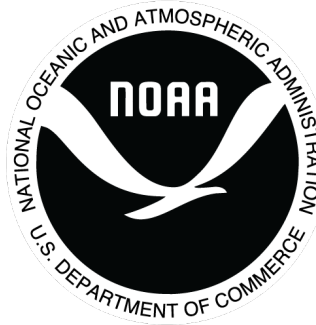




NOAA Technical Memorandum NMFS-NE-301

2023 Standardized Bycatch Reporting Methodology Annual Discard Report with Observer Sea Day Allocation

**US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts
July 2023**



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2023 Standardized Bycatch Reporting Methodology Annual Discard Report with Observer Sea Day Allocation

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Editorial Notes

Information Quality Act Compliance: In accordance with section 515 of Public Law 106-554, the Northeast Fisheries Science Center (NEFSC) completed both technical and policy reviews for this report. These predissemination reviews are on file at the NEFSC Editorial Office.

Species Names: The NEFSC Editorial Office's policy on the use of species names in all technical communications is generally to follow the American Fisheries Society's lists of scientific and common names for fishes, mollusks, and decapod crustaceans and to follow the Society for Marine Mammalogy's guidance on scientific and common names for marine mammals. Exceptions to this policy occur when there are subsequent compelling revisions in the classifications of species, resulting in changes in the names of species.

Statistical Terms: The NEFSC Editorial Office's policy on the use of statistical terms in all technical communications is generally to follow the International Standards Organization's handbook of statistical methods.

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LIST OF ACRONYMS AND ABBREVIATIONS

AA = access area
ASM = At-Sea Monitoring Program
CI = confidence interval
CV = coefficient of variation
EM = electronic monitoring
EPU = Ecological Production Unit
ESA = Endangered Species Act
FMP = fishery management plan
FY = fiscal year
GEN = general category
IFS = Industry Funded Scallop Program
IFQ = individual fishing quota
LAGC = limited access general category
lg = large mesh
LIM = limited access category
MA = Mid-Atlantic
MAFMC = Mid-Atlantic Fishery Management Council
MMPA = Marine Mammal Protection Act
MPC = minimum pilot coverage
MREM = maximized retention electronic monitoring
NE = New England
NEFMC = New England Fishery Management Council
NEFOP = Northeast Fisheries Observer Program
NEFSC = Northeast Fisheries Science Center
NGOM = Northern Gulf of Maine Scallop Management Area
NMFS = National Marine Fisheries Service
OPEN = nonaccess area
PTNS = Pre-Trip Notification System
SBRM = Standardized Bycatch Reporting Methodology
SE = standard error of the estimate
sm = small mesh
TDD = turtle deflector dredges
US = United States
VTR = Vessel Trip Report
xlg = extra large mesh

EXECUTIVE SUMMARY

This document contains a compilation of the information to meet the 2023 Standardized Bycatch Reporting Methodology (SBRM) annual discard report requirements. For fish and invertebrate species groups, several of the required annual discard report elements (discards and precision by fleet) can be found in McAfee and Wigley 2023, along with a description of the data sources, methods, results, and discussion. Similarly, for sea turtles, further information can be found in Murray 2012, 2020, and 2023.

The sea days needed to monitor the 15 SBRM species groups (14 fish/invertebrates species groups and 1 sea turtle species) for April 2023 through March 2024 are based on July 2021 through June 2022 data. Of the 6,926 sea days, 5,293 sea days are needed for agency-funded fleets, and 1,633 sea days are needed for industry-funded scallop fleets.

The funds available to the Northeast Fisheries Science Center's Fisheries Monitoring and Operations Branch in fiscal year (FY) 2023 are estimated to provide support for 2,099 days, and 1,835 days are carried over (i.e., bought ahead) from FY2022 funds for a total of 3,934 days (3,373 prioritized days + 561 nonprioritized days) for April 2023 through March 2024. Based upon the 2023 observer set-aside compensation rate analysis for the Industry Funded Scallop Program, there is industry funding for 1,696 days. Hence, 5,630 days are available for observer coverage for April 2023 through March 2024.

Within the agency-funded fleets and prioritization-applicable funding, a shortfall of 1,920 (5,293 – 3,373) days is expected. The 2023 funding shortfall triggers the SBRM prioritization process; the penultimate approach is utilized with a portion of the agency funds. Practical limitations prevent the observer program from covering 63 sea days associated with 6 fleets. These 63 sea days have been reallocated to the last fleet impacted by the prioritization process. The numbers of sea days allocated by fleet (where a fleet represents gear type, access area, trip category, region, and mesh group combinations) are given for April 2023 through March 2024.

There is a pending SBRM framework action to expand the sampling frame for the Mid-Atlantic and New England lobster pot fleets. When the framework action is implemented, then beginning in the calendar quarter following the implementation date, all active federal lobster vessels may be eligible for selection to take an observer, regardless of whether they are required to submit Vessel Trip Reports (VTR). Additionally, the Greater Atlantic Regional Fisheries Office has published a proposed rule to implement a requirement for electronic VTR submissions for all vessels in the lobster industry. Either scenario would expand the sampling frame for lobster pot fleets once they go into effect.

INTRODUCTION

The Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment was implemented in February 2008 (NEFMC, MAFMC, NMFS 2007; NMFS 2008) to address the requirements of the Magnuson-Stevens Fishery Conservation and Management Act to include standardized bycatch reporting methodology in all of the New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC) federal fishery management plans (FMPs). A revised SBRM Omnibus Amendment was approved in March 2015, and a final rule was implemented in July 2015 (NEFMC, MAFMC, NMFS 2015).

The SBRM amendment requires an annual discard report utilizing information obtained from the Northeast Fisheries Science Center’s (NEFSC) Fisheries Monitoring and Operations Branch’s (formerly known as the Fisheries Sampling Branch) observer programs (Northeast Fisheries Observer Program [NEFOP] and Industry Funded Scallop [IFS] Program) for 14 federally managed species groups and sea turtles (Table 1) in the waters of the northeastern United States (US). Specifically, the SBRM annual discard report requirements include:

... summaries of the trips observed, fishing modes in the relevant time period, funding issues and other related issues and developments, and projections of coverage across fisheries for [the] upcoming time period. More detailed information would be provided in tables and figures that addressed: The number of observer trips and sea days scheduled that were accomplished for each fishing mode and quarter, as well as the number of trips and sea days of industry activity; the kept weight from unobserved quarters and statistical areas summarized by fishing mode; the amount kept and estimated discards of each species by fishing mode; and the relationship between sample size and precision for relevant fishing modes. (NEFMC, MAFMC, NMFS 2015, pages 237-238).

Each year, discard estimates and variability are derived by using observer data from the prior year to inform observer coverage needs for the upcoming year. For fish and invertebrate species groups, several of the required annual discard report elements (discards and precision by fleet) can be found in McAfee and Wigley 2023, along with a description of the data sources, methods, results, and discussion. Similarly, for sea turtles, further information can be found in Murray 2012, 2020, and 2023. This report describes the sea days needed to monitor the 15 SBRM species groups (14 fish/invertebrates species groups¹ and 1 sea turtle species; Table 1), funding available for observer coverage, and the numbers of sea days allocated by fleet² (where a fleet represents gear type, access area, trip category, region, and mesh group combinations) for April 2023 through March 2024. Thus, this document, together with McAfee and Wigley 2023 and Murray 2020 and 2023, compose the information to meet the 2023 SBRM annual discard report requirements.

¹ On August 4, 2020 Atlantic chub mackerel (*Scomber colias*) was integrated into the MAFMC Mackerel, Squid, Butterfish fishery management plan via Amendment 21. The 2022 SBRM species group for squid, butterfish and mackerel was expanded to include Atlantic chub mackerel (Table 1). Since the full SBRM analysis was not conducted in 2022, the 2023 SBRM analysis is the first to include Atlantic chub mackerel.

² Fleets are synonymous with “fishing modes.”

SUMMARY OF OBSERVER COVERAGE

A total of 1,576 trips (4,561 days) were observed from July 2021 through June 2022. When these trips were stratified by fleet and quarter, some trips were partitioned between fleets resulting in 1,690 trips (4,790 days). See Tables 2 and 3 in McAfee and Wigley 2023 for a summary of the number of observed trips and industry Vessel Trip Reports (VTR) trips by fleet and calendar quarter and a summary of the number of observed sea days and industry sea days by fleet and calendar quarter, respectively. There were 64 fleets uniquely identified in the July 2021 through June 2022 data. Based upon the industry activity during this time period, 6 new fleets were added to the collection analyzed: Mid-Atlantic (MA) large mesh belly panel large mesh otter trawl (Row 9), New England (NE) large mesh belly panel large mesh otter trawl (Row 11), NE beach haul seine (Row 27), NE eel pots and traps (Row 50), NE small mesh beam trawl (Row 57), and MA small mesh Scottish seine (Row 59).

A spatial and temporal analysis of the kept weight of all species (i.e., any species retained during the trip) from statistical areas and calendar quarter was conducted. Over all fleets, 67.9% of kept weight of all species occurred in statistical areas and calendar quarters that had observer coverage. For a summary of the percentage of kept weight with observer coverage by fleet from July 2021 through June 2022, see Table 4 in McAfee and Wigley 2023.

SUMMARY OF DISCARD ESTIMATES

For fish/invertebrate species, the total catch, kept, and estimated discards (in live weight) and their associated coefficient of variation (CV) were derived for fleets by using data collected from July 2021 through June 2022 (McAfee and Wigley 2023). Based upon that discard estimation analysis, an estimated 55,824 mt (123,070,619 lb) of federally regulated species were discarded from nonconfidential fleets (Table 2). Fleet stratification abbreviations used in this report are described in Appendix Table 1. For summaries by fleet and SBRM species group and summaries by fleet and individual species that compose these 14 species groups, see Tables 5A and 5B in McAfee and Wigley 2023. The most recent average annual estimates of sea turtle interactions and CVs in US commercial fisheries are listed in Table 3. Methods to estimate sea day needs for the different gear types can be found in either Murray (2020) or Murray (2023).

SUMMARY OF SEA DAYS NEEDED

For fish/invertebrate species groups, the number of sea days needed to achieve a 30% CV of total discards for each species group was derived for 64 fleets by using data collected from July 2021 through June 2022 (McAfee and Wigley 2023). Based on that sample size analysis, a total of 7,238 sea days would be needed for the 14 fish and invertebrate species groups. Table 4 presents the number of sea days needed for each of the 14 species groups, number of pilot coverage³ days, and number of minimum pilot days. Table 4 and Step 1 in Table 5 present the sea days needed by

³ Pilot coverage is the minimum level of observer coverage necessary to acquire bycatch information with which to calculate variance estimates that can then be used to further define the level of sampling needed (NMFS 2004).

fleet. The number of needed sea days for fish/invertebrate species groups is further adjusted as described below.

In the McAfee and Wigley 2023 analysis, there were 17 “erroneous” fleets identified that resulted from either VTR misreporting the gear type used (e.g., scallop trawl, beam trawl), fishing outside the regulations (by using smaller mesh size than allowed), or inconsistent gear codes between data collection systems (e.g., otter trawl, other; pots and trap, other; dredge, other; and shrimp trawl). Additionally, one fleet was removed because it is allowed under an exempted fishing permit (fishing outside standard fishing behavior) to support the development of maximized retention electronic monitoring (MREM) under Amendment 23. The 541 sea days associated with these fleets (composed of 725 VTR trips for July 2021 through June 2022) have been set to zero (Table 5, Step 2, gray and tan shaded cells). When this adjustment is made, 6,697 days total are needed to monitor 14 fish/invertebrate species groups in 46 fleets (Table 5, Step 2).

