127         | 39.8        |             |              |              |             |                                                | 5            | 215          | 127         | 39.8        |
| NGOM               | Platts                               | 2.2          | 29           | 18          | 13.2        | 4           | 43           | 17           | 11.3        |                                                | 3            | 36           | 18          | 12.0        |
| NGOM               | Ipswich                              | 21.5         | 550          | 243         | 25.6        | 9           | 163          | 63           | 18.1        |                                                | 15           | 357          | 153         | 23.4        |
| NGOM               | Machias Seal<br>Island               | 18.4         | 322          | 117         | 17.5        |             |              |              |             |                                                | 18           | 322          | 117         | 17.5        |
| <b>NGOM</b>        | <b>TOTAL</b>                         | <b>96</b>    | <b>2802</b>  | <b>1411</b> | <b>29.1</b> | <b>157</b>  | <b>4729</b>  | <b>1328</b>  | <b>30.1</b> |                                                | <b>174</b>   | <b>5817</b>  | <b>1217</b> | <b>33.5</b> |
| <b>NGOM</b>        | <b>TOTAL - Open</b>                  | <b>96</b>    | <b>2802</b>  | <b>1411</b> | <b>29.1</b> | <b>54.2</b> | <b>1313</b>  | <b>821</b>   | <b>24.2</b> |                                                | <b>71</b>    | <b>2079</b>  | <b>1724</b> | <b>29.3</b> |
| <b>GRAND TOTAL</b> |                                      | <b>12986</b> | <b>64421</b> | <b>6390</b> | <b>5.0</b>  | <b>8149</b> | <b>65061</b> | <b>10725</b> | <b>8.0</b>  | <b>8669</b> <b>74491</b> <b>883</b> <b>8.6</b> | <b>11276</b> | <b>78182</b> | <b>4311</b> | <b>6.9</b>  |

Figure 6 - 2024 Georges Bank SAMS Areas.