The analysis of sea turtle bycatch in MA bottom trawl gear from 2014-2018 was used to project sea day monitoring needs for turtles in 2023 (Murray 2020). Interaction rates for each turtle species were estimated with stratified ratio estimators, where rates were stratified by Ecological Production Unit (EPU; Georges Bank and Mid-Atlantic), latitude zone, season, and depth. In the Mid-Atlantic region, a total of 571 loggerhead (*Caretta caretta*, CV = 0.29, 95% confidence interval [CI] = 318-997), 46 Kemp’s ridley (*Lepidochelys kempii*, CV = 0.45, 95% CI = 10-88), 16 green (*Chelonia mydas*, CV = 0.73, 95% CI = 0-44), and 20 leatherback (*Dermochelys coriacea*, CV = 0.72, 95% CI = 0-50) turtle interactions were estimated to have occurred in bottom trawl gear over the 5 year period. On Georges Bank, 12 loggerheads (CV = 0.70, 95% CI = 0-31) and 6 leatherback (CV = 1.0, 95% CI = 0-20) interactions were estimated to have occurred (Table 3).

Prior to estimating observer coverage needs for future fishing years, the probability of encountering each turtle species in either the Georges Bank or Mid-Atlantic region was estimated by using results of this analysis. This process was recommended for sea turtles to prevent SBRM sea day needs in some fleets from being driven by species with a low probability of encounter with the fishing gear (Hogan et al. 2019). As a result, monitoring levels were not estimated for Kemp’s ridley, leatherback, or green turtles in the updated analysis, nor for loggerheads on Georges Bank, because there was <50% probability of observing 5 or more turtles over 800 trips in a year. Observer coverage needs were estimated for loggerheads in the Mid-Atlantic.

The results of Murray 2020 indicate that 2,668 sea days are needed annually to monitor loggerhead interactions with 30% precision across bottom trawl fleets operating in the Mid-Atlantic EPU (see text table given below). However, allocating 2,668 days to MA⁴ SBRM trawl fleets will overshoot the needed number of days for turtles because some portion of the effort in the Mid-Atlantic EPU is composed of NE fleets. To avoid this, we removed the proportion of sea days from the needed number of days allocated for turtles to account for the overlap of spatial strata when fish and sea turtle sea days are merged. We followed the same approach used in NEFSC and GARFO 2020.

According to VTR data from 2014-2018, approximately 67% of NE small mesh otter trawl effort (in terms of days fished) and 10% of NE large mesh otter trawl effort occurred in the Mid-

⁴ The sampling frame for SBRM “Mid-Atlantic” fleets is composed of vessels departing from Connecticut to North Carolina; however, vessels operating in the Mid-Atlantic EPU depart from Massachusetts to North Carolina, based on the turtle analysis.

Atlantic EPU⁵. We applied these proportions to the number of days needed to monitor fish in each of the NE otter trawl fleets (892 and 782 days in the NE small mesh and large mesh otter fleets, respectively; Table 5, Step 2, Rows 7 and 8), for a total of 676 days. We then removed 676 days from the coverage needed for turtles, so that days allocated for turtles in the Mid-Atlantic were reduced to 1,992 days (see text table given below and Table 5). We anticipate that the actual amount of observer effort in the Mid-Atlantic EPU is the adjusted amount for turtles plus the amount of effort operating there from NE fleets. The amount of MA effort fishing in the Northeast EPUs was small (<5% of effort), so we did not make any adjustments in the other direction (i.e., removing MA effort from the NE fish days).

The analysis to determine sea day needs for turtles in gillnet fleets was updated in Murray 2023. The updated analysis expanded the existing study region to include the Gulf of Maine EPU in addition to the Georges Bank and Mid-Atlantic EPUs. Over 800 trips, there was only a 10% estimated probability of observing 5 or greater loggerhead turtles and even lower probabilities for green, Kemp's ridley, and leatherback turtles (Murray 2023). Since the 10% estimated probability of observing 5 or more loggerhead turtles is lower than the established 50% threshold required by SBRM, sea days to monitor turtles were set to zero (Table 5; Step 3), and needed sea days will be driven by other species groups instead of turtles for the 6 impacted gillnet fleets (Rows 30-35). Estimates of sea day needs for turtles are revised approximately every 5 years when new bycatch estimates are published for a particular gear type.

Similar to 2022, coverage needs for turtles on vessels using scallop dredge gear in the Mid-Atlantic were not estimated. Since May 2013, the use of turtle deflector dredges (TDDs) with chain mats have been required on scallop dredges in times and areas where loggerhead turtles are known to be most common. These modifications are intended to reduce those interactions in which animals are landed or observed from the deck, although other "unobservable" interactions may still be occurring (i.e., those in which animals escape from the gear or come in contact with the gear but are not captured and brought to the surface where they can be observed; Warden and Murray 2011). Observer coverage levels in the MA scallop dredge fleets in 2023 will be driven by other species groups, so some level of coverage will exist to monitor the effectiveness of TDDs and chain mats in reducing observable interactions and to help monitor turtle interactions outside of gear regulated times and areas.

The numbers of sea days needed to achieve a 30% CV associated with the Gulf of Maine, Georges Bank, and Mid-Atlantic turtle gear types and fish/invertebrate fleets are given below and in Table 5, Steps 2 and 3.

⁵ Other bases for these percentages were explored, including a 3 year average from 2016-2018, or the latest year's effort (2018). In both scenarios the percentages differed by <5%, so the 2014-2018 percentages were used to adjust turtle days because these years were the basis of the sea day analysis.

Turtle Gear Types and Fish/Invertebrate Fleets	Sea Days Needed	
	Loggerhead Turtles	Fish/Invertebrate Species Groups
MA Otter Trawl, MA Scallop Trawl, MA Ruhle Trawl, MA Other Otter Trawl Rows 5, 6, 12, 16, 17, 23, and 24	2,668 (reduced to 1,992)	1,763
MA and NE Gillnet Rows 30-35	0	709

The numbers of sea days needed for the combined fish/invertebrate and turtle species groups were derived as follows:

- If the sum of the sea days needed for fish/invertebrate species groups of the corresponding fish/invertebrate fleets exceeded the sea days needed for the turtle gear type, then the sea days needed for fish/invertebrate was used. To support the penultimate prioritization approach, the sea days needed for turtles are apportioned to the corresponding fish/invertebrate fleets by using the proportion of fish/invertebrate sea days within the turtle gear type (Table 5, Step 4).
- If the number of sea days needed for turtles for the gear type exceeded the sum of the sea days needed for fish/invertebrate groups of the corresponding fish/invertebrate fleets, then the difference between the sea days needed for turtles and fish were distributed according to the proportion of VTR sea days corresponding to fish/invertebrate fleets and added to the days needed for fish/invertebrate groups, by fleet (Table 5, Step 4). The number of VTR sea days by fleet is taken from Table 3 in McAfee and Wigley 2023 and reflects industry activity from July 2021 through June 2022.

A total of 6,926 sea days is needed for fish/invertebrates and loggerhead turtles (COMBINED; Table 5, Step 5) for April 2023 through March 2024. Of the 6,926 sea days, 5,293 sea days are needed for agency-funded fleets (i.e., funded by National Marine Fisheries Service [NMFS]), and 1,633 sea days are needed for industry-funded scallop fleets (Table 5, Step 6).

SUMMARY OF FUNDING AVAILABLE FOR APRIL 2023 THROUGH MARCH 2024

The funds available to the NEFSC’s Fisheries Monitoring and Operations Branch in fiscal year (FY) 2023 are estimated to provide support for 2,099 days. There are also 456 days carried over (i.e., bought ahead) from FY2022 funds⁶ and 1,379 prioritized days from obligated but not spent FY2022 funds after all carryover days were purchased. A total of 3,934 (2,099 + 456 + 1,379)

⁶ The best estimate of the FY2022 carryover days is 456 days (320 prioritized carryover days and 136 MMPA carryover days).

agency-funded days are available for April 2023 through March 2024. Based upon an observer set-aside compensation rate analysis for the Industry Funded Scallop Program, there is industry funding for 1,696 days for scallop fleets. Hence, 5,630 (3,934 + 1,696) days are available for observer coverage for April 2023 through March 2024.

Below is a summary of the 2 funding source categories: agency-funded and industry-funded. Within the agency-funded category, there are 7 subcategories: Atlantic Coast Observers, National Catch Share Program, National Observer Program, Northeast Fisheries Observers, Marine Mammal Protection Act, Endangered Species Act (ESA) Annual Determination, and Reducing Bycatch.

- **Agency-funded:** The funding sources for the 3,934 agency-funded sea days include: Atlantic Coast Observers (477 days); Northeast Fisheries Observers (296 days); National Observer Program (735 days); Reducing Bycatch (54 days); National Catch Share Program (90 days); Marine Mammals, Sea Turtles, and Other Marine Species (23 days); FY2022 obligated prioritized days (1,379 days) that were carried over/brought ahead; and FY2022 unachieved prioritized days (320 days) that were carried over/brought ahead. These combined sources fund the sea days for prioritization (3,373 days; Table 5, Step 7)⁷. In addition, there is funding from the Marine Mammal Protection Act (MMPA; 380 days), the FY2022 carryover/brought ahead days (136 days), and the ESA Annual Determination provision (45 days) to collectively fund the sea days to monitor protected species (561 additional days; Table 5, Step 7).
 - 561 agency-funded days are applicable to protected species⁸ only.
 - 350 MMPA days are associated with trips having sampling protocols that are specific to protected species (marine mammals, sea turtles, ESA listed fish species) and are not applicable for non-ESA listed fish and invertebrates. Owing to the extra demands of monitoring protected species, information on finfish and shellfish discards is not collected on these trips. However, these days will provide observer coverage for sea turtles and ESA-listed fish species above that which is allocated for all species.
 - Funding equivalent to 166 days will be in support of observer data analysis.
 - 45 days are associated with the ESA Annual Determination provision to monitor Mid-Atlantic state waters gillnet trips for sea turtle interactions. These trips follow the same sampling protocol as MMPA trips.
 - 3,373 (3,934 – 561) agency-funded days are applicable for all species.

⁷ Individual funding sources for agency-funded, prioritized sea days described in text are rounded to the nearest sea day equivalent, which causes their sum to differ from the aggregate sea day total in Table 5, Step 7.

⁸ In this document, protected species refers to marine mammals, sea turtles, and ESA-listed fish.

- 3,373 days are subject to the prioritization process across all fleets. The prioritization approach is described in the next section and given in Table 6.
 - No sea days have been set aside to support discovery days to address emerging questions of scientific and management interest as the year progresses.
- There is a single provider for NEFOP sea days, and consequently, the projected costs (i.e., at-sea costs based on realized costs in FY23) are confidential. An estimated rate for shoreside infrastructure that includes fixed and variable costs for operations, training, and data processing is \$512/day.
- **Industry-funded:** The number of industry-funded sea days available for scallop fleets is determined by taking 1% of the total acceptable biological catch/annual catch limit set for the year. The IFS provides vessels with additional landings to help defray the costs of carrying an observer (i.e., the compensation rate). The sale of the additional scallops allocated to each boat supplies the funding for the at-sea costs of observer coverage. Based upon projected landings and expected prices, the IFS generates funds in support of discard monitoring of the scallop fleets. A compensation rate analysis was undertaken to support observer coverage of the 9 industry-funded scallop fleets (Rows 12, and 38-45; Table 5).

For the 2023 scallop fishing year (April 2023 through March 2024), the NE open area limited access trips will be observed at 12.5% and MA open area limited access trips will be observed at 9%. The observer compensation rate in the Area II Access Area is 250 lb/day for limited access vessels, and the observer coverage rate will be 10.5%. There are 2 trips allocated in Area II (24,000 lb/full time vessel) with a maximum possession limit per trip of 12,000 lb for limited access vessels. The limited access general category (LAGC) individual fishing quota (IFQ) fleet is allocated a total of 1,256,633 lb, with 571 access area trips available to use either in the Area II or Nantucket Lightship-North Scallop Rotational Areas. For LAGC IFQ vessels, the open area possession limit is 600 lb and the access area possession limit is 800 lb. The observer coverage rate for LAGC IFQ vessels in the MA open area will be 4.0% and 17.8% in the GB open area. LAGC IFQ access area trips will be covered at 19.0%. The observer compensation rate for LAGC IFQ vessels is 250 lb/trip. The overall Northern Gulf of Maine Scallop Management Area (NGOM) total allowable catch for 2023 is 380,855 lb with a trip possession limit of 200 lb/day. The observer compensation rate for the NGOM is 125 lb/day at a target coverage rate of 2.7% and is only open to LAGC IFQ and LAGC NGOM permitted vessels in 2023 along with limited research set-aside compensation fishing.

- Based upon the compensation rate analysis and proposed Framework 36 allocations, a total of 1,696 sea days can be funded: 1,056 days for Open Areas, 68 days for MA Access Areas, and 572 days in the NE Access Areas, which includes 51 days for the NGOM (Table 7).
 - The industry-funded schedule runs April through March
 - [Bulletins](#) describing the [2023 set-aside compensation rate calculations](#) and scallop management measure (Framework 36) are available online.

- Of the 1,056 days for the Open Areas, there are 150 days for Limited Access General Category fleets (Rows 12, 42, and 43; Table 7) and 906 days for Limited Access fleets (Rows 44 and 45; Table 7).
- Coverage of the 9 fleets depends on industry activity among these fleets for April 2023 through March 2024; the sea days represent the maximum coverage (i.e., caps).
- Projected costs: the average cost to industry for the at-sea portion is \$733/day for industry-funded scallop fleets. Additional agency funds are needed for training and certification of observers and data processing.

Below is a summary of sea days based on the agency budget and the compensation rate analysis by funding source for April 2023 through March 2024.

Funding Source	Sea Days
Agency-funded total	3,934
Agency-funded applicable to all species (prioritized days)	3,373
Agency-funded applicable to protected species only (nonprioritized days)	561
Industry-funded scallop total applicable to all species	1,696
Total	5,630

PRIORITIZATION TRIGGER AND DETAILS OF THE ALLOCATION OF SEA DAYS TO FLEETS

Within the agency-funded fleets and prioritization-applicable funding, a funding shortfall of 1,920 (5,293 – 3,373) days is expected (Table 5). The 2023 funding shortfall triggers the SBRM prioritization approach; the prioritization approach is utilized with a portion of the agency funds.

The following describes the steps taken to allocate the 5,630 funded sea days (Tables 5-7).

- Step 1. Derive the number of sea days needed for the 14 fish/invertebrate species groups (Table 5; the importance filter has been applied, see McAfee and Wigley 2023 for the methods used in the sample size analyses).
- Step 2. Apply the sea day adjustments to 17 “erroneous” fleets (Rows 9, 16-19, 22-28, 47, 50, 57, 58, and 61). Additionally, Row 20 has been removed because this fleet is allowed under an exempted fishing permit (fishing outside standard fishing behavior) to support the development of MREM under Amendment 23 (Table 5). A total of 6,697 days is needed for fish/invertebrate species group across 46 fleets (37 agency-funded fleets and 9 industry-funded scallop fleets; Table 5).
- Step 3. Derive the number of sea days needed for sea turtles (Table 5; see Murray 2012, 2020, 2023 for the methods used in sample size analyses).

A total of 2,668 sea days is needed annually to monitor loggerhead (TURS) interactions with 30% precision across bottom trawl fleets operating in the MA EPU (Murray 2020).

The 2,668 sea days were adjusted to account for the overlap of spatial strata when fish and sea turtle sea days are merged. The proportion of NE fishing effort in the Mid-Atlantic EPU was estimated by using the VTR data from 2014-2018. Approximately 67% of NE small mesh otter trawl effort and 10% of NE large mesh otter trawl effort (in terms of days fished) occurred in the Mid- Atlantic EPU. These proportions were applied to the number of days needed to monitor fish in each of the New England otter trawl fleets (892 and 782 days in the NE small mesh [Row 7] and large mesh [Row 8] otter fleets, respectively (Table 5) yielding a total of 676 $([0.67 * 892] + [0.10 * 782])$ days.

After adjusting, the total number of days needed to monitor loggerhead turtles in the MA trawl fleets is 1,992 days (2,668 – 676). The 1,992 days will be integrated with sea days needed for fish in the SBRM MA trawl fleets.

Step 4. To integrate the monitoring needs of fish/invertebrates and sea turtles and to support the penultimate prioritization approach, derive the number of sea days needed for loggerhead turtles for each of the fish/invertebrate fleets associated with the turtle gear types (Table 5).

- a. Summarize the number of VTR sea days corresponding to each fish/invertebrate fleet (see Table 3 in McAfee and Wigley 2023). The VTR sea days associated with the 17 “erroneous” fleets are given but not used (Table 5, Step 4a, gray shaded cells).
- b. Derive the percentage of VTR sea days for each fish/invertebrate fleet within the turtle gear type. For each fish/invertebrate fleet associated with the turtle gear type, divide the VTR sea days by the sum of the VTR sea days for the gear type.
- c. Derive the percentage of sea days needed for fish/invertebrate for each fish/invertebrate fleet within the turtle gear type. For each fish/invertebrate fleet associated with a turtle gear type, divide the adjusted sea days (Step 2) by the sum of the sea days for the gear type.
- d. Derive the number of additional sea days needed for loggerhead turtles.

If the number of sea days needed for loggerhead turtles is less than or equal to the sum of the sea days needed for the fish/invertebrate fleets associated with the turtle gear type, then no additional sea days are needed to monitor turtles. The additional sea days for turtles are set to zero for fish/invertebrate fleets.

If the number of sea days needed for loggerhead turtles is greater than the sum of the sea days needed for the fish/invertebrate fleets associated with the turtle gear type, then derive the difference between the sea days needed for loggerhead turtles and the sum of the sea days needed for fish/invertebrates. For each turtle gear type, multiply the difference between the number of sea days needed by the percentage of VTR sea days

for each fish/invertebrate fleet within the turtle gear type. These days represent the number of additional days needed to monitor turtles in the fish/invertebrate fleets.

- e. Derive the number of sea days needed for loggerhead turtles by fish/invertebrate fleets.

If the number of sea days needed for loggerhead turtles is less than or equal to the sum of the sea days needed for the fish/invertebrate fleets associated with the turtle gear type, then multiply the sea days needed for turtles by the percentage of sea days needed for fish for each fish/invertebrate fleet within the turtle gear type (Step 4c).

If the number of sea days needed for loggerhead turtles is greater than the sum of the sea days needed for the fish/invertebrate fleets associated with the turtle gear type, then add the sea days needed for fish/invertebrates (Step 2) and the additional days needed for turtles (Step 4d) for each fish/invertebrate fleet.

- Step 5. Derive the number of sea days needed for fish/invertebrates and turtles COMBINED; select the larger of the 2 numbers of sea days (i.e., adjusted sea days needed for the 14 fish/invertebrate species groups [Step 2] and sea days needed for loggerhead turtles [Step 4e]) within the fleet.

A total of 6,926 days is needed to achieve a 30% CV on the discards of the 15 species groups in 2023 (Table 5).

- Step 6. Partition fleets into funding source categories and sum the number of sea days needed by funding source.

There were 5,293 days and 1,633 days needed to achieve a 30% CV for the 15 species groups for agency-funded and industry-funded scallop fleets, respectively (Table 5).

- Step 7. Obtain funded sea days by funding source category. For agency-funded sea days, calculate the number of sea days applicable to the prioritization process (prioritized versus nonprioritized days).

There are 3,373 agency-funded days applicable to the prioritization process (Table 5).

- Step 8. Evaluate needed sea days versus funded sea days for each funding category, and calculate shortfall or surplus sea days associated with the prioritization process.

A funding shortfall of 1,920 days is expected for agency-funded fleets (Table 5).

- Step 9. Apply the penultimate approach algorithm⁹ to allocate sea days to fleets for agency-funded days that are applicable to the prioritization process.

⁹ See section 6.6.2.3 of the revised SBRM Omnibus Amendment (NEFMC, MAFMC, NMFS 2015) for a detailed description of the penultimate cell approach.

As described in the revised SBRM Omnibus Amendment (NEFMC, MAFMC, NMFS 2015), the number of agency-funded sea days applicable to the prioritization process is assigned to each fleet (fishing mode) after sequentially removing the sea days needed for the species group/fleet with the highest sea day difference between adjacent species groups within a fleet until the sea day shortfall is removed.

The following describes the steps taken to assign the agency-funded sea days applicable to the prioritization process by using the penultimate approach (Table 6).

Step 9.1. For each agency-funded fleet where sea days are needed, list the sea days needed for the 15 species groups (fish/invertebrates and loggerhead turtles) in descending order within a fleet (Table 6). The minimum pilot days (Table 4) serve as the minimum sea days needed for fleets.

Step 9.2. Calculate the differences in sea days between adjacent species groups within each agency-funded fleet (Table 6).

Step 9.3. Within the resulting matrix of sea day differences (Step 9.2), identify the largest difference and remove the sea days associated with the species group accounting for this difference (Table 6).

Repeat this process for the next largest difference, with the constraint that the differences are taken in penultimate order (from left to right in the matrix) within a fleet, until the cumulative reduction of sea days equals the sea day shortfall (Step 8). If the reduction in sea days by using the next largest (penultimate) value is greater than the shortfall, reduce the number of sea days only enough to remove the shortfall. If there is a tie in sea day differences between adjacent species groups (e.g., 2 fleets with the same sea day difference), then select the fleet with the largest penultimate sea days first to break the tie¹⁰.

The 2023 sea day shortfall is 1,920 days.

- The 501 days (spiny dogfish [*Squalus acanthias*] DOG, in Row 34; Tables 4, 5, and 6) associated with the largest sea day difference (483 days) between adjacent species groups is removed first (Table 6). The penultimate value in Row 34 is associated with minimum pilot coverage (MPC, 18 days; Tables 4 and 6).
- The 892 days (small mesh groundfish, GFS in Row 7; Tables 4, 5, and 6) associated with the second largest sea day difference (467 days) between adjacent species groups is removed next (Table 6). The penultimate value in Row 7 is associated with skate complex (Rajidae, SKATE, 425 days; Tables 4 and 6).

¹⁰ The SBRM Amendment does not describe how to handle ties. This approach was selected because it has the potential to impact the fewest number of species groups compared to other approaches of dealing with ties.