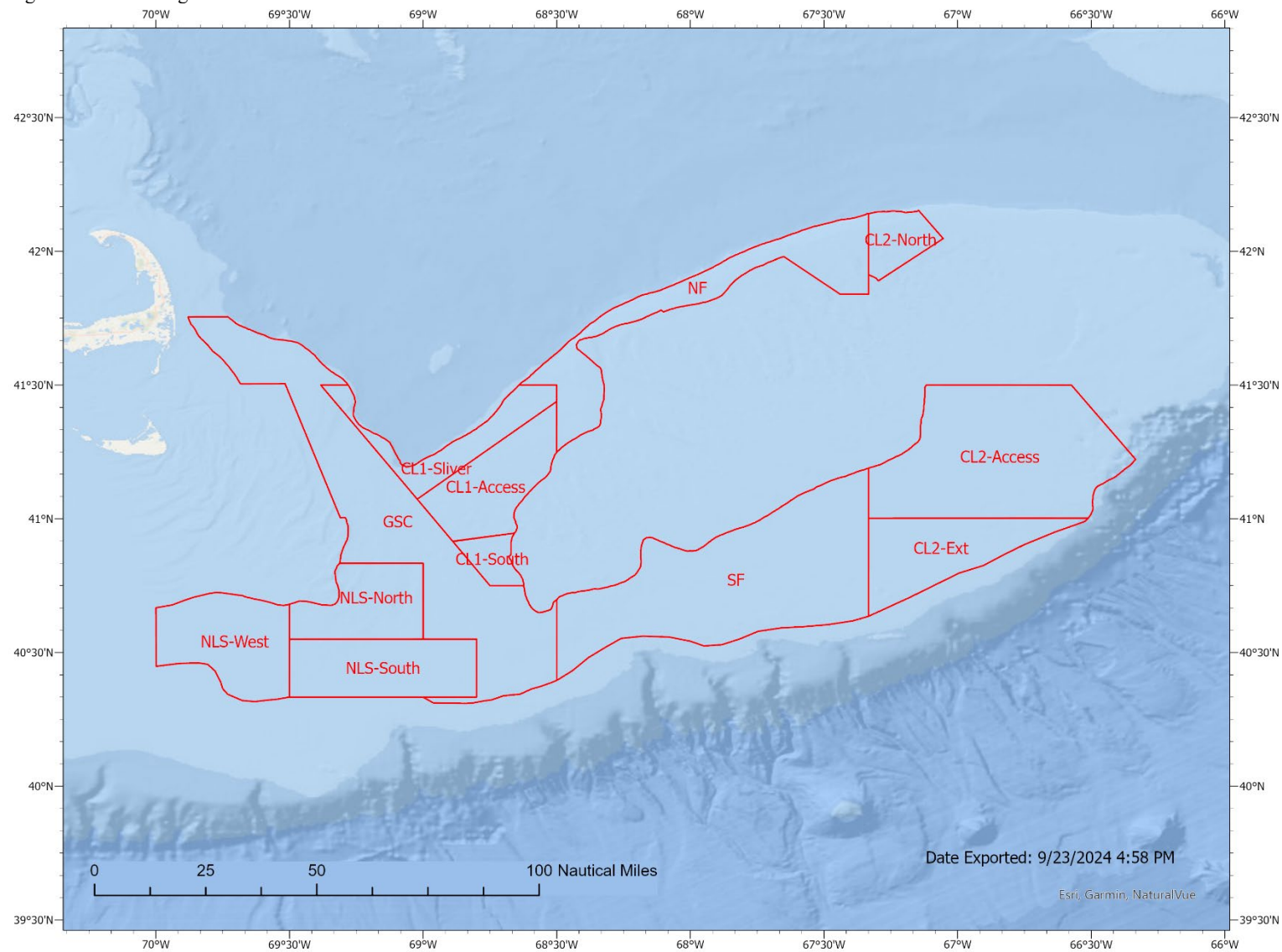


Figure 7 – 2024 Mid-Atlantic Bight SAMS Areas.

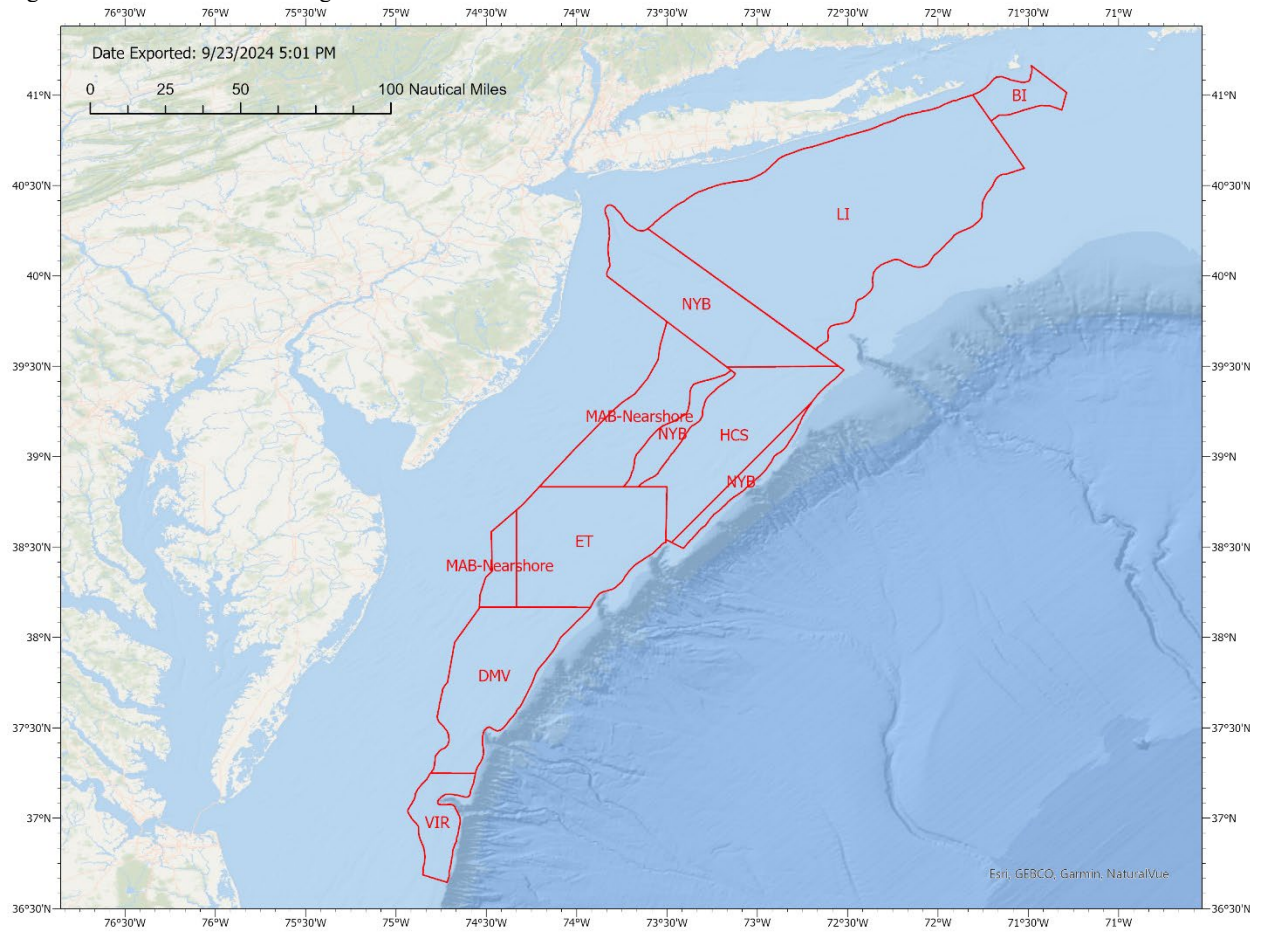


Figure 8 - 2024 Scallop RSA Survey Coverage for the Gulf of Maine, Georges Bank, and the Mid-Atlantic.