- The 782 days (Fluke-Scup-Black sea bass, *Paralichthys dentatus*, *Stenotomus chrysops*, *Centropristis striata*, FSB, in Row 8; Tables 4, 5, and 6) associated with the third largest sea day difference (266 days) between adjacent species groups is removed next (Table 6). The penultimate value in Row 8 is associated with spiny dogfish (DOG, 516 days; Tables 4 and 6).
- The 516 days (DOG, in Row 8, a fleet that has already been prioritized; Tables 4, 5, and 6) associated with the fourth largest sea day difference (240 days) between adjacent species groups is removed next (Table 6). The penultimate value in Row 8 is associated with monkfish (*Lophius americanus*, MONK, 276 days; Tables 4 and 6).
- The 188 days (GFS in Row 54; Tables 4, 5, and 6) associated with the fifth largest sea day difference (170 days) between adjacent species groups is removed next (Table 6). The penultimate value in Row 54 is associated with minimum pilot coverage (MPC, 18 days; Tables 4 and 6).
- The 487 days (TURS in Row 6; Tables 5 and 6) associated with the sixth largest sea day difference (133 days) between adjacent species groups is removed next (Table 6). The penultimate value in Row 6 is associated with Fluke-Scup-Black sea bass (FSB, 354 days, Tables 4 and 6).
- Removing the 354 days (FSB in Row 6 a fleet that has already been prioritized; Tables 4, 5, and 6) associated with the seventh largest sea day difference (162 days) between adjacent species groups would remove more sea days than needed to reach the shortfall amount of 1,920 days (Table 6). Thus, only 161 of the 162 sea day difference between adjacent species groups (354 days for the FSB and 192 days for DOG are needed (Table 6). The penultimate value for Row 6 becomes 193 (354 - 161) days for FSB.

Step 9.4. After the removal of sea days within a fleet (Step 9.3), the remaining highest sea days (i.e., the penultimate or the value farthest to the left in Step 9.1) becomes the “PRIORITIZED” sea days required for that fleet.

The 3,373 prioritized sea days provide observer coverage to all 37 agency-funded fleets. There are 32 fleets for which no reduction in sea days occur, and there are 5 fleets (Rows 6, 7, 8, 34, and 54) for which the numbers of sea days allocated are fewer than the days needed to achieve a 30% CV. The prioritized sea days for Rows 6, 7, 8, 34, and 54 become 193, 425, 276, 18, and 18, respectively (Table 6). The MA large mesh otter trawl fleet (Row 6) is expected to exceed a 30% CV for TURS and FSB. The NE small mesh otter trawl fleet (Row 7) is expected to exceed a 30% CV for GFS, while the NE large mesh otter trawl fleet (Row 8) is expected to exceed a 30% CV for FSB and DOG. The NE large mesh gillnet fleet (Row 34) is expected to exceed a 30% CV for DOG and the NE lobster pot, and trap fleet (Row 54) is expected to exceed a 30% CV for GFS.

Step 9.5. Identify fleets that cannot be covered by the observer program this year. In 2023, there are practical limitations that prevent the observer program from

covering 6 fleets (NE floating trap [Row 29], MA purse seine [Row 36], MA small mesh beam trawl [Row 56], MA small mesh Scottish seine [Row 59], MA other dredge [Row 60], and NE mussel dredge [Row 62]; Table 7, rose shaded cells). The observer program currently has no sampling protocols in place for these fleets and will need time to create new trainings, logs, and/or databases to support sampling in these fleets. It is unlikely that the observer program will be able to make significant changes to the observer databases or observer manuals this year. The 63 prioritized sea days associated with the 6 fleets have been reallocated to the MA large mesh otter trawl fleet (Row 6), the last fleet impacted by the prioritization process. The MA large mesh otter trawl fleet now has 256 (193 + 63) days; however, the CVs for TURS and FSB are expected to exceed 30%. The 6 fleets with practical limitations have zero days (Table 7).

Step 10. Allocate agency-funded, nonprioritized sea days.

There are 561 agency-funded days that are not applicable to the prioritization process (nonprioritized MMPA and ESA days; Table 7).

Of the 516 MMPA sea days, 350 MMPA days, all assumed to have limited sampling protocols, are allocated to a row designated as “MMPA coverage” and will be associated with the MA and NE gillnet fleets (Rows 30-35; Table 7). The funding equivalent of 166 MMPA sea days are assigned to a row designated as “MMPA analysis.” The 45 ESA days, all assumed to have limited sampling protocols, are allocated to a row designated “ESA coverage” and will be associated with MA large and extra large mesh gillnet fleets (Rows 31 and 32).

Step 11. Allocate industry-funded scallop days. The sea days for the industry-funded scallop fleets are assigned to trips via the [call-in system](#). The sea day coverage for industry-funded scallop fleets will depend on industry activity from April 2023 through March 2024 and will be capped as described above. Because of differences in stratification between the SBRM and scallop compensation rate analyses, the 1,696 industry-funded scallop sea days have not been allocated to individual fish/invertebrate fleets but rather to groups of fish/invertebrate fleets that correspond to the stratification used in the compensation rate analysis: MA Access Area fleets (Rows 38 and 40; Table 7); Open Areas fleets (Rows 12, 42, and 43 for Limited Access General Category fleets and Rows 44 and 45 for Limited Access; Table 7); and NE Access Area fleets (Rows 39 and 41; Table 7). The allocated sea days represent the maximum coverage (i.e., caps). The NGOM fleet has been grouped with the NE Access Area fleets.

Because of the lack of any accessible rotational areas in the Mid-Atlantic in 2023, 68 IFS days were allocated to the MA Access Area fleets (Rows 38 and 40; Table 7), which results in a 75 (143 – 68) day shortfall. The only open rotational area for the Limited Access fleet in 2023 will be Area II¹¹, and the 68 days represent the proportion of Area II trips expected

¹¹ March 31, 2023 GARFO bulletin: [2023 fishing year limited access allocations for the Atlantic sea scallop fishery](#)

to depart from MA ports. Area II, as well as the Nantucket Lightship-North are open for the Limited Access General Category fleet, but none of this fleet's access area trips are expected to depart from MA ports. It is assumed that an adequate proportion of the surplus 131 (572 - 441) sea days in the NE Access Area fleets (Rows 39 and 41; Table 7) will be enough to cover the required 75 day shortfall in the MA Access Area fleets (Rows 38 and 40; Table 7). Thus, industry-funded scallop sea days are expected to meet or exceed the SBRM required sea days for each fleet group corresponding to the stratification used in the compensation rate analysis (Table 7).

Step 12. The sea days allocated for April 2023 through March 2024 (TOTAL) is the sum of the prioritized days (Step 9.5), nonprioritized days (Step 10), and industry-funded scallop days (Step 11). A total of 5,630 days is allocated across 35 fleets (Table 7).

The agency-funded fleets with an * or ** (Table 7) indicate that all or some of the observer coverage will be assigned via the Pre-Trip Notification System (PTNS; Palmer et al. 2013) or call-in programs for scallops and herring. This designation means all or some of the observer coverage within each of these fleets will depend upon industry activity for April 2023 through March 2024. The PTNS sea days for agency-funded fleets will be proportionally allocated based initially on previous year's industry activity and then adjusted to correspond to current year's activity.

All other fleets will have sea days assigned to fishing trips via the NEFOP sea day schedule. The prioritized sea days on the NEFOP sea day schedule are provided by fleet. A matrix of VTR trip percentages by quarter and state within a fleet based on July 2021 through June 2022 data is provided as information on previous industry activity patterns. This information does not replace third-party provider's local knowledge of current industry activity.

DISCUSSION

The sample size analysis conducted by McAfee and Wigley (2023) derived the expected CV of the discard estimates for various species groups over a range of sample sizes for each of the species groups that were not filtered out by the importance filter (see Table 7 and Figure 3 in McAfee and Wigley 2023). Deriving the expected CV assumes the variance of the discard estimate is constant over a range of sample sizes (number of trips). The results of the fish/invertebrate sample size analysis influences the outcome of the prioritization process from year to year depending on available funding, the rank order of sea days needed by species group, and the sea day differences between adjacent species groups within each fleet. All of these factors (both within and between fleets) dictate the outcome of the penultimate approach algorithm, and ultimately determines which fleets have less sea days allocated to them in order to meet the funding shortfall. For example, there was a funding shortfall in both 2022 and 2023 that triggered the prioritization process. The arrangement of sea day differences caused sea days to be removed from the MA small mesh otter trawl fleet (Row 5) in 2022, but not in 2023. This difference results in more allocated sea days for this fleet in 2023. The results of the fish/invertebrate sample size analysis is more pronounced in the 6 gillnet fleets in 2023 because of the updated sea turtle analysis in Murray 2023

which caused these fleets to be driven by species groups other than TURS (Table 5). The effect is most noticeable in the MA gillnet fleets where less sea days are needed compared to 2022.

New NMFS funding in 2023 from the [ESA Annual Determination](#) provision provides additional coverage to MA large and extra large mesh gillnet fleets this year to monitor sea turtle interactions in state waters. These trips will follow MMPA sampling design and protocols where the observer performs protected species haul watches. Full bycatch sampling of fish/invertebrates does not occur on these trips.

The estimated 320 prioritized carryover days are the result of unaccomplished sea days from April 2022 through March 2023, and the 1,379 prioritized days are from obligated but not spent funds. Together, the 1,699 (320 + 1,379) days increase the number of prioritized sea days to monitor the 15 SBRM species groups from April 2023 through March 2024. Because of the unaccomplished and unused sea days from April 2022 through March 2023, it is possible that the lower observer coverage could lead to discard estimates with CVs that are higher than the SBRM precision standard for some fleets.

At-Sea Monitoring (ASM) coverage associated with Northeast Multispecies (groundfish) FMP, is used for compliance monitoring and is not used to meet SBRM sea day requirements. To reduce potential bias within SBRM, data associated with ASM were not used in the 2023 fish/invertebrate analyses (McAfee and Wigley 2023) because these trips may have different goals/objectives and/or different stratification/sea day allocations than the other NEFOP and IFS trips. Data collected from electronic monitoring (EM) programs, which serve as an alternative to ASM, were not included, but NEFOP data collected from vessels participating in EM programs were used in the analyses. This approach follows the 2018 SBRM Fishery Management Action Team recommendation to exclude individual FMP compliance monitoring trips from future annual discard estimation, precision, and sample size analyses for fish/invertebrate species groups (Hogan et al. 2019).

The SBRM analyses use master data and are predicated upon accurately reported and audited data. To reduce or prevent “erroneous” fleets, the VTR master data would benefit from enhanced data auditing (including data leverage between data collection systems) coupled with targeted outreach and education to industry members on the importance of accurate reporting. Additionally, gear code consistency is needed between the fishery dependent data collection systems (Observer, Vessel Trip Report, and Commercial Fisheries databases).

As a practical matter, fleets with low trip activity within a quarter or overall are very difficult to “find” unless they are part of PTNS or a call-in program. Attempts to assign observers can be inefficient since the probability of randomly finding such trips at a specific port or time period will be very low. While some of the challenges may be overcome with outreach, vessel selection letters, and other operational efforts, some fleets may fall below practical detection limits, and therefore some of the sea days associated with low trip activity fleets may not be accomplished. If any sea days are not accomplished, those sea days will be carried over.

Trip Selection Systems

The observer program uses 3 systems to select fishing trips for observer coverage: the PTNS; the IFS interactive voice response/call-in program; and the NEFOP Sea Day Schedule selection protocols that include selection by phone, email, letter, Vessel Monitoring System message, or in person at the docks (dock intercept). The methods used to apportion observer sea days among the trip selection systems are described in the 2023 Observer Sea Days by Trip Selection System (NEFSC 2023).