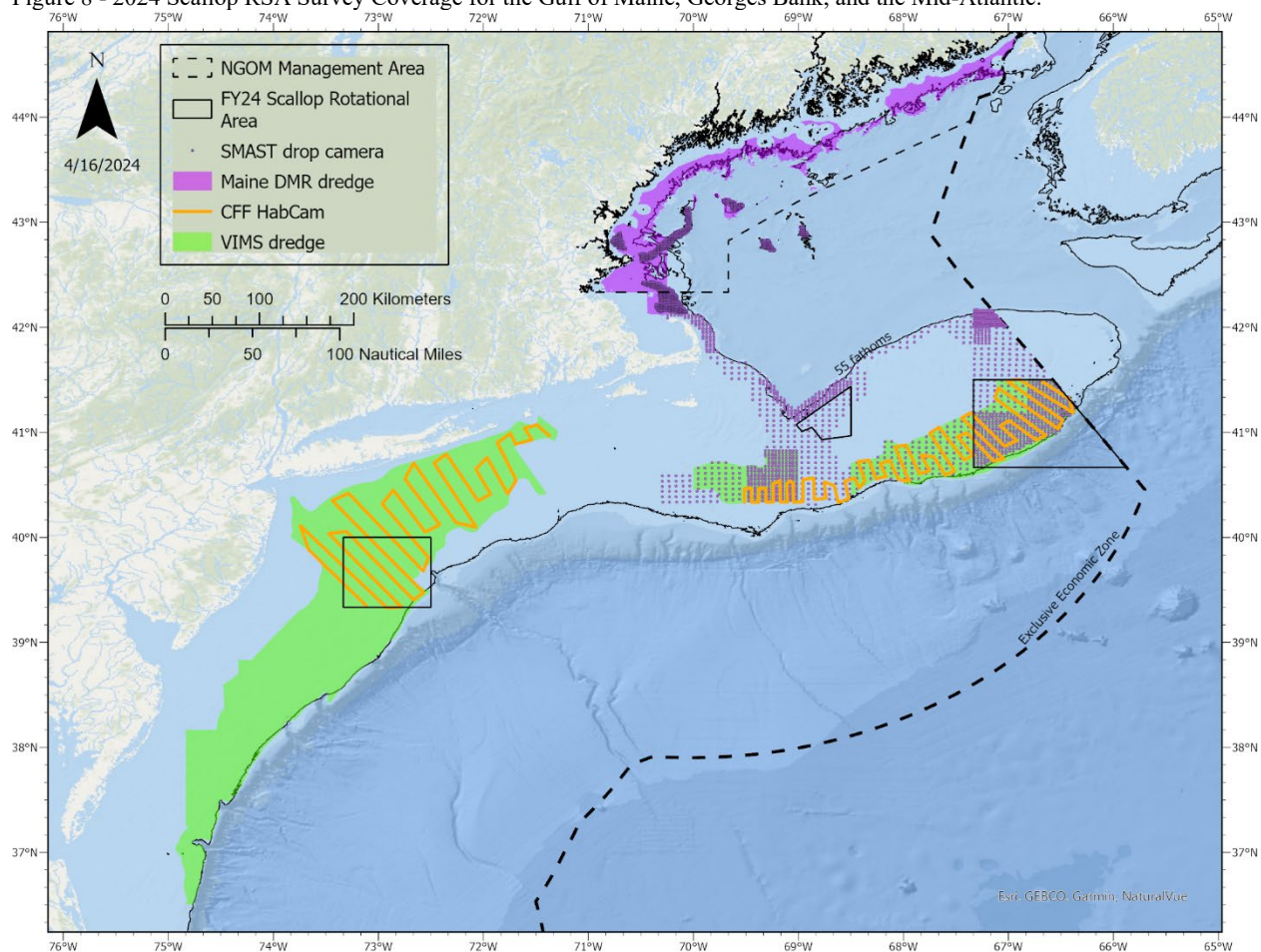


Figure 9 – 2024 Scallop RSA survey coverage for the Gulf of Maine by the SMAST drop camera relative to the Northern Gulf of Maine Management Area (dotted black line), Western Gulf of Maine Closure area (solid red line). Mean scallop density (all scallop sizes, including those less than 40mm shell height, per m<sup>2</sup>).

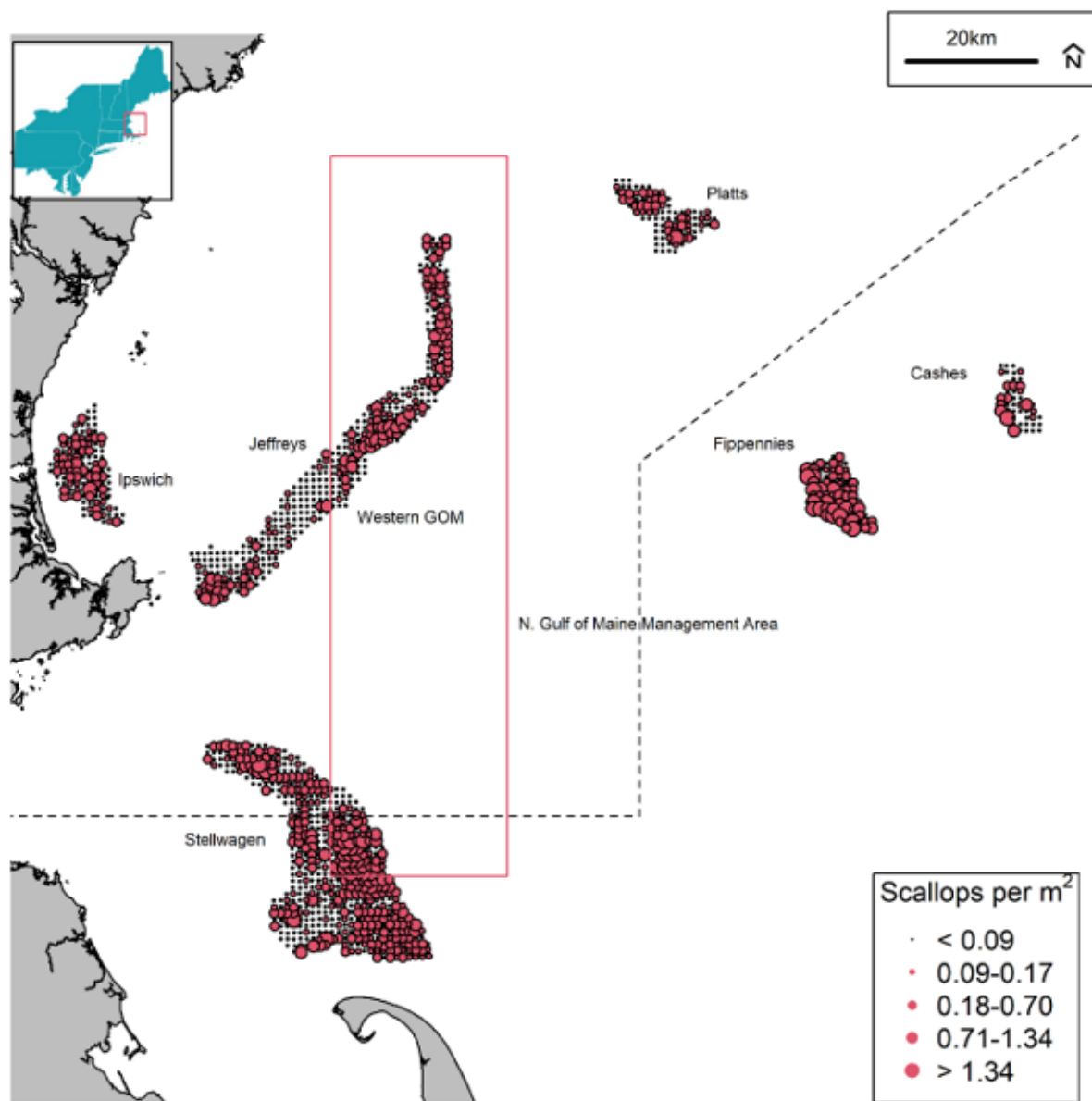
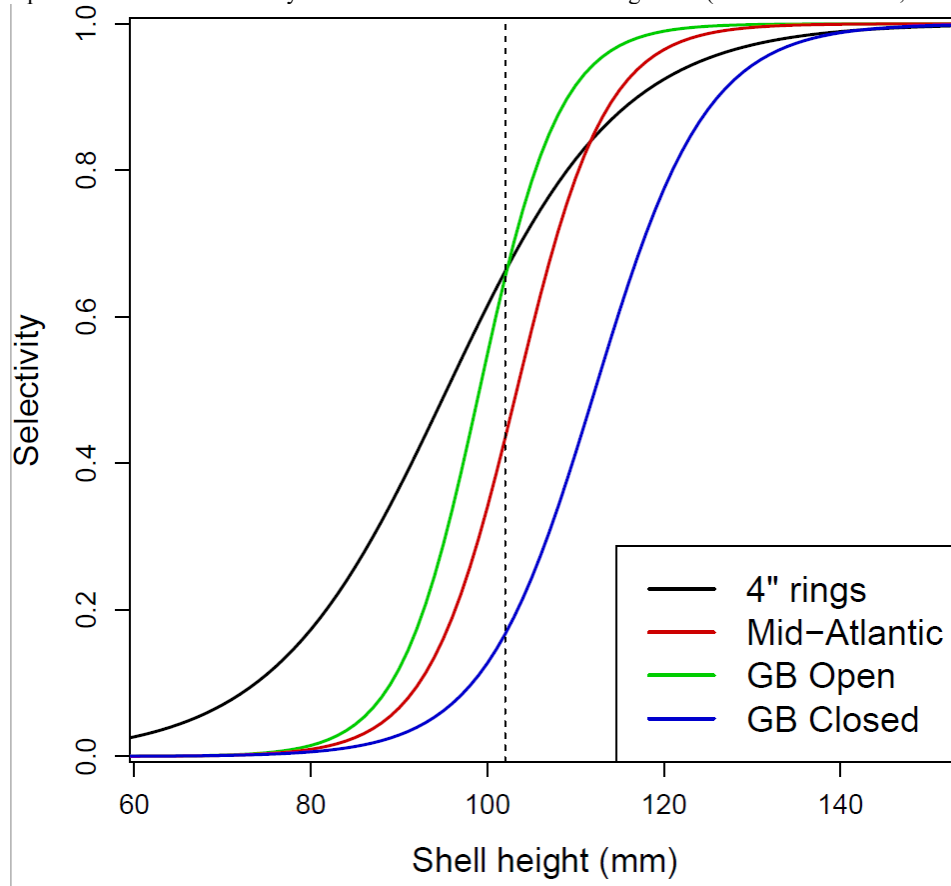