Expanded Sampling Frame for MA and NE Lobster Pot Fleets

In April 2016, the agency found that expanding the sampling frame for the MA and NE lobster pot fleets to include all vessels with a federal permit requires a regulatory change to the SBRM Amendment. The agency has pursued the required language change through a pending framework action. The pending SBRM framework action seeks to clarify the NEFMC and MAFMC's intent for the SBRM process to monitor bycatch of federally managed or protected species from the entire active lobster pot fleet. This pending action would expand the lobster pot sampling frame used in this analysis by allowing the NEFSC to include fishing activity and catch data (e.g., trip length, date, pounds kept, port of landing) for all active lobster pot vessels in the annual SBRM analyses and to assign NEFOP coverage to any federal lobster pot vessel, regardless of whether the vessel is required to submit VTRs. In the calendar quarter following the implementation of this pending SBRM framework action, all active federal lobster vessels may be eligible for selection. Implementing the pending action would not change the number of sea days needed for April 2023 through March 2024. Under a separate action, a proposed rule¹² to implement a requirement for electronic VTR submissions for all vessels in the lobster industry was published on July 11, 2022.

The rest of the SBRM fleets did not need to have the sampling frame expanded because these vessels have VTR reporting requirements associated with their federal fishing permits and their fishing trips are already included in the SBRM sampling frame.

Specific FMP Changes and SBRM

As mentioned above, Atlantic chub mackerel was integrated into the MAFMC's Mackerel, Squid, and Butterfish FMP in August 2020. This is the first year Atlantic chub mackerel was included in the SBRM analysis because annual SBRM discard reports were not produced in 2021 and 2022 because of data gaps from the COVID-19 pandemic (McAfee and Wigley 2023). Additionally, NMFS implemented Amendment 23 to the Northeast Multispecies FMP on January 9, 2023. Amendment 23 changes several components of the sector monitoring program, which includes how the ASM coverage target is determined, authorizes the audit model EM and MREM alternatives to human at-sea monitoring, and exempts vessels from ASM coverage if fishing exclusively west of 71°30'W, in addition to other administrative and management changes¹³. Most of these changes to the ASM program will not directly affect the SBRM because ASM data are excluded from the SBRM fish/invertebrate analyses; however, some technical modifications will be needed to account for the retention requirement of all allocated groundfish species catch in the newly implemented operational MREM program.

¹² Proposed rule published July 11, 2022: [Federal Register RIN 0648-BF01](#)

¹³ [See Greater Atlantic Regional Fisheries Office Amendment 23 website for more information.](#)

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Table 1. A list of the 14 fish and invertebrate species groups and 1 species of sea turtle (in bold), with species group abbreviations in parentheses and scientific names in italics. The species that compose these groups correspond to the 13 federal fishery management plans implemented in the waters off the northeastern United States.

Species/Group	Scientific Name
ATLANTIC HERRING (HERR)	<i>Clupea harengus</i>
ATLANTIC SALMON (SAL)	<i>Salmo salar</i>
BLUEFISH (BLUE)	<i>Pomatomus saltatrix</i>
FLUKE - SCUP - BLACK SEA BASS (FSB)	
Black sea bass	<i>Centropristis striata</i>
Fluke	<i>Paralichthys dentatus</i>
Scup	<i>Stenotomus chrysops</i>
LARGE MESH GROUND FISH (GFL)	
Acadian redfish	<i>Sebastes fasciatus</i>
American plaice	<i>Hippoglossoides platessoides</i>
Atlantic cod	<i>Gadus morhua</i>
Atlantic halibut	<i>Hippoglossus hippoglossus</i>
Atlantic wolffish	<i>Anarhichas lupus</i>
Haddock	<i>Melanogrammus aeglefinus</i>
Ocean pout	<i>Zoarces americanus</i>
Pollock	<i>Pollachius virens</i>
White hake	<i>Urophycis tenuis</i>
Windowpane flounder	<i>Scophthalmus aquosus</i>
Winter flounder	<i>Pseudopleuronectes americanus</i>
Witch flounder	<i>Glyptocephalus cynoglossus</i>
Yellowtail flounder	<i>Limanda ferruginea</i>
MONKFISH (MONK)	<i>Lophius americanus</i>
RED DEEPSEA CRAB (RCRAB)	<i>Chaceon quinquedens</i>
SEA SCALLOP (SCAL)	<i>Placopecten magellanicus</i>
SKATE COMPLEX¹⁴ (SKATE)	Rajidae
Barndoor skate	<i>Dipturus laevis</i>
Clearnose skate	<i>Raja eglanteria</i>
Little skate	<i>Leucoraja erinacea</i>
Rosette skate	<i>Leucoraja garmani</i>
Smooth skate	<i>Malacoraja senta</i>
Thorny skate	<i>Amblyraja radiata</i>
Winter skate	<i>Leucoraja ocellata</i>
SMALL MESH GROUND FISH (GFS)	
Offshore hake	<i>Merluccius albidus</i>
Red hake	<i>Urophycis chuss</i>
Silver hake	<i>Merluccius bilinearis</i>
SPINY DOGFISH (DOG)	<i>Squalus acanthias</i>
SQUID¹⁵ - BUTTERFISH - MACKEREL (SBM)	
Atlantic chub mackerel	<i>Scomber colias</i>
Atlantic mackerel	<i>Scomber scombrus</i>
Butterfish	<i>Peprilus triacanthus</i>
Longfin inshore squid	<i>Doryteuthis (Amerigo) pealeii</i>
Northern shortfin squid	<i>Illex illecebrosus</i>
SURFLAM - OCEAN QUAHOG¹⁶ (SCOQ)	
Surfclam	<i>Spisula solidissima</i>
Ocean quahog	<i>Arctica islandica</i>
TILEFISH¹⁷ (TILE)	
Blueline tilefish	<i>Caulolatilus microps</i>
Golden tilefish	<i>Lopholatilus chamaeleonticeps</i>
LOGGERHEAD TURTLE (TURS)	<i>Caretta caretta</i>

¹⁴ Skate complex is composed of 7 species as well as skate, unknown, and little/winter mixed skate. Individual species are not summarized separately.

¹⁵ Squid, unclassified is included in this species group. Longfin inshore squid and northern shortfin squid are also known as Loligo squid and Illex squid, respectively.

¹⁶ In this analysis, surfclams and ocean quahogs compose the species group and are not reported separately.

¹⁷ Tilefish, unclassified is included in this species group.

Table 2. Total catch (live lb), Vessel Trip Report landings (kept; live lb), estimated discards (live lb), associated coefficient of variation (CV), and standard error (SE) of the estimated discards (live lb) for 14 Standardized Bycatch Reporting Methodology (SBRM) species groups combined, by fleet, based on July 2021 through June 2022 data. Dark shading indicates fleets not considered or with no observed trips in the annual analysis. These CVs were not used in the annual sample size analysis. Hatching indicates confidential cells. Blank CV indicates either no discards or discards equals 0. See Appendix Table 1 for fleet stratification abbreviations; “P” indicates fleets with “pilot” designation. Taken from Table 5C in McAfee and Wigley 2023.

Species: 14 SBRM SPECIES GROUPS COMBINED

Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Total	Kept	Discarded	CV	SE	Pilot
1	Longline, Bottom	OPEN	all	MA	all	1,561,431	1,498,688	62,743	0.428	26,876	
2	Longline, Bottom	OPEN	all	NE	all	1,128,045	1,068,859	59,186	0.338	20,006	
3	Hand Line	OPEN	all	MA	all	323,736	258,247	65,489	0.370	24,244	
4	Hand Line	OPEN	all	NE	all	1,358,444	1,313,331	45,113	3.256	146,906	
5	Otter Trawl	OPEN	all	MA	sm	34,258,261	28,328,639	5,929,622	0.220	1,305,924	
6	Otter Trawl	OPEN	all	MA	lg	18,281,462	12,727,735	5,553,727	0.121	672,832	
7	Otter Trawl	OPEN	all	NE	sm	71,664,038	53,669,761	17,994,277	0.118	2,124,031	
8	Otter Trawl	OPEN	all	NE	lg	69,528,257	44,529,139	24,999,118	0.110	2,756,295	
10	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	6,604,979	5,654,069	950,910	0.000	0	P
12	Otter Trawl, Scallop	OPEN	GEN	MA	lg	86,069	86,069				P
13	Otter Trawl, Twin	OPEN	all	MA	sm	1,511,049	765,149	745,900	0.392	292,228	
14	Otter Trawl, Twin	OPEN	all	MA	lg	66,117	66,117				P
15	Otter Trawl, Twin	OPEN	all	NE	sm	816,681	816,681				P
18	Otter Trawl, Ruhle	OPEN	all	NE	sm	990,192	860,430	129,762	0.000	0	P
19	Otter Trawl, Ruhle	OPEN	all	NE	lg	180,520	180,520				P
20	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	895,978	895,978				P
21	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	1,504,008	1,186,873	317,135	0.000	0	
22	Otter Trawl, Shrimp	OPEN	all	MA	sm	1,421	1,421				P
23	Otter Trawl, Other	OPEN	all	MA	sm	978,397	978,397				P
24	Otter Trawl, Other	OPEN	all	MA	lg	931,576	931,576				P
25	Otter Trawl, Other	OPEN	all	NE	sm	869,914	869,914				P
26	Otter Trawl, Other	OPEN	all	NE	lg	206,815	206,815				P
27	Haul Seine, Beach	OPEN	all	NE	all	0	0				P
29	Floating Trap	OPEN	all	NE	all	2,515	2,515				P
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	2,192,675	2,146,811	45,864	0.270	12,394	
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	3,671,753	3,515,980	155,773	0.236	36,720	
32	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	2,112,392	1,962,033	150,359	0.253	38,041	
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	7,841	7,841				P

Table 2, continued. Total catch (live lb), Vessel Trip Report landings (kept; live lb), estimated discards (live lb), associated coefficient of variation (CV), and standard error (SE) of the estimated discards (live lb) for 14 Standardized Bycatch Reporting Methodology (SBRM) species groups combined, by fleet, based on July 2021 through June 2022 data. Dark shading indicates fleets not considered or with no observed trips in the annual analysis. These CVs were not used in the annual sample size analysis. Hatching indicates confidential cells. Blank CV indicates either no discards or discards equals 0. See Appendix Table 1 for fleet stratification abbreviations; “P” indicates fleets with “pilot” designation. Taken from Table 5C in McAfee and Wigley 2023.