Figure 10 - Comparison of CASA selectivity curves from SARC 65 with 4" ring curve (Yochum & DuPaul, 2008).



## Appendix I: 2024 Projections for 2025 – Outputs and Assumptions

2024 Projections for Georges Bank and the Mid-Atlantic:

1. Several changes were made to the model configuration from Framework 38. The NYB-Closure area was removed and reverted to the previous SAMS area boundaries, with 8 areas in MA, 12 in GB, and 4 in the Gulf of Maine. Ipswich Bay was added as a new SAMS area in the Gulf of Maine, and Machias Seal Island was added to the NGOM-Open SAMS area (see Figure 9).
2. Initialized using the average (mean) of available 2024 survey data.
3. No changes were made to growth assumptions between 2023 and 2024. Continued to use slow growth assumptions from 2020 management track assessment where  $L_{\infty}$  is reduced in all SAMS areas except CAII-S and NLS-South to match observed growth. In the GOM, growth was set to match GB estimates from the most recent period.

Table 6 - Projected biomass and exploitable biomass for 2025 for Georges Bank and Mid-Atlantic SAMS area and the Gulf of Maine.

| SAMS/Region      | Biomass (mt) | Exploitable (mt) | ACL (GB/MA F=0.45; GOM F=0.32) (mt) |
|------------------|--------------|------------------|-------------------------------------|
| HCS              | 4873         | 2455             | 844                                 |
| Vir              | 467          | 0                | 0                                   |
| ET               | 6657         | 3224             | 1147                                |
| DMV              | 396          | 53               | 31                                  |
| NYB              | 2230         | 1510             | 561                                 |
| LI               | 7503         | 4620             | 1750                                |
| Inshore          | 680          | 267              | 173                                 |
| <b>MAB TOTAL</b> | <b>22806</b> | <b>12129</b>     | <b>4506</b>                         |
| CA1-N            | 15337        | 4245             | 1896                                |
| CA1-Mid          | 1262         | 765              | 249                                 |
| CA2-N            | 14166        | 12369            | 3485                                |
| CA2-S            | 5899         | 3313             | 1139                                |
| CA2-Ext          | 3957         | 2495             | 894                                 |
| NLS-W            | 3195         | 309              | 108                                 |
| NLS-N            | 932          | 473              | 174                                 |
| NLS-S            | 12109        | 682              | 213                                 |
| GSC              | 6910         | 4435             | 1611                                |
| NF               | 1711         | 873              | 362                                 |
| SF               | 8835         | 6167             | 1882                                |
| <b>GB TOTAL</b>  | <b>74313</b> | <b>36126</b>     | <b>12013</b>                        |
| Stell-S          | 731          | 388              | 131                                 |
| Stell-NGOM       | 1256         | 1023             | 269                                 |
| Ipswich          | 362          | 279              | 76                                  |
| NGOM-Other       | 847          | 715              | 178                                 |
| NGOM-CI          | 3431         | 3170             | 730                                 |
| <b>GOM TOTAL</b> | <b>6627</b>  | <b>5575</b>      | <b>1384</b>                         |

Table 7 - Comparison of the meat weight and growth parameters used in recent SAMS configurations for GB and MA.

|      | Meat weight                                                                                                                                                                                                                                            | Growth                                                                                                                                                                                 |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2015 | SARC 59                                                                                                                                                                                                                                                | SARC 59                                                                                                                                                                                |
| 2016 | SARC 59, with changes to SH-MW parameters using VIMS 2016 data (NLS-S, NLS-NA, NLS-ext)                                                                                                                                                                | SARC 59, with reductions to growth in NLS                                                                                                                                              |
| 2017 | SARC 50, with changes to SH-MW parameters in NLS using VIMS 2016 & 2017 data (NLS-S, NLS-NA).                                                                                                                                                          | SARC 59, with reductions to growth in NLS-S deep (>70m) based on observed growth between 2016 and 2017. Change ET-Flex L infinity to 110 mm based on observed growth in 2016 and 2017. |
| 2018 | SARC 65, with changes to SH-MW parameters in the NLS using VIMS 2016 – 2018 data                                                                                                                                                                       | SARC 65, with reduction in $L_{\infty}$ in NLS-W to 119mm. SARC 65 set the $L_{\infty}$ of scallops in the NLS-S-deep at 110 mm.                                                       |
| 2019 | SARC 65, with changes to SH-MW parameters in the NLS using VIMS 2016 – 2019 data                                                                                                                                                                       | SARC 65, with reduction in $L_{\infty}$ in NLS-W to 119mm. SARC 65 set the $L_{\infty}$ of scallops in the NLS-S-deep at 110 mm.                                                       |
| 2020 | SARC 65, with changes to SH-MW parameters in the NLS using VIMS 2016 – 2020 data (NLS-S, NLS-N, NLS-W)                                                                                                                                                 | SARC 65, scaled to the growth expectations from the 2020 management track assessment for all areas except NLS-South and CAII-SW.                                                       |
| 2021 | SARC 65, with changes to SH-MW parameters in the NLS-South using VIMS 2016 – 2021 data<br><br>NGOM-Stellwagen-AOI using ME DMR/UMAINE 2021 SH-MW (w/ covariates)                                                                                       | SARC 65, scaled to the growth expectations from the 2020 management track assessment for all areas except NLS-South and CAII-SW.                                                       |
| 2022 | SARC 65, with changes to SH-MW parameters in the NLS-South using VIMS 2016 – 2022 data. Changes to NYB-closure using 2015-2022 data.<br><br>Stellwagen Region using ME DMR/UMAINE 2021 SH-MW (w/ covariates). Other areas using Hart 2020 SHMW curves. | SARC 65, scaled to the growth expectations from the 2020 management track assessment for all areas except NLS-South and CAII-SW. GB growth applied to areas of the GOM.                |
| 2023 | SARC 65, with changes to SH-MW parameters in the NLS-South using VIMS 2016 – 2023 data. Changes to NYB-closure using 2015-2023 data.<br><br>DMR & SMAST (2016-2023) SH-MW for all GOM areas.                                                           | SARC 65, scaled to the growth expectations from the 2020 management track assessment for all areas except NLS-South and CAII-SW. GB growth applied to areas of the GOM.                |
| 2024 | SARC 65, with changes to SH-MW parameters in the NLS-South using VIMS 2016 – 2023 data.<br><br>DMR & SMAST (2016-2024) SH-MW for all GOM areas, except for Platts Bank and Machias Seal Island, which used the DMR SH-MW (2016-2024) parameters.       | SARC 65, scaled to the growth expectations from the 2020 management track assessment for all areas except NLS-South and CAII-S. GB growth applied to areas of the GOM.                 |

Table 8 - 2024 Survey Data Treatments by SAMS areas for GB, MA, NGOM, and GOM.