Species: 14 SBRM SPECIES GROUPS COMBINED

Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Total	Kept	Discarded	CV	SE	Pilot
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	3,702,291	3,226,656	475,635	0.689	327,712	
35	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	13,974,077	12,855,148	1,118,929	0.132	147,602	
36	Purse Seine	OPEN	all	MA	all	0	0				P
37	Purse Seine	OPEN	all	NE	all	3,083,450	3,083,450	0			
38	Dredge, Scallop	AA	GEN	MA	all	846,538	808,632	37,906	0.326	12,354	
39	Dredge, Scallop	AA	GEN	NE	all	11,273,994	9,844,956	1,429,037	0.142	202,254	
40	Dredge, Scallop	AA	LIM	MA	all	25,837,593	21,188,136	4,649,457	0.201	934,837	
41	Dredge, Scallop	AA	LIM	NE	all	166,515,254	145,006,368	21,508,886	0.118	2,545,953	
42	Dredge, Scallop	OPEN	GEN	MA	all	9,238,123	7,052,010	2,186,113	0.086	188,242	
43	Dredge, Scallop	OPEN	GEN	NE	all	8,724,730	7,785,473	939,257	0.162	152,106	
44	Dredge, Scallop	OPEN	LIM	MA	all	15,327,450	13,226,456	2,100,994	0.540	1,135,160	
45	Dredge, Scallop	OPEN	LIM	NE	all	147,818,759	123,511,805	24,306,954	0.109	2,649,390	
46	Trawl, Midwater	all	all	NE	sm	7,342,426	7,340,500	1,926	0.666	1,282	
48	Pots and Traps, Fish	OPEN	all	MA	all	769,547	690,481	79,066	0.269	21,261	
49	Pots and Traps, Fish	OPEN	all	NE	all	812,177	517,123	295,054	0.281	82,846	
51	Pots and Traps, Conch	OPEN	all	MA	all	6,297	4,686	1,611	2.263	3,646	
52	Pots and Traps, Conch	OPEN	all	NE	all	9,277	7,883	1,394	0.651	908	
53	Pots and Traps, Lobster	OPEN	all	MA	all	171,081	129,220	41,861	0.501	20,988	
54	Pots and Traps, Lobster	OPEN	all	NE	all	2,311,548	788,337	1,523,211	0.720	1,096,773	
55	Pots and Traps, Crab	OPEN	all	NE	all	5,696,351	4,530,381	1,165,970	0.143	166,310	
56	Beam Trawl	OPEN	all	MA	sm	17,500	17,500				P
60	Dredge, Other	OPEN	all	MA	all	340,680	340,680				P
61	Dredge, Other	OPEN	all	NE	all	2,166,533	2,166,533				P
63	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	197,068,066	195,314,347	1,753,719	0.385	674,906	
64	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	141,786,505	139,537,844	2,248,662	1.683	3,785,402	
	Confidential fleets					286,329	286,329				
	Other minor fleets					214,039	214,039				
	TOTAL					987,075,177	864,004,559	123,070,619	0.055	6,803,971	

Table 3. The most recent average annual estimates and 5 year pooled estimates of sea turtle (Loggerhead [*Caretta caretta*], Kemp's ridley [*Lepidochelys kempii*], Leatherback [*Dermochelys coriacea*], and Green [*Chelonia mydas*]) interactions and their associated coefficient of variation (CV) in US commercial fisheries.

Fishery	Average Annual Estimate	5 year Estimate	CV	Years Included	Species*	Reference
Bottom trawl, for fish and scallops, Mid-Atlantic	114	571	0.29	01 Jan 2014-2018	Loggerhead	Murray 2020
Bottom trawl, for fish and scallops, Mid-Atlantic	9	46	0.45	01 Jan 2014 - 2018	Kemp's ridley	Murray 2020
Bottom trawl, for fish and scallops, Mid-Atlantic	4	20	0.72	01 Jan 2014 - 2018	Leatherback	Murray 2020
Bottom trawl, for fish and scallops, Mid-Atlantic	3	16	0.73	01 Jan 2014 - 2018	Green	Murray 2020
Bottom trawl, for fish and scallops, Georges Bank	2	12	0.70	01 Jan 2014 - 2018	Loggerhead	Murray 2020
Bottom trawl, for fish and scallops, Georges Bank	1	6	1.0	01 Jan 2014 - 2018	Leatherback	Murray 2020
Sink Gillnet (Mid-Atlantic, Gulf of Maine, and Georges Bank combined)	28	142	0.89	01 Jan 2017-2021	Loggerhead	Murray 2023
Sink Gillnet (Mid-Atlantic, Gulf of Maine, and Georges Bank combined)	18	91	0.62	01 Jan 2017-2021	Kemp's ridley	Murray 2023
Sink Gillnet (Mid-Atlantic, Gulf of Maine, and Georges Bank combined)	5	26	0.98	01 Jan 2017-2021	Leatherback	Murray 2023
Sink Gillnet (Mid-Atlantic, Gulf of Maine, and Georges Bank combined)	10	49	1.01	01 Jan 2017-2021	Green	Murray 2023
Sink Gillnet (Mid-Atlantic, Gulf of Maine, and Georges Bank combined)	6	32	0.59	01 Jan 2017-2021	Unidentified hard-shelled	Murray 2023

* Sea day monitoring needs for green, Kemp's ridley, and leatherback turtles in sink gillnet gear were not projected because of the low encounter rate of these species.

Table 4. The number of sea days needed to achieve a 30% coefficient of variation of the discard estimate for each of the 14 fish and invertebrate species groups, the number of pilot sea days, the number of minimum pilot sea days, and the maximum number of sea days needed for each fleet (2023 Sea Days Needed) for fish and invertebrate species groups based on July 2021 through June 2022 data. Bold red font indicates basis for fleet sea days. See Appendix Table 1 for fleet stratification abbreviations; “P” indicates fleets with “pilot” designation. Species group abbreviations are given in Table 1. Taken from Table 6B in McAfee and Wigley 2023.

Row	Fleet Gear Type	Access Area	Trip	Region	Mesh Size	BLUE	HERR	SAL	RCRAB	SCAL	SBM	MONK	GFL	GFS	SKATE	DOG	FSB	SCOQ	TILE	Pilot Days	Min Pilot Days	2023 Sea Days Needed	Pilot	
1	Longline, Bottom	OPEN	all	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	92	92	
2	Longline, Bottom	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	14	14	
3	Hand Line	OPEN	all	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	14	14	
4	Hand Line	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	15	15	
5	Otter Trawl	OPEN	all	MA	sm	0	0	0	0	0	804	0	0	1,388	565	490	474	0	0	0	104	31	1,388	
6	Otter Trawl	OPEN	all	MA	lg	0	0	0	0	0	0	0	0	0	94	192	354	0	0	0	146	34	354	
7	Otter Trawl	OPEN	all	NE	sm	0	0	0	0	0	309	0	283	892	425	381	302	0	0	0	158	41	892	
8	Otter Trawl	OPEN	all	NE	lg	0	0	0	0	0	0	276	185	168	138	516	782	0	0	0	242	33	782	
9	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
10	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	P
11	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	P
12	Otter Trawl, Scallop	OPEN	GEN	MA	lg	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	P
13	Otter Trawl, Twin	OPEN	all	MA	sm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40	40	
14	Otter Trawl, Twin	OPEN	all	MA	lg	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	P
15	Otter Trawl, Twin	OPEN	all	NE	sm	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	P
16	Otter Trawl, Ruhle	OPEN	all	MA	sm	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	P
17	Otter Trawl, Ruhle	OPEN	all	MA	lg	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	P
18	Otter Trawl, Ruhle	OPEN	all	NE	sm	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	P
19	Otter Trawl, Ruhle	OPEN	all	NE	lg	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	P
20	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104	P
21	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	0	0	0	0	0	0	0	0	0	0	72	0	0	0	0	94	94	94	
22	Otter Trawl, Shrimp	OPEN	all	MA	sm	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	P
23	Otter Trawl, Other	OPEN	all	MA	sm	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	P
24	Otter Trawl, Other	OPEN	all	MA	lg	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	P
25	Otter Trawl, Other	OPEN	all	NE	sm	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	P
26	Otter Trawl, Other	OPEN	all	NE	lg	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	P
27	Haul Seine, Beach	OPEN	all	NE	all	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	P
28	Floating Trap	OPEN	all	MA	all	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	P
29	Floating Trap	OPEN	all	NE	all	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	13	14	P
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	13	13	
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0	27	13	93	
32	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	13	13	
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	P
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	0	0	0	0	0	0	0	0	0	0	501	0	0	0	0	31	18	501	
35	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	0	0	0	0	0	0	75	0	0	82	0	0	0	0	0	52	18	82	

Table 4, continued. The number of sea days needed to achieve a 30% coefficient of variation of the discard estimate for each of the 14 fish and invertebrate species groups, the number of pilot sea days, the number of minimum pilot sea days, and the maximum number of sea days needed for each fleet (2023 Sea Days Needed) for fish and invertebrate species groups based on July 2021 through June 2022 data. Bold red font indicates basis for fleet sea days. See Appendix Table 1 for fleet stratification abbreviations; “P” indicates fleets with “pilot” designation. Species group abbreviations are given in Table 1. Taken from Table 6B in McAfee and Wigley 2023.

Row	Fleet Gear Type	Access Area	Trip	Region	Mesh Size	BLUE	HERR	SAL	RCRAB	SCAL	SBM	MONK	GFL	GFS	SKATE	DOG	FSB	SCOQ	TILE	Pilot Days	Min Pilot Days	2023 Sea Days Needed	Pilot	
36	Purse Seine	OPEN	all	MA	all	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	P
37	Purse Seine	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	10	10	
38	Dredge, Scallop	AA	GEN	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	15	15	
39	Dredge, Scallop	AA	GEN	NE	all	0	0	0	0	0	0	91	0	0	0	0	0	0	0	0	107	16	91	
40	Dredge, Scallop	AA	LIM	MA	all	0	0	0	0	0	0	101	0	0	128	0	0	0	0	0	96	93	128	
41	Dredge, Scallop	AA	LIM	NE	all	0	0	0	0	350	0	132	0	153	181	0	0	0	0	0	266	101	350	
42	Dredge, Scallop	OPEN	GEN	MA	all	0	0	0	0	0	0	28	0	0	13	0	0	0	0	0	58	25	28	
43	Dredge, Scallop	OPEN	GEN	NE	all	0	0	0	0	0	0	93	0	0	0	0	0	0	0	0	64	19	93	
44	Dredge, Scallop	OPEN	LIM	MA	all	0	0	0	0	0	0	189	0	0	39	0	0	0	0	0	107	107	189	
45	Dredge, Scallop	OPEN	LIM	NE	all	0	0	0	0	316	0	169	227	717	198	552	513	0	0	177	111	717		
46	Trawl, Midwater	all	all	NE	sm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	23		
47	Pots and Traps, Other	OPEN	all	NE	all	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
48	Pots and Traps, Fish	OPEN	all	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	13	13	
49	Pots and Traps, Fish	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	13	13	
50	Pots and Traps, Eel	OPEN	all	NE	all	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	P
51	Pots and Traps, Conch	OPEN	all	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	12	12	
52	Pots and Traps, Conch	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	12	12	
53	Pots and Traps, Lobster	OPEN	all	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	20	20	
54	Pots and Traps, Lobster	OPEN	all	NE	all	0	0	0	0	0	0	0	0	188	0	0	0	0	0	0	415	18	188	
55	Pots and Traps, Crab	OPEN	all	NE	all	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	105	105	105	
56	Beam Trawl	OPEN	all	MA	sm	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
57	Beam Trawl	OPEN	all	NE	sm	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	P
58	Beam Trawl	OPEN	all	NE	lg	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	P
59	Scottish Seine	OPEN	all	MA	sm	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	P
60	Dredge, Other	OPEN	all	MA	all	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	P
61	Dredge, Other	OPEN	all	NE	all	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	P
62	Dredge, Mussel	OPEN	all	NE	all	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	P
63	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	63	25	47	
64	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	19	19	
					Totals	778	778	778	792	1,444	1,891	1,979	1,473	4,284	2,641	3,575	3,203	778	778	3,593	2,016	7,238		

Table 5. The number of sea days needed to monitor fish/invertebrates (FISH), loggerhead turtles (TURS), combined species groups (COMBINED) by fleet (Steps 1 through 5); the number of funded sea days for April 2023 through March 2024 (Steps 6 and 7); and the differences between needed and funded days (Step 8). See Appendix Table 1 for fleet stratification abbreviations.

Fleet						Step 1	Step 2	Step 3	Step 4a	Step 4b	Step 4c	Step 4d	Step 4e	Step 5
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed for FISH	2023 Sea Days Needed for FISH ADJUSTED	2023 Sea Days Needed for TURS	Vessel Trip Report Sea Days	% Vessel Trip Report Sea Days	% Sea Days Needed for FISH	Additional Sea Days needed for TURS	TURS Sea Days by FISH fleet	2023 Sea Days Needed COMBINED
1	Longline, Bottom	OPEN	all	MA	all	92	92	891	891	0.413	0.787	95	1,483	92
2	Longline, Bottom	OPEN	all	NE	all	14	14							14
3	Hand Line	OPEN	all	MA	all	14	14							2,783
4	Hand Line	OPEN	all	NE	all	15	15							2,055
5	Otter Trawl	OPEN	all	MA	sm	1,388	1,388	1,992	5,189	0.582	0.201	133	487	1,483
6	Otter Trawl	OPEN	all	MA	lg	354	354		7,316					
7	Otter Trawl	OPEN	all	NE	sm	892	892	7,879	7,879	0.005	0.012	1	22	892
8	Otter Trawl	OPEN	all	NE	lg	782	782							12,111
9	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg	3	0							8
10	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	51	51							585
11	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	11	11	30	30	0.005	0.012	1	22	11
12	Otter Trawl, Scallop	OPEN	GEN	MA	lg	21	21	60	60	0.005	0.012	1	22	22
13	Otter Trawl, Twin	OPEN	all	MA	sm	40	40	164	164	0.000	0.000	0	0	40
14	Otter Trawl, Twin	OPEN	all	MA	lg	40	40							41
15	Otter Trawl, Twin	OPEN	all	NE	sm	44	44							108
16	Otter Trawl, Ruhle	OPEN	all	MA	sm	23	0	30	30	0.000	0.000	0	0	0
17	Otter Trawl, Ruhle	OPEN	all	MA	lg	13	0		13	0.000	0.000	0	0	0
18	Otter Trawl, Ruhle	OPEN	all	NE	sm	30	0	123	123	0.000	0.000	0	0	0
19	Otter Trawl, Ruhle	OPEN	all	NE	lg	39	0							72
20	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	104	0							321
21	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	94	94							436
22	Otter Trawl, Shrimp	OPEN	all	MA	sm	65	0	437	437	0.000	0.000	0	0	0
23	Otter Trawl, Other	OPEN	all	MA	sm	40	0	242	242	0.000	0.000	0	0	0
24	Otter Trawl, Other	OPEN	all	MA	lg	44	0		460	0.000	0.000	0	0	0
25	Otter Trawl, Other	OPEN	all	NE	sm	58	0	229	229	0.000	0.000	0	0	0
26	Otter Trawl, Other	OPEN	all	NE	lg	22	0							113
27	Haul Seine, Beach	OPEN	all	NE	all	6	0							13
28	Floating Trap	OPEN	all	MA	all	10	0							16
29	Floating Trap	OPEN	all	NE	all	14	14	496	496	0.000	0.000	0	0	14
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	13	13	0	1,239	0.175	0.018	0	0	13
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	93	93		1,305	0.184	0.131	0	0	93
32	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	13	13		588	0.083	0.018	0	0	13
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	7	7		7	0.001	0.010	0	0	7
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	501	501		1,352	0.190	0.707	0	0	501
35	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	82	82		2,609	0.367	0.116	0	0	82

Table 5, continued. The number of sea days needed to monitor fish/invertebrates (FISH), loggerhead turtles (TURS), combined species groups (COMBINED) by fleet (Steps 1 through 5); the number of funded sea days for April 2023 through March 2024 (Steps 6 and 7); and the differences between needed and funded days (Step 8). See Appendix Table 1 for fleet stratification abbreviations.

Fleet						Step 1	Step 2	Step 3	Step 4a	Step 4b	Step 4c	Step 4d	Step 4e	Step 5
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed for FISH	2023 Sea Days Needed for FISH ADJUSTED	2023 Sea Days Needed for TURS	Vessel Trip Report Sea Days	% Vessel Trip Report Sea Days	% Sea Days Needed for FISH	Additional Sea Days needed for TURS	TURS Sea Days by FISH fleet	2023 Sea Days Needed COMBINED
36	Purse Seine	OPEN	all	MA	all	13	13		341					13
37	Purse Seine	OPEN	all	NE	all	10	10		653					10
38	Dredge, Scallop	AA	GEN	MA	all	15	15		440					15
39	Dredge, Scallop	AA	GEN	NE	all	91	91		5,331					91
40	Dredge, Scallop	AA	LIM	MA	all	128	128		3,324					128
41	Dredge, Scallop	AA	LIM	NE	all	350	350		13,297					350
42	Dredge, Scallop	OPEN	GEN	MA	all	28	28		2,895					28
43	Dredge, Scallop	OPEN	GEN	NE	all	93	93		3,221					93
44	Dredge, Scallop	OPEN	LIM	MA	all	189	189		1,252					189
45	Dredge, Scallop	OPEN	LIM	NE	all	717	717		8,305					717
46	Trawl, Midwater	all	all	NE	sm	23	23		84					23
47	Pots and Traps, Other	OPEN	all	NE	all	3	0		21					0
48	Pots and Traps, Fish	OPEN	all	MA	all	13	13		1,027					13
49	Pots and Traps, Fish	OPEN	all	NE	all	13	13		1,064					13
50	Pots and Traps, Eel	OPEN	all	NE	all	45	0		69					0
51	Pots and Traps, Conch	OPEN	all	MA	all	12	12		572					12
52	Pots and Traps, Conch	OPEN	all	NE	all	12	12		859					12
53	Pots and Traps, Lobster	OPEN	all	MA	all	20	20		1,396					20
54	Pots and Traps, Lobster	OPEN	all	NE	all	188	188		32,977					188
55	Pots and Traps, Crab	OPEN	all	NE	all	105	105		628					105
56	Beam Trawl	OPEN	all	MA	sm	3	3		59					3
57	Beam Trawl	OPEN	all	NE	sm	3	0		13					0
58	Beam Trawl	OPEN	all	NE	lg	9	0		9					0
59	Scottish Seine	OPEN	all	MA	sm	8	8		9					8
60	Dredge, Other	OPEN	all	MA	all	16	16		271					16
61	Dredge, Other	OPEN	all	NE	all	24	0		343					0
62	Dredge, Mussel	OPEN	all	NE	all	9	9		67					9
63	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	47	47		3,166					47
64	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	19	19		1,978					19

Table 5, continued. The number of sea days needed to monitor fish/invertebrates (FISH), loggerhead turtles (TURS), combined species groups (COMBINED) by fleet (Steps 1 through 5); the number of funded sea days for April 2023 through March 2024 (Steps 6 and 7); and the differences between needed and funded days (Step 8). See Appendix Table 1 for fleet stratification abbreviations.

Fleet						Step 1	Step 2	Step 3	Step 4a	Step 4b	Step 4c	Step 4d	Step 4e	Step 5	
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed for FISH	2023 Sea Days Needed for FISH ADJUSTED	2023 Sea Days Needed for TURS	Vessel Trip Report Sea Days	% Vessel Trip Report Sea Days	% Sea Days Needed for FISH	Additional Sea Days needed for TURS	TURS Sea Days by FISH fleet	2023 Sea Days Needed COMBINED	
					Total	7,238	6,697	1,992	133,314					6,926	
	Step 6	Agency Fleets (Sea Days Needed)					5,606	5,065							5,293
		Industry Fleets (Sea Days Needed)					1,632	1,632							1,633
	Step 7	Agency Fleets (Sea Days Funded)							Prioritized						3,373
		Agency Fleets (Sea Days Funded)							Nonprioritized (MMPA and ESA) ¹⁸						561
		Industry Fleets (Sea Days Funded)													1,696
	Step 8	Agency Fleet Difference							SHORTFALL						-1,920
		Industry Fleet Difference							SURPLUS						63
		Turtle Gear Types													
						MA Trawl	1,883	1,763	1,992	12,565	229	229	1,992	1,992	
						Gillnet	709	709	0	7,100	709	0	0	709	
														Difference between taxa	
	KEY: Agency-funded fleets	Industry-funded fleets													
	Fleets identified as "erroneous"														
	Steps used in sea day allocation														
	Fleets identified as "not applicable"														

¹⁸ Marine Mammal Protection Act (MMPA); Endangered Species Act (ESA)

Table 6, continued. The 2023 sea days needed (COMBINED; Step 5) and the information used in the penultimate approach to prioritize sea days to fleets for agency-funded days that are applicable to the prioritization process (Steps 9.1 through 9.5). See Appendix Table 1 for fleet stratification abbreviations.

Fleet						Step 5	Step 9.1					Step 9.2					Step 9.3		Step 9.4	Step 9.5	
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed COMBINED	Penultimate sea days needed for the 15 species groups, in descending order with minimum pilot coverage as minimum for fleet					Sea day differences between adjacent species groups within a row (red font indicated values used in Step 9.3)					Sea day differences, in descending order with fleet constraint	Cumulative reduction of sea days	2023 Sea Days PRIORITIZED (Penultimate)	2023 Sea Days PRIORITIZED (Penultimate)	
47	Pots and Traps, Other	OPEN	all	NE	all	0	0								0					0	0
48	Pots and Traps, Fish	OPEN	all	MA	all	13	13								0					13	13
49	Pots and Traps, Fish	OPEN	all	NE	all	13	13								0					13	13
50	Pots and Traps, Eel	OPEN	all	NE	all	0	0								0					0	0
51	Pots and Traps, Conch	OPEN	all	MA	all	12	12								0					12	12
52	Pots and Traps, Conch	OPEN	all	NE	all	12	12								0					12	12
53	Pots and Traps, Lobster	OPEN	all	MA	all	20	20								0					20	20
54	Pots and Traps, Lobster	OPEN	all	NE	all	188	18								170					18	18
55	Pots and Traps, Crab	OPEN	all	NE	all	105	105								0					105	105
56	Beam Trawl	OPEN	all	MA	sm	3	3								0					3	0
57	Beam Trawl	OPEN	all	NE	sm	0	0								0					0	0
58	Beam Trawl	OPEN	all	NE	lg	0	0								0					0	0
59	Scottish Seine	OPEN	all	MA	sm	8	8								0					8	0
60	Dredge, Other	OPEN	all	MA	all	16	16								0					16	0
61	Dredge, Other	OPEN	all	NE	all	0	0								0					0	0
62	Dredge, Mussel	OPEN	all	NE	all	9	9								0					9	0
63	Dredge, Ocean Quahog/Surclam	OPEN	all	MA	all	47	25								22					47	47
64	Dredge, Ocean Quahog/Surclam	OPEN	all	NE	all	19	19								0					19	19
Total						6,926														3,373	3,373

Step 6	Agency Fleets (Sea Days Needed)	5,293	
	Industry Fleets (Sea Days Needed)	1,633	
Step 7	Agency Fleets (Sea Days Funded)	3,373	Prioritized days
	Agency Fleets (Sea Days Funded)	561	Nonprioritized days
	Industry Fleets (Sea Days Funded)	1,696	Industry-funded scallop days
Step 8	Agency Fleet Difference	-1,920	
	Industry Fleet Difference	63	
	Turtle Gear Types		
	MA Trawl	1,992	
	Gillnet	709	