| <b>GB</b>                                       | <b><i>SHMW equation, Dredge Efficiency</i></b>                                                           | <b><i>Treatment, notes</i></b>                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>CL1-Access (M)</b>                           | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>CL1-Sliver (N)</b>                           | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>CL1-South</b>                                | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>CL2-North</b>                                | SARC 65, select station (.13 at 2 stations)                                                              | Survey mean                                                                                                 |
| <b>CL2-S</b>                                    | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>CL2-Ext</b>                                  | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>NLS-North</b>                                | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>NLS-South</b>                                | VIMS 16-23                                                                                               | Survey mean                                                                                                 |
| <b>NLS-West</b>                                 | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>NF</b>                                       | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>GSC</b>                                      | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>SF</b>                                       | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>MidAtlantic</b>                              |                                                                                                          |                                                                                                             |
| <b>BI</b>                                       | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>LI</b>                                       | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>NYB</b>                                      | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>MAB-Nearshore</b>                            | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>HCS</b>                                      | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>ET Open</b>                                  | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>ET Flex</b>                                  | SARC 65                                                                                                  | Survey mean                                                                                                 |
| <b>DMV</b>                                      | SARC 65                                                                                                  | VIMS Dredge Data (no other survey data)                                                                     |
| <b>VIR</b>                                      | SARC 65                                                                                                  | VIMS Dredge Data (no other survey data)                                                                     |
| <b>Gulf of Maine and Northern Gulf of Maine</b> |                                                                                                          |                                                                                                             |
| <b>NGOM - Stellwagen</b>                        | DMR & SMAST (2016-2024) SH-MW                                                                            | Survey mean, GB Open Selectivity                                                                            |
| <b>Ipswich Bay</b>                              | DMR & SMAST (2016-2024) SH-MW                                                                            | Survey mean, GB Open Selectivity                                                                            |
| <b>NGOM Other</b>                               | DMR & SMAST (2016-2024) SH-MW, except for Platts Bank and Machias Seal Island, which use DMR (2016-2024) | Survey mean for Jeffreys Ledge and Platts Bank, DMR dredge data for Machias Seal Island.                    |
| <b>GOM Closed</b>                               | DMR & SMAST (2016-2024) SH-MW                                                                            | SMAST Drop Camera only, inside WGOM closed area on Stellwagen and Jeffreys, Fippennies Ledge, Cashes Ledge. |
| <b>Stellwagen South</b>                         | DMR & SMAST (2016-2024) SH-MW                                                                            | Survey mean                                                                                                 |

Table 9 - Description of the SH-MW changes in Nantucket Lightship and New York Bight Closure SAMS areas from 2016 to 2024.

| SAMS area                                                                                                                                                                                                                          | SH-MW applied in 2016, FW28 | SH-MW applied in 2017, FW29     | SH-MW applied in 2018, FW30                  | SH-MW applied in 2019, FW32 | SH-MW applied in 2020, FW33         | SH-MW applied in 2021, FW34         | SH-MW applied in 2022, FW36 | SH-MW applied in 2023, FW38 | SH-MW applied in 2024, FW39 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------------------------------------------|-----------------------------|-------------------------------------|-------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| NLS-N                                                                                                                                                                                                                              | SARC 59                     | SARC 50                         | VIMS 2016-2018 Combined                      | VIMS 2016-2019 Combined     | VIMS 2016-2020 Combined             | SARC 65                             | SARC 65                     | SARC 65                     | SARC 65                     |
| NLS-S ‘Shallow’ (>70m)                                                                                                                                                                                                             | SARC 59                     | SARC 50                         | VIMS 2016-2018 Combined (South Shallow only) | VIMS 2016-2019 Combined     | VIMS 2016-2020 Combined             | VIMS 2016-2021 Combined             | VIMS 2016-2022 Combined     | VIMS 2016-2023 Combined     | VIMS 2016-2023 Combined     |
| NLS-S ‘Deep’ (<70m)                                                                                                                                                                                                                | VIMS 2016                   | VIMS 2016/2017 Combined (NLS S) | VIMS 2016-2018 Combined (Deep only)          | VIMS 2016-2019 Combined     | (Merged into one SAMS area in 2020) | (Merged into one SAMS area in 2020) |                             |                             |                             |
| NLS-Ext                                                                                                                                                                                                                            | VIMS 2016                   | SARC 50                         | SARC 65                                      | N/A (part of GSC)           | N/A (part of GSC)                   | N/A (part of GSC)                   | N/A                         | N/A                         |                             |
| NLS-W                                                                                                                                                                                                                              | VIMS 2016                   | VIMS 2016/2017 Combined (NLS W) | VIMS 2016-2018 Combined (West only)          | VIMS 2016-2019 Combined     | VIMS 2016-2020 Combined             | SARC 65                             | SARC 65                     | SARC 65                     | SARC 65                     |
| NYB-Closure                                                                                                                                                                                                                        | N/A                         |                                 |                                              |                             |                                     |                                     | VIMS 2015-2022              | VIMS 2015-2023              | N/A                         |
| Estimate of relative meat weight were derived using the following assumptions: Length = 100 mm, mean depth by SAMS area used. Mean depth for NLS-S SAMS area calculated by depth bin. Mean latitude by SAMS area used for SARC 50. |                             |                                 |                                              |                             |                                     |                                     |                             |                             |                             |

Table 10 - Comparison of SARC 65 and FW39 growth parameters

| Subarea | Years | SARC-65      |       | FW-39 (2020 Mgmt Track growth) |       |
|---------|-------|--------------|-------|--------------------------------|-------|
|         |       | $L_{\infty}$ | K     | $L_{\infty}$                   | K     |
| GSC     | 12-16 | 150.3        | 0.397 | 135.7                          | 0.397 |
| NF      | 12-16 | 148.8        | 0.397 | 134.3                          | 0.397 |
| SF      | 12-16 | 137.3        | 0.464 | 123.9                          | 0.464 |
| CAI     | 12-16 | 149.4        | 0.397 | 134.5                          | 0.397 |
| CAII    | 12-16 | 146.9        | 0.397 | 132.3                          | 0.397 |
| CAII-SW | 12-16 | 146.9        | 0.397 | 146.9                          | 0.397 |
| NLS     | 12-16 | 151.2        | 0.397 | 136.1                          | 0.397 |
| NLS-S   | 15-16 | 110.3        | 0.423 | 110.3                          | 0.423 |
| DMV     | 08-12 | 136.4        | 0.547 | 130.5                          | 0.547 |
| ET      | 08-12 | 137.9        | 0.547 | 131.9                          | 0.547 |
| HCS     | 08-12 | 129.5        | 0.547 | 123.9                          | 0.547 |
| NYB     | 08-12 | 140.8        | 0.547 | 134.6                          | 0.547 |
| LI      | 08-12 | 139.6        | 0.547 | 133.5                          | 0.547 |
| Inshore | 08-12 | 147.3        | 0.547 | 140.8                          | 0.547 |

Table 11 – FW39 natural mortality parameters by SAMS area

| <b>Region</b>        | <b>Subarea</b>           | <b>M</b> |
|----------------------|--------------------------|----------|
| <b>Gulf of Maine</b> | <b>NGOM - Stellwagen</b> | 0.2      |
| <b>Gulf of Maine</b> | <b>Ipswich Bay</b>       | 0.2      |
| <b>Gulf of Maine</b> | <b>NGOM Other</b>        | 0.2      |
| <b>Gulf of Maine</b> | <b>GOM Closed</b>        | 0.2      |
| <b>Gulf of Maine</b> | <b>Stellwagen South</b>  | 0.2      |
| <b>Georges Bank</b>  | <b>GSC</b>               | 0.2      |
| <b>Georges Bank</b>  | <b>NF</b>                | 0.2      |
| <b>Georges Bank</b>  | <b>SF</b>                | 0.2      |
| <b>Georges Bank</b>  | <b>CAI</b>               | 0.2      |
| <b>Georges Bank</b>  | <b>CAII-S</b>            | 0.2      |
| <b>Georges Bank</b>  | <b>CAII-Ext</b>          | 0.2      |
| <b>Georges Bank</b>  | <b>NLS</b>               | 0.2      |
| <b>Georges Bank</b>  | <b>NLS-S</b>             | 0.2      |
| <b>Mid-Atlantic</b>  | <b>DMV</b>               | 0.6      |
| <b>Mid-Atlantic</b>  | <b>ET</b>                | 0.25     |
| <b>Mid-Atlantic</b>  | <b>VIR</b>               | 4.2      |
| <b>Mid-Atlantic</b>  | <b>HCS</b>               | 0.25     |
| <b>Mid-Atlantic</b>  | <b>NYB</b>               | 0.25     |
| <b>Mid-Atlantic</b>  | <b>LI</b>                | 0.25     |
| <b>Mid-Atlantic</b>  | <b>Inshore</b>           | 0.25     |

Table 12 - OFL and ABC estimates with discards for FY2025 and FY2026. Values in metric tons.

| <b>Year</b> | <b>ACL<br/>Landings</b> | <b>OFL<br/>Landings</b> | <b>ACL<br/>Discards</b> | <b>OFL<br/>Discards</b> | <b>ABC</b> | <b>OFL</b> |
|-------------|-------------------------|-------------------------|-------------------------|-------------------------|------------|------------|
| 2025        | 17901                   | 22440                   | 4939                    | 6530                    | 22840      | 28970      |
| 2026        | 17745                   | 22475                   | 5692                    | 7556                    | 23437      | 30031      |