KEY: Agency-funded fleets	Industry-funded fleets
Fleets identified as "erroneous"	Fleets with Northeast Fisheries Observer Program (NEFOP) Limitation
Steps used in sea day allocation	Fleets with reduction in sea days
Fleets identified as "not applicable"	

Table 7. The 2023 sea days needed to monitor the combined species groups (COMBINED), prioritized days (Step 9.5), nonprioritized days (Step 10), industry-funded scallop days (Step 11), and observer sea days allocated for April 2023 through March 2024 (Step 12) by fleet. Note: * indicates all coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); ** indicates some coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); * indicates coverage for protected species bycatch. NEFOP = Northeast Fisheries Observer Program; (MMPA) Marine Mammal Protection Act; (ESA) Endangered Species Act. See Appendix Table 1 for fleet stratification abbreviations.**

Fleet						Step 5	Step 9.5	Step 10	Step 11	Step 12	
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed COMBINED	2023 Sea Days PRIORITIZED (Penultimate)	2023 Sea Days nonprioritized (MMPA and ESA)	2023 Sea Days Industry-funded Scallop	Sea Days Allocated for April 2023 - March 2024 (TOTAL)	Comments
1	Longline, Bottom	OPEN	all	MA	all	92	92			92	Fish stock assessment support
2	Longline, Bottom	OPEN	all	NE	all	14	14			14	Fish stock assessment support **
3	Hand Line	OPEN	all	MA	all	14	14			14	Fish stock assessment support
4	Hand Line	OPEN	all	NE	all	15	15			15	Fish stock assessment support
5	Otter Trawl	OPEN	all	MA	sm	1,483	1,483			1,483	Fish stock assessment and turtle bycatch support
6	Otter Trawl	OPEN	all	MA	lg	487	256			256	Fish stock assessment and turtle bycatch support **
7	Otter Trawl	OPEN	all	NE	sm	892	425			425	Fish stock assessment support **
8	Otter Trawl	OPEN	all	NE	lg	782	276			276	Fish stock assessment support **
9	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg	0	0			0	Fleet removed (erroneous fleet)
10	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	51	51			51	Fish stock assessment support
11	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	11	11			11	Fish stock assessment support
12	Otter Trawl, Scallop	OPEN	GEN	MA	lg	22					Industry-funded scallop * (see Row 42)
13	Otter Trawl, Twin	OPEN	all	MA	sm	40	40			40	Fish stock assessment support
14	Otter Trawl, Twin	OPEN	all	MA	lg	40	40			40	Fish stock assessment support
15	Otter Trawl, Twin	OPEN	all	NE	sm	44	44			44	Fish stock assessment support
16	Otter Trawl, Ruhle	OPEN	all	MA	sm	0	0			0	Fleet removed (erroneous fleet)
17	Otter Trawl, Ruhle	OPEN	all	MA	lg	0	0			0	Fleet removed (erroneous fleet)
18	Otter Trawl, Ruhle	OPEN	all	NE	sm	0	0			0	Fleet removed (erroneous fleet)
19	Otter Trawl, Ruhle	OPEN	all	NE	lg	0	0			0	Fleet removed (erroneous fleet)
20	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	0	0			0	Fleet removed (not applicable)
21	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	94	94			94	Fish stock assessment support *
22	Otter Trawl, Shrimp	OPEN	all	MA	sm	0	0			0	Fleet removed (erroneous fleet)
23	Otter Trawl, Other	OPEN	all	MA	sm	0	0			0	Fleet removed (erroneous fleet)
24	Otter Trawl, Other	OPEN	all	MA	lg	0	0			0	Fleet removed (erroneous fleet)
25	Otter Trawl, Other	OPEN	all	NE	sm	0	0			0	Fleet removed (erroneous fleet)
26	Otter Trawl, Other	OPEN	all	NE	lg	0	0			0	Fleet removed (erroneous fleet)
27	Haul Seine, Beach	OPEN	all	NE	all	0	0			0	Fleet removed (erroneous fleet)
28	Floating Trap	OPEN	all	MA	all	0	0			0	Fleet removed (erroneous fleet)
29	Floating Trap	OPEN	all	NE	all	14	0			0	Fleet removed (NEFOP limitation)
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	13	13			13	Fish stock assessment and turtle bycatch support
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	93	93			93	Fish stock assessment and turtle bycatch support
32	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	13	13			13	Fish stock assessment and turtle bycatch support
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	7	7			7	Fish stock assessment and turtle bycatch support
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	501	18			18	Fish stock assessment and turtle bycatch support**
35	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	82	82			82	Fish stock assessment and turtle bycatch support**

Table 7, continued. The 2023 sea days needed to monitor the combined species groups (COMBINED), prioritized days (Step 9.5), nonprioritized days (Step 10), industry-funded scallop days (Step 11), and observer sea days allocated for April 2023 through March 2024 (Step 12) by fleet. Note: * indicates all coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); ** indicates some coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); * indicates coverage for protected species bycatch. NEFOP = Northeast Fisheries Observer Program; (MMPA) Marine Mammal Protection Act; (ESA) Endangered Species Act. See Appendix Table 1 for fleet stratification abbreviations.**

Fleet						Step 5	Step 9.5	Step 10	Step 11	Step 12	
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed COMBINED	2023 Sea Days PRIORITIZED (Penultimate)	2023 Sea Days nonprioritized (MMPA and ESA)	2023 Sea Days Industry-funded Scallop	Sea Days Allocated for April 2023 - March 2024 (TOTAL)	Comments
36	Purse Seine	OPEN	all	MA	all	13	0			0	Fleet removed (NEFOP limitation)
37	Purse Seine	OPEN	all	NE	all	10	10			10	Fish stock assessment support **
38	Dredge, Scallop	AA	GEN	MA	all	15			68	68	Industry-funded scallop * (Rows 38 & 40)
39	Dredge, Scallop	AA	GEN	NE	all	91			572	572	Industry-funded scallop * (Rows 39 & 41)
40	Dredge, Scallop	AA	LIM	MA	all	128					Industry-funded scallop * (see Row 38)
41	Dredge, Scallop	AA	LIM	NE	all	350					Industry-funded scallop * (see Row 39)
42	Dredge, Scallop	OPEN	GEN	MA	all	28			150	150	Industry-funded scallop * (Rows 12, 42, & 43)
43	Dredge, Scallop	OPEN	GEN	NE	all	93					Industry-funded scallop * (see Row 42)
44	Dredge, Scallop	OPEN	LIM	MA	all	189			906	906	Industry-funded scallop * (Rows 44 & 45)
45	Dredge, Scallop	OPEN	LIM	NE	all	717					Industry-funded scallop * (see Row 44)
46	Trawl, Midwater	all	all	NE	sm	23	23			23	Fish stock assessment support *
47	Pots and Traps, Other	OPEN	all	NE	all	0	0			0	Fleet removed (erroneous fleet)
48	Pots and Traps, Fish	OPEN	all	MA	all	13	13			13	Fish stock assessment support
49	Pots and Traps, Fish	OPEN	all	NE	all	13	13			13	Fish stock assessment support
50	Pots and Traps, Eel	OPEN	all	NE	all	0				0	Fleet removed (erroneous fleet)
51	Pots and Traps, Conch	OPEN	all	MA	all	12	12			12	Fish stock assessment support
52	Pots and Traps, Conch	OPEN	all	NE	all	12	12			12	Fish stock assessment support
53	Pots and Traps, Lobster	OPEN	all	MA	all	20	20			20	Fish stock assessment support
54	Pots and Traps, Lobster	OPEN	all	NE	all	188	18			18	Fish stock assessment support
55	Pots and Traps, Crab	OPEN	all	NE	all	105	105			105	Fish stock assessment support
56	Beam Trawl	OPEN	all	MA	sm	3	0			0	Fleet removed (NEFOP limitation)
57	Beam Trawl	OPEN	all	NE	sm	0	0			0	Fleet removed (erroneous fleet)
58	Beam Trawl	OPEN	all	NE	lg	0	0			0	Fleet removed (erroneous fleet)
59	Scottish Seine	OPEN	all	MA	sm	8	0			0	Fleet removed (NEFOP limitation)
60	Dredge, Other	OPEN	all	MA	all	16	0			0	Fleet removed (NEFOP limitation)
61	Dredge, Other	OPEN	all	NE	all	0	0			0	Fleet removed (erroneous fleet)
62	Dredge, Mussel	OPEN	all	NE	all	9	0			0	Fleet removed (NEFOP limitation)
63	Dredge, Ocean Quahog/Surflclam	OPEN	all	MA	all	47	47			47	Fish stock assessment support
64	Dredge, Ocean Quahog/Surflclam	OPEN	all	NE	all	19	19			19	Fish stock assessment support
	MMPA coverage							350		350	Coverage associated with Rows 30-35***
	MMPA analysis							166		166	Observer data analysis support
	ESA coverage							45		45	Coverage associated with Rows 31-32***

Table 7, continued. The 2023 sea days needed to monitor the combined species groups (COMBINED), prioritized days (Step 9.5), nonprioritized days (Step 10), industry-funded scallop days (Step 11), and observer sea days allocated for April 2023 through March 2024 (Step 12) by fleet. Note: * indicates all coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); ** indicates some coverage is dependent on industry activity (assigned via the Pre-Trip Notification System); *** indicates coverage for protected species bycatch. NEFOP = Northeast Fisheries Observer Program; (MMPA) Marine Mammal Protection Act; (ESA) Endangered Species Act. See Appendix Table 1 for fleet stratification abbreviations.

Fleet						Step 5	Step 9.5	Step 10	Step 11	Step 12	Comments
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2023 Sea Days Needed COMBINED	2023 Sea Days PRIORITIZED (Penultimate)	2023 Sea Days nonprioritized (MMPA and ESA)	2023 Sea Days Industry-funded Scallop	Sea Days Allocated for April 2023 - March 2024 (TOTAL)	
Total						6,926	3,373	561	1,696	5,630	
Step 6						Agency Fleets (Sea Days Needed) 5,293					
						Industry Fleets (Sea Days Needed) 1,633					
Step 7						Agency Fleets (Sea Days Funded) 3,373	Prioritized days			3,373	
						Agency Fleets (Sea Days Funded) 561	Nonprioritized days			561	
						Industry Fleets (Sea Days Funded) 1,696	Industry-funded scallop days			1,696	
Step 8						Agency Fleet Difference -1,920					
						Industry Fleet Difference 63					
						Turtle Gear Types					
						MA Trawl					
						Gillnet					

KEY: Agency-funded fleets	Industry-funded fleets
Fleets identified as "erroneous"	Fleets with Northeast Fisheries Observer Program (NEFOP) Limitation
Steps used in sea day allocation	Fleets with reduction in sea days
Fleets identified as "not applicable"	

Appendix Table 1. Stratification abbreviations used for 2023 fleets.

Abbreviation	Definition
NE	New England ports (RI and northward)
MA	Mid-Atlantic ports (CT and southward)
Sm	Small mesh (less than 5.50 in)
Lg	Large mesh (from 5.50 to 7.99 in for gillnet; 5.50 in and greater for trawl)
Xlg	Extra large mesh (8.00 in and greater for gillnet)
AA	Access
OPEN	Nonaccess area
GEN	General category
LIM	Limited access category

